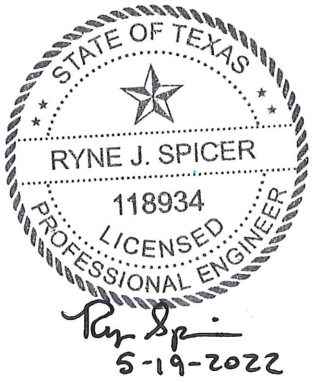
# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## VOLUME 1 OF 6




Prepared for

City of Arlington
and
Republic Waste Services of Texas, Ltd.

May 2022

Prepared by

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

Project No. 0023-404-11-104

This document is intended for permitting purposes only.

REPUBLIC SERVICES

Sustainability in Action

May 19, 2022

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

Re: City of Arlington Landfill
Major Permit Amendment Application, TCEQ Permit No. MSW-358B
Tarrant County

Dear Mr. Baker:

Please find enclosed a major permit amendment application to reconfigure the City of Arlington 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 to reconfigure the waste disposal area of the existing City of Arlington Landfill, TCEQ Permit No. MSW-358B. The permitted 382.7-acre waste disposal area will be reconfigured, resulting in a net increase of approximately 7.8 acres (from 382.7 acres to 390.5 acres). No changes will be made to the existing 774.3-acre permit boundary. The maximum permitted final cover elevation will remain unchanged at 759 ft-msl. The City of Arlington Landfill has provided for the municipal solid waste (MSW) disposal needs of Tarrant County and surrounding areas for over 40 years. This major permit amendment will ensure that this critical service will continue for the landfill's service area.

Republic Waste Services of Texas, Ltd. (a Republic Services company) and the City of Arlington are fully committed to operating the City of Arlington 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 an questions, please do not hesitate to contact me by phone (903-539-4065) or email (ahart2@republicservices.com).

Sincerely,

Adam Hart
Environmental Manager

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

cc: Duncan Norton, Lloyd Gosselink Rochelle & Townsend, P.C.
Ryne Spicer, P.E., Weaver Consultants Group, LLC

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION
## VOLUME 1 OF 6

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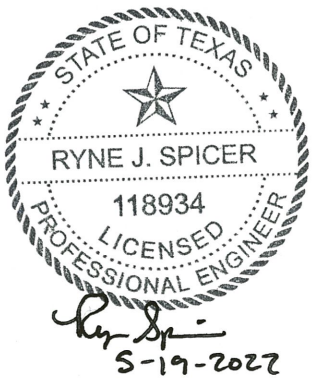
**PARTS I/II – GENERAL APPLICATION REQUIREMENTS**

**PART III – SITE DEVELOPMENT PLAN**

Site Development Plan Narrative
Appendix IIIA – Landfill Unit Design Information







# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
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## MAJOR PERMIT AMENDMENT APPLICATION

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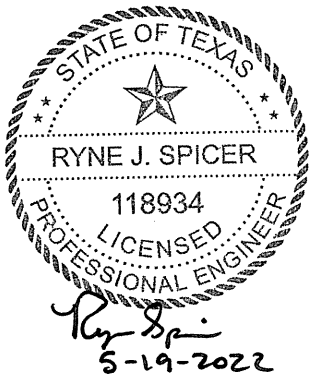


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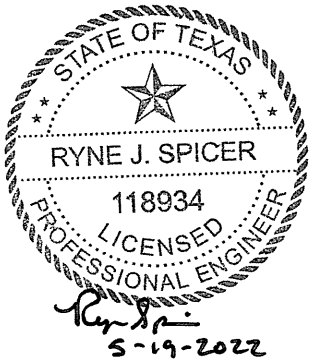


# CITY OF ARLINGTON LANDFILL
# MAJOR PERMIT AMENDMENT APPLICATION
# TCEQ PERMIT NO. MSW-358C

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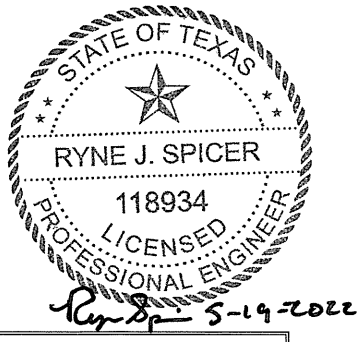



| | |
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# CITY OF ARLINGTON LANDFILL
# MAJOR PERMIT AMENDMENT APPLICATION
# TCEQ PERMIT NO. MSW-358C

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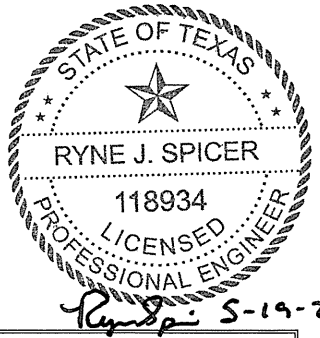



| | |
|---|---|
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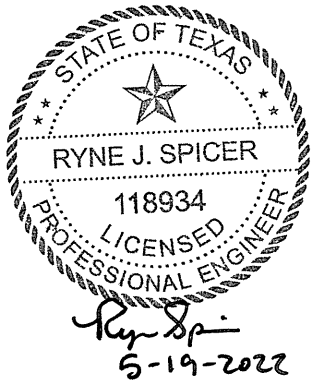
# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

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

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# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

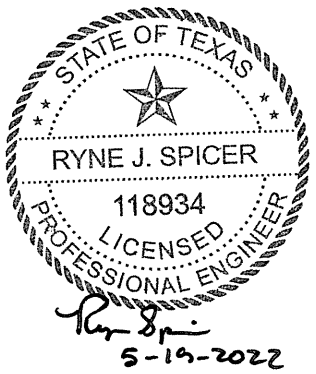
## MAJOR PERMIT AMENDMENT APPLICATION
## TCEQ PART I APPLICATION FORM, CORE DATA FORM, AND MAILING LABELS

## CONTENTS

**PART I FORM**

**CORE DATA FORM**

**MAILING LABELS (on CD)**



**Facility Name: City of Arlington Landfill**
**Permittee/Registrant Name: City of Arlington**
**MSW Authorization #:358C**
**Initial Submittal Date: 05/2022**
**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: **582EA000493765**

### 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://**www.ftwweaverboos.com**

## 6. Application Publishing

Party Responsible for Publishing Notice:

☐ Applicant ☐ Agent in Service ☒ Consultant

Contact Name: **Ryne Spicer** Title: **Project Director**

## 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: **Arlington Public Library – Northeast Branch**

Physical Address: **1905 Brown Blvd.**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76006**

(Area code) Telephone Number: **817-459-6900**

## 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) TCEQ Air Quality Permit and Registration | ☒ | ☐ | ☐ |
| Other (describe) Petroleum Storage Tank Registration | ☒ | ☐ | ☐ |
| Other (describe) | ☐ | ☐ | ☐ |
| Other (describe) | ☐ | ☐ | ☐ |

## 12. General Facility Information

Facility Name: **City of Arlington Landfill**

Contact Name: **Adam Hart** Title: **Team Environmental Manager**

MSW Authorization No. (if available): **358C**

Regulated Entity Reference No. (if issued)*: RN**102336039**

Physical or Street Address (if available): **800 Mosier Valley Road**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76040**

(Area Code) Telephone Number: **817-354-2306**

Latitude (Degrees, Minutes Seconds): **N 32° 48′ 27.05″**

Longitude (Degrees, Minutes Seconds): **W 97° 06′ 04.97″**

Benchmark Elevation (above mean sea level): **475.05** ft.

Provide a description of the location of the facility with respect to known or easily identifiable landmarks: **At the southwest corner of FM 157 (North Collins Street) and Mosier Valley Road, between SH 183 (to the north) and Green Oaks Blvd. (to the south).**

Detail access routes from the nearest United States or state highway to the facility: **From Interstate 30, north on FM 157 approximately 4 miles to Mosier Valley Road, left on Mosier Road to landfill entrance.**

*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):
☐ Other (specify):
☐ 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 is secure authorization to reconfigure the existing City of Arlington Landfill. The resulting capacity increase is approximately 15,910,900 cubic yards. This Major Permit Amendment will provide for the long-term disposal needs of City of Arlington and surrounding communities.**

## 17. Facility Contact Information

**Site Operator (Permittee/Registrant) Name: City of Arlington**

Customer Reference No. (if issued)*: CN**600131791**

Contact Name: **Sunanda Katragadda** Title: **Environmental Services Administrator**

Mailing Address: **801 W. Main Street, Mail Stop 01-0370**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76010**

(Area Code) Telephone Number: **817-459-6220**

Email Address: **Sunanda.katragadda@arlingtontx.gov**

TX Secretary of State (SOS) Filing Number:

*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]: Republic Waste Services of Texas, Ltd.**

Customer Reference No. (if issued)*: **600132534**

Contact Name: **Adam Hart** Title: **Team Environmental Manager**

Mailing Address: **1212 Harrison Ave.**

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

(Area Code) Telephone Number: **817-317-2047**

Email Address: **ahart2@republicservices.com**

TX SOS Filing Number: **0012916510**

[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**

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

Contact Name: **Ryne Spicer, P.E.** Title: **Project Director**

Mailing Address: **6420 Southwest Blvd., Suite 206**

City: **Fort Worth** County: **Tarrant** State: **Texas** Zip Code: **76040**

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

Email Address: **rspicer@wcgrp.com**

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

Mailing Address:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email 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:

## 20. Other Governmental Entities Information

**Texas Department of Transportation District: Fort Worth District, #2**

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: **Texas** Zip Code: **76133**

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

Email Address: **Not Available**

**The Local Governmental Authority Responsible for Road Maintenance (if applicable): City of Arlington Public Works and Transportation**

Contact Person's Name: **Bill Bateman**

Street Address or P.O. Box: **101 W. Abram Street, P.O. Box 90231**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76004**

(Area Code) Telephone Number: **817-459-5435**

Email Address: **publicworks@arlingtontx.gov**

**City Mayor Information**

City Mayor's Name: **Jim Ross**

Office Address: **101 W. Abram Street, P.O. Box 90231**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76004**

(Area Code) Telephone Number: **817-459-6121**

Email Address: **Not Available**

**City Health Authority: Public Health Department, City of Arlington**

Contact Person's Name: **Aimee Rockhill-Carpenter, Manager**

Street Address or P.O. Box: **101 W. Abram Street**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76010**

(Area Code) Telephone Number: **817-459-6656**

Email Address: **Not Available**

**County Judge Information**

County Judge's Name: **B. Glen Whitley**

Street Address or P.O. Box: **100 E. Weatherford St., #501**

City: **Fort Worth** County: **Tarrant** State: **Texas** Zip Code: **76010**

(Area Code) Telephone Number: **817-459-6656**

Email Address: **Not Available**

**County Health Authority: Tarrant County Public Health**

Contact Person's Name: **Catherine Colquitt, MD**

Street Address or P.O. Box: **1101 S. Main Street**

City: **Fort Worth** County: **Tarrant** State: **Texas** Zip Code: **76104**

(Area Code) Telephone Number: **817-321-4700**

Email Address: **Not Available**

**State Representative Information**

District Number: **92**

State Representative's Name: **Jeff Cason**

District Office Address: **1600 Airport Freeway, Suite 334**

City: **Bedford** County: **Tarrant** State: **Texas** Zip Code: **76022**

(Area Code) Telephone Number: **512-463-0522**

Email Address: **jeff.cason@house.texas.gov**

**State Senator Information**

District Number: **9**

State Representative's Name: **Kelly Hancock**

District Office Address: **9121 Belshire Drive, Suite 200**

City: **North Richland Hills** County: **Tarrant** State: **Texas** Zip Code: **76182**

(Area Code) Telephone Number: **817-514-3804**

Email Address: **Not Available**

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

COG Representative's Name: **Mike Eastland**

COG Representative's Title: **Executive Director**

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

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

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

Email Address: **Not Available**

**River Basin Authority Name: Trinity River Authority**

Contact Person's Name: **Kevin Ward, General Manager**

Watershed Sub-Basin Name: **Johnson Creek – West Fork Trinity River**

Street Address or P.O. Box: **P.O. Box 60**

City: **Arlington** County: **Tarrant** State: **Texas** Zip Code: **76004**

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

Email Address: **Not Available**

**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: **City of Arlington**

Within Extraterritorial Jurisdiction of:

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, Sunanda Katragadda, Environmental Services Administrator,
(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: _____ Date: 5/19/22

---

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 Sunanda Katragadda
On this 19th day of May, 2022
My commission expires on the 1st day of September, 2025
Stephanie Dimas
Notary Public in and for
Tarrant County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)

STEPHANIE DIMAS
Notary Public, State of Texas
Comm. Expires 09-01-2025
Notary ID 129000418

## Part I Attachments

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

| **Required Attachments** | **Attachment No.** |
|---|---|
| Supplementary Technical Report | **Parts I/II Section 2** |
| Property Legal Description | **Parts I/II Section 13** |
| Property Metes and Bounds Description | **Parts I/II Section 13** |
| Facility Legal Description | **Parts I/II Section 13** |
| Facility Metes and Bounds Description | **Parts I/II Section 13** |
| Metes and Bounds Drawings | **Parts I/II Section 13** |
| On-Site Easements Drawing | **Parts I/II Section 13** |
| Land Ownership Map | **Parts I/II Section 5** |
| Land Ownership List | **Parts I/II Section 5** |
| Electronic List or Mailing Labels | **Provided in CD** |
| Texas Department of Transportation (TxDOT) County Map | **Parts I/II Section 4** |
| General Location Map | **Parts I/II Section 4** |
| General Topographic Map | **Parts I/II Section 4** |
| Verification of Legal Status | **Parts I/II Section 15** |
| Property Owner Affidavit | **Parts I/II Section 14** |
| Evidence of Competency | **Parts I/II Section 16** |

**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 **Major Permit Amendment**

| 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 600131791 | | RN 102336039 |

## SECTION II: Customer Information

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

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

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

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

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

| 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: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 801 W. Main Street | | | | | | | |
| | Mail Stop 01-0370 | | | | | | | |
| | City | Arlington | State | TX | ZIP | 76010 | ZIP + 4 | 7102 |

| 16. Country Mailing Information *(if outside USA)* | 17. E-Mail Address *(if applicable)* |
|---|---|
| | sunanda.katragadda@arlingtontx.gov |

| 18. Telephone Number | 19. Extension or Code | 20. Fax Number *(if applicable)* |
|---|---|---|
| ( 817 ) 459-6220 | | ( ) - |

## 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.)*

City of Arlington Landfill

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **23. Street Address of the Regulated Entity:** *(No PO Boxes)* | 800 Mosier Valley Road | | | | | | | |
| | **City** | Arlington | **State** | TX | **ZIP** | 76040 | **ZIP + 4** | 2113 |
| **24. County** | Tarrant | | | | | | | |

**Enter Physical Location Description if no street address is provided.**

| | | | | | |
|---|---|---|---|---|---|
| **25. Description to Physical Location:** | | | | | |
| **26. Nearest City** | | | **State** | | **Nearest ZIP Code** |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **27. Latitude (N) In Decimal:** | 32.8075 | | **28. Longitude (W) In Decimal:** | -97.1014 | |
| Degrees | Minutes | Seconds | Degrees | Minutes | Seconds |
| 32 | 48 | 27.05 | -97 | 06 | 04.97 |

| | | | |
|---|---|---|---|
| **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 | | | |

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

Disposal of Municipal Solid Waste

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **34. Mailing Address:** | **801 W. Main Street** | | | | | | | |
| | **Mail Stop 01-0370** | | | | | | | |
| | **City** | **Arlington** | **State** | **TX** | **ZIP** | **76010** | **ZIP + 4** | **7102** |
| **35. E-Mail Address:** | **sunanda.katragadda@arlingtontx.gov** | | | | | | | |

| | | |
|---|---|---|
| **36. Telephone Number** | **37. Extension or Code** | **38. Fax Number** *(if applicable)* |
| **( 817 ) 459-6220** | | **( ) -** |

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

| | | | | |
|---|---|---|---|---|
| ☐ Dam Safety | ☐ Districts | ☐ Edwards Aquifer | ☐ Emissions Inventory Air | ☐ Industrial Hazardous Waste |
| | | | | |
| ☒ Municipal Solid Waste | ☐ New Source Review Air | ☐ OSSF | ☐ Petroleum Storage Tank | ☐ PWS |
| 358C | | | | |
| ☐ Sludge | ☐ Storm Water | ☐ Title V Air | ☐ Tires | ☐ Used Oil |
| | | | | |
| ☐ Voluntary Cleanup | ☐ Waste Water | ☐ Wastewater Agriculture | ☐ Water Rights | ☐ Other: |
| | | | | |

## SECTION IV: Preparer Information

| | | | |
|---|---|---|---|
| **40. Name:** | Weaver Consultants Group/Ryne Spicer, P.E. | **41. Title:** | Project Director |

| | | | |
|---|---|---|---|
| **42. Telephone Number** | **43. Ext./Code** | **44. Fax Number** | **45. E-Mail Address** |
| ( 817 ) 735-9770 | | ( ) - | rspicer@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:** | City of Arlington | **Job Title:** | Environmental Services Administrator |
| **Name** *(In Print):* | Sunanda Katragadda | **Phone:** | ( 817 ) 459- **6220** |
| **Signature:** | | **Date:** | 5/19/22 |

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## PARTS I/II
## GENERAL APPLICATION REQUIREMENTS







Prepared for:

City of Arlington
and
Republic Waste Services of Texas, Ltd.

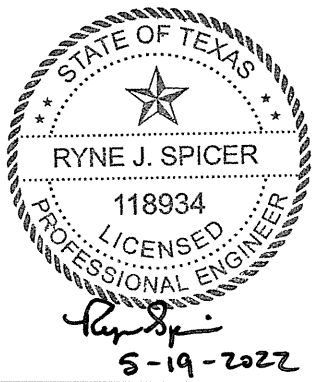
May 2022

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. 0023-404-11-104

This document intended for permitting purposes only.

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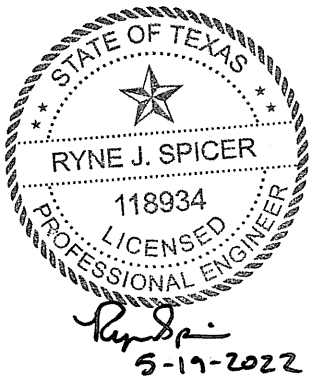


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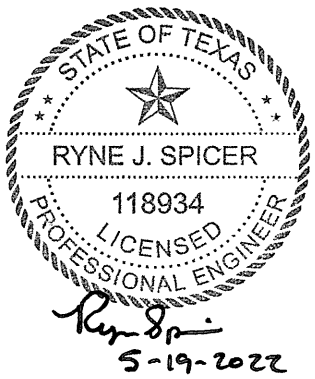


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- Unstable Areas
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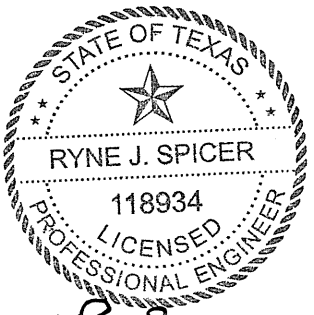


5-19-2022

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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

GCL – geosynthetic clay liner

GLER – Geomembrane Liner Evaluation Report

GWSAP – Groundwater Sampling and Analysis Plan

HDPE – high density polyethylene

LCS – leachate collection system

LF – landfill

## LIST OF ACRONYMNS (Continued)

LFG – landfill gas

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

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

NCTCOG – North Central Texas Council of Governments

PSD – Prevention of Significant Deterioration

PVI – point of vertical intersection

## LIST OF ACRONYMNS (Continued)

QA/QC – quality assurance/quality control

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

USDA – U.S. Department of Agriculture

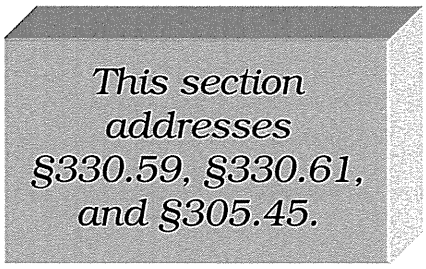
USACE – U.S. Army Corps of Engineers

USGS – 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 to reconfigure the waste disposal area of the existing City of Arlington Landfill, TCEQ Permit No. MSW-358B. The permitted 382.7-acre waste disposal area will be reconfigured, resulting in a net increase of approximately 7.8 acres (from 382.7 acres to 390.5 acres). No changes will be made to the 774.3-acre existing permit boundary. The maximum permitted final cover elevation will remain unchanged at 759 ft-msl. The landfill reconfiguration results in a capacity increase of 15,910,900 cubic yards (refer to Section 2.1 for a detailed project overview). This major permit amendment will provide for the long term disposal needs of Tarrant County and surrounding areas.

The City of Arlington Landfill has provided for the municipal solid waste (MSW) disposal needs of Tarrant County and surrounding areas for over 40 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 City of Arlington 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 City of Arlington Landfill is an existing Type I municipal solid waste (MSW) facility (TCEQ Permit No. MSW-358B). The landfill is located west of Farm-to-Market (FM) 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. The facility property is bounded by the former roadbed of FM 157 to the east, Mosier Valley Road and the Trinity Railway Express (TRE) railroad line to the north, undeveloped property to the west, and the West Fork Trinity River to the south.

*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).*

A general site map is provided on Figure I/II-4.1.

### Owner and Operator

The existing landfill is owned by the City of Arlington and operated by Republic Waste Services of Texas, Ltd., which is a corporation qualified to do business in Texas. Republic Waste Services of Texas, Ltd. is an indirect, wholly-owned subsidiary of Republic Services, Inc. (Republic). Republic is one of the leading solid waste management companies in the nation. For over 40 years, the landfill has been a part of the community and is the main recipient of waste from the residents and businesses in the City of Arlington and surrounding communities.

### Major Permit Amendment Summary

The purpose of this Major Permit Amendment is to secure authorization to reconfigure the permitted waste disposal footprint at the existing City of Arlington Landfill. Comparisons between (1) the existing permitted and proposed landfill

completion plans and (2) the existing permitted and proposed top of liner plans are shown on Figure I/II-2.1 and Figure I/II-2.2, respectively.

The facility serves residences and businesses in the City of Arlington and surrounding communities. 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-358C will be the same as those currently accepted at the site.

### 2.1.1 Waste Acceptance Plan

The City of Arlington 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 within the City of Arlington and surrounding communities. The proposed reconfiguration 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 City of Arlington 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 (note that not all of the special wastes listed in §330.3(148) will be accepted at this site – refer to Part IV for additional information).

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

Waste will only be disposed of in the 390.5-acre proposed solid waste disposal area described in this permit application. No other waste disposal activities will occur within the 774.3-acre City of Arlington 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-358B | Permit No. MSW-358C |
| Consumed Airspace | 34,085,447 cy | 34,085,447 cy |
| Remaining Airspace | 45,672,100 cy | 61,583,000 cy |
| Airspace Gained by Expansion | --- | 15,910,900 cy |
| **Total Capacity** | **79,757,547 cy** | **95,668,447 cy** |

[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 November 16, 2020.

## Disposal Rate Projections

The disposal rate estimate is based on Republic Waste Services of Texas, Ltd.'s knowledge of market conditions, both currently and after the permit is issued.

The disposal rate projections are discussed in detail in Appendix IIIM 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 (years) |
|---|---|---|---|---|
| 1,043,900 tons/year<br>3,650 tons/day | 1,298,726 tons/year<br>4,541 tons/day | 1,537,173 tons/year<br>5,375 tons/day | 1,865,142 | 33.4 |

Republic Waste Services of Texas, Ltd.'s estimate for 2021 waste inflow is approximately 1,043,900 tons per year (3,650 tons per day based on a 286-day operating schedule). After 2021, 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) |
|---|---|
| 2022 | 1,072,181 |
| 2023 | 1,086,607 |
| 2024 | 1,101,227 |
| 2025 | 1,116,044 |
| 2026 | 1,131,061 |
| 2027 | 1,146,279 |
| 2028 | 1,161,703 |

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

### 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 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 geomembrane liner, and drainage geocomposite). The overliner system that will separate the existing waste in the pre-subtitle D waste disposal area and the Subtitle D disposal area will consist of a geosynthetic clay liner (GCL), a 40-mil LLDPE geomembrane liner, and a drainage geocomposite layer. A generalized detail of the containment system for the City of Arlington Landfill is shown in Figure 2.1. 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.

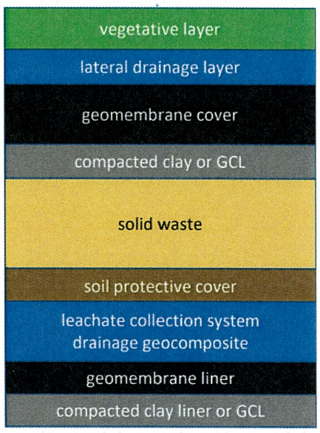



*Figure 2.1. The composite liner and cover systems will be designed to meet or exceed all state and federal regulations.*

### 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 existing permit boundary (TCEQ Permit No. MSW-358B) will not change and includes an area of 774.3 acres. 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-358B) = 45,672,100 cubic yards (as of November 16, 2020).
  - Increase due to major permit amendment application = 15,910,900 cubic yards.
  - Remaining capacity of the site with the major permit amendment (TCEQ Permit No. MSW-358C) = 61,583,000 cubic yards (as of November 16, 2020).
- The maximum elevation of the final cover will be 759 ft-msl, and the maximum waste elevation will be 757 ft-msl.
- The elevation of the deepest excavation (referred to as EDE) will be 424.5 ft-msl (i.e., bottom of underdrain system in deepest sump), which is the same as the currently approved EDE. This elevation represents the bottom of the underdrain sump elevation.
- A Subtitle D composite liner (2-foot-thick 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. A GCL may be used in lieu of the compacted clay liner. Details for the liner and LCS are provided in Part III, Appendix IIIA-A.
- This application includes a composite overliner system to be constructed over the pre-Subtitle D portion of the landfill. A containment system design for this area is provided to meet the point of compliance (POC) requirements listed in Title 30 TAC §330.331(a)(1). The composite overliner system consists of a 1-foot-thick foundation layer, GCL, 40-mil LLDPE geomembrane, drainage geocomposite leachate collection layer, and 2-foot-thick protective layer. Details for the overliner system are provided in Part III, Appendix IIIA. 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 the Landfill Completion Plan. Side fill slopes will not exceed 25 percent 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 five percent maximum slope.

- A final cover system will be constructed over the filled waste material, as shown in Part III, Appendix IIIA-A. The final cover system is designed to minimize stormwater infiltration.
- The major permit amendment includes numerous drainage improvements to the existing permitted drainage system design. The final cover erosion control structures and perimeter channel system have been redesigned 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 relocation of Hurricane Creek, 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.

### 2.1.5 Site Monitoring Systems

To verify the integrity of the environmental protection systems, the following existing and proposed landfill monitoring systems will be installed and/or 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 and proposed groundwater monitoring system.

  The existing permitted groundwater monitoring network design (TCEQ Permit No. 358B) includes two point of compliance (POC) systems. An abbreviated POC comprised of eight monitor wells (MW-8, MW-9, MW-10, MW-18, MW-19, MW-20, MW-21, and MW-24) is designed to monitor groundwater along the southern extent of historical waste fill areas. This POC is herein referred to as the Historical Waste Point of Compliance (HWPOC). The HWPOC is an interim system that is permitted for removal following the completion of waste relocation in accordance with the facility's Waste Relocation Plan (refer to Site Operating Plan). Seven of the eight permitted HWPOC wells are currently installed (MW-8, MW-9, MW-10, MW-18, MW-19, MW-20, and MW-21). One permitted HWPOC well (MW-24) is scheduled to be installed in the near future.

  The second permitted POC serves to monitor groundwater along the permitted limits of waste with monitor wells scheduled to be installed in phases as the landfill develops. This POC constitutes the facility's final POC at full build-out and is herein referred to as the Final POC.

  The existing permitted HWPOC and Final POC are supported by four background monitor wells located hydraulically upgradient of the landfill unit. These include three existing background monitor wells (MW-1, 2, and 11) and

one background monitor well scheduled for future installation as the landfill develops (MW-41).

- **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 twenty-six gas probes located along the existing permit boundary. As a result of the proposed major permit amendment, existing LFG monitoring probes, GP-1 and GP-28 will be redrilled, and 16 existing and 8 permitted LFG monitoring probe locations will remain in-place. In addition, existing 11 trench vents will remain in-place as well. The existing two monitoring probes, GP-1 and GP-28 will be abandoned and redrilled to allow for future filling and site operations. At landfill completion, the monitoring network will consist of twenty-six (26) LFG monitoring probes and eleven (11) trench vents. The landfill gas monitoring system is discussed in more detail in Part III, Appendix III I.
- **Texas Pollutant Discharge Elimination System (TPDES) Compliance –** A comprehensive Storm Water Pollution Prevention Plan (SWPPP) has been developed for the facility and is maintained with the site operating record. The SWPPP sets forth the erosion protection, monitoring, and recordkeeping requirements for surface water runoff from the facility. The SWPPP is updated as required by regulation or by changes in site operations, as set forth in the TPDES requirements.

### 2.1.6 Site Operations

The City of Arlington Landfill is now and will continue to be operated by trained and TCEQ-certified personnel. The site operating plan (SOP) for the City of Arlington 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. The active landfill area will be covered each evening with soil or an approved ADC to prevent potential nuisance conditions such as odors and vectors.

As discussed in Part IV – SOP, the site will have the option to operate and accept waste 24 hours per day, seven days per week. Hours of operation and waste acceptance may vary within a 24-hour period depending on incoming volumes of waste. Refer to Section 4.3 of Part IV – SOP for more information.

## 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. The Historical Commission concluded that no historic properties will be affected by the proposed expansion.

## 2.4 North Central Texas Council of Governments

The reconfiguration of the City of Arlington Landfill is consistent with the North Central Texas Council of Governments' (NCTCOG) Regional Solid Waste Plan. The City of Arlington 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. A letter documenting that Parts I/II were submitted to the NCTCOG is provided in Appendix I/IIB.

## 2.5 Abandoned Oil and Water Wells

A January 2022 search for water wells within a one-mile radius of the site conducted by GeoSearch included a review of records from the Texas Water Development Board, the TCEQ, and other database records (refer to Appendix IIIG for more information). No groundwater wells exist within the permit boundary (see Figure I/II-4.2). 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.

If an abandoned water well is located within the permit boundary 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. As the site is developed, if any wells are encountered, the wells will be plugged in accordance with all applicable rules and regulations of the TCEQ, the Railroad Commission of

Texas, or other applicable state agency and written certification provided to the Executive Director within 30 days after the plugging is complete.

If crude oil, natural gas wells, or other wells associated with mineral recovery that are under the jurisdiction of the Railroad Commission of Texas are located within the permit boundary during the course of site development, within 30 days after the plugging of any such well, the Landfill Manager will provide the Executive Director of the TCEQ with written notice and shall provide to the Executive Director with certification that all such wells have been properly plugged, capped, and closed in accordance with all applicable rules and regulations of the Railroad Commission of Texas within 30 days after the plugging is complete.

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 §330.161(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

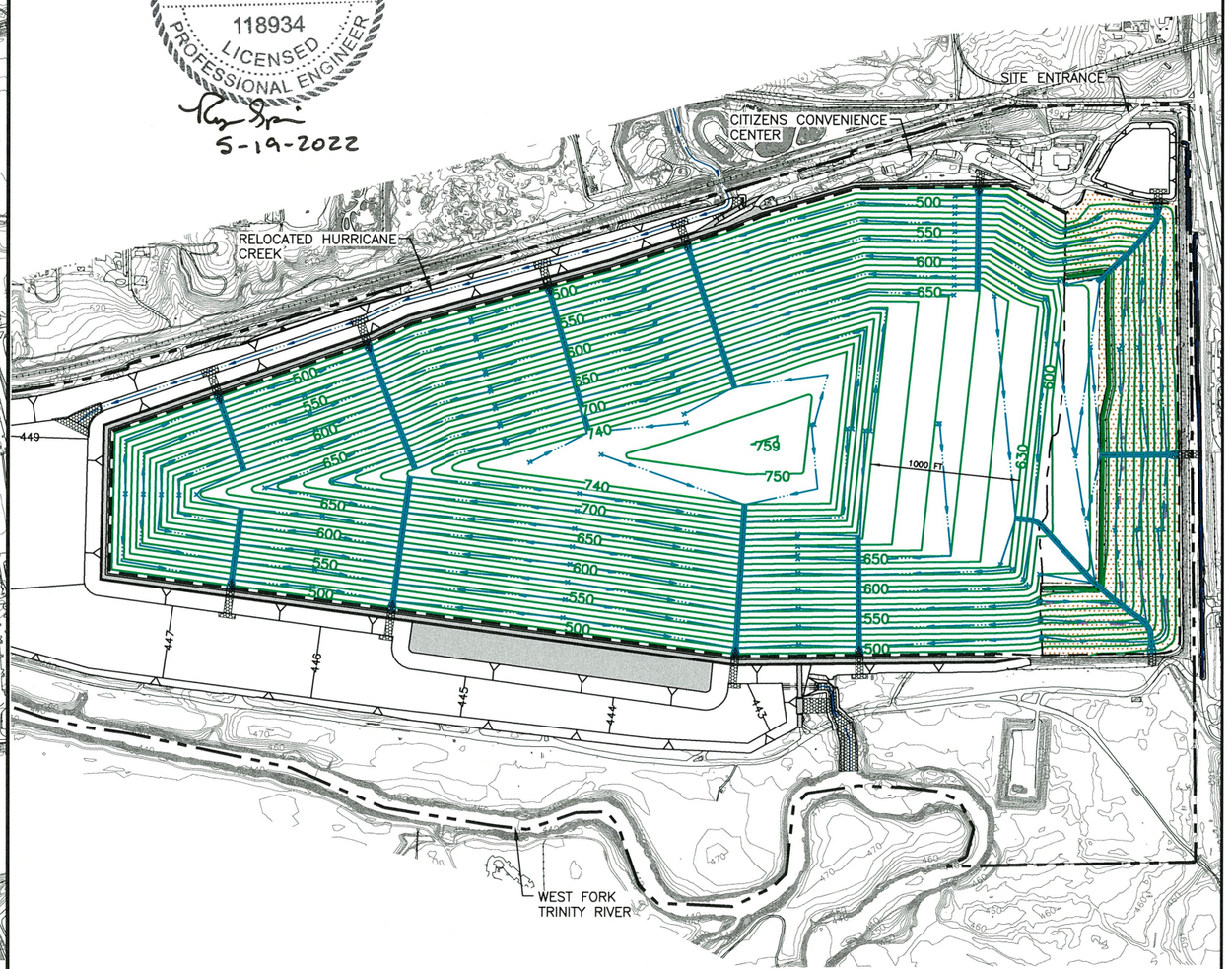
In accordance with Title 30 TAC §305.45(a)(7), the existing permits and authorizations for the facility are summarized below in Table 2-3.

# 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/IIF for more information. |
| 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 | | 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. 81884 issued March 21, 2021. In addition, the landfill is authorized by a Title V General Operating Permit (Permit No. O-02374) issued on April 11, 2022. The Title V Permit and air authorizations will be updated and revised, when needed. |
| Other Environmental Permits | Petroleum Storage Tank Registration | ID Type: Registration; ID Number: 13145; ID Status: Active |




## PERMITTED LANDFILL COMPLETION PLAN
## (TCEQ PERMIT NO. MSW-358B)




## PROPOSED LANDFILL COMPLETION PLAN
## (TCEQ PERMIT NO. MSW-358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- EXISTING FINAL COVER

N

0 500 1000
SCALE IN FEET

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GENERAL INFORMATION

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW-358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW-358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT-MSL) | 740 (FT-MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT-MSL) | 759 (FT-MSL) |

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 05/2022
FILE: 0023-404-11
CAD:\II-2.1 FINAL COVER COMPARISON.DWG
DRAWN BY: SRF
DESIGN BY: RJS
REVIEWED BY: JAE

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |

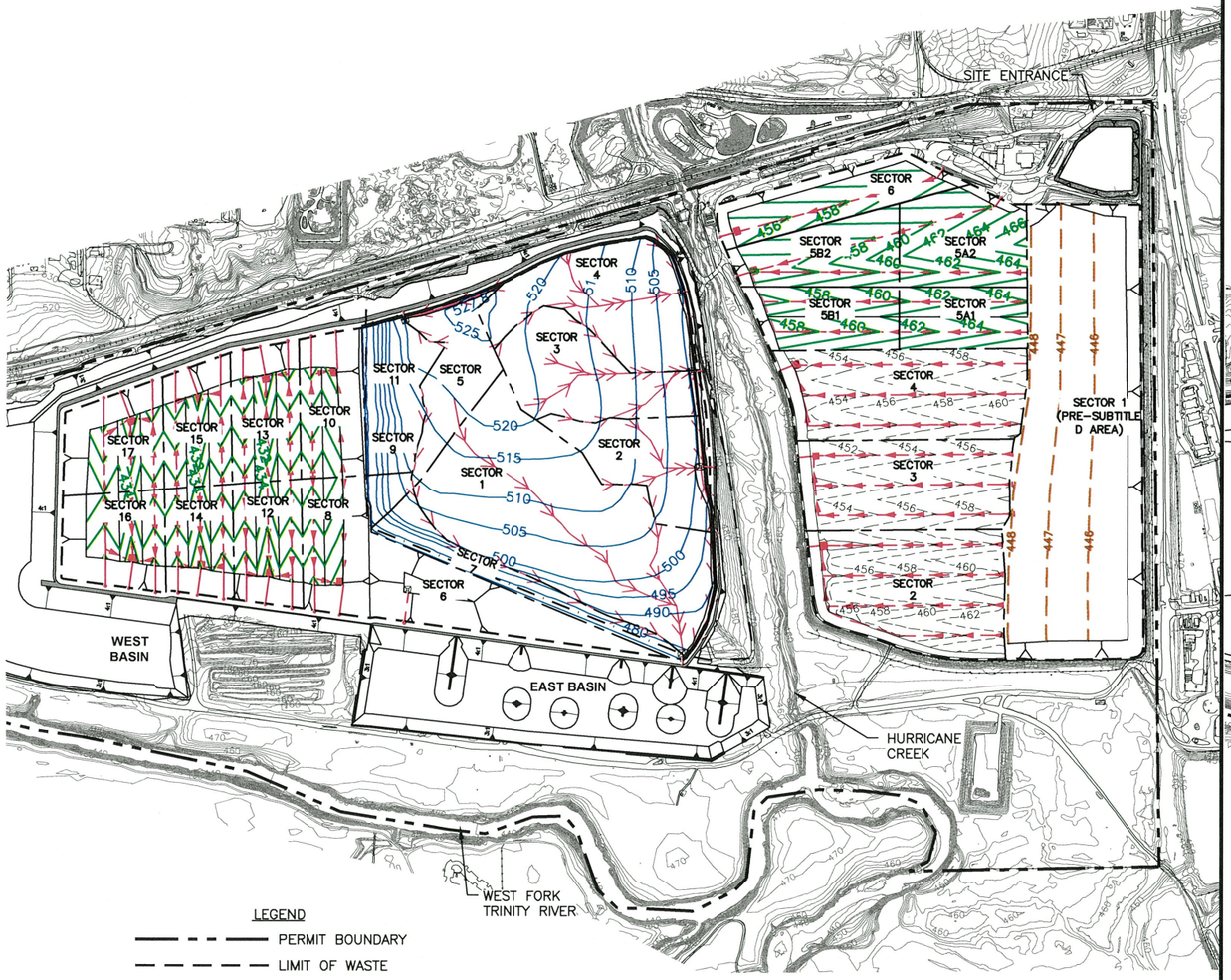
MAJOR PERMIT AMENDMENT
EXISTING AND PROPOSED
LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

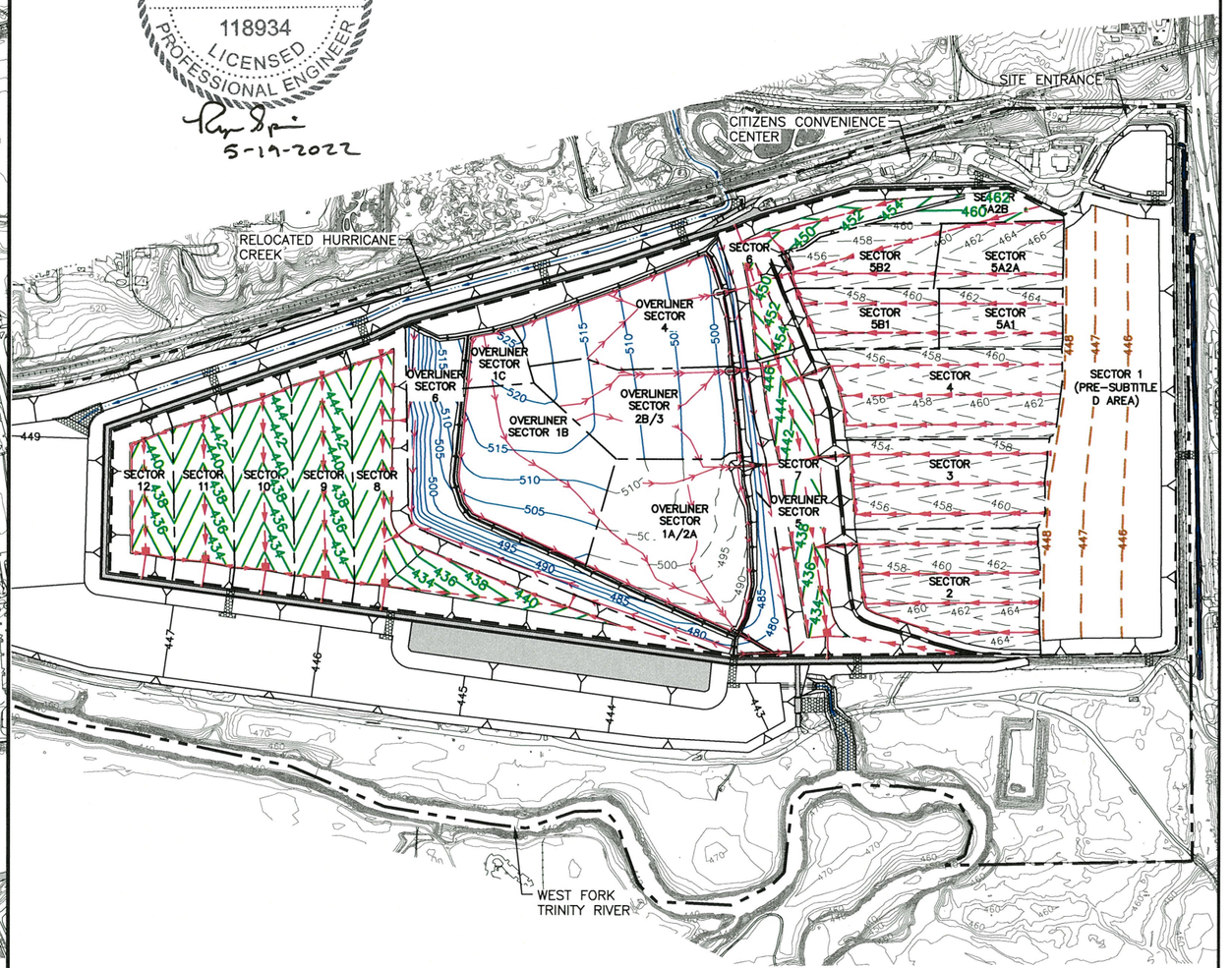
WWW.WCGRP.COM

FIGURE II-2.1

0:\0023\404\EXPANSION 2021\PARTS I-II\2.1-FINAL COVER COMPARISON.dwg, jwilson, 1:2




## PERMITTED TOP OF LINER PLAN
## (TCEQ PERMIT NO. MSW-358B)




## PROPOSED TOP OF LINER PLAN
## (TCEQ PERMIT NO. MSW-358C)

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 430 TOP OF LINER CONTOUR
- 520 TOP OF OVERLINER CONTOUR
- 510 AS-BUILT TOP OF LINER CONTOUR
- 448 APPROXIMATE TOP OF PRE-SUBTITLE D LINER
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)

N

0 500 1000
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

**GENERAL INFORMATION**

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW-358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW-358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT-MSL) | 740 (FT-MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT-MSL) | 759 (FT-MSL) |

STATE OF TEXAS
RYNE J. SPICER
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DRAWN BY: SRF
DESIGN BY: RJS
REVIEWED BY: JAE

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

MAJOR PERMIT AMENDMENT
EXISTING AND PROPOSED
TOP OF LINER PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE I/II-2.2

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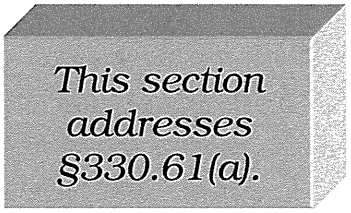
O:\0023\404 EXPANSION 2021\PARTS I-II\2.2-LINER COMPARISON.dwg, jwilson, 1:2

# 3 EXISTING CONDITIONS SUMMARY

## 3.1 Site History




The site is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) within the corporate limits of the City of Arlington in Tarrant County. A site plan showing the site as it existed on November 18, 2020 is provided on Figure I/II-3.1.

The site was originally permitted as a landfill under Texas Department of Health (TDH) Permit No. 358 in 1978. The site was upgraded to Subtitle D standards in 1994. The City of Arlington Landfill is currently comprised of two separate disposal areas, the East Disposal Area (EDA) and the West Disposal Area (WDA), which are separated by Hurricane Creek. The WDA began operation in 1978 and continued until waste disposal activities were moved to the EDA in 1999 following the construction of final cover on the WDA. TCEQ Permit No. MSW-358B expanded the landfill horizontally (WDA) and vertically including authorization of an overliner system for the WDA pre-Subtitle D portion of the facility. As part of this permit amendment application, Hurricane Creek will be relocated west around the WDA and the two separate areas (WDA and EDA) will be combined.

As part of this major permit ament application, two historic waste fill areas, located south of the WDA pre-Subtitle D area and along Hurricane Creek, will be relocated to the main disposal area within the City of Arlington Landfill. The estimated limits are based on previous subsurface investigations for the facility and visual observations. The waste relocation plan is discussed in Part III, Appendix IIIA, Section 6, and the waste relocation procedure is discussed in Part IV – SOP, Section 4.25.

## 3.2 Existing Liner Systems

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 185.5 acres of pre-Subtitle D area and 97.6 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 Areas

Figure I/II-3.1 shows the location of the pre-Subtitle D areas. The existing pre-Subtitle D liner areas include the West Disposal Area (WDA) unit, which is approximately 128 acres, and Sector 1 of the East Disposal Area (EDA) unit, which is approximately 57.5 acres. Since 1970, the Texas State Board of Health MSW Regulations required that a natural or artificial barrier be in place, which most commonly was the placement of a 3-foot-thick compacted clay or in-situ clay liner ($k<1x10^{-7}$ cm/s). The Texas Department of Health (TDH) permit for the site was issued in March 1978 (Permit No. 358). Detailed liner requirements were listed in this permit for either a 3-foot-thick low-permeability compacted clay or in-situ liner ($k<1x10^{-7}$ cm/s).

### 3.2.2 Subtitle D Lined Areas

Sectors 2 through 5 and Overliner Sector 1A/2A were constructed to Subtitle D standards, under Permit No. MSW-358 through MSW-358B. Sectors 2 through 5 was constructed with a liner system consisting of 2 feet of compacted clay liner, 60-mil HDPE geomembrane liner, drainage geocomposite, and a protective cover layer. Overliner Sector 1A/2A was constructed with a liner system consisting of a 12-inch-thick foundation layer, reinforced geosynthetic clay liner, 40-mil LLDPE geomembrane liner, drainage geocomposite, and a protective cover layer.

### 3.2.3 Existing Leachate Collection System

The existing Subtitle D lined areas were constructed with a geocomposite leachate collection layer. 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 collection sumps. Leachate from the leachate collection sumps is pumped via a leachate forcemain to leachate storage tanks.

## 3.3 Groundwater Monitoring System

The existing Subtitle D groundwater monitoring system was approved in 2014 with the issuance of Permit No. MSW-358B. The existing currently installed groundwater monitoring network consists of 19 point of compliance (POC) monitor wells (MW-3, MW-8, MW-9, MW-10, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-23, MW-25, MW-26, MW-27, MW-42, MW-43, MW-44, and MW-45) and three background monitor wells (MW-1, MW-2, and MW-11).

## 3.4 Landfill Gas Monitoring System

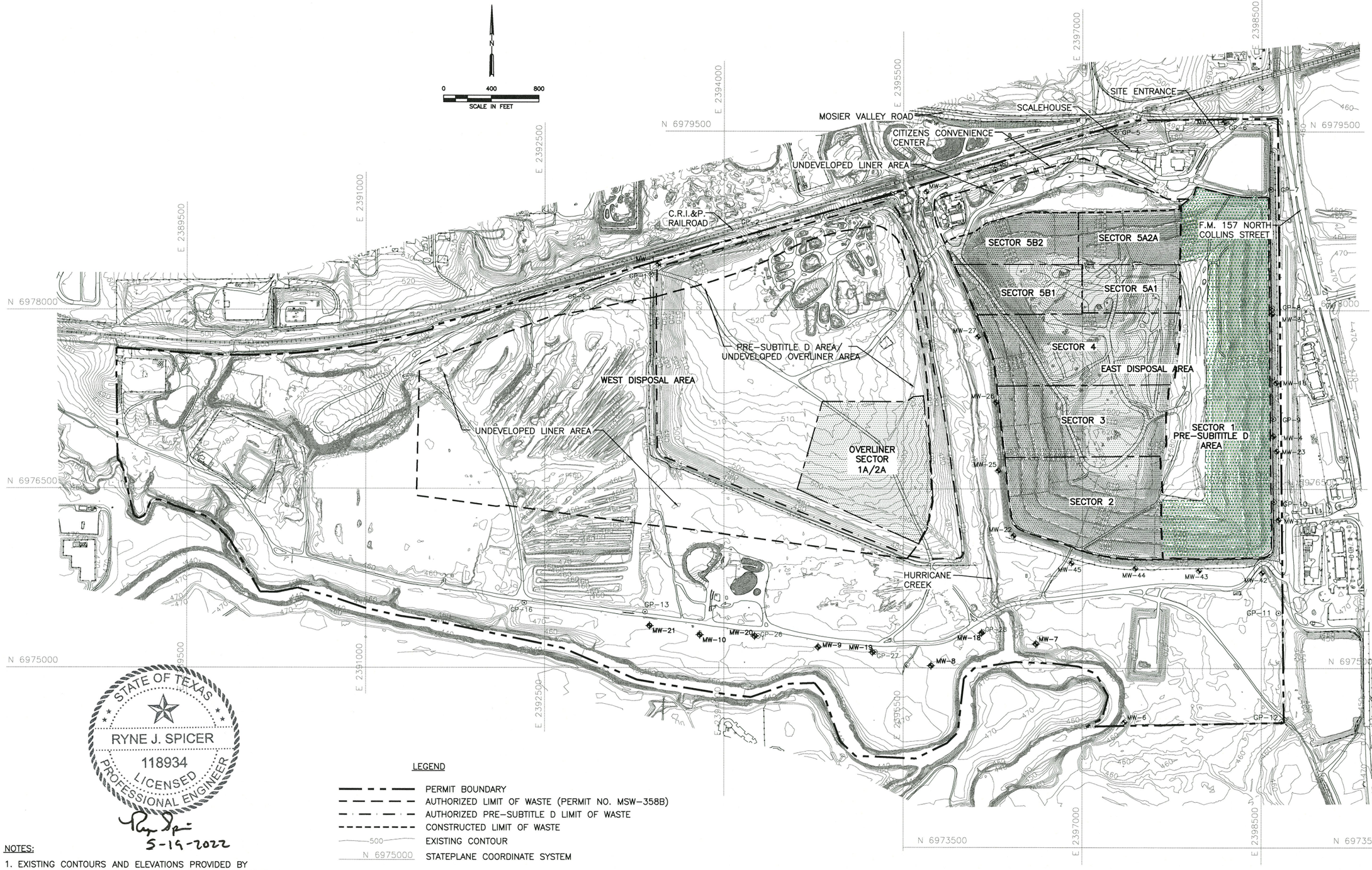
The existing TCEQ-approved landfill gas monitoring system consists of eighteen gas probes and eleven utility trench vents located along the permit boundary. Monitoring is conducted quarterly. The site currently has an active LFG collection and control system (GCCS). The existing GCCS consists of vertical LFG extraction wells, horizontal LFG collectors, a piping network, condensate management system, a flare facility, and a third party LFG-to-energy (LFGTE) facility. The LFGTE facility is owned and operated by an independent third party. The gas collection piping system conveys the extracted LFG from the collection points (i.e., vertical wells/horizontal collectors) to the LFGTE facility and/or flare facility.

## 3.5 Existing Landfill Air Permits

The site currently has a Title V Operating Permit approved on April 11, 2022, Permit No. O-02374.

## 3.6 Citizens Convenience Center

The existing citizens convenience center is located near the scalehouse (refer to Figure I/II-3.2). The convenience center allows small vehicle landfill customers to transfer their waste into a roll-off container without having to travel to the working face. City of Arlington Landfill personnel take the roll-off containers to the working face for disposal when needed.




STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM A LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.

LEGEND

- PERMIT BOUNDARY
- AUTHORIZED LIMIT OF WASTE (PERMIT NO. MSW-358B)
- AUTHORIZED PRE-SUBTITLE D LIMIT OF WASTE
- CONSTRUCTED LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM
- SECTOR BOUNDARY
- MW-3 EXISTING GROUNDWATER MONITOR WELL
- GP-11 EXISTING LANDFILL GAS DETECTION PROBE
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- EXISTING FINAL COVER

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DATE: 05/2022
FILE: 0023-404-11
CAD: 3.1-EXISTING SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT EXISTING SITE PLAN (TCEQ PERMIT NO. MSW-358B)

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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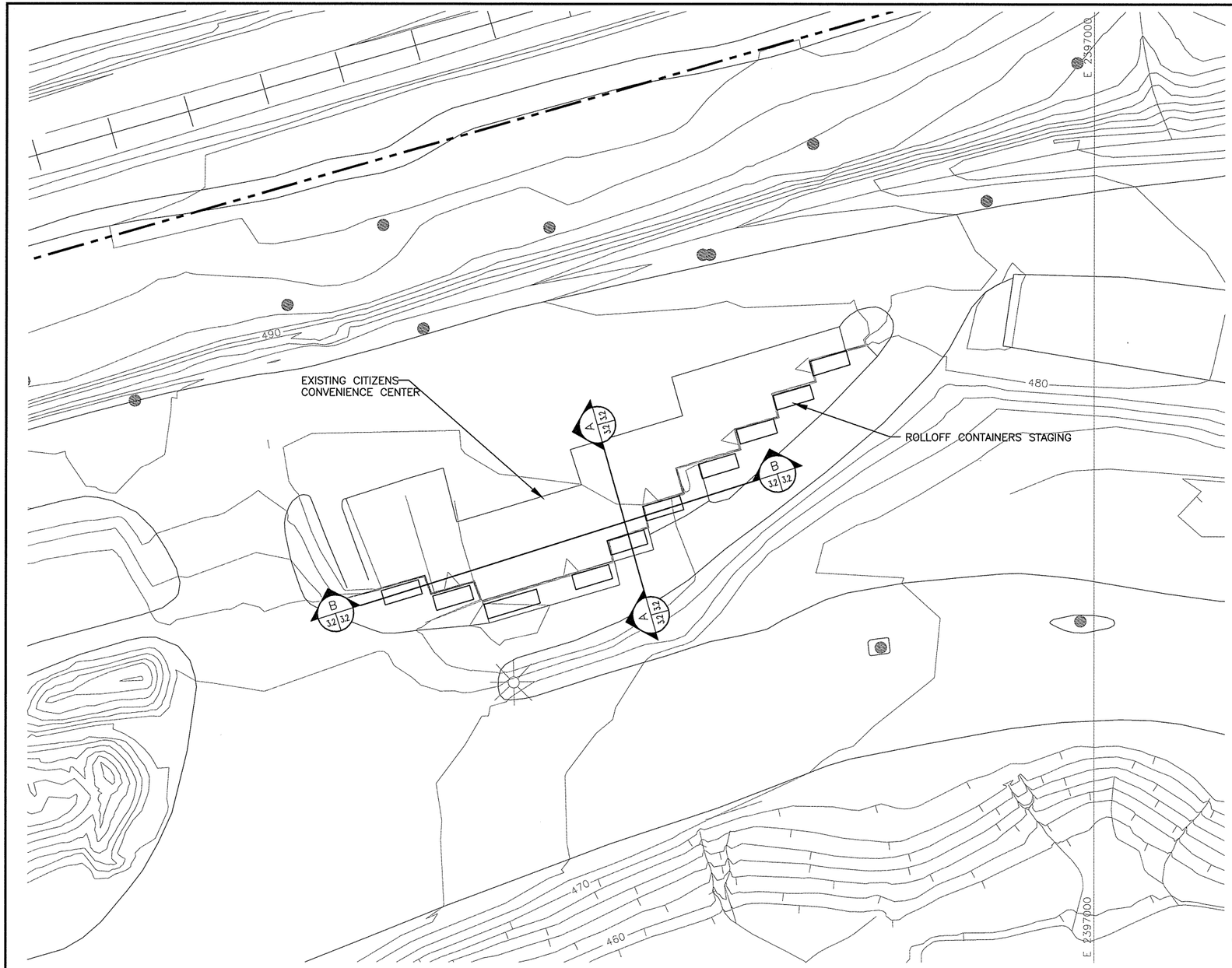
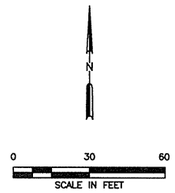
FIGURE I/II-3.1

O:\0023\404\EXPANSION 2021\PARTS I-II\3.1-EXISTING SITE PLAN.dwg, jwilson, 1:2




LEGEND

- PERMIT BOUNDARY
- N 7060000 — STATE PLANE COORDINATE
- 520 — EXISTING CONTOUR

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.

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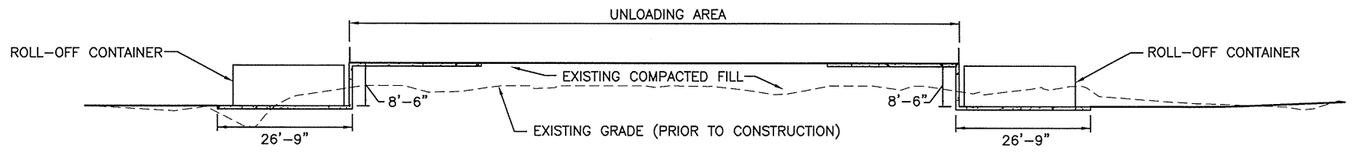
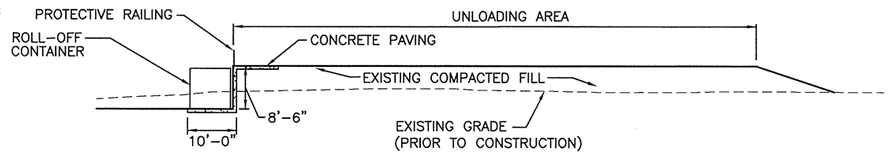



CONVENIENCE CENTER SECTION B (3.2 | 3.2)

0 15 30
SCALE IN FEET




CONVENIENCE CENTER SECTION A (3.2 | 3.2)

0 15 30
SCALE IN FEET

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DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

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# MAJOR PERMIT AMENDMENT
# CITIZENS CONVENIENCE CENTER PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-3.2

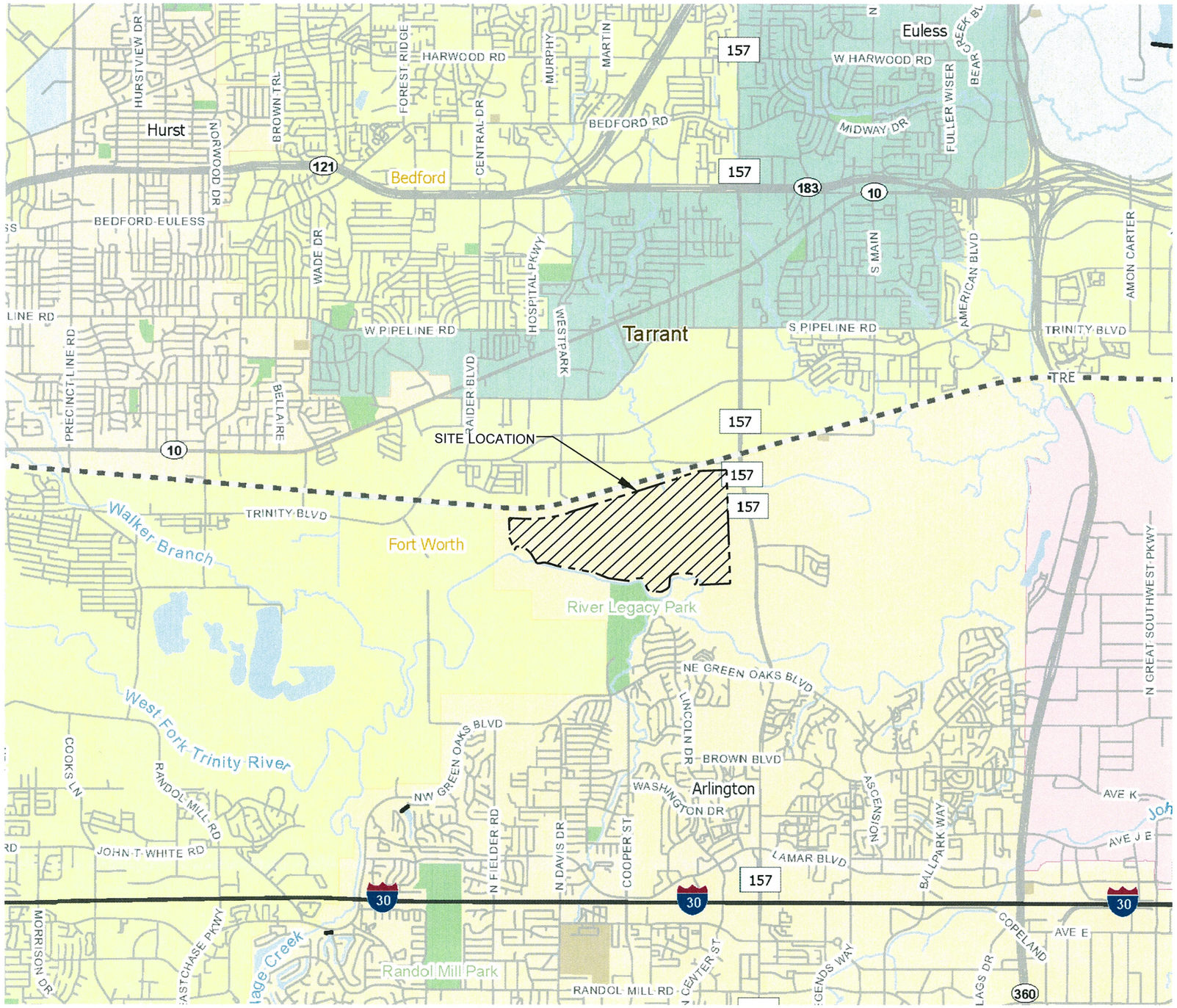
O:\0023\404\EXPANSION 2021\PARTS I-II\3.2-EXISTING CONVIENCE PLAN.dwg, jwilson, 1:2

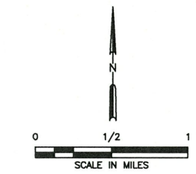
# 4 MAPS

*This section addresses §330.59(c), §330.61(c), (e), and §305.45(a)(6)(A), (C).*

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). Water wells within 500 feet are shown on Figure I/II-4.3.




LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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DATE: 05/2022
FILE: 0023-404-11
CAD: 4.1-SITE LOC.DWG

DRAWN BY: RAA
DESIGN BY: RJS
REVIEWED BY: CRM

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# MAJOR PERMIT AMENDMENT
# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-4.1

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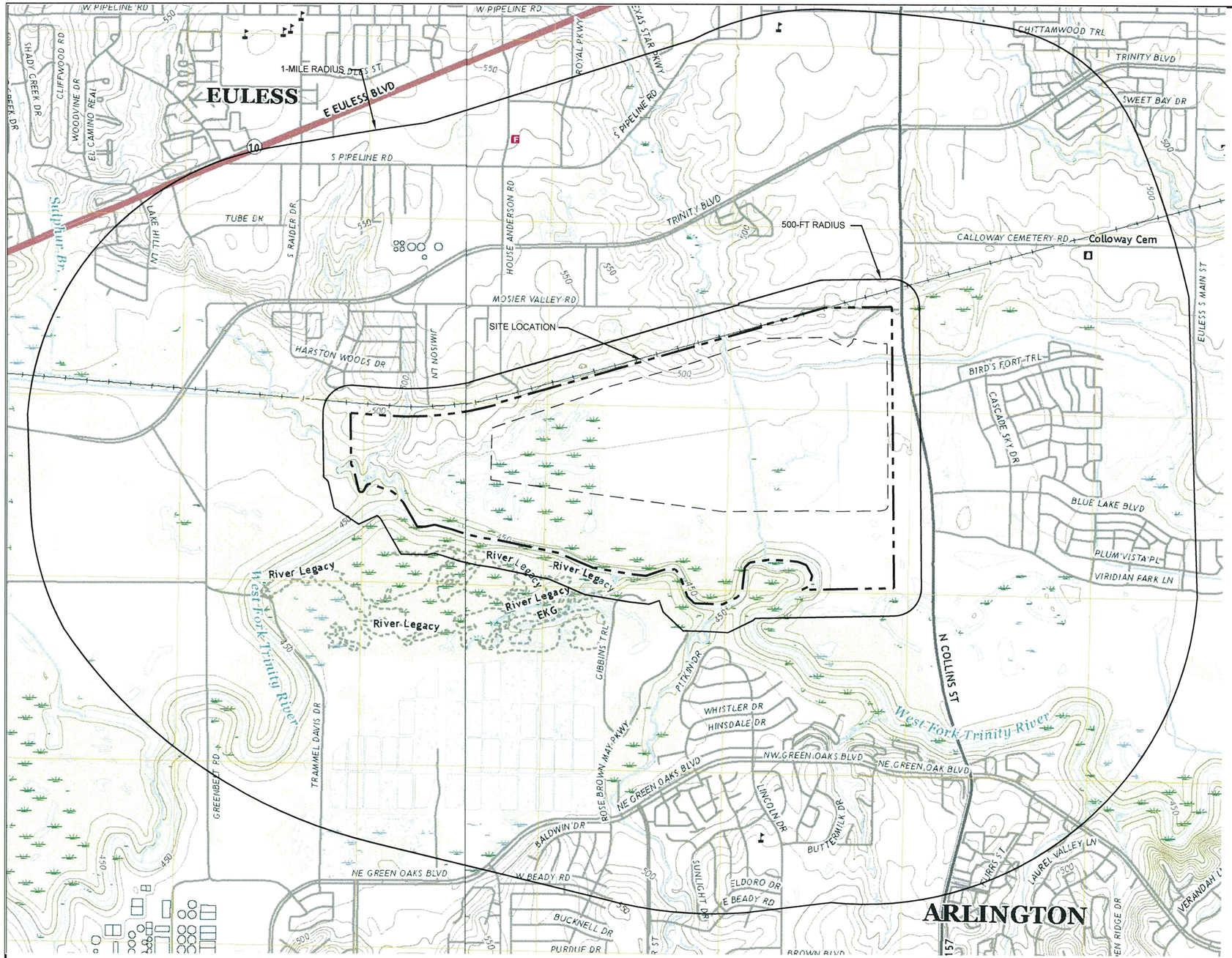
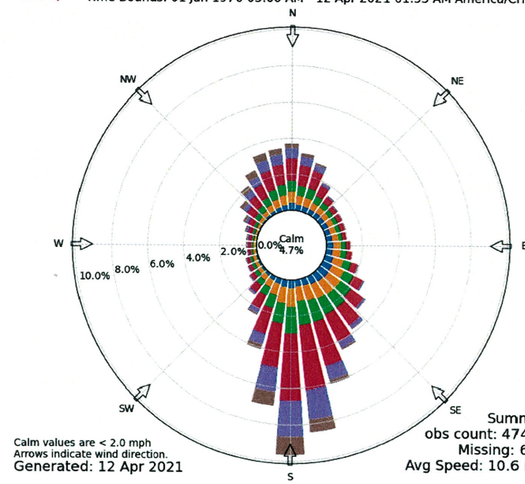
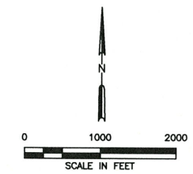
O:\0023\404\EXPANSION 2021\PARTS I-II\4.1 - SITE LOCATION.dwg, jwilson, 1:2




NOTES:

1. THE PRIMARY SITE ACCESS ROADS WITHIN ONE MILE OF THE SITE INCLUDE FM 157 (N COLLINS ST), MOSIER VALLEY ROAD, AND ALLAN SAXE PARKWAY. OTHER ROADWAYS IN THE TRAFFIC STUDY AREA INCLUDE TRINITY BOULEVARD, GREEN OAKS BOULEVARD, CALLOWAY CEMETERY ROAD, BLUE LAKE BOULEVARD, AND VIRIDIAN PARK LANE.
2. SEE FIGURE I/II–5.1 FOR PROPERTY OWNERS WITHIN 1/4–MILE OF THE SITE.
3. SEE SECTION 7.7 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 FOR WATER WELLS WITHIN ONE MILE OF THE PERMIT BOUNDARY.
4. NO SPRINGS ARE DOCUMENTED WITHIN ONE MILE OF THE PERMIT BOUNDARY.
5. REFER TO FIGURE 4.3 FOR LOCATION OF THE NEAREST RESIDENCE.
6. REFER TO SECTION 8 FOR AIRPORTS LOCATED WITHIN 6 MILES OF THE PERMIT BOUNDARY.
7. REFER TO SECTION 13 FOR EASEMENT INFORMATION AND DRAWING I/IIA.11 FOR ACCESS CONTROL INFORMATION.
8. THE WIND ROSE IS REPRODUCED FROM THE AUTOMATED SURFACE OBSERVING SYSTEM (ASOS) AT THE DFW AIRPORT AND GENERATED FROM THE IOWA ENVIRONMENTAL MESONET. THE ASOS IS A JOINT PROGRAM OF THE NATIONAL WEATHER SERVICE, THE FEDERAL AVIATION ADMINISTRATION AND THE DEPARTMENT OF DEFENSE.
9. ALL TOPOGRAPHIC INFORMATION REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

LEGEND

ROAD CLASSIFICATION

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

PERMIT BOUNDARY

LIMIT OF WASTE

EULESS, TX 2019

HURST, TX 2019

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DRAWN BY: RAA
DESIGN BY: RJS
REVIEWED BY: CRM

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# MAJOR PERMIT AMENDMENT
# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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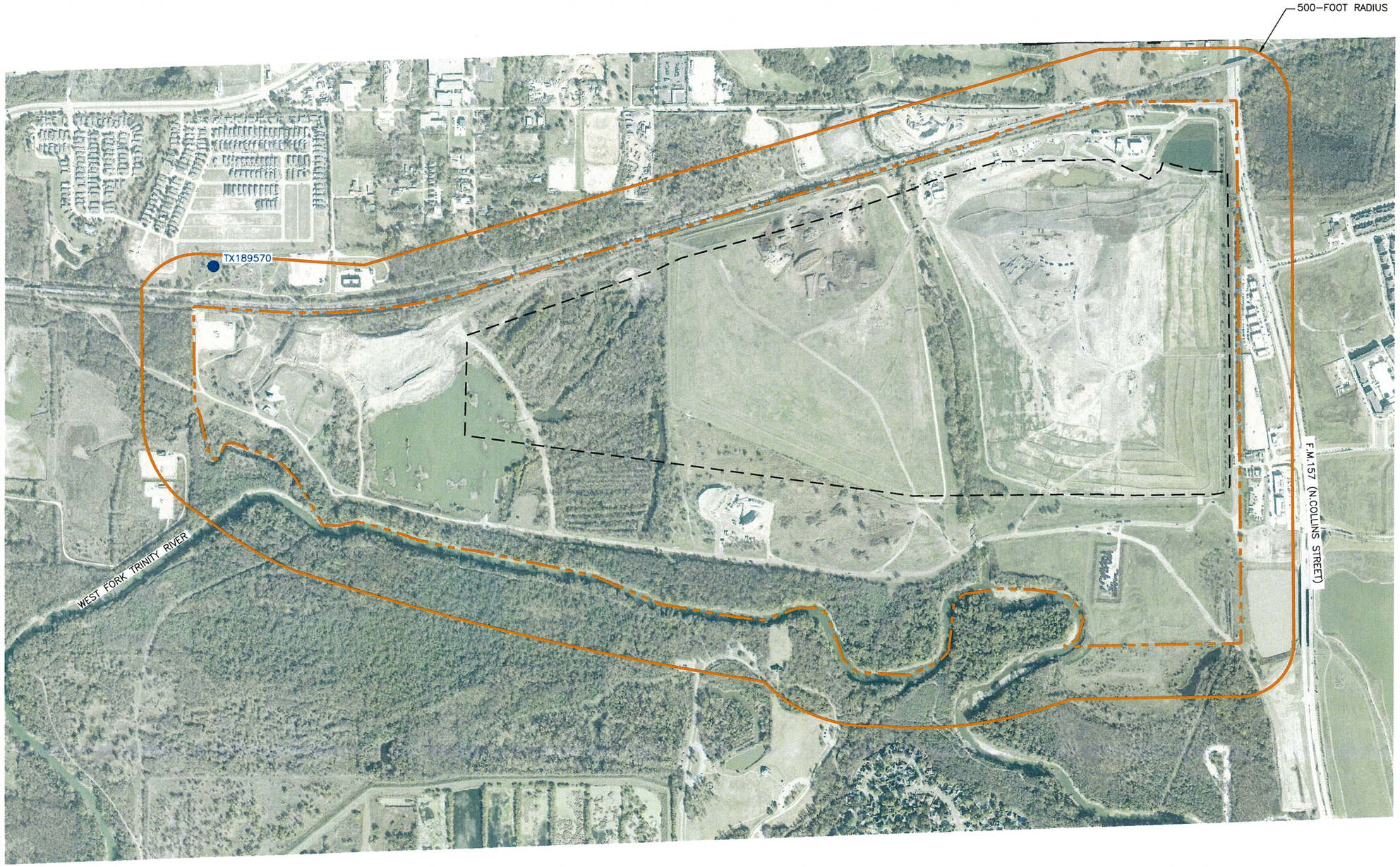
FIGURE I/II–4.2

O:\0023\404\EXPANSION 2021\PARTS I-II\4.2 - GENERAL TOPO.dwg, jwilson, 1:2




N

0 500 1000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

LIMIT OF WASTE

TX189570 WATER WELL IDENTIFIED IN TCEQ RECORDS

STATE OF TEXAS
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118934
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5-19-2022

NOTE:

1. AERIAL PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.
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 IS APPROXIMATELY 200 FEET EAST OF THE THE PERMIT BOUNDARY. THERE ARE SEVENTEEN COMMERCIAL BUILDINGS ON THE EAST SIDE OF THE LANDFILL THAT ARE WITHIN 500 FEET OF THE PERMIT BOUNDARY. THERE ARE NO RESIDENCES WITHIN 500 FEET OF THE PERMIT BOUNDARY.

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DATE: 05/2022
FILE: 0023-404-11
CAD: 4.3 STRUCTURES.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-4.3

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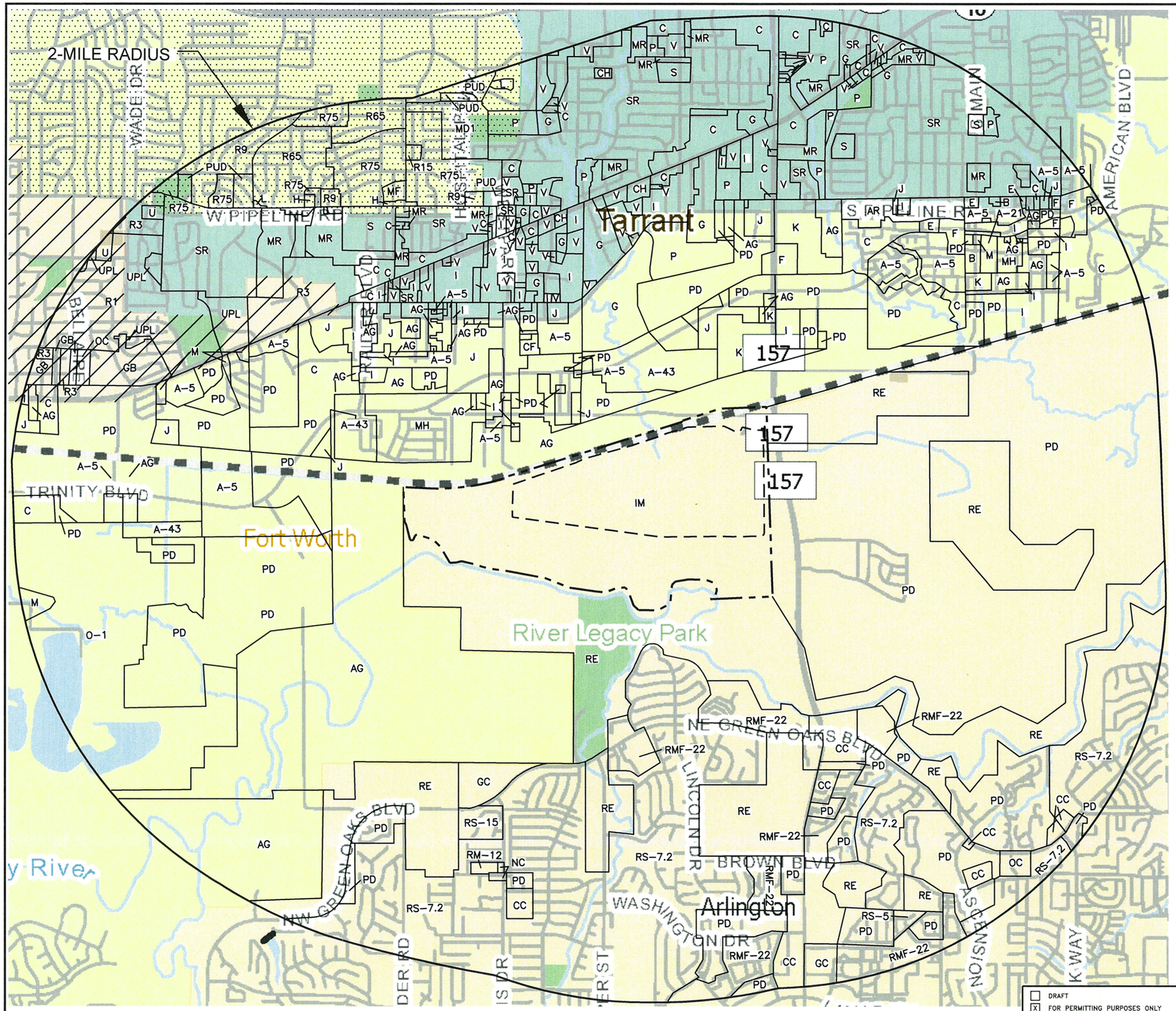
O:\0023\404\EXPANSION 2021\PARTS I-II\4.3 STRUCTURES.dwg, jwilson, 1:2




0 1500 3000
SCALE IN FEET

LEGEND

Texas Department of Transportation

- 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

PERMIT BOUNDARY
LIMIT OF WASTE

STATE OF TEXAS
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CITY OF FORT WORTH ZONING

| | |
|---|---|
| AG | AGRICULTURAL |
| C | MULTI-FAMILY |
| MH | RESIDENTIAL (MANUFACTURED HOUSING) |
| J;K | HEAVY INDUSTRIAL |
| A-43 | RESIDENTIAL (SINGLE FAMILY 1 ACRE+) |
| PD | PLANNED DEVELOPMENT |
| CF | COMMUNITY FACILITY |
| F | GENERAL COMMERCIAL |
| I | LIGHT INDUSTRIAL |
| A-5 | SINGLE FAMILY |
| M | MIXED USE |
| O-1 | FLOODPLAIN |

CITY OF ARLINGTON ZONING

| | |
|---|---|
| RMF-22 | RESIDENTIAL MULTI-FAMILY 22 |
| RS-7.2 | RESIDENTIAL SINGLE-FAMILY 7.2 |
| RS-15 | RESIDENTIAL SINGLE-FAMILY 15 |
| RS-5 | RESIDENTIAL SINGLE-FAMILY 5 |
| PD | PLANNED DEVELOPMENT |
| RE | RESIDENTIAL ESTATE |
| CC | COMMUNITY COMMERCIAL |
| OC | OFFICE COMMERCIAL |
| IM | INDUSTRIAL MANUFACTURING |

CITY OF BEDFORD ZONING

| | |
|---|---|
| R75 | RESIDENTIAL- 7,500 SF DETACHED |
| R65 | RESIDENTIAL- 6,500 SF DETACHED |
| R15 | RESIDENTIAL- 15,000 SF DETACHED |
| R9 | RESIDENTIAL- 9,000 SF DETACHED |
| MF | MULTI FAMILY |
| H | HEAVY COMMERCIAL |
| L | LIGHT COMMERCIAL |
| S | SERVICE COMMERCIAL |

CITY OF EULESS ZONING

| | |
|---|---|
| SR | SINGLE FAMILY RESIDENTIAL |
| MR | MULTI-FAMILY RESIDENTIAL |
| CH | CHURCH |
| G | GOVERNMENT |
| P | PARK/PUBLIC OPEN SPACE |
| S | SCHOOLS |
| C | COMMERCIAL |
| V | VACANT |

CITY OF HURST ZONING

| | |
|---|---|
| UPL | INSTITUTIONAL PARK LAND AND OPEN SPACE DISTRICT |
| GB | GENERAL BUSINESS |
| OC | OUTDOOR COMMERCIAL |
| R1 | DWELLING DISTRICT (6.0 du/ac) |
| R3 | DWELLING DISTRICT (18.0 du/ac) |
| U | INSTITUTIONAL DISTRICT (SCHOOL, CHURCH, ETC.) |

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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DRAWN BY: RAA
DESIGN BY: RJS
REVIEWED BY: CRM

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MAJOR PERMIT AMENDMENT
ZONING MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-4.4

O:\0023\404\EXPANSION 2021\PARTS I-II\4.4 - ZONING MAP.dwg, rarrington, 1:2

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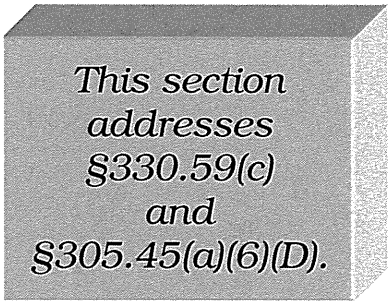
# 5 PROPERTY OWNERS LIST AND MAP




The following list and figure provide the names, mailing addresses, and locations of the "Adjacent and Potentially Affected Landowners" within ¼ mile of the City of Arlington Landfill. The numbers on the landowner list correspond to the numbers listed on Figure I/II-5.1. The list is based on records of the Tarrant County Central Appraisal District as of May 2022. In accordance with Title 30 Texas Administrative Code §330.59(c)(3), the availability of mineral ownership beneath the facility has been investigated. Based on a conversation with the Tarrant County Central Appraisal District, they do not maintain mineral ownership records.

# TABLE 5-1
# PROPERTY OWNERS LIST

1. CITY OF ARLINGTON
PO BOX 90231
ARLINGTON TX 76004-3231

2. RCI HOLDINGS INC
10737 CUTTEN RD
HOUSTON TX 77066-5003

3. TXI OPERATIONS LP
P.O BOX 8040
FORT WAYNE IN 46898

4. CITIES OF FORT WORTH AND DALLAS
1000 THROCKMORTON ST
FORT WORTH TX 76102-6312

5. HSF ARLINGTON LLC
2201 W ROYAL LN #100
IRVING TX 75063

6. VIRIDIAN MUNICIPAL MANAGEMENT DISTRICT
3100 MCKINNON ST., STE 1100
DALLAS, TX 75201

7. VIRIDIAN HOLDINGS LP
5005 RIVERWAY DR., STE 500
HOUSTON TX 77056

8. VIRIDIAN MEDICAL PARK LTD
365 MIRON DR STE A
SOUTHLAKE TX 76092

9. HC LOBF ARLINGTON LLC ETAL
8200 DOUGLAS AVE STE 300
DALLAS TX 75225

10. EXPLORER PIPELINE CO
PO BOX 2650
TULSA OK 74101-2650

11. ELLA M JOYNER
887 BIRDS FORT TR
ARLINGTON, TX 76005

12. PEGGY RODRIGUEZ MONTANEZ
TOMAS NIEVES ANGEL
705 GILTIN CT
ARLINGTON TX 76006

13. MOUFFA NAHHAS
SARAH G NAHHAS
703 GILTIN CT
ARLINGTON TX 76006-2424

14. STEVEN B REILLY
609 LINCOLN DR
ARLINGTON TX 76006-2037

15. WILLIAM BROWN
CONNIE BROWN
607 LINCOLN DR
ARLINGTON TX 76006-2037

16. TERRY B JOHNSON
ANNE JOHNSON
605 LINCOLN DR
ARLINGTON TX 76006-2037

17. THOMAS E ORNDORFF
603 LINCOLN DR
ARLINGTON TX 76006-2037

18. MERICA CARRINGTON
601 LINCOLN DR
ARLINGTON TX 76006-2037

19. JOSEFINA GONZALEZ
3030 PITKIN DR
ARLINGTON TX 76006-2044

20. THE LANGFORD FAMILY PROPERTY TRUST
3028 PITKIN DR
ARLINGTON TX 76006-2044

# TABLE 5-1
# PROPERTY OWNERS LIST (Continued)

21. EDWARD P BRADY
DIXIE L BRADY
3026 PITKIN DR
ARLINGTON TX 76006-2044

22. ARISTIDES C GRUMBOS
3024 PITKIN DR
ARLINGTON TX 76006-2044

23. HAROLD JOHNSON
ROBIN B JOHNSON
3022 PITKIN DR
ARLINGTON TX 76006-2044

24. JOHN PAUL TOMME
3020 PITKIN DR
ARLINGTON TX 76006-2044

25. DOUG SMITH
3018 PITKIN DR
ARLINGTON TX 76006-2044

26. ROBERT ANDRIEU
3016 PITKIN DR
ARLINGTON TX 76006-2044

27. HOPKINS CATHERINE
GUNN LIVING TRUST
3014 PITKIN DR
ARLINGTON TX 76006-2044

28. JEFFERY WILSON
3012 PITIKIN DR
ARLINGTON, TX 76006

29. ROBERT MAGNUSSON
512 GILTIN DR
ARLINGTON TX 76006-2044

30. WALTER LOWE
PATRICIA LOWE
3008 PITKIN DR
ARLINGTON TX 76006-2044

31. HELENA LEJUENE EMBRY
3006 PITKIN DR
ARLINGTON TX 76006-2044

32. GLEN TAYLOR
3004 PITKIN DR
ARLINGTON TX 76006-2044

33. VIGIL MATEJKO SNIRCH
3002 PITKIN DR
ARLINGTON TX 76006-2044

34. MICHAEL E BISHOP
3000 PITKIN DR
ARLINGTON TX 76006-2044

35. JOSEPH WES DAUPHINOT
900 W ABRAM ST
ARLINGTON TX 76013

36. LOC HUY NGUYEN
PHAN THI NGUYEN
3003 PITKIN DR
ARLINGTON TX 76006-2000

37. RONALD E HORTON
LAURA K HORTON
500 LINCOLN DR
ARLINGTON TX 76006-2034

38. RIGOBERTO BALDERAS
502 LINCOLN DR
ARLINGTON TX 76006

39. MICHAEL BALDOCK
LORI BALDOCK
504 LINCOLN DR
ARLINGTON TX 76006-2034

40. IVO Y IVANOV
STACEY L IVANOV
506 LINCOLN DR
ARLINGTON TX 76006-2034

# TABLE 5-1
# PROPERTY OWNERS LIST (Continued)

41. JAMES C GILDEA
CINDY ANN GILDEA
508 LINCOLN DR
ARLINGTON TX 76006-2034

42. OWEN LESLIE WILLIAMS
TERESA WILLIAMS
510 LINCOLN DR
ARLINGTON TX 76006-2034

43. HASSAN MOHAMMAD
512 LINCOLN DR
ARLINGTON TX 76006

44. FARKHUNDA BEIG
MUJTABA BEIG
600 LINCOLN DR
ARLINGTON TX 76006-2036

45. EDMUND K LAU
MAY N LAU
604 LINCOLN DR
ARLINGTON TX 76006-2036

46. DAVID DE LA CRUZ
MONNIQU DE LA CRUZ
607 GILTIN DR
ARLINGTON TX 76006-2031

47. JERRY W FORD
MADELEINE L FORD
605 GILTIN DR
ARLINGTON TX 76006-2031

48. WILLIAM FOX
603 GILTIN DR
ARLINGTON TX 76006-2031

49. DAINEL PENICHE-PEYRON
601 GILTIN DR
ARLINGTON TX 76006-2031

50. STEVEN MORRIELL
STEVEN BREAKY
515 GILTIN DR
ARLINGTON TX 76006-2029

51. WILLIAM O TEMPLE
KAREN TEMPLE
511 GILTIN DR
ARLINGTON TX 76006-2029

52. STEVE KUHNS
KAREN KUHNS
509 GILTIN DR
ARLINGTON TX 76006-2029

53. SHARON DOUGHERTY
RICHARD DOUGHERTY
507 GILTIN DR
ARLINGTON TX 76006-2029

54. SCOTT COONER
PAMELA COONER
505 GILTIN DR
ARLINGTON TX 76006-2029

55. TODD W HARTLEY
503 GILTIN DR
ARLINGTON TX 76006-2029

56. DIANE K RYAN
501 LINCOLN DR
ARLINGTON TX 76006-2035

57. SERGEI EDWARDS
EVA EDWARDS
3011 PITKIN DR
ARLINGTON TX 76006-2073

58. CATHERINE A LOWE
3015 PITKIN DR
ARLINGTON TX 76006-2073

59. LEIGH CROWE ROBBIE
TRUSTEE OF CROWE FAMILY TRUST
3019 PITKIN DR
ARLINGTON TX 76006-2073

60. SUSAN C KELLY
LEEROY KELLY
3023 PITKIN DR
ARLINGTON TX 76006-2073

# TABLE 5-1
# PROPERTY OWNERS LIST (Continued)

61. JUDITH M MAGEE
3027 PITKIN DR
ARLINGTON TX 76006-2073

62. ELIZABETH MORGAN TAMMY
PERRY MORGAN CORTLAND
3029 PITKIN DR
ARLINGTON TX 76006-2073

63. CHARLES T POTTS
LINDA K POTTS
507 LINCOLN DR
ARLINGTON TX 76006-2035

64. DANIEL N OSTER
KELLEY E OSTER
505 LINCOLN DR
ARLINGTON TX 76006-2035

65. KIRK PLEASANTS
BONNIE PLEASANTS
503 LINCOLN DR
ARLINGTON TX 76006-2035

66. J & W SAND & GRAVEL INC
3224 BRYN MAWR DR
DALLAS TX 75225-7645

67. LESLEY H COLEMAN ET AL
3625 BRAMBLETON PL
FORT WORTH TX 76119-6763

68. MOSIER VALLEY CEMETERY
3126 HOUSE ANDERSON RD
EULESS TX 76040-2100

69. JUDIE PARKER EST
5120 AUTUMN HILL
GRAND PRARIE TX 75052

70. CITY OF FORT WORTH
1000 THROCKMORTON ST.
FORT WORTH TX 76102-6311

71. MARIA D HERNANDEZ
1237 WOODSEY ST
SOUTHLAKE TX 76092

72. SHIELA G BABERS
7500 MONTERREY DR
FORT WORTH TX 76112-5411

73. O & J COATINGS INC
1720 CYNTHIA LN
HURST TX 76054

74. MARSHALL ALLEN TUCKER
1601 BRIAR DR
BEDFORD TX 76022-6709

75. ARMINTHA BROWN
3216 HOUSE ANDERSON RD
EULESS TX 76040-2102

76. BURRIS LAWN & LANDSCAPE LLC
PO BOX 120399
ARLINGTON TX 76012

77. JAARAH PROPERTIES LLC
97 GRAND AVE
STATEN ISLAND, NY 10301

78. DARCY KNAPP FRICKS ET AL
PO BOX 2243
MANSFIELD TX 76063

79. THORNTON H DENNIS
936 PARK FOREST DR
HURST TX 76053-7160

80. HECTOR MALDONADO
YANCI RAMIREZ ROSA
104 FALLS DR
EULESS TX 76039

# TABLE 5-1
# PROPERTY OWNERS LIST (Continued)

81. EMANUEL MILLEDGE
804 DICKEY DR.
EULESS TX 76040-5569

82. DAVID MATOKE
P O BOX 2108
EULESS TX 76039

83. ALLEN TUCKER
11500 MOSIER VALLEY RD
EULESS TX 76040-2104

84. OSCAR TRUJILLO
3215 WINDY HOLLOW WAY
EULESS TX 76040-7767

85. CITY OF EULESS
201 N ECTOR DR
EULESS TX 76039-3543

86. JMC-IV REAL ESTATE CO
6205 PEACHTREE DUNWOODY RD
ATLANTA GA 30328-4524

87. RAG RENTAL LLC
4300 BELTWAY PL.,STE 120
ARLINGTON TX 76018

88. RONALD O'DONNELL
LINDA O'DONNELL
653 JAN CT
SAGINAW TX 76179-0920

89. DAVID SHELTON
CRYSTAL SHELTON
3220 HOUSE ANDERSON RD
EULESS TX 76040-2102

90. 3124 KNAPP STREET
801 MEADOW HILL RD
FORT WORTH TX 76108

91. TINA MARIE CUNDIFF
CHARLES LEE CUNDIFF
3131 HOUSE ANDERSON RD
EULESS TX 76040

92. BAIK LUCILLE
BAIK SEUNG HWAN
10141 HAVERSHAM DR
FORT WORTH TX 76131

93. MOISES HERNANDEZ
PO BOX 429
EULESS TX 76039-0429

94. IMAD EDWARD
ESSAM EDWAR
3228 VINE ST
EULESS, TX 76040

95. MIGUEL MEDRANO
DIANA MEDRANO
3216 VINE ST.
EULESS TX 76040-7717

96. ROZO JAVIER EDUARDO
GARNIER HIDALGO CLARA CITALLI
310 CROWE DR
EULESS TX 76040

97. ADAM WEBSTER
JENNIFER WEBSTER
3220 VINE ST
EULESS TX 76040-7717

98. EDDIE RODRIGUEZ
3224 VINE ST
EULESS TX 76040

99. JIM K HALL
TRUE NORTH PROPERTY OWNER B LLC
PO BOX 4090
SCOTTSDALE AZ 85261

100. ESSAM EDWAR
IMAD EDWARD
4303 HAZY MEADOW LN
GRAPEVINE, TX 76051

# TABLE 5-1
# PROPERTY OWNERS LIST (Continued)

101. SHANNON A VICKERS
3221 VINE ST
EULESS TX76040-7719

102. DHIRAN GIRI
4620 CANYON TRL S #512
EULESS TX 76040

103. HAROLD L DUKES
MELINDA DUKES
3113 VINE ST
EULESS, TX 76040-7718

104. ASG HOLDINGS INC
6600 SAPPHIRE CIR S
COLLEYVILLE TX 76036

105. RAUL GUTIERREZ
SANDRA GUTIERREZ
506 NW 16TH ST
FORT WORTH, TX 76164-8919

106. VINDEL RENED
MARTINEZ V MARIA DEL ROSARIO
3209 VINE ST
EULESS TX 76040

107. ARMANYOUS ENGY
3117 VINEST
FORT WORTH TX 76040

108. PATRICIO GUTIERREZ
3140 JIMISON LN
EULESS TX 76040-7720

109. CAZIMIRO GUTIERREZ
506 NW 16TH ST
FORT WORTH TX 76164-8919

110. HURST-EULESS-BEDFORD ISD
1849 CENTRAL DR
BEDFORD TX 76022-6017

111. BARNETT GATHERING LP
PO BOX 53
HOUSTON TX 77001

112. PATRICIO GUTIERREZ
3140 JIMISON LN
EULESS TX 77040-7720

113. WEST FORK PARTNERS LP
5956 SHERRY LN STE 1810
DALLAS TX 75225-8029

114. HARSTON MHC LP
9606 N MOPAC EXPWY
STE 560
AUSTIN TX 78759-5960

115. JERRY SURBER
151 HARRIS RD
HATFIELD AR 71945-0021

116. NORA HUANG
2917 GALERIA DR
ARLINGTON, TX 76011-6717

117. BARBARA J CUNNINGHAM
880 HATTON SUMNER PL
ARLINGTON TX 76005

118. JAMES S NORWOOD
BONNIE C NORWOOD
882 BRITTON SUMMER PL
ARLINGTON TX 76005

119. PAUL E AXTELL
884 HATTON SUMNER PL
ARLINGTON TX 76005

120. ROBIN A ELLIS
MICHAEL C ELLIS
886 HATTON SUMNER PL
ARLINGTON TX 76005

# TABLE 5-1
# PROPERTY OWNERS LIST (CONTINUED)

121. MARTA LEE TRAUGOTT
879 BIRDS FORT TRL
ARLINGTON TX 76005

122. KARIMI ENTERPRISES LLC
PO BOX 122385
ARLINGTON, TX 76012

123. BASSEM EL-KHODOR
889 BIRDS FORT TRL
ARLINGTON TX 76005

124. R DEADEA EDWARDS
881 BIRDS FORT TRL
ARLINGTON TX 76005

125. CHARLES E BROUSSARD
BARBARA R BROUSSARD
885 BIRDS FORT TRAIL
ARLINGTON TX 76005

126. ARTHUR M CLASSEN REVOCABLE TRUST
68102 BLACK CANYON RD
PARKFIELD, CA 93451

127. URGENTOLOGY CARE
MEDICAL PROPERTIES LLC
4130 N COLLINS ST
ARLINGTON, TX 76005

128. PLOTT PROPERTIES LLC
1579 MAIN ST
SOUTHLAKE, TX 76092

129. ARION INVESTMENT LLC
3802 PLUM VISTA PL
ARLINGTON, TX 76005

130. LU VIRIDIAN LLC
1419 CALIBORNE LN
ALEDO, TX 76008

131. NOEMI PERALES
EVODIO LEDEZMA
113 DALLAS DR
EULESS, TX 76039

132. PROFESSIONAL LIVING CENTERS LLC
3201 VINE ST
EULESS TX 76040

133. OAKHALLOW GROUP CTD
2500 NE GREEN OAKS BLVD
ARLINGTON TX 76006

134. B&M RADHE HOSPITALITY LLC
3230 FOREST HILL CR
FOREST HILL TX 76140

135. WATER EDGE WEST AT VIRIDIAN L
2500 NE GREEN OAKS BLVD STE 20
ARLINGTON TX 76006

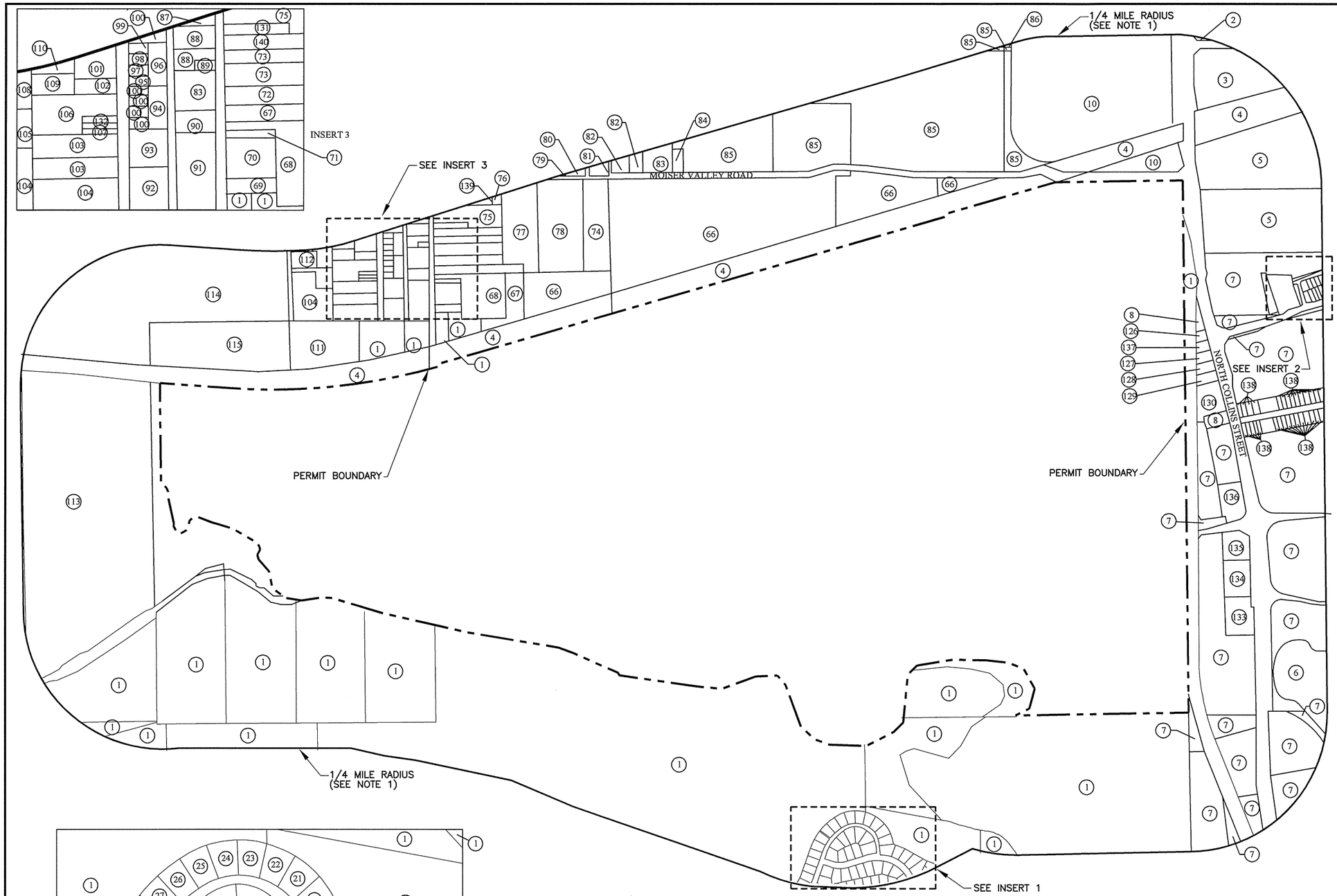
136. FIVE STAR ENTERPRISES LLC
3140 LONG BEACH BLVD 1ST FLOOR
LONG BEACH CA 90807

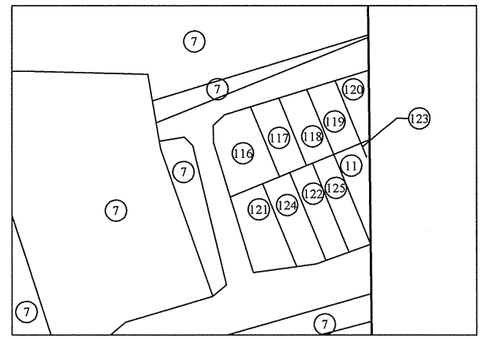
137. CONDREY LAND LLC
201 RIVERSIDE DR
LAKE PROVIDENCE CA 71254

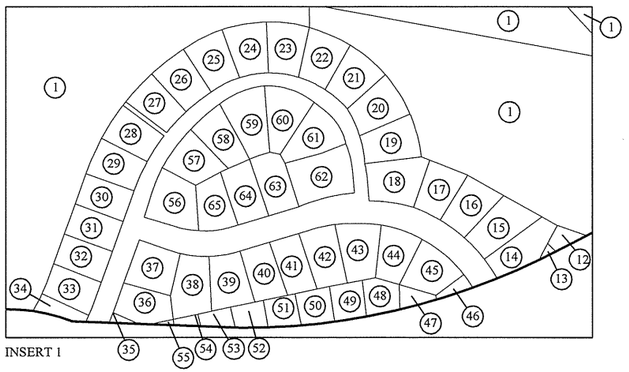
138. CRP/SLR VIRIDIAN OWNER LP
2300 N FIELD ST STE 800
DALLAS TX 75201

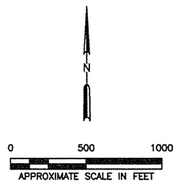
139. ROBERT PELINO
11412 MOSIER VALLEY RD
EULESS TX 76040-7716

140. LEDEZMA ROBERTO
113 DALLAS DR
EULESS TX 76039




LEGEND

PERMIT BOUNDARY

1/4 MILE RADIUS LIMIT

(1) PROPERTY OWNER DESIGNATION

NOTES:

1. THIS LINE REPRESENTS A 1/4 MILE DISTANCE FROM THE LIMIT OF THE PERMIT BOUNDARY.
2. PROPERTY OWNER LIST WAS DEVELOPED FROM MAY 2022 TARRANT COUNTY APPRAISAL DISTRICT RECORDS.
3. TARRANT COUNTY APPRAISAL DISTRICT DOES NOT MAINTAIN MINERAL OWNERSHIP RECORDS.

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RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: 5.1-ADJ. PROP. OWNERS MAP.DWG

DRAWN BY: RAA
DESIGN BY: DS
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
# PROPERTY OWNERS MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-5.1

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O:\0023\404\EXPANSION 2021\PARTS I-II\5.1-ADJACENT PROPERTY OWNERS.dwg, rarrington, 1:2

# 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).*




N

0 1000 2000

SCALE IN FEET

LEGEND

PERMIT BOUNDARY

AUTHORIZED LIMITS OF WASTE

PROPOSED LIMITS OF WASTE

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

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DRAWN BY: RAA
DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-6.1

O:\0023\404\EXPANSION 2021\PARTS I-II\6.1-AERIAL PHOTOGRAPH.dwg, jwilson, 1:2

# 7 LAND USE

## 7.1 Character of Surrounding Land and Land Use

A land use evaluation was performed for the area within one mile of the City of Arlington Landfill permit boundary. Growth trends within 5 miles of the facility were also evaluated. Land use information is summarized on the following maps.

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

- Figure I/II-7.1 (Land Use Map – Aerial). This map highlights land use within a one-mile radius of the site on an aerial photograph.
- Figure I/II-7.2 (Land Use Map). This map indicates major land uses within 1 mile of the site.
- Figure I/II-7.3 (Cities within 5 Miles – Aerial). This map is used to show area cities within 5 miles and to summarize growth trends.
- Figure I/II-7.4 (Zoning Map). This map summarizes the zoning description for each area within a two-mile radius of the permit boundary.

## 7.2 Location and Zoning

The City of Arlington Landfill lies within the City Limits of the City of Arlington in Tarrant County. The 774.3-acre permit boundary is zoned as Industrial Manufacturing (IM). This zoning designation allows for the continued development of the landfill. A Specific Use Permit (SUP 11-5) was issued by the City of Arlington authorizing operations of the landfill.

Zoning in the vicinity of the site is shown graphically on Figure I/II-7.4. As shown, the city limits of five separate cities are located within two miles mile of the site. They include the cities of Arlington, Fort Worth, Hurst, Euless, and Bedford.

## 7.3 Surrounding Land Use

As shown on Figures I/II-7.1 and I/II-7.2, land use within one mile of the site consists of predominantly single family and multi-family residential land

## 7.5 Proximity to Residences and Other Uses

Based on a ground survey and an examination of a recent aerial photograph, it is estimated that there are 4,200 residences located within a mile of the permit boundary. The nearest residence is approximately 800 feet from the northern portion of the permit boundary (approximately 1,200 feet from the limits of waste).

There are an estimated 250 commercial/industrial businesses within one mile of the permit boundary. Located north of the permit boundary and adjacent to the Trinity Railway Express railroad tracks, Strata Materials, LLC Mosier Valley Recycle Yard is the nearest business establishment.

Three schools are located within one mile of the landfill permit boundary. The closest is Viridian Elementary School, which is approximately 2,100 feet east of the landfill permit boundary.

Two daycare facilities are located within one mile of the landfill permit boundary. The closest is the Children's Lighthouse of Arlington – Viridian, which is approximately 1,950 feet east of the permit boundary.

Four churches are located within a mile of the landfill permit boundary. Three are located north of the landfill permit boundary and one church is located east of the permit boundary (church services are held within the Viridian Lakeview Event and Conference Center). The Saint John Missionary Baptist Church is nearest to the permit boundary (located 2,000 feet north).

The Texas Historic Sites Atlas of the Texas Historical Commission identifies six historic sites within one mile of the site:

- Saint John Missionary Baptist Church is located approximately 2,000 feet north of the landfill permit boundary.
- Mosier Valley School is located approximately 1,600 feet north of the landfill permit boundary.
- Mosier Valley Cemetery is located approximately 200 feet north of the landfill permit boundary.
- Calloway Cemetery is located approximately 3,300 feet northeast of the landfill permit boundary.
- Bird's Fort is located approximately 5,100 feet east of the landfill permit boundary. No structures remain.
- Sloan-Journey Expedition of 1838 historical marker is located approximately 2,000 feet south of the permit boundary in River Legacy Park.

There are no hospitals within a mile of the permit boundary, however, there is one urgent care center (Urgentology Care) located 200 feet east of the permit boundary.

There are no known archaeologically significant sites or sites of exceptional aesthetic quality within one mile of the permit boundary.

The proximity of residences and other uses are shown on the Land Use Map – Aerial (Figure I/II-7.1).

## 7.6 Land Use Conclusions

The use of this land for a municipal solid waste site represents a compatible land use for the following reasons.

- The site has been permitted as a landfill for over 40 years.
- The waste placement footprint represents only 390.5 acres out of a permit boundary of 774.3 acres.
- The site has not and will not affect area growth trends.

In summary, the existing site has long been established as a disposal facility. The reconfiguration of the City of Arlington Landfill will provide long term waste disposal for area communities at a facility that will continue to be developed to meet or exceed all regulatory requirements.

## 7.7 Water Wells Within 500 Feet

A search to identify water wells within a 1-mile radius of the landfill permit boundary was completed in January 2022 by GeoSearch and WCG. The results of this search are provided in Part III, Appendix IIIG, Section 2.5 and Appendix IIIG-A. The water well locations are plotted on Figure IIIG-A-6 (Water Well Location Map). There is one registered water well located within 500 feet of the permit boundary. The water well is approximately 450 feet north of the landfill permit boundary and is reportedly used for domestic purposes.




0 1000 2000
SCALE IN FEET

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LEGEND

| | |
|---|---|
| — — — | PERMIT BOUNDARY |
| - - - - - - - - | AUTHORIZED LIMIT OF WASTE |
| — — — | PROPOSED LIMIT OF WASTE |
| R | RESIDENCE |
| B | BUSINESS |
| DC | DAYCARE FACILITY |
| I | INDUSTRIAL MANUFACTURER |
| ✞ | CHURCH |
| HM | HISTORICAL MARKER |
| F | FIRE DEPARTMENT STATION |
| S | SCHOOL |
| C | CEMETERY |

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.
2. LAND USE IS SHOWN WITHIN THE ONE-MILE BOUNDARY OF THE SITE.
3. REFER TO FIGURE I/II-7.2 FOR SITE ZONING INFORMATION.
4. WITHIN ONE MILE OF THE FACILITY THERE ARE:
   - 3 SCHOOLS (NEAREST IS VIRIDIAN ELEMENTARY 2100' EAST)
   - 2 DAYCARES (NEAREST IS CHILDRENS LIGHTHOUSE OF ARLINGTON-VIRIDIAN 1950' EAST)
   - 4 CHURCHES (NEAREST IS ST. JOHN MISSIONARY BABTIST CHURCH 2000' NORTH), AND
   - 6 HISTORIC SITES; 2 OF WHICH ARE CEMETERIES (NEAREST IS MOSIER VALLEY CEMETERY 200' NORTH)
   - 1 LAKE (LAKE VERIDIAN)
   - 9 PONDS (APPROXIMATE)

   THERE ARE NO HOSPITALS, ARCHEOLOGY SIGNIFICANT SITES, OR SITES OF EXCEPTIONAL AESTHETIC QUALITY LOCATED WITHIN ONE MILE OF THE PERMIT BOUNDARY. WEST FORK TRINITY RIVER AND LAKE VIRIDIAN ARE THE MAJOR WATER FEATURES IN THE AREA.
5. REFER TO FIGURE I/II-4.3 FOR INFORMATION REGARDING STRUCTURES AND INHABITABLE BUILDINGS LOCATED WITHIN 500 FEET OF THE PERMIT BOUNDARY.

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DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# LAND USE MAP-AERIAL

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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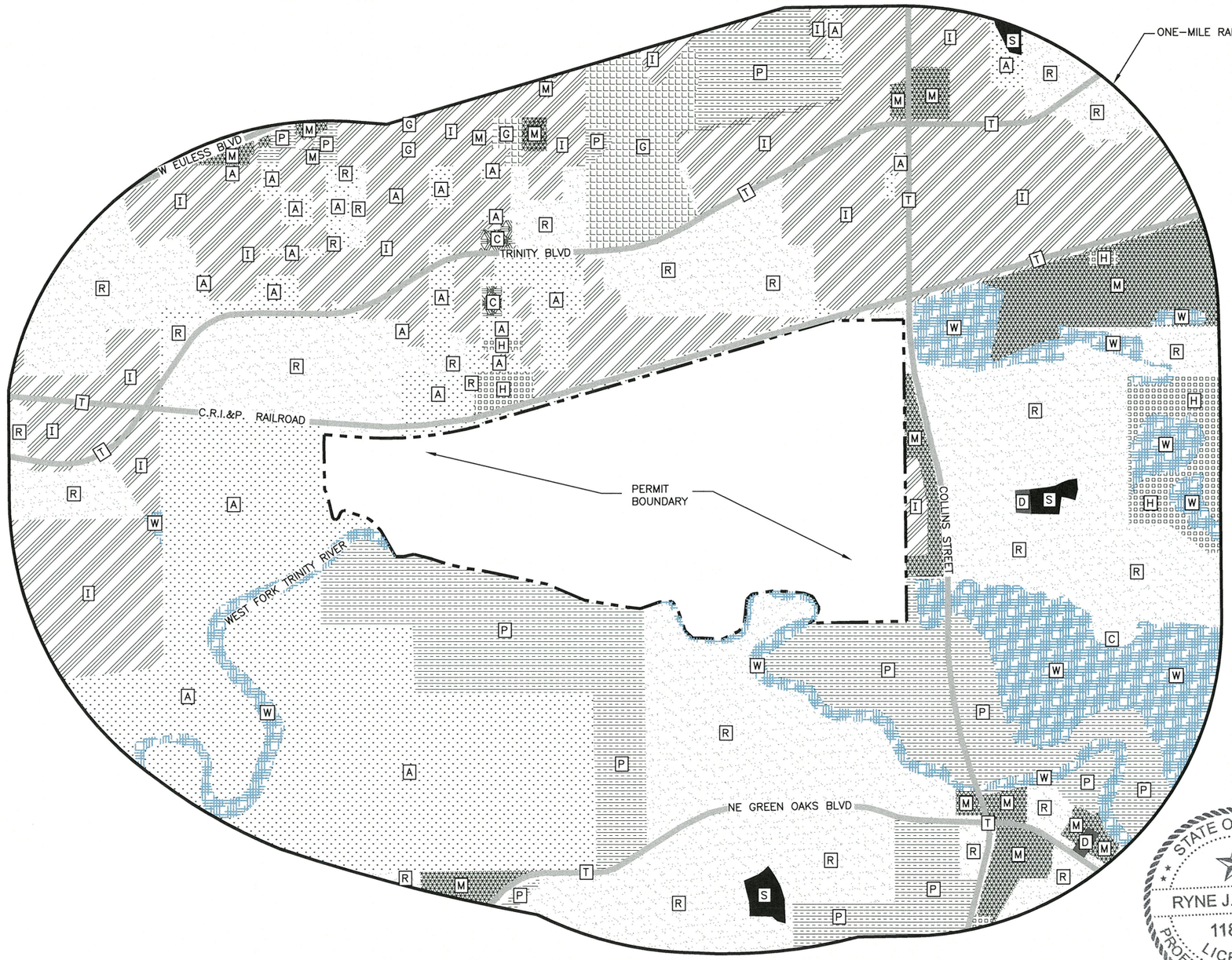
FIGURE I/II-7.1

O:\0023\404\EXPANSION 2021\PARTS I-II\7.1-AERIAL PHOTOGRAPH.dwg, jwilson, 1:2

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0 1000 2000

SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- A — AGRICULTURE
- C — CHURCH
- M — COMMERCIAL
- W — POND/ LAKE/ RIVER
- D — DAYCARE
- G — GOVERNMENT OWNED
- H — HISTORIC AREA
- I — INDUSTRIAL
- P — PARK/ OPEN SPACE/ RECREATION AREA
- R — RESIDENTIAL
- T — TRANSPORTATION CORRIDOR
- S — SCHOOLS

| LAND USE WITHIN ONE MILE OF PERMIT BOUNDRY | | |
|---|---|---|
| ZONE DESCRIPTION | ACREAGE | PERCENT OF AREA |
| CITY OF ARLINGTON LANDFILL PERMIT BOUNDRY | 774 | 12.9% |
| AGRICULTURE | 975 | 16.3% |
| CHURCH | 10 | 0.2% |
| COMMERCIAL | 230 | 3.8% |
| POND/ LAKE/ RIVER | 395 | 6.6% |
| DAYCARE | 5 | 0.1% |
| GOVERNMENT OWNED | 126 | 2.1% |
| HISTORIC AREA | 77 | 1.3% |
| INDUSTRIAL | 1,122 | 18.7% |
| PARK/ OPEN SPACE/ RECREATION AREA | 661 | 11.0% |
| RESIDENTIAL | 1,431 | 23.9% |
| TRANSPORTATION CORRIDOR | 160 | 2.7% |
| SCHOOLS | 21 | 0.4% |
| TOTAL | 5,987 | 100.0% |

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118934
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PROFESSIONAL ENGINEER
5-19-2022

NOTE:

1. LAND USE MAP WAS GENERATED USING A COLAGE OF INFORMATION FROM THE FORT WORTH PLANNING AND ZONING DEPARTMENT, CITY OF ARLINGTON ZONING, THE EULESS MAP ATLAS, AND TEXAS HISTORICAL COMMISSION.

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FILE: 0023-404-11
CAD: 7.2-LANDUSE MAP.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

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# MAJOR PERMIT AMENDMENT LAND USE MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-7.2

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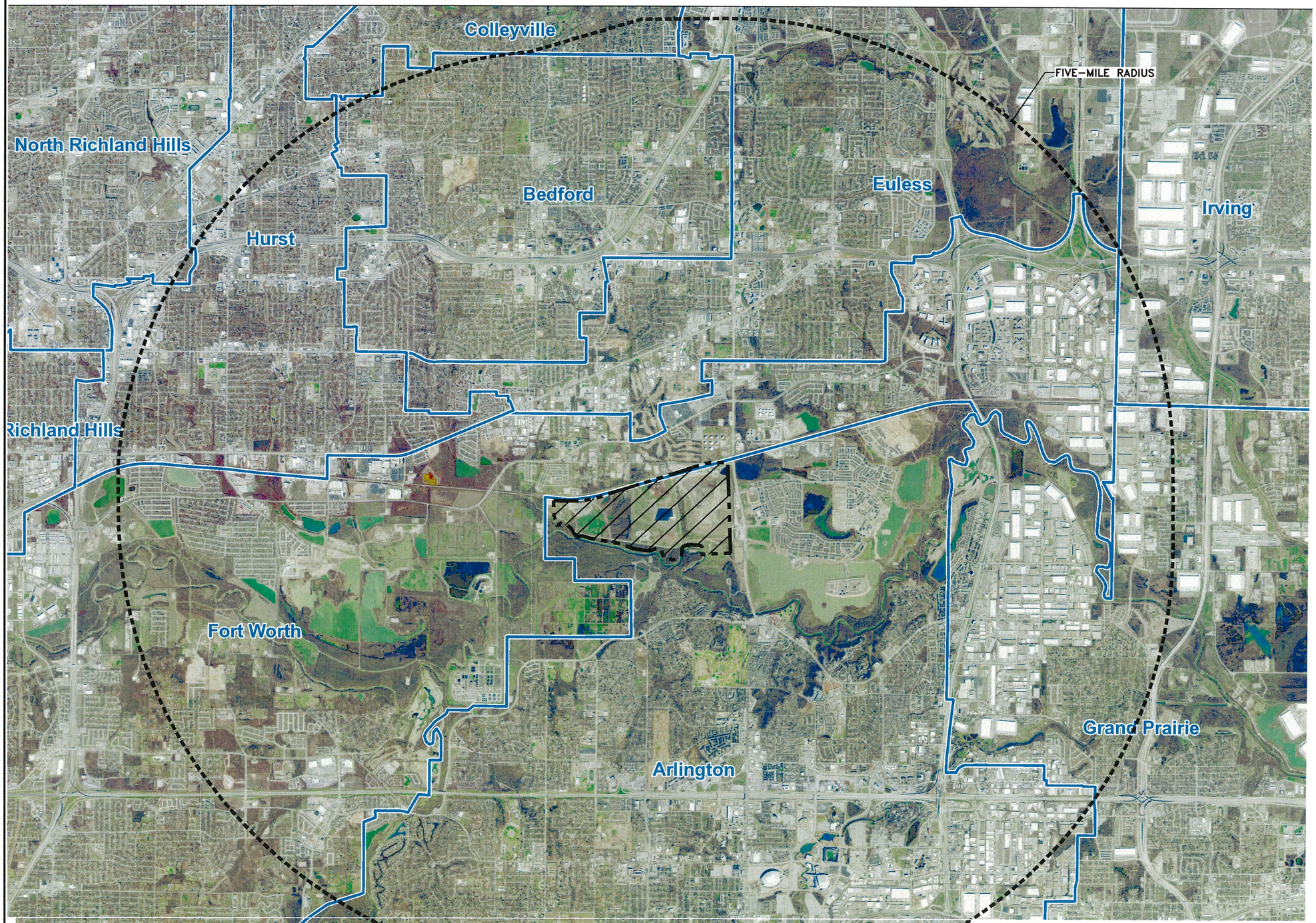


0 3000 6000
SCALE IN FEET

LEGEND

LANDFILL PROPERTY

CITY LIMITS

NOTE:

1. AERIAL PHOTOGRAPH AND CITY BOUNDARIES OBTAINED FROM NCTCOG (DFWMAPS.COM) DATED 2021.

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PROFESSIONAL ENGINEER
5-19-2022

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- [ ] ISSUED FOR CONSTRUCTION

DATE: 05/2022
FILE: 0023-404-11
CAD: 7.3-LAND USE MAP.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
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# MAJOR PERMIT AMENDMENT
# CITIES WITHIN 5-MILE RADIUS

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-7.3

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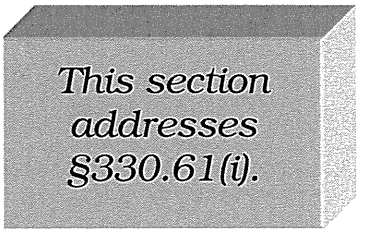
O:\0023\404\EXPANSION 2021\PARTS I-II\7.3-LAND USE MAP.dwg, jwilson, 1:2

# 8 TRANSPORTATION

## 8.1 Traffic Information




### 8.1.1 Availability and Adequacy of Roads

The City of Arlington Landfill is located on the southwest corner of the intersection of FM 157 (North Collins Street) and Mosier Valley Road in Arlington, Texas. The primary access roadways to the site are FM 157 and Mosier Valley Road.

A traffic impact analysis was prepared by Lee Engineering in May 2022 to evaluate the continued operation of the City of Arlington Landfill on local roadways and traffic. The traffic impact analysis is included in Parts I/II, Appendix I/IID.

In summary, the traffic impact analysis concludes that access roads within 1 mile of the landfill will continue to provide adequate access to the site. The facility is presently in operation and the intersection of Mosier Valley Road and FM 157 already has traffic signal control and turn lanes in place. The permit amendment does not result in any changes to the traffic flow or access route along FM 157 into the site. Coordination with TxDOT regarding traffic and location restrictions is included in Appendix I/IIB (TxDOT Tab).

## 8.2 Airport Impact

TCEQ distance restrictions set forth in Title 30 TAC §330.545 require municipal solid waste disposal facilities to be located no closer than 10,000 feet to any runway end used by turbojet aircraft or no closer than 5,000 feet to any runway end used by piston-engine aircraft. As shown on Figure I/II-8.1. No airports (privately-owned or general service) are identified within the 10,000 foot radius of the landfill.

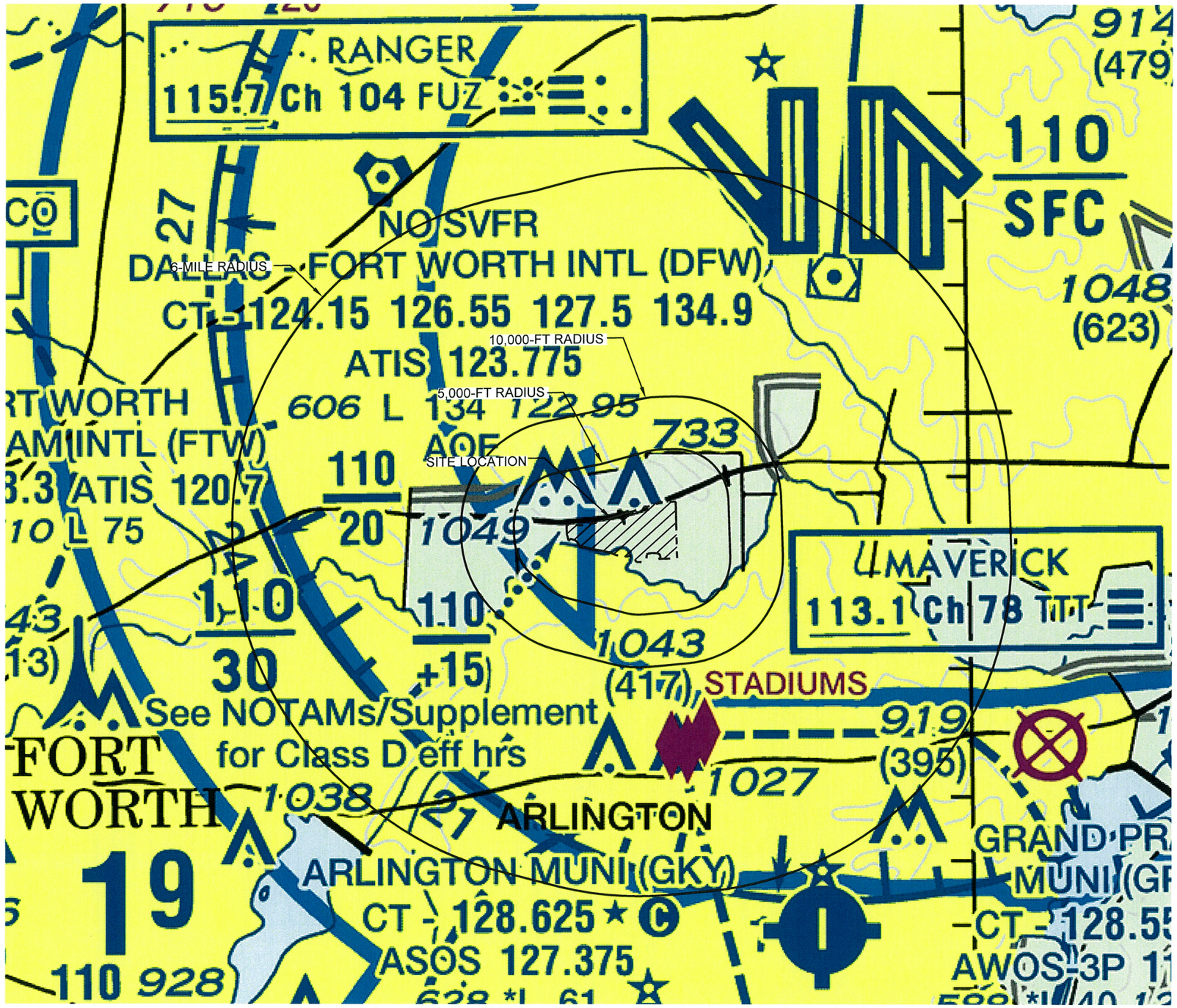
The FAA reviewed the proposed changes to determine the potential for the site to be a hazard to air navigation. As documented in the letter dated April 13, 2022, the FAA has determined that the proposed changes do not pose a hazard to air navigation (refer to Appendix I/IIB for more information).

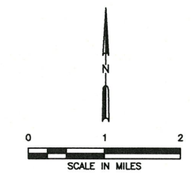
As noted in the FAA approval letters in Appendix I/IIB, obstruction lights must be installed in accordance with *FAA Advisory Circular 70/7460-IM, Obstruction Marking*

*and Lighting, Red Lights – Chapters 4, 5 (Red) & 15.* It is anticipated that approximately four observation lights will be needed to mark the landfill top deck. The proposed layout of the obstruction lights for the final condition is shown on Figure I/II-8.2.

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. As shown on Figure 1/II-8.1, no small general services 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.




LEGEND

LANDFILL PROPERTY

**AIRPORTS**

Other than hard-surfaced runways
Seaplane Base
Hard-surfaced runways 1500 ft. to 8069 ft. in length
Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, 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**

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.
Heliport Selected
Unverified
Abandoned - paved having landmark value, 3000 ft. or greater
Ultralight Flight Park Selected
Fuel availability indicated by use of tick marks around basic airport symbol. Consult Supplement for details and availability at airports with hard-surfaced runways greater than 8069 ft.
Rotating airport beacon in operation Sunset to Sunrise
OBJECTIONABLE - Airport may adversely affect airspace use.

**AIRPORT DATA**

Box indicates FAR 93 Special Air Traffic Rules & Airport Traffic Patterns. FSS FAR 91 NO SVFR — Location Identifier [NAME] (NAM) (PNAM) — ICAO Location indicator shown outside contiguous U.S.
Runways with Right Traffic Patterns (public use) — CT - 118.3 * ATIS 123.8 285 L 72 122.95 — RP 23, 34
*RP Special conditions exist - see Supplement.
VFR Advsy 125.0 — UNICOM
WX CAM — Weather Camera (AK)
FSS - Flight Service Station
AOE — Airport of Entry
NO SVFR - Fixed-wing special VFR flight is prohibited.
CT - 118.3 - Control Tower (CT) - primary frequency
* - Star indicates operation part-time. See tower frequencies tabulation for hours of operation.
G - Follows the Common Traffic Advisory Frequency (CTAF)
ATIS 123.8 - Automatic Terminal Information Service
AFIS 135.2 - Automatic Flight Information Service (AK)
ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown where full-time ATIS not available). Some ASOS/AWOS facilities may not be located at airports.
UNICOM - Aeronautical advisory station
VFR Advsy - VFR Advisory Service shown where full-time ATIS not available and frequency is other than primary CT frequency.
285 - Elevation in feet
L - Lighting in operation Sunset to Sunrise
*L - Lighting limitations exist; refer to Supplement.
72 - Length of longest runway in hundreds of feet; usable length may be less.
When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting.

**AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION**

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown.
Class B Airspace
Class C Airspace (Mode C - see FAR 91.215(AIM).)
Class D Airspace
Ceiling of Class D Airspace in hundreds of feet (A minus ceiling value indicates surface up to but not including that value.)
Class E (shl) Airspace
CLASS G
Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace
2400 MSL / 4500 MSL — Differentiates floors of Class E Airspace greater than 700 ft. above surface.
Class E Airspace exists at 1200' AGL unless otherwise designated as shown above. Class E Airspace low altitude Federal Airways and RNAV 2 Routes are indicated by center line. Intersection - Arrows are directed towards facilities which establish intersection.
Total mileage between NAVAIDs on direct Airways
Helicopter Only
RNAV Waypoint
Prohibited, Restricted, and Warning Areas; Canadian Advisory, Danger, and Restricted Areas
*Alert Area and Military Operations Area (MOA)
*Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.
Special Airport Traffic Area (See FAR 93 for details.)
National Defense Airspace
Temporary Flight Restriction Area
ADIZ - Air Defense Identification Zone
MODE C (See FAR 91.215/AIM.)
National Security Area
Terminal Radar Service Area (TRSA)
MTR - Military Training Route
IR211

**COMMUNICATION BOXES**

OAKDALE — 382* 118.6 OAK 122.1R 122.8 123.6
Underline indicates no voice on frequency.
Crosshatch indicates Shutdown status.
* - Operates less than continuous or On-Request.
@ - ASOS/AWOS
R - Receive only
FSS radio providing voice communication
MIAMI — 122.1R
Frequencies above thin line box are remoted to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Supplement for complete information.
CHICAGO CHI — 122.6
Heavy line box indicates Flight Service Station (FSS). Frequencies 122.2 and 255.4 (Contiminous U.S.), 121.5, 122.2, 243.0 and 255.4 (Alaska), and 121.5, 126.7, and 243.0 (Canada) are available at many FSSs and are not shown above boxes. All other frequencies are shown.

**RADIO AIDS TO NAVIGATION**

VHF OMNI RANGE (VOR)
VORTAC
VOR-DME
DME
Other facilities, i.e., FSS Outlet, RCO, WX CAM (AK) (see Supplement), etc.
Non-Directional Radio Beacon (NDB)
NDB - DME

**OBSTRUCTIONS**

1000 ft and higher AGL
Above 200 ft & below 1000 ft AGL (above 299 ft AGL in urban area)
Wind Turbine
Group Obstruction
Wind Turbine Farm
2894' UC
Elevation of the top above mean sea level
Height above ground
2049 (1149) UC
Under construction or reported; position and elevation unverified
Obstruction with high-intensity lights; may operate part-time
NOTICE: Guy wires may extend outward from structures.

**MISCELLANEOUS**

A - Aerobatic Practice Area (See Supplement.)
G - Glider Operations
H - Hang Glider Activity
U - Ultralight Activity
UA - Unmanned Aircraft Activity
P - Parachute Jumping Area (See Supplement.)
STADIUM
Intermittent TFR site (within 3 NM, up to & incl 3000' AGL)
Space Launch Activity Area
Marine Light
-10E- Isogonic Line (2020 VALUE)
VPXYZ
VFR Waypoints
NAME (VPXYZ)

**TOPOGRAPHIC INFORMATION**

Power Transmission Line
Aerial Cable
Lookout Tower
618 (Elevation Base of Tower)
Mountain Pass
11823 (Elevation of Pass)
Pass symbol does not indicate a recommended route or direction of flight and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes.

NOTES:

1. THIS MAP REPRODUCED FROM THE FAA DALLAS–FORT WORTH SECTIONAL AERONAUTICAL CHARTS DATED AUGUST 2021
2. THERE ARE NO PUBLIC AIRPORTS WITHIN A 10,000 FOOT RADIUS OF THE SITE.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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CAD: 8.1-AREA AIRPORTS.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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# MAJOR PERMIT AMENDMENT
# AREA AIRPORTS

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II-8.1

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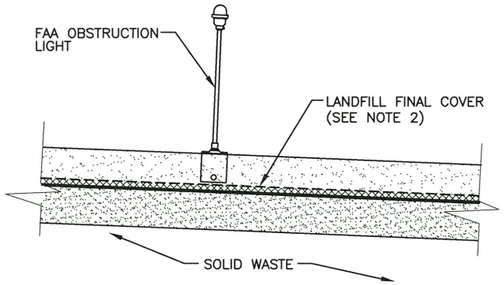





NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. FINAL COVER DETAILS ARE PROVIDED IN APPENDIX IIIA–A.
3. MAXIMUM FINAL COVER ELEVATION: 759.0 FT–MSL
   MAXIMUM WASTE ELEVATION: 757.0 FT–MSL
4. AS DISCUSSED IN SECTION 8.2, ONCE THE TOP DECK REACHES 200 FEET ABOVE GRADE, LIGHTS WILL BE INSTALLED PER ADVISORY CIRCULAR 70–7460–1M, OBSTRUCTION MARKING AND LIGHTING, RED LIGHTS–CHAPTERS 4,5(RED) AND 15. THE LIGHTS WILL BE EVENLY SPACED, AS PRACTICAL, TO MARK THE TOP DECK. THE CONFIGURATION SHOWN ON THIS DRAWING REPRESENTS THE FINAL SITE CONDITION ONLY. A SIMILAR PATTERN WILL BE USED DURING THE DEVELOPMENT OF THE SITE, ONCE THE TOP DECK REACHES 200 FEET ABOVE GRADE.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- RED OBSTRUCTION LIGHTS REQUIRED BY FAA (SEE NOTE 4)

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023–404–11
CAD: 8.2–OBSERVATION LIGHTS.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

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# MAJOR PERMIT AMENDMENT
# FAA OBSTRUCTION LIGHTS
# TYPICAL LAYOUT

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/II–8.2

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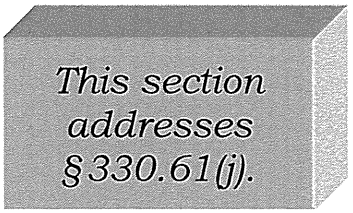
# 9 GENERAL GEOLOGY AND SOILS STATEMENT

## 9.1 Geology and Soils




According to the Bureau of Economic Geology (Geologic Atlas of Texas: Dallas Sheet, 1987), the City of Arlington Landfill is located upon Quaternary alluvium and terrace deposit sediments deposited over Woodbine Formation sediments.

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 Woodbine Aquifer.

Based on the lithologic logs from 142 facility boreholes and nearby water well logs, subsurface geology can be divided into five site-specific stratigraphic units. These site-specific geologic units include (in descending order): Stratum A (surficial alluvium), Stratum B (coarse-grained transmissive alluvium), Stratum C (Weathered Woodbine Formation sediments), Stratum D (course-grained potentially transmissive Woodbine Formation sediments), and Stratum E (non-transmissive unweathered Woodbine Formation sediments). Regional and site-specific geologic and hydrogeologic conditions are discussed in detail in Part III, Appendix IIIG.

## 9.2 Fault Areas

The City of Arlington 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 facility 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

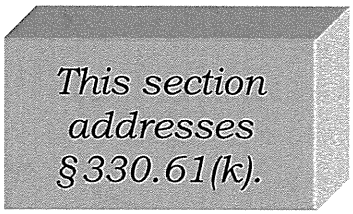
The seismic impact zone location restriction defined by Title 30 TAC §330.557 is an area with a 10 percent or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in 250 years. According to the U.S.GS earthquake hazard data, the site-specific maximum horizontal seismic acceleration estimated at a 10 percent probability of exceedance in a 250-year time period is 0.0457g (4.57 percent of the force of gravity as estimated from the USGS seismic impact zone map). As such, the USGS-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-6 in Appendix I/IIC presents the USGS Seismic Impact Zone Map. As shown on this drawing, the site is not located within a seismic impact zone. For these reasons, the City of Arlington 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 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, is contained within the course-grained alluvium sediments of site-specific Stratum B and, to a lesser extent, the interconnected portions of the course-grained Woodbine Formation sediments of site-specific Stratum D. The permitted lower confining unit is comprised of indurated Woodbine Formation sediments of site-specific Stratum C and Stratum E which act as an aquiclude to restrict the downward vertical movement of Uppermost Aquifer groundwater.

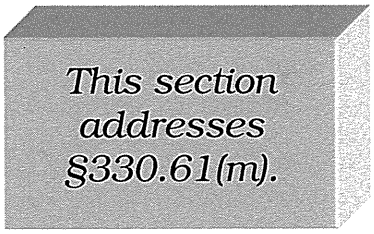
## 10.2 Surface Water Statement

The 774.3-acre City of Arlington Landfill permit boundary is located north of the West Fork Trinity River and west of F.M. 157, located within the Trinity River Drainage Basin. The permit boundary is located near the confluence of the Clear Fork and the West Fork of the Trinity River. The site mostly drains south to the West Fork via overland flow or Hurricane Creek; however, the northeast portion of the site drains east to an existing culvert under F.M. 157. The West Fork flows 6 miles east to the main branch of the Trinity River. The total drainage area of the West Fork Watershed upstream of the site is approximately 159,000 acres or 250 square miles. The landfill permit boundary encompasses approximately 0.05 percent of the watershed upstream of the permit boundary.

For the proposed landfill reconfiguration, 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 that will convey stormwater collected from the landfill area to one of two detention ponds. The stormwater detention ponds are designed to attenuate stormwater flow before stormwater is discharged into existing drainage features located downstream of the site. As discussed in Appendix IIIF, the site's stormwater management system is

# 11 FLOODPLAINS AND WETLANDS STATEMENT

## 11.1 Floodplains Statement




The West Fork of the Trinity River forms the southern boundary of the site and Hurricane Creek, a tributary of West Fork, flows in-between the existing east and west disposal areas. The continued development of the City of Arlington Landfill will involve placement of fill within the 100-year floodplain and relocation of Hurricane Creek. Drawing I/IIC-2 in Appendix I/IIC compares the existing floodplain and the effect the proposed revisions to the site development plan will have on the 100-year floodplain under TCEQ Permit No. 358C. The site is also located within the Trinity River corridor, and a Trinity River Corridor Development Certificate (CDC) has been developed for the continued development of the landfill. In addition, a Conditional Letter of Map Revision (CLOMR) has also been developed for the proposed development within the 100-year floodplain. Excerpts of the CLOMR and CDC permit applications are included in Part III, Appendix IIIN, and represent the approvals required to develop the site.

Compliance with the floodplain location restriction is further discussed in Appendix I/IIC (each of the four items listed under §330.63(c)(2)(d) are addressed in Appendix I/IIC, Section 4).

## 11.2 Wetlands Statement

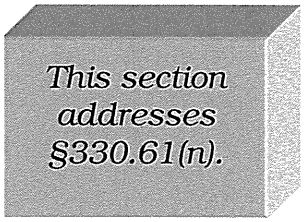
The area within the existing permit boundary of the City of Arlington Landfill was evaluated for compliance with wetlands provisions, including the determination and identification requirements in Title 30 TAC §330.61(m)(2) and (3) and the wetlands location restriction in §330.553(b).

A waters of the U.S. and wetlands determination/delineation was performed by KBA EnviroScience, Ltd. Excerpts from their January 2010 report is included in Appendix I/IIB which describes and identifies wetlands located within the facility boundary. The U.S. Army Corps of Engineers (USACE) Permit (Project Number SWF-2010-00056) was issued on November 21, 2014, authorizing the permanent filling and excavation of approximately 86 acres of waters of the U.S. associated with the

City of Arlington Expansion Project (TCEQ Permit No. 358B). The permit associated with Project Number SWF-2010-00056 is also included in Appendix I/IIB.

The proposed post-development condition of the landfill will require (1) excavation of additional waters of the U.S. previously delineated as forested wetland and open water and (2) relocation of Hurricane Creek. Coordination with the USACE for the proposed changes to Project Number SWF-2010-00056 in included in Appendix I/IIB, which represents the authorizations required to develop the site.

# 12 PROTECTION OF ENDANGERED SPECIES




A Biological Assessment Report for the City of Arlington Landfill was prepared by Weaver Consultants Group (WCG) in December 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 suitable habitat for any species listed for Tarrant County, nor has critical habitat been designated in the project are for any threatened or endangered species.

Therefore, it is concluded that the reconfiguration of the City of Arlington 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 existing 774.3-acre permit boundary is included on the following pages. This area is shown on the attached drawing.

The area within the permit boundary is owned by City of Arlington. Current ownership records for the property may be found in Tarrant County Real Property records.

*This section addresses §330.59(d)(1).*

PROPERTY DESCRIPTION

774.329 acres of land situated in the J. J. Wingfield Survey, Abstract No. 1634, the M. Lee Survey, Abstract No. 967, the McKinney and Williams Survey, Abstract No. 1908, The William Lee Survey, Abstract No. 968 and the W. R. Loving Survey, Abstract No. 944, City of Arlington, Tarrant County, Texas, being all of Lot 1, J. J. Wingfield Addition, an addition to the City of Arlington, Tarrant County, Texas, as recorded in Cabinet A, Slides 553 and 554, Plat Records of Tarrant County, Texas, all of the tracts of land conveyed to the City of Arlington, Texas, as recorded in Volume 9872, Page 1087, Deed Records of Tarrant County, Texas, County Clerk's Document No. D209239249, Deed Records of Tarrant County, Texas, County Clerk's Document No. D204267342, Deed Records of Tarrant County, Texas, County Clerk's Document No. D205030835, Deed Records of Tarrant County, Texas, also being a portion of Lot 1, R. Brown Addition, an addition to the City of Arlington as recorded in Volume 388-213, Page 20, Plat Records of Tarrant County, Texas, and a portion of a tract of land conveyed to the City of Arlington as recorded in County Clerk's Document No. D206251199, Deed Records of Tarrant County, Texas, said 774.329 acres of land being more particularly described by metes and bounds as follows using N.A.D. 83/86 Texas State Plane Grid Bearings:

BEGINNING at a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." found, having N.A.D. 83/86 Texas State Plane Grid Coordinates of North 6979611.86 and East 2398634.26 (using a combined scale factor of 0.99985928), at the northeast corner of the aforementioned Lot 1, J. J. Wingfield Addition being the intersection of the westerly R.O.W. line of F. M. No. 157 ( North Collins Street) and the southerly R.O.W. line of Mosier Valley Road;

THENCE S 00 Degrees 36 Minutes 27 Seconds E, along the easterly line of said Lot 1 and said westerly R.O.W. line, a distance of 5067.24 feet to a 1/2 inch iron rod with plastic cap stamped "Brittain & Crawford" found, having N.A.D. 83/86 Texas State Plane Grid Coordinates of North 6974545.62 and East 2398687.97 (using a combined scale factor of 0.99985928), at the southeast corner of said Lot 1 in the north line of a tract of land conveyed to the City of Arlington as recorded in Volume 11733, Page 1727, Deed Records of Tarrant County, Texas;

THENCE S 89 Degrees 02 Minutes 44 Seconds W, along the southerly line of said Lot 1, at 1290.18 feet pass a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." set, a total distance of 1644.30 feet to the center of the West Fork of the Trinity River per Lot 1 Plat call;

THENCE along the southerly line of said Lot 1 and the approximate centerline of said river (per Plat call) the following courses and distances:

N 63 Degrees 26 Minutes 33 Seconds E, a distance of 147.80 feet;

N 14 Degrees 56 Minutes 33 Seconds E, a distance of 195.00 feet;

N 28 Degrees 48 Minutes 27 Seconds W, a distance of 215.00 feet;

N 67 Degrees 48 Minutes 27 Seconds W, a distance of 155.00 feet;

N 84 Degrees 03 Minutes 27 Seconds W, a distance of 220.00 feet;

N 88 Degrees 48 Minutes 27 Seconds W, a distance of 310.00 feet;

S 80 Degrees 45 Minutes 33 Seconds W, a distance of 347.00 feet;

S 44 Degrees 56 Minutes 33 Seconds W, a distance of 125.00 feet;

S 05 Degrees 26 Minutes 33 Seconds W, a distance of 455.00 feet;

S 44 Degrees 33 Minutes 33 Seconds W, a distance of 126.00 feet;

S 62 Degrees 51 Minutes 33 Seconds W, a distance of 295.00 feet;

N 88 Degrees 03 Minutes 27 Seconds W, a distance of 350.00 feet;

N 70 Degrees 03 Minutes 27 Seconds W, a distance of 150.00 feet;

N 47 Degrees 23 Minutes 27 Seconds W, a distance of 178.50 feet;

N 20 Degrees 13 Minutes 27 Seconds W, a distance of 420.00 feet;

N 40 Degrees 28 Minutes 27 Seconds W, a distance of 120.00 feet;

S 87 Degrees 26 Minutes 33 Seconds W, a distance of 210.00 feet;

S 69 Degrees 53 Minutes 57 Seconds W, a distance of 341.25 feet;

N 84 Degrees 31 Minutes 59 Seconds W, a distance of 234.10 feet;

N 81 Degrees 50 Minutes 27 Seconds W, a distance of 751.47 feet to the southwest corner of said Lot 1, J. J. Wingfield Addition;

N 00 Degrees 27 Minutes 08 Seconds W, leaving the southerly line of said Lot 1 , a distance of 20.67 feet, a 7/8 inch iron rod found at the northeast corner of Lot 1, R. Brown Addition an addition to the City of Arlington as recorded in Volume 388-213, Page 20, Plat Records of Tarrant County, Texas and the southeast corner of a 7.000 acre tract of land conveyed to the City of Arlington, Texas, as recorded in Volume 9872, Page 1087, Deed Records of Tarrant County, Texas, bears N 00 Degrees 27 Minutes 08 Seconds W, 654.42 feet;

THENCE continuing along the centerline of said river;

N 66 Degrees 18 Minutes 09 Seconds W, a distance of 484.65 feet;

N 70 Degrees 08 Minutes 18 Seconds W, a distance of 142.37 feet;

N 80 Degrees 36 Minutes 24 Seconds W, a distance of 875.20 feet;

N 77 Degrees 10 Minutes 31 Seconds W, a distance of 270.62 feet to the west line of said Lot 1, R. Brown Addition, a 7/8 inch iron rod found at the northwest corner of said Lot 1, bears N 00 Degrees 22 Minutes 42 Seconds W, a distance of 194.94 feet, said iron rod having N.A.D. 83/86 Texas State Plane Grid Coordinates of North 6975560.56 and East 2391567.79 (using a combined scale factor of 0.99985928);

N 77 Degrees 10 Minutes 31 Seconds W, a distance of 549.75 feet;

N 73 Degrees 23 Minutes 03 Seconds W, a distance of 504.35 feet;

N 86 Degrees 26 Minutes 44 Seconds W, a distance of 100.18 feet;

S 81 Degrees 31 Minutes 59 Seconds W, a distance of 195.02 feet;

N 81 Degrees 04 Minutes 26 Seconds W, a distance of 156.76 feet;

N 52 Degrees 55 Minutes 04 Seconds W, a distance of 156.63 feet;

THENCE leaving said river and continuing along the centerline of the Walker Branch of the West Fork of the Trinity River with its meanders, the following courses and distances:

N 10 Degrees 58 Minutes 12 Seconds W, a distance of 159.62 feet, a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." set on the easterly bank of said Branch bears N 51 Degrees 47 Minutes 35 Seconds E, 60.17 feet;

N 41 Degrees 02 Minutes 21 Seconds W, a distance of 149.37 feet;

N 16 Degrees 58 Minutes 19 Seconds W, a distance of 47.69 feet;

N 27 Degrees 50 Minutes 40 Seconds E, a distance of 56.89 feet;

N 13 Degrees 57 Minutes 06 Seconds W, a distance of 29.54 feet;

N 32 Degrees 56 Minutes 18 Seconds W, a distance of 43.76 feet;

N 59 Degrees 45 Minutes 17 Seconds W, a distance of 166.19 feet;

N 59 Degrees 40 Minutes 29 Seconds W, a distance of 102.51 feet;

N 73 Degrees 34 Minutes 45 Seconds W, a distance of 199.15 feet;

N 68 Degrees 53 Minutes 17 Seconds W, a distance of 132.25 feet;

N 87 Degrees 19 Minutes 16 Seconds W, a distance of 52.21 feet;

S 54 Degrees 41 Minutes 17 Seconds W, a distance of 48.12 feet;

S 14 Degrees 51 Minutes 35 Seconds W, a distance of 79.32 feet;

S 34 Degrees 13 Minutes 44 Seconds W, a distance of 24.48 feet;

S 60 Degrees 19 Minutes 29 Seconds W, a distance of 62.32 feet;

N 75 Degrees 05 Minutes 26 Seconds W, a distance of 33.59 feet;

N 28 Degrees 15 Minutes 01 Seconds W, a distance of 75.43 feet;

N 21 Degrees 00 Minutes 14 Seconds E, a distance of 17.08 feet;

N 12 Degrees 20 Minutes 41 Seconds W, a distance of 246.02 feet;

N 02 Degrees 53 Minutes 10 Seconds W, a distance of 69.72 feet;

N 25 Degrees 21 Minutes 25 Seconds W, a distance of 40.31 feet;

N 46 Degrees 28 Minutes 10 Seconds W, a distance of 68.86 feet to a point in the west line of a 58.909 acre tract of land conveyed to the City of Arlington, as recorded in County Clerk's Document No. D206251199, Deed Records of Tarrant County, Texas, said point having N.A.D. 83/86 Texas State Plane Grid Coordinates of North 6976729.77 and East 2388919.24 (using a combined scale factor of 0.99985928);

THENCE N 00 Degrees 48 Minutes 07 Seconds W, along the west line of said 58.909 acres, leaving said Branch, at 50.30 feet pass a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." set, a total distance of 757.65 feet to a 1/2 inch iron rod found;

THENCE N 00 Degrees 02 Minutes 53 Seconds E, continuing along said west line, a distance of 190.50 feet to a 1/2 inch iron rod found, having N.A.D. 83/86 Texas State Plane Grid Coordinates of North 6977677.70 and East 2388908.80 (using a combined scale factor of 0.99985928), in the southerly R.O.W. line of the Trinity Railway Express (formerly the Chicago, Rock Island and Pacific Railroad Company) as recorded in Volume 7726, Page 1848, Deed Records of Tarrant County, Texas, said iron rod also being the northwest corner of the aforesaid 58.909 acres;

THENCE S 85 Degrees 56 Minutes 57 Seconds E, along said southerly R.O.W. line, a distance of

654.79 feet to a 5/8 inch iron rod found at the beginning of a curve to the left with a radius of 5782.61 feet and whose long chord bears N 84 Degrees 07 Minutes 03 Seconds E, 2008.41 feet;

THENCE Easterly along said curve, with said R.O.W., passing the northeast corner of said 58.909 acres, the northwest and northeast corners of a 0.645 of an acre tract of land conveyed to the City of Arlington as recorded in County Clerk's Document No. D205030835, the northwest corner of Tract One conveyed to the City of Arlington as recorded in County Clerk's Document No. D204267342, Deed Records of Tarrant County, Texas and continuing with the northerly line of said Tract One, through a central angle of 20 Degrees 00 Minutes 05 Seconds, an arc distance of 2018.64 feet, to 1/2 inch iron rod with cap stamped "Brittain & Crawford" found at the end of said curve;

THENCE N 00 Degrees 13 Minutes 02 Seconds W, along said R.O.W. line and the northerly line of said Tract One, a distance of 25.96 feet to a 1/2 inch iron rod with cap stamped "Brittain & Crawford" found at the beginning of a curve to the left with a radius of 5757.61 feet and whose long chord bears N 73 Degrees 36 Minutes 45 Seconds E, 91.15 feet;

THENCE Northeasterly along said curve, with said R.O.W. and the north line of Tract One, through a central angle of 00 Degrees 54 Minutes 26 Seconds, an arc distance of 91.15 feet to a to 1/2 inch iron rod with cap stamped "Brittain & Crawford" found at the beginning of a compound curve to the left with a radius of 20978.04 feet and whose long chord bears N 74 Degrees 09 Minutes 08 Seconds E, 279.43 feet;

THENCE Easterly along said curve with said R.O.W. line, through a central angle of 00 Degrees 45 Minutes 47 Seconds, an arc distance of 279.43 feet to a to 1/2 inch iron rod with cap stamped "Brittain & Crawford" found the end of said curve;

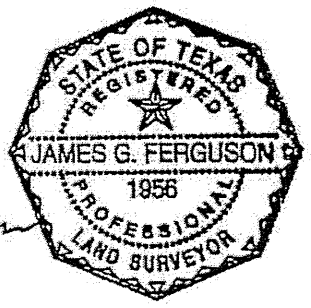
THENCE N 73 Degrees 45 Minutes 45 Seconds E, with said southerly R.O.W. line, at 523.27 feet pass a 1 inch iron rod found at the most northerly northeast corner of said Tract One and the northwest corner of the aforesaid Lot 1, J. J. Wingfield Addition and continuing with the north line of said Lot 1, a total distance of 4656.13 feet to a 1 inch iron rod found;

THENCE N 00 Degrees 34 Minutes 48 Seconds W, along said R.O.W. line and the northerly line of said Lot 1, a distance of 26.11 feet to a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." found;

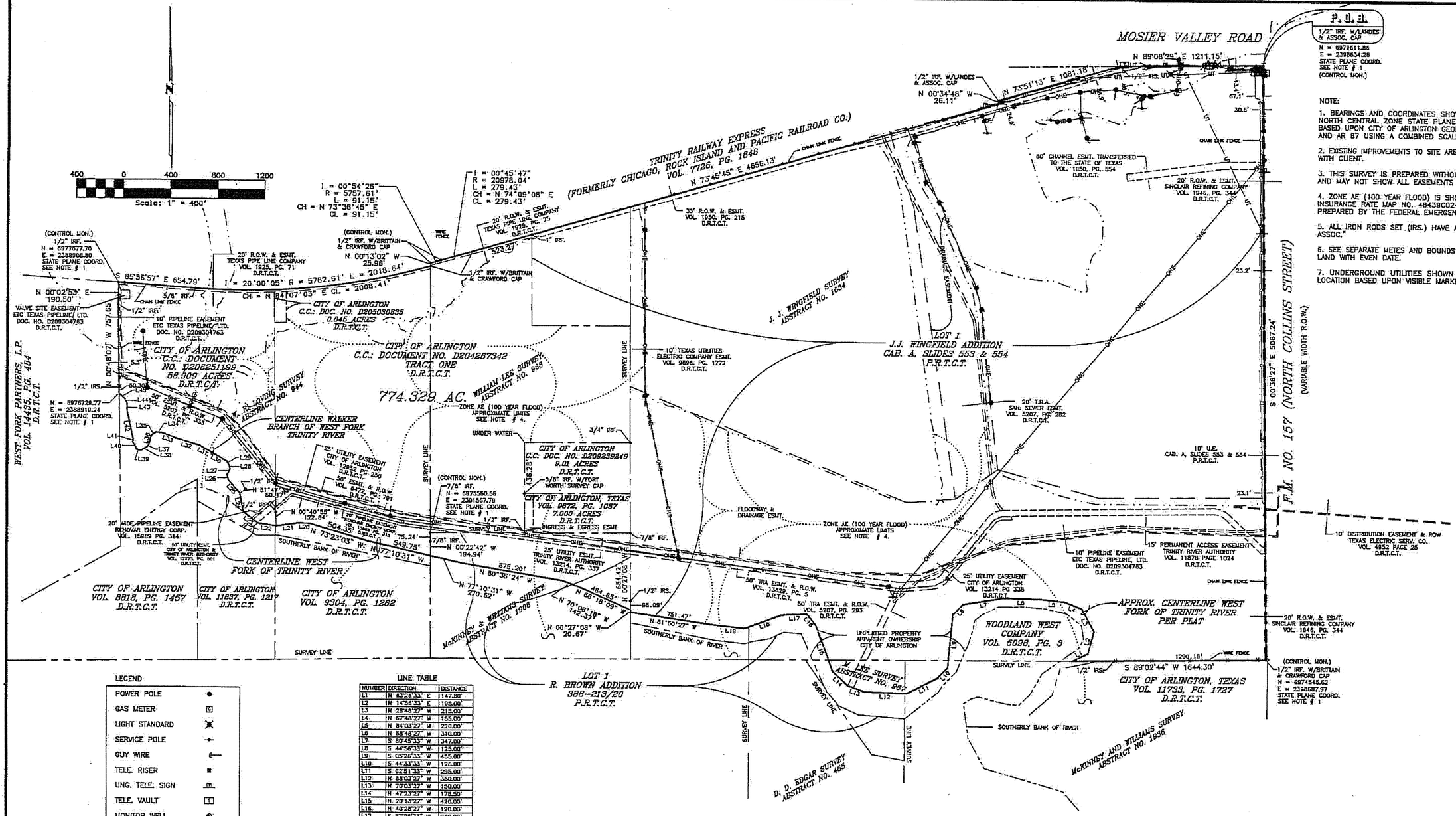
THENCE N 73 Degrees 51 Minutes 13 Seconds E, continuing along said R.O.W. line and said Lot 1, a distance of 1081.18 feet to a 1/2 inch iron rod with plastic cap stamped "Landes & Assoc." found in the south R.O.W. line of Mosier Valley Road;

THENCE N 89 Degrees 08 Minutes 29 Seconds E, along said south R.O.W. line and the north line of said Lot 1, a distance of 1211.15 feet to the PLACE OF BEGINNING and containing 774.329 acres of land.

See separate survey map of 774.329 acres of land
with even date.
Revised 04-21-11




James G. Ferguson
3-9-2011




LEGEND

| | |
|---|---|
| POWER POLE | ● |
| GAS METER | G |
| LIGHT STANDARD | ✕ |
| SERVICE POLE | ⊸ |
| GUY WIRE | ⟵ |
| TELE. RISER | ■ |
| UNG. TELE. SIGN | m |
| TELE. VAULT | T |
| MONITOR WELL | ⊙ |
| WATER VAULT | W |
| WATER GATE VALVE | ⋈ |
| AIR RELEASE VALVE | |
| FIRE HYDRANT | |
| SAN. SEWER MANHOLE | ○ |
| TRAFFIC SIGNAL BOX | ▣ |
| SIGN | ⊓ |
| UNG. ELEC. VAULT | ▭ |
| OVERHEAD ELEC. | —OHE— |
| BURIED TELE. | —UT— |

LINE TABLE

| NUMBER | DIRECTION | DISTANCE |
|---|---|---|
| L1 | N 63°26'33" E | 147.80' |
| L2 | N 14°26'33" E | 195.00' |
| L3 | N 28°48'27" W | 215.00' |
| L4 | N 67°48'27" W | 155.00' |
| L5 | N 84°03'27" W | 220.00' |
| L6 | N 88°48'27" W | 310.00' |
| L7 | S 80°45'33" W | 347.00' |
| L8 | S 44°56'33" W | 125.00' |
| L9 | S 05°26'33" W | 455.00' |
| L10 | S 44°33'33" W | 126.00' |
| L11 | S 02°51'33" W | 295.00' |
| L12 | N 84°03'27" W | 350.00' |
| L13 | N 70°03'27" W | 150.00' |
| L14 | N 47°23'27" W | 178.50' |
| L15 | N 20°13'27" W | 420.00' |
| L16 | N 46°28'27" W | 120.00' |
| L17 | S 87°28'33" W | 310.00' |
| L18 | S 69°53'57" W | 341.25' |
| L19 | N 84°31'59" W | 234.10' |
| L20 | N 56°26'44" W | 190.18' |
| L21 | S 81°31'59" W | 195.02' |
| L22 | N 81°04'26" W | 136.76' |
| L23 | N 52°55'04" W | 136.83' |
| L24 | N 10°58'12" W | 159.02' |
| L25 | N 41°02'21" W | 149.37' |
| L26 | N 16°58'19" W | 47.69' |
| L27 | N 27°50'40" E | 58.89' |
| L28 | N 13°57'06" W | 29.54' |
| L29 | N 32°56'18" W | 43.78' |
| L30 | N 59°45'17" W | 166.19' |
| L31 | N 59°40'29" W | 102.51' |
| L32 | N 73°34'45" W | 189.15' |
| L33 | N 68°53'17" W | 132.25' |
| L34 | N 87°19'16" W | 82.21' |
| L35 | S 54°41'17" W | 48.12' |
| L36 | S 14°51'35" W | 79.32' |
| L37 | S 34°13'44" W | 24.48' |
| L38 | S 60°19'29" W | 62.32' |
| L39 | N 75°03'26" W | 33.59' |
| L40 | N 28°15'01" W | 75.43' |
| L41 | N 21°00'14" E | 17.08' |
| L42 | N 12°20'41" W | 246.02' |
| L43 | N 02°53'10" W | 69.72' |
| L44 | N 25°21'25" W | 140.31' |
| L45 | N 46°28'10" W | 68.86' |

LANDES & ASSOCIATES, INC.
REGISTERED PROFESSIONAL LAND SURVEYORS
1107 E. FIRST STREET • FORT WORTH, TEXAS 76102 • (817) 870-1220 • FAX 870-1232

NOTE:

1. BEARINGS AND COORDINATES SHOWN HEREON ARE NAD 83/86 TEXAS NORTH CENTRAL ZONE STATE PLANE GRID BEARINGS AND COORDINATES BASED UPON CITY OF ARLINGTON GEODETIC CONTROL MONUMENTS NO. AR3 AND AR 87 USING A COMBINED SCALE FACTOR OF 0.99985928.
2. EXISTING IMPROVEMENTS TO SITE ARE NOT LOCATED PER PRIOR AGREEMENT WITH CLIENT.
3. THIS SURVEY IS PREPARED WITHOUT BENEFIT OF A TITLE COMMITMENT AND MAY NOT SHOW ALL EASEMENTS AFFECTING THE PROPERTY.
4. ZONE AE (100 YEAR FLOOD) IS SHOWN HEREON AS DEPICTED ON FLOOD INSURANCE RATE MAP NO. 48439C0240K, REVISED SEPTEMBER 25, 2009, PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
5. ALL IRON RODS SET (IRS.) HAVE A PLASTIC CAP STAMPED "LANDES & ASSOC."
6. SEE SEPARATE METES AND BOUNDS DESCRIPTION OF 774.329 ACRES OF LAND WITH EVEN DATE.
7. UNDERGROUND UTILITIES SHOWN HEREON ARE IN AN APPROXIMATE LOCATION BASED UPON VISIBLE MARKERS AND APPURTENANCES.

CERTIFICATION

I DO HEREBY CERTIFY THAT THE MAP SHOWN HEREON REPRESENTS A SURVEY MADE ON THE GROUND UNDER MY DIRECTION IN THE MONTH OF FEBRUARY, 2011. THE CORNERS ARE MARKED AS SHOWN.

James G. Ferguson 3-9-2011
JAMES G. FERGUSON R.P.L.S. # 1966 — DATE

STATE OF TEXAS REGISTERED JAMES G. FERGUSON 1966 PROFESSIONAL LAND SURVEYOR

04-21-11 REVISED TO ADD TRACTS.

I/II-13-7

A SURVEY OF

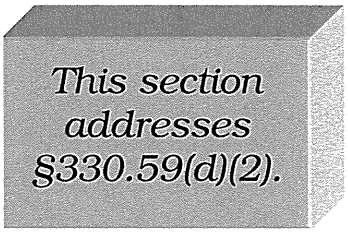
## 774.329 ACRES OF LAND

774.329 ACRES OF LAND SITUATED IN THE J. J. WINGFIELD SURVEY, ABSTRACT NO. 1634, THE W. LEE SURVEY, ABSTRACT NO. 967, THE MCKINNEY AND WILLIAMS SURVEY, ABSTRACT NO. 1908, THE WILLIAM LEE SURVEY, ABSTRACT NO. 968 AND THE W. R. LOVING SURVEY, ABSTRACT NO. 944, CITY OF ARLINGTON, TARRANT COUNTY, TEXAS, BEING ALL OF LOT 1, J. J. WINGFIELD ADDITION, AN ADDITION TO THE CITY OF ARLINGTON, TARRANT COUNTY, TEXAS, AS RECORDED IN CABINET A, SLIDES 553 AND 554, PLAT RECORDS OF TARRANT COUNTY, TEXAS, ALL OF THE TRACTS OF LAND CONVEYED TO THE CITY OF ARLINGTON, TEXAS, AS RECORDED IN VOLUME 9872, PAGE 1087, DEED RECORDS OF TARRANT COUNTY, TEXAS, COUNTY CLERK'S DOCUMENT NO. D209239249, DEED RECORDS OF TARRANT COUNTY, TEXAS, COUNTY CLERK'S DOCUMENT NO. D204267342, DEED RECORDS OF TARRANT COUNTY, TEXAS, COUNTY CLERK'S DOCUMENT NO. D205030835, DEED RECORDS OF TARRANT COUNTY, TEXAS, ALSO BEING A PORTION OF LOT 1, R. BROWN ADDITION, AN ADDITION TO THE CITY OF ARLINGTON AS RECORDED IN VOLUME 388-213, PAGE 20, PLAT RECORDS OF TARRANT COUNTY, TEXAS, AND A PORTION OF A TRACT OF LAND CONVEYED TO THE CITY OF ARLINGTON AS RECORDED IN COUNTY CLERK'S DOCUMENT NO. D206251199, DEED RECORDS OF TARRANT COUNTY, TEXAS.

# 05135-D

# 14 PROPERTY OWNER AFFIDAVIT

The property owner affidavit from City of Arlington, with attached legal description is included on the following pages.



STATE OF TEXAS §
COUNTY OF TARRANT §

**PROPERTY OWNER'S AFFIDAVIT**

On this day, Sunanda Katragadda, appeared before me, the undersigned notary public, and after I administered an oath to her, upon her oath she said:

"My name is Sunanda Katragadda. I am the Environmental Services Administrator of City of Arlington, and I am authorized to make the following statements on behalf of City of Arlington."

City of Arlington is the owner of certain real property in Tarrant County, Texas, including the tract(s) described in Exhibit A attached hereto ("the Property"), which City of Arlington is requesting be included within the permitted area of its City of Arlington Landfill municipal solid waste landfill facility ("the Facility"), pursuant to amendment of Texas Commission on Environmental Quality Permit No. MSW-358C.

City of Arlington 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.

City of Arlington hereby acknowledges that the owner of the Property has the responsibility to file in the deed records of Tarrant 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 30 TAC §330.19.

City of Arlington 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.

STEPHANIE DIMAS
Notary Public, State of Texas
Comm. Expires 09-01-2025
Notary ID 129000418

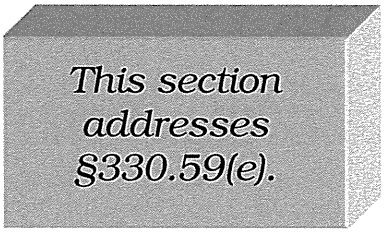
Sunanda Katragadda
Environmental Services Administrator
City of Arlington

SWORN TO AND SUBSCRIBED before me by Sunanda Katragadda on the 19th day of May, 2022.

Stephanie Dimas
Notary Public

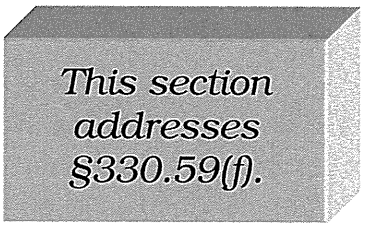
# 15 LEGAL AUTHORITY

The City of Arlington was incorporated in the State of Texas in 1884 and operates under the charter from of government. A copy of the City's charter is included in Appendix I/IIF. Under Texas law, the City has the responsibility to provide for the management of solid waste generated by residences and businesses.



# 16 EVIDENCE OF COMPETENCY

## 16.1 Solid Waste Sites




The existing landfill is the only solid waste site currently operated by the City of Arlington. The operation of the City of Arlington Landfill is under the direction of the City Manager.

The City of Arlington is the permittee and site operator of the City of Arlington Landfill facility and is responsible for overall operation of the facility. Pursuant to an agreement with the City, Republic Waste Services of Texas, Ltd. is the contract operator of the landfill. Republic Waste Services of Texas, Ltd. is an indirect, wholly-owned subsidiary of Republic Services (Republic). Republic has owned or operated the sites in Texas listed in Table 16-1 within the last ten (10) years. Republic has a direct financial interest in the sites outside of Texas listed in Table 16-2. A listing of the state regulatory agencies for these landfills is provided in Table 16-3. Republic 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. Republic shares are publicly traded on the New York stock exchange.

## 16.2 City of Arlington Landfill Key Personnel

### 16.2.1 City of Arlington

The key personnel involved in the management and operations of the City of Arlington Landfill are listed below.

### Trey Yelverton, City of Arlington, City Manager

The City Manager is the Chief Executive Officer of the City organization, responsible directly for the Finance, Communications, and Economic Development Departments and indirectly for all other departments. Mr. Yelverton is the signatory for this application.

### Sunanda Katragadda, Environmental Services Administrator

The landfill operation and the administration of the operating contract with Republic are under the direction of Ms. Katragadda and the Asset Management Department's office.

## 16.2.2 Contract Operator (Republic Waste Services of Texas, Ltd.)

The key personnel involved in the management and operations of the City of Arlington Landfill are listed below.

### Yasser Brenes, Area President

Mr. Brenes is responsible for all hauling, transfer stations, and landfill operations in the Texas area. Responsibilities include financial planning and environmental compliance, as well as other management responsibilities. Also, he oversees operations; sales and marketing; and finance for Republic's landfills, transfer stations, recycling, and waste collection operations.

### Scott A. Trebus, Area Environmental Manager

Mr. Trebus is responsible for the engineering management, regulatory coordination, and environmental compliance of Republic's landfills, transfer stations, and hauling facilities in Texas.

### Clint Dickerson, General Manager

Mr. Dickerson is responsible for operations of the City of Arlington Landfill and other hauling and landfill facilities in Republic's DFW area. Generally, Mr. Dickerson's responsibilities include management of all operational aspects of these facilities, such as engineering, construction, environmental compliance, equipment maintenance, operational strategy, safety programs, financial planning and budgeting. Additionally, Mr. Dickerson plays a key role in securing new permits and permit expansions, and he assists with community relations, as well as customer development.

### Adam Hart, Environmental Manager

Mr. Hart has management and oversight responsibilities for environmental compliance at Republic's landfills, transfer stations, and hauling facilities in Texas. Mr. Hart has primary responsibility for permitting and environmental compliance at the City of Arlington Landfill.

### David Hildreth, Site Manager

Mr. Hildreth is responsible for the daily operations of the City of Arlington Landfill. His responsibilities include oversight of hourly employees, equipment maintenance, construction management, and operations compliance. Mr. Hildreth has a Texas Class A license for MSW Landfill Management and 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
# List of Republic Services Texas Solid Waste Facilities
# Owned or Operated Last Ten Years
# (as of May 2022)

| Name & Location | Permit Type & No. | Dates of Operation [1] |
|---|---|---|
| **NORTH TEXAS AREA** | | |
| Southwest Landfill<br>Tarrant County | Type 1, MSW No. 1663C | 1985 to present |
| Abilene Regional Landfill<br>Jones County | Type 1, MSW No. 1469A | 1983 to present |
| Brazos Transfer Station<br>Parker County | Type 5TS, MSW No. 2356 | April 7, 2008, to present |
| Camelot Landfill<br>Denton County | Type 1, MSW No. 1312B | Dec. 1979 to present |
| Charter Waste Landfill<br>Ector County | Type 1, MSW No. 2158A | May 26, 1992, to present |
| City of Arlington Landfill<br>Tarrant County | Type 1, MSW No. 358B | March 14, 1978, to present |
| City of Fort Worth Southeast Landfill<br>Tarrant County | Type 1, MSW No. 218C | 1976 to present |
| CSC Landfill<br>Ellis County | Type 1, MSW No. 1209B | July 15, 1999, to present |
| ECD Landfill<br>Ellis County | Type 1, MSW No. 1745B | 1988 to present |
| Fort Worth Regional Landfill<br>Tarrant County | Type 1, MSW No. 464A | Mar. 1987 to Oct. 1995 (CLOSED) |
| Fort Worth Transfer Station<br>Tarrant County | Type V, MSW No. 2275 | 2001 to present |
| Greenwood Farms Landfill<br>Smith County | Type 1, MSW No. 1972A | Sept. 1988 to present |
| Hutchins Landfill<br>Dallas County | Type 1, MSW No. 1236A | CLOSED in 1992 |
| Itasca Landfill<br>Hill County | Type 1, MSW No. 241D | 1988 to present |
| Lewisville Landfill<br>Denton County | Type 1V, MSW No. 1749B | 1986 to present |
| Maloy Landfill<br>Hunt County | Type 1, MSW No. 358B | January 23, 1979, to present |
| Mexia Landfill<br>Limestone County | Type 1, MSW No. 1558A | 1983 to present |
| Mill Creek Landfill<br>Tarrant County | Type 1, MSW No. 208A | 1973 to Nov. 2001 (CLOSED) |

# Table 16-1
# List of Republic Services Texas Solid Waste Facilities
# Owned or Operated Last Ten Years
# (as of May 2022)

| Name & Location | Permit Type & No. | Dates of Operation [1] |
|---|---|---|
| **NORTH TEXAS AREA (Continued)** | | |
| Pinehill Landfill<br>Gregg County | Type 1, MSW No. 1327B | Dec. 1987 to present |
| Pleasant Oaks Landfill<br>Titus County | Type 1, MSW No. 797A | 1960 to present |
| Quail Canyon Landfill<br>Lubbock County | Type 1, MSW No. 987A | 1977 to 1992 (CLOSED) |
| Royal Oaks Landfill<br>Cherokee County | Type 1, MSW No. 1614A | Dec. 1988 to present |
| Trinity Oaks Landfill<br>Dallas County | Type 1, MSW No. 556 | 1976 to Nov. 2002 (CLOSED) |
| **SOUTH TEXAS AREA** | | |
| BFI Burnet TS<br>Burnet County | Registration No. 40035 | Aug. 17, 1994 to present |
| BFI Sealy TS<br>Austin County | Registration No. 40025 | April 19, 1995 to present |
| BFI Corpus Christi Recyclery<br>Nueces County | Registration No. 65019 | July 31, 2002 to present |
| BFI Galveston County TS<br>Galveston County | Registration No. 1680 | Oct. 4, 1989 to present |
| Blue Ridge Landfill<br>Fort Bend County | Type 1, MSW No. 1505A | Dec. 10, 1990, to present |
| Cefe Valenzuela Landfill<br>Nueces County | Type 1, MSW No. 2269 | July 22, 2005 to present |
| City of El Campo CCS<br>Wharton County | Type 5CC, MSW No. 120025 | March 17, 2009, to present |
| El Centro Landfill<br>Nueces County | Type 1, MSW No. 2267 | 2003 to present |
| Galveston County Landfill<br>Galveston County | Type 1, MSW No. 1149B | January 14, 1971, to present |
| Golden Triangle Landfill<br>Jefferson County | Type 1, MSW No. 2027 | May 24, 1991, to present |
| Gulf West Landfill<br>Chambers County | Type 1, MSW No. 39039 | March 1991 to present |
| Hardin County Landfill<br>Hardin County | Type 1, MSW No. 2214A | September 2017 to the present |
| Holmes Road Landfill<br>Harris County | Type 1, MSW No. 38 (N ½)<br>& MSW No. 377 (S ½) | CLOSED in 1978 |
| Houston Northwest TS<br>Harris County | Type 5TS, MSW No. 1092 | Jan. 12, 1999 to present |
| Houston Southeast TS<br>Harris County | Type 5TS, MSW No. 1074 | December 22, 1983, to present |
| Houston Southwest TS<br>Harris County | Type 5TS, MSW No. 1091 | November 23, 1977, to present |

# Table 16-1
# List of Republic Services Texas Solid Waste Facilities
# Owned or Operated Last Ten Years
# (as of May 2022)

| Name & Location | Permit Type & No. | Dates of Operation [1] |
|---|---|---|
| **SOUTH TEXAS AREA (Continued)** | | |
| Kerrville Landfill<br>Kerr County | Type 1, MSW No. 1506A | 1984 to present |
| La Feria TS<br>Cameron County | Type 5TS, MSW No. 2375 | November 9, 2011, to present |
| La Gloria Ranch Landfill<br>Hidalgo County | Type 1, MSW No. 2348 | May 24, 2007, to present |
| La Porte LF<br>Harris County | Type 1, MSW No. 1765 | Closed in 1988 |
| McCarty Road Landfill<br>Harris County | Type 1, MSW No. 261B | 1972 to present |
| North County Landfill<br>Galveston County | Type 4, MSW No. 1849B | April 24, 1998, to present |
| Pinn Road 1 Landfill<br>Bexar County | Type 1 and IV, MSW No. 92 | Type 1: 1975 to April 1986; revised to Type 1V to Sept. 1991 (CLOSED) |
| Pinn Road 2 Landfill<br>Bexar County | Type 1, MSW No. 14 | Jul. 1975 to 1994 (CLOSED) |
| Port Arthur Landfill<br>Jefferson County | Type 1, MSW No. 1815 | CLOSED in 1985 |
| Rio Grande Valley Landfill<br>Hidalgo County | Type 1, MSW No. 1948 | Jan. 19, 1994, to present |
| Sinton Landfill<br>San Patricio County | Type 1, MSW No. 242A | Sept. 8, 1972, to 2003 (CLOSED) |
| Sunset Farms Landfill<br>Travis County | Type 1, MSW No. 1447 | May 17, 1982, to present |
| Tessman Road Landfill<br>Bexar County | Type 1, MSW No. 1410B | 1981 to present |
| Total Roll-Offs TS<br>Washington County | Registration No. 40173 | Sept. 4, 2001 to present |
| Victoria Landfill<br>Victoria County | Type 1, MSW No. 1522A | Nov. 15, 1982, to present |
| Whispering Pines Landfill<br>Harris County | Type 1, MSW No. 1193 | Jan. 1, 1984, to present |

[1]This list includes the approximate dates of operation of the facility. This includes the previous owner/operators of certain facilities prior to the facility being acquired by Republic Services, Inc., or its subsidiaries.

# Table 16-2
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Mobile TS | Mobile | AL | TS | June 1980 to Present |
| Marshall County TS | Albertville | AL | TS | March 1999 to Present |
| Andalusia TS | Andalusia | AL | TS | April 2000 to Present |
| BFI Waste Services of Anniston / Albertville TS | Albertville | AL | TS | June 2003 to Present |
| Little Creek TS | Guin | AL | TS | December 1999 to Present |
| BFI Waste Services of Greenville | Greenville | AL | TS | December 1993 to Present |
| BFI Huntsville MRF | Huntsville | AL | MRF | December 1975 to Present |
| Prattville C&D Landfill | Prattville | AL | LF | November 2004 to Present |
| Prattville Transfer Station | Prattville | AL | TS | December 1999 to Present |
| BFI Athens TS | Athens | AL | TS | December 1999 to Present |
| BFI Selma TS | Selma | AL | TS | May 1995 to Present |
| Brundidge LF | Brundidge | AL | LF | May 2000 to Present |
| Chilton Landfill | Clanton | AL | CLF | Closed |
| Sand Valley LF | Collinsville | AL | LF | May 2000 to Present |
| Greenville TS | Greenville | AL | TS | December 1993 to Present |
| Morris Farms LF | Hillsboro | AL | LF | June 1996 to Present |
| Pineview LF | Dora | AL | LF | March 1993 to Present |
| Talledaga TS | Lincoln | AL | TS | December 1999 to Present |
| Timberlands LF | Brewton | AL | LF | August 1993 to Present |
| Willow Ridge LF | Haleyville | AL | LF | May 2000 to Present |
| Bella Vista Hauling & TS | Bella Vista | AR | TS | August 1996 to Present |
| Model Fill LF | Little Rock | AR | LF | February 1991 to Present |
| 7th Street TS | Phoenix | AZ | TS | * |
| 7th Street MRF | Phoenix | AZ | MRF | * |
| Central Arizona Transfer | Queen Creek | AZ | TS | December 1999 to Present |
| Cave Creek Transfer Station | Phoenix | AZ | TS | December 1999 to Present |
| Aztec Waste | Phoenix | AZ | TS | December 1999 to Present |
| Apache Junction LF | Apache Junction | AZ | LF | October 1993 to Present |
| Cactus Landfill | Eloy | AZ | LF | December 2004 to Present |
| Chandler LF Services | Chandler | AZ | LF | August 1982 to Present |
| Cocopah Landfill | Somerton | AZ | CLF | Closed |
| Copper Mountain LF | Wellton | AZ | LF | June 2000 to Present |
| La Paz County LF | Parker | AZ | LF | November 1993 to Present |
| Lake Havasu LF Services | Lake Havasu | AZ | LF | May 1997 to Present |
| Mesa TS | Queen Creek | AZ | TS | * |
| Mohave Valley LF | Fort Mohave | AZ | LF | October 1996 to Present |
| Paradise Waste TS | Phoenix | AZ | TS | January 1998 to Present |
| Allied Waste Transfer Services of Page | Page | AZ | TS | April 1997 to Present |
| Queen Creek LF | Queen Creek | AZ | CLF | Closed |
| Southwest Regional LF | Buckeye | AZ | LF | December 1994 to Present |
| Suburban Transfer | Yuma | AZ | TS | April 2000 to Present |
| Seagull Sanitation Systems | Avalon | CA | LF | April 2001 to Present |
| West Contra Costa Sanitary Landfill (WCCSL) | Richmond | CA | LF | Closed |
| Barrett Junction Burn Site | Dulzura | CA | LF | July 2000 to Present |
| Boulevard Burn Site | Boulevard | CA | LF | * |
| Campo Burn Site | Campo | CA | LF | July 2000 to Present |
| ECDC LF Group - Northwest | San Francisco | CA | LF | * |
| ECDC LF Group - Southwest | Newport Beach | CA | LF | * |
| Julian Burn Site | Julian | CA | LF | Closed |
| Palomar Mountain Burn Site | Palomar Mountain | CA | LF | Closed |
| Ranchita Burn Site | Ranchita | CA | LF | August 1998 to Present |
| Viejas Burn Site | Alpine | CA | LF | Closed |
| Independent Trucking | Stockton | CA | TS | * |
| American Waste TS | San Carlos | CA | TS | April 1998 to Present |

## Table 16-2 (Continued)
## List of Republic Services Solid Waste Sites in States Other Than Texas
## (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Bel-Art TS | Gardena | CA | TS | May 1995 to Present |
| Del Norte Regional Recycling and Transfer Station | Oxnard | CA | TS | June 1999 to Present |
| LA Consolidated East LA Transfer Station | Los Angeles | CA | TS | * |
| West County Resource Recovery | Richmond | CA | TS | * |
| Vallecito TS | Julian | CA | TS | December 1999 to Present |
| Sunshine Summit TS | Warner Springs | CA | TS | December 1999 to Present |
| Ocotillo Wells TS | Borrego Springs | CA | TS | December 1999 to Present |
| French Camp LF | Stockton | CA | CLF | Closed |
| Central LA Recycling and Transfer Station | Los Angeles | CA | TS | December 1999 to Present |
| Azusa Land Reclamation | Azusa | CA | CLF | Closed |
| Vasco Road LF | Livermore | CA | LF | December 1999 to Present |
| BFI Compton TS | Compton | CA | TS | September 1989 to Present |
| BFI Falcon TS | Wilmington | CA | TS | July 1997 to Present |
| BFI Mussel Rock TS | Daly City | CA | TS | January 1995 to Present |
| BFI Pescadero TS | Pescadero | CA | TS | December 1996 to Present |
| BFI Rice Road MRF | Fresno | CA | MRF | February 1990 to Present |
| BFI Rice Road TS | Fresno | CA | TS | February 1990 to Present |
| BFI San Carlos TS | San Carlos | CA | TS | June 1968 to Present |
| Allied Waste Transfer of San Mateo County | San Carlos | CA | TS | June 1968 to Present |
| Borrego Springs LF | Borrego Springs | CA | LF | October 1997 to Present |
| Chateau Fresno LF | Fresno | CA | CLF | Closed |
| Chestnut Avenue LF | Fresno | CA | CLF | Closed |
| Contra Costa Transfer | Martinez | CA | TS | March 1994 to Present |
| Devlin Road TS & Recycling Facility | American Canyon | CA | TS | February 1994 to Present |
| Elder Creek Recovery and Trash Station | Sacramento | CA | TS | May 2000 to Present |
| Elder Creek Recovery and Trash Station | Sacramento | CA | MRF | May 2000 to Present |
| Forward LF | Manteca | CA | LF | March 1973 to Present |
| Allied Imperial LF | Imperial | CA | LF | April 2000 to Present |
| Keller Canyon LF | Pittsburgh | CA | LF | September 1991 to Present |
| Newby Island LF | Milpitas | CA | LF | August 1987 to Present |
| Otay LF | Chula Vista | CA | LF | October 1997 to Present |
| Ox Mountain LF | Half Moon Bay | CA | LF | June 1987 to Present |
| Palomar TS | Carlsbad | CA | TS | November 1997 to Present |
| Ramona LF | Ramona | CA | LF | October 1997 to Present |
| Ranchita TS | Ranchita | CA | TS | Closed |
| Allied Waste Recyclery of San Mateo County | San Carlos | CA | MRF | October 1991 to Present |
| Sunshine Canyon LF | Sylmar | CA | LF | March 1955 to Present |
| Sycamore Canyon LF | Santee | CA | CLF | Closed |
| The Recyclery at Newby Island | Milpitas | CA | MRF | August 1987 to Present |
| Valley Environmental MRF | El Centro | CA | MRF | June 2000 to Present |
| BFI Glenwood Springs TS | Glenwood Springs | CO | TS | December 1999 to Present |
| Washington Street TS | Denver | CO | TS | December 1999 to Present |
| BFI Glenwood Springs TS | Glenwood Springs | CO | TS | December 1991 to Present |
| Greeley TS | Greeley | CO | TS | November 1995 to Present |
| Boulder LF | Boulder | CO | CLF | Closed |
| Basalt TS | Basalt | CO | TS | January 1999 to Present |
| Denver Regional LF North | Erie | CO | CLF | Closed |
| Foothills LF | Golden | CO | LF | September 1992 to Present |
| Grand Junction Recyclery | Grand Junction | CO | MRF | February 1982 to Present |
| Jeffco 1 LF | | CO | CLF | Closed |
| Tower LF | Commerce City | CO | LF | November 1982 to Present |
| ADS of Connecticut - Stratford | Stratford | CT | TS | December 1999 to Present |
| PM Services Transfer | Hartford | CT | TS | December 1999 to Present |
| Capitol Recycling & Brokerage | Hartford | CT | MRF | November 1990 to Present |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| BFI Consolidated TS | WASHINGTON | DC | TS | |
| BFI Waste Services of Washington (Consolidated TS) | Washington | DC | TS | September 1994 to Present |
| 545 Landfill | Winter Garden | FL | LF | * |
| Cedar Trail Landfill | Bartow | FL | LF | * |
| Nine Mile Road | St. Augustine | FL | LF | * |
| Metro Recycling | Tampa | FL | TS | * |
| Envirocycle | Ft. Lauderdale | FL | MRF | * |
| Rocket Blvd Material Recovery Facility | Orlando | FL | MRF | * |
| Southland Recycling Services | Jacksonville | FL | MRF | * |
| Buckeye Landfill (CLOSED TO PUBLIC) | Perry | FL | LF | December 1999 to Present |
| BFI Sarasota TS | Sarasota | FL | TS | December 1999 to Present |
| Delta Lakefill | Pompano Beach | FL | LF | December 1999 to Present |
| Key West Recyclery | Key West | FL | MRF | December 1999 to Present |
| Miami Beach TS | Miami Beach | FL | TS | December 1999 to Present |
| Pensacola TS | Pensacola | FL | TS | December 1999 to Present |
| Royal Oaks Ranch C&D LF | Titusville | FL | CLF | Closed |
| Tall Pines Recycling | W Palm Beach | FL | MRF | December 1999 to Present |
| BFI Pasco Recyclery | New Port Richey | FL | MRF | Closed |
| Pensacola TS | Pensacola | FL | TS | January 1990 to Present |
| BFI Pensacola Recyclery | Pensacola | FL | MRF | January 1990 to Present |
| BFI Tampa Bay Recyclery | Clearwater | FL | MRF | December 1986 to Present |
| Cone Road LF C&D | Tampa | FL | LF | March 1991 to Present |
| Delta Dade TS | Miami | FL | TS | December 1998 to Present |
| Ft. Lauderdale MRF | Davie | FL | MRF | December 1991 to Present |
| Ft. Walton TS | Ft. Walton Beach | FL | TS | April 2002 to Present |
| Jacksonville MRF | Jacksonville | FL | MRF | October 1978 to Present |
| Jones Road LF (C&D) | Jacksonville | FL | LF | October 1989 to Present |
| McKay Bay TS | Tampa | FL | TS | December 2001 to Present |
| Miami MRF | Miami | FL | MRF | March 1990 to Present |
| Miami TS | Miami | FL | TS | March 1990 to Present |
| Nassau LF (C&D) | Callahan | FL | LF | August 2002 to Present |
| BFI Sarasota Recyclery | Sarasota | FL | MRF | September 1990 to Present |
| Broadhurst Environmental | Screven | GA | LF | * |
| Highway 78 C&D Landfill | Monroe | GA | LF | * |
| Oak Grove LF | Winder | GA | LF | * |
| Pine Ridge Recycling | Griffin | GA | LF | * |
| Savannah Regional Landfill | Port Wentworth | GA | LF | * |
| Speedway LF | Winder | GA | LF | * |
| Swift Creek Environmental | Macon | GA | LF | * |
| Evans Co, Transfer Station | Claxton | GA | TS | * |
| Lee Transfer Station | Austell | GA | TS | * |
| Mauldin Drive Transfer Station | Alpharetta | GA | TS | * |
| Newnan Transfer Station | Winder | GA | TS | * |
| BFI Fayette County TS | Fayetteville | GA | TS | December 1999 to Present |
| Inland Paper & Packaging LF | Rome | GA | LF | October 2001 to Present |
| NORTH GEORGIA TRANSFER STATION | Rome | GA | TS | December 1999 to Present |
| SSES Newnan | Newman | GA | TS | December 1999 to Present |
| Tifton TS | Tifton | GA | TS | December 1999 to Present |
| BFI East Point TS | E. Point | GA | TS | January 1996 to Present |
| BFI Marble Mill TS | Marietta | GA | TS | August 1991 to Present |
| BFI Smyrna TS | Smyrna | GA | TS | January 1991 to Present |
| BFI Waste Services of Atlanta/Smyrna TS | Smyrna | GA | TS | January 1991 to Present |
| East DeKalb LF (C&D) | Lithonia | GA | LF | January 1992 to Present |
| Fayette County LF (C&D) | Fayetteville | GA | CLF | Closed |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Gateway LF | Ringgold | GA | CLF | Closed |
| Golden Waste Disposal/Tifton TS | Tifton | GA | TS | June 1998 to Present |
| Hickory Ridge LF | Conley | GA | LF | September 1992 to Present |
| Richland Creek LF | Buford | GA | LF | November 1995 to Present |
| Roberts Road LF | Fayetteville | GA | CLF | Closed |
| Southern States TS | Thomaston | GA | TS | July 1996 to Present |
| Southern States TS | Columbus | GA | TS | December 1993 to Present |
| Taylor County LF | Mauk | GA | LF | September 1987 to Present |
| Watts Road LF | Atlanta | GA | CLF | Closed |
| Wayne County Regional Landfill | Screven | GA | LF | * |
| Delaware Transfer Station | Manchester | IA | TS | December 1999 to Present |
| Hawkeye TS | Clinton | IA | TS | December 1999 to Present |
| Dubuque MRF | Dubuque | IA | MRF | December 1995 to Present |
| Hawkeye Disposal | Clinton | IA | TS | July 1998 to Present |
| Hawkeye Disposal | Maquoketa | IA | TS | January 1999 to Present |
| Boise TS | Boise | ID | TS | December 1999 to Present |
| C.C. LF | Danville | IL | LF | * |
| Southern Illinois Regional Landfill | DeSoto | IL | LF | * |
| Suburban Warehouse | Riverdale | IL | LF | * |
| AWS - Northlake TS | Northlake | IL | TS | * |
| Marion TS | Marion | IL | TS | * |
| Sparta TS | Sparta | IL | TS | * |
| Alliance Waste Services - Rockford | Belleville | IL | TS | December 1999 to Present |
| Alliance Waste Services - Rockford MRF | Rockford | IL | MRF | December 1999 to Present |
| Bloomington TS | Bloomington | IL | TS | December 1999 to Present |
| Bond County Landfill | Greenville | IL | LF | October 2003 to Present |
| Dukane TS | W Chicago | IL | TS | December 1999 to Present |
| Evanston TS | Evanston | IL | TS | December 1999 to Present |
| Kankakee Quarry | Momence Township | IL | CLF | Closed |
| LandComp LF | Ottawa | IL | LF | November 2002 to Present |
| Litchfield-Hillsboro LF | Litchfield | IL | LF | November 1998 to Present |
| Loop Recycling #1 | Chicago | IL | MRF | December 1999 to Present |
| Melrose Park Transfer Station | Melrose Park | IL | TS | December 1999 to Present |
| Palatine MRF | Palatine | IL | MRF | December 1999 to Present |
| Planet Resources | Chicago | IL | MRF | December 1999 to Present |
| Robbins Transfer Station | Robbins | IL | TS | December 1999 to Present |
| Rolling Meadows TS | Rolling Meadows | IL | TS | December 1999 to Present |
| Southern Illinois TS (Metropolis) | Metropolis | IL | TS | December 1999 to Present |
| Speelman TS | Chicago | IL | TS | December 1999 to Present |
| Spoon Ridge LF | Fairview | IL | LF | July 1999 to Present |
| Tri-State MRF | Northlake | IL | MRF | December 1999 to Present |
| Urbana TS | Urbana | IL | TS | December 1999 to Present |
| Zion LF - Site 1A | Zion | IL | LF | December 1999 to Present |
| Zion LF, Site 1 - Phase B | Zion | IL | CLF | Closed |
| Zion LF, Site 2 (Old) | Zion | IL | LF | December 1999 to Present |
| 34th Street Sorting Center | Chicago | IL | MRF | February 2003 to Present |
| Bloomington TS | Bloomington | IL | TS | November 1997 to Present |
| Apollo TS | Momence | IL | TS | April 1996 to Present |
| Belleville LF | Belleville | IL | CLF | Closed |
| BFI Elk Grove Recyclery | Elk Grove Village | IL | MRF | February 1996 to Present |
| BFI Quad Cities LF - Phase 1/2 | Milan | IL | CLF | Closed |
| BFI Quad Cities LF - Phase 3 | Milan | IL | CLF | March 1983 to Present |
| Brickyard Disposal | Danville | IL | LF | November 1995 to Present |
| Brickyard Unit #1 | Danville | IL | CLF | Closed |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Calumet TS | Chicago | IL | TS | May 1997 to Present |
| Urbana TS | Urbana | IL | TS | February 1996 to Present |
| Citiwaste TS (C&D Only) | Joliet | IL | TS | March 1996 to Present |
| City of Paris TS | Paris | IL | TS | December 1998 to Present |
| Congress Development Company | Hillside | IL | LF | March 1974 to Present |
| D&L Disposal | Greenville | IL | TS | April 1996 to Present |
| Davis Junction LF | Davis Junction | IL | CLF | Closed |
| Dixon/GROP LF No. 2 | Dixon | IL | CLF | Closed |
| Environtech LF | Morris | IL | LF | December 1986 to Present |
| Envotech LF | Litchfield | IL | LF | April 1996 to Present |
| ERC / Coles County LF | Charleston | IL | LF | June 2000 to Present |
| Groen TS | Crestwood | IL | TS | June 1981 to Present |
| Herrin TS | Herrin | IL | TS | May 1994 to Present |
| Illini Recycling | Champaign | IL | MRF | April 1996 to Present |
| Illinois LF | Hoopeston | IL | LF | December 1991 to Present |
| Illinois Valley Recycling | Ottawa | IL | MRF | July 2000 to Present |
| Illinois Waste System LF | Milford | IL | CLF | Closed |
| Jersey Sanitation LF | Jerseyville | IL | CLF | Closed |
| K&H Disposal | Donovan | IL | CLF | Closed |
| Lee County LF | Dixon | IL | LF | October 1997 to Present |
| Livingston LF | Pontiac | IL | LF | August 2001 to Present |
| Loop Recycling (64th Street) | Chicago | IL | MRF | August 1998 to Present |
| Loop Recycling (Laflin Street) | Chicago | IL | MRF | September 1994 to Present |
| Loop Transfer (Laflin Street) | Chicago | IL | TS | August 1998 to Present |
| Loop Transfer (64th Street) | Chicago | IL | TS | August 1998 to Present |
| Mallard Lake LF | Hanover Park | IL | CLF | Closed |
| McCook TS | McCook | IL | TS | September 1996 to Present |
| McLean County LF | Bloomington | IL | LF | November 1997 to Present |
| Medill Sorting Center | Chicago | IL | MRF | February 2003 to Present |
| Midtown TS | Chicago | IL | TS | June 1982 to Present |
| Modern LF (Belleville) (MIG/DEWANE) | Belleville | IL | CLF | Closed |
| New Age Recycling | Danville | IL | MRF | October 1988 to Present |
| North Chicago LF | North Chicago | IL | CLF | Closed |
| Northwest Sorting Center | Chicago | IL | MRF | February 2003 to Present |
| Okaw Valley Recycling | Sullivan | IL | MRF | April 1999 to Present |
| Planet Recovery | Chicago | IL | TS | January 1992 to Present |
| Planet Recovery MRF | Chicago | IL | MRF | January 1992 to Present |
| RCS LF | Jerseyville | IL | LF | January 1993 to Present |
| Roxana LF | Edwardsville | IL | LF | October 1985 to Present |
| Roxana MRF | Edwardsville | IL | MRF | October 1985 to Present |
| Saline County LF | Harrisburg | IL | LF | May 1999 to Present |
| Sangamon Valley LF | Springfield | IL | LF | November 1999 to Present |
| Shred-All Recycling | Chicago | IL | TS | December 1995 to Present |
| Shred-All Recycling & Transfer | Chicago | IL | TS | September 1997 to Present |
| Shred-All TS | Chicago | IL | TS | December 1995 to Present |
| South Barrington LF | South Barrington | IL | CLF | Closed |
| Streator Area LF | Streator | IL | LF | December 1991 to Present |
| Upper Rock Island LF | East Moline | IL | LF | October 1994 to Present |
| Watts-Springfield Unit 1 LF | Springfield | IL | CLF | Closed |
| Wayne County LF | Fairfield | IL | LF | June 1997 to Present |
| National Serv-All Landfill | Fort Wayne | IN | LF | * |
| Sycamore Ridge Landfill | Pimento | IN | LF | * |
| Wabash Valley Landfill | Wabash | IN | LF | * |
| Advantage Transfer Station | Huntingburg | IN | TS | * |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Circle City Recycling | Indianapolis | IN | TS | * |
| National Serv-ALL/Scott TS | Shipshewana | IN | TS | * |
| National Serv-ALL TS | Auburn | IN | TS | * |
| Vincennes TS | Vincennes | IN | TS | * |
| C.A.R.E. | Fort Wayne | IN | MRF | * |
| EAST CHICAGO COMPOST | East Chicago | IN | MRF | * |
| Republic Services - Langsdale Recycling | Indianapolis | IN | MRF | * |
| Blackfoot LF | Winslow | IN | LF | December 1999 to Present |
| Clinton County Landfill | Frankfort | IN | LF | May 2004 to Present |
| Illiana Transfer Station - Crown Point | Crown Point | IN | TS | December 1999 to Present |
| Illiana Transfer Station III | Crown Point | IN | TS | December 1999 to Present |
| Key Waste MRF | Culver | IN | MRF | December 1999 to Present |
| Koester TS | Evansville | IN | TS | December 1999 to Present |
| Metropolitan Landfill | Albany | IN | CLF | Closed |
| County Line LF | Argos | IN | LF | April 1994 to Present |
| Illiana Waste Transfer Station I | Schererville | IN | TS | January 1994 to Present |
| Illiana Waste Transfer Station II | East Chicago | IN | TS | February 2002 to Present |
| Illiana Waste Transfer Station IV | Lake Station | IN | TS | August 1998 to Present |
| Kosciusko County LF | Claypool | IN | LF | February 1998 to Present |
| Lake County C&D LF | Lowellville | IN | LF | June 1988 to Present |
| Laubascher Meadow LF | Evansville | IN | LF | October 1982 to Present |
| Newton County Development LF | Brook | IN | LF | February 1996 to Present |
| Ooms Brothers TS | DeMotte | IN | TS | December 1994 to Present |
| Springfield Environmental C&D LF | Mt Vernon | IN | LF | April 2000 to Present |
| Tri-County TS | Covington | IN | TS | June 1994 to Present |
| United Refuse Landfill | Fort Wayne | IN | LF | * |
| Finney County LF | Garden City | KS | CLF | Closed |
| American Disposal Services - Galena | Galena | KS | TS | February 1996 to Present |
| Forest View Landfill | Kansas City | KS | CLF | Closed |
| Resource Recovery LF | Cherryvale | KS | LF | April 1986 to Present |
| Wheatland LF | Columbus | KS | LF | March 1997 to Present |
| Dozit Company | Morganfield | KY | LF | October 1993 to Present |
| Epperson Waste Disposal | Williamstown | KY | LF | March 1992 to Present |
| Ohio County Balefill | Beaver Dam | KY | LF | * |
| Tri-K Landfill | Stanford | KY | LF | April 1992 to Present |
| Valley View Landfill | Sulpher | KY | LF | August 1999 to Present |
| Blue Grass Waste Alliance | Lexington | KY | TS | February 2003 to Present |
| CSI Covington TS | Covington | KY | TS | * |
| CWI of Kentucky - Paducah TS | Paducah | KY | TS | June 2003 to Present |
| Daviess County Solid Waste | Owensboro | KY | TS | June 2002 to Present |
| Dozit Company - Henderson Transfer | Henderson | KY | TS | * |
| Ohion County Balefill - City of Hopkinsville | Hopkinsville | KY | TS | * |
| Kenneday Road (merged w/ div 993) | Lexington | KY | TS | December 1999 to Present |
| Louisville Recyclery | Louisville | KY | MRF | December 1999 to Present |
| Mother Earth LF | Louisville | KY | LF | December 1999 to Present |
| Bath County TS | Owingsville | KY | TS | May 2000 to Present |
| Benson Valley LF | Frankfort | KY | LF | July 2002 to Present |
| BFI Danville | Danville | KY | TS | May 2000 to Present |
| BFI Elizabethtown TS | Elizabethtown | KY | TS | September 1990 to Present |
| Blue Ridge LF | Irvine | KY | LF | May 2000 to Present |
| Green Valley LF | Ashland | KY | LF | March 2000 to Present |
| Morehead LF | Morehead | KY | LF | May 2000 to Present |
| Stevens Dispos-All | Danville | KY | TS | May 2000 to Present |
| St. John Pickup Station | Laplace | LA | TS | December 1999 to Present |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Sugarmill TS | Broussard | LA | TS | December 1999 to Present |
| Area 90 LF | Avondale | LA | CLF | Closed |
| Baton Rouge MRF | Baton Rouge | LA | MRF | December 1999 to Present |
| BFI Shreveport MRF | Shreveport | LA | MRF | February 2000 to Present |
| Carlyss LF | Carlyss | LA | CLF | Closed |
| CECOS - Calcasieu | Sulphur | LA | CLF | Closed |
| Colonial LF | Sorrento | LA | LF | November 1984 to Present |
| Crescent Acres LF | New Orleans | LA | CLF | Closed |
| East St. Charles LF | Kenner | LA | CLF | Closed |
| Geismar LF | Darrow | LA | CLF | Closed |
| Hackberry LF | Hackberry | LA | CLF | Closed |
| Jefferson Davis LF | Welsh | LA | LF | July 1989 to Present |
| New Orleans MRF | Metairie | LA | MRF | May 1974 to Present |
| North Baton Rouge LF | Zachary | LA | LF | November 1993 to Present |
| Siegen Lane LF | Baton Rouge | LA | CLF | Closed |
| Webster Parrish LF | Minden | LA | LF | February 2000 to Present |
| West Saint Charles LF | Boutte | LA | CLF | Closed |
| White Oaks LF | Monroe | LA | CLF | Closed |
| Woodland Hills LF | Sulphur | LA | CLF | Closed |
| Woolworth Road LF | Keithville | LA | LF | October 1986 to Present |
| Auburn Transcyclery | Auburn | MA | TS | December 1999 to Present |
| Cambridge TS | Cambridge | MA | TS | December 1999 to Present |
| Holliston LF | Holliston | MA | LF | December 1999 to Present |
| Holliston TS | Holliston | MA | TS | December 1999 to Present |
| Allied Waste Services of MA, LLC | Peabody | MA | TS | May 1997 to Present |
| BFI Brockton Recyclery | Brockton | MA | MRF | October 1984 to Present |
| BFI Howard TS | Roxbury | MA | TS | December 1976 to Present |
| BFI Waste Services of Tyngsboro | Tyngsboro | MA | TS | February 1993 to Present |
| Chicopee LF | Chicopee | MA | CLF | Closed |
| East Bridgewater LF | East Bridgewater | MA | CLF | Closed |
| Fall River LF | Fall River | MA | LF | March 1983 to Present |
| Halifax LF | Halifax | MA | CLF | Closed |
| McNamara Transfer | Springfield | MA | TS | July 1995 to Present |
| Oak Bluff - Tisbury | Oakbluffs | MA | TS | May 1993 to Present |
| Oak Bluff - Tisbury | Oakbluffs | MA | MRF | May 1993 to Present |
| BFI Peabody TS | Peabody | MA | TS | August 1990 to Present |
| Plainville LF | Plainville | MA | CLF | Closed |
| Randolph LF | Randolph | MA | CLF | Closed |
| Honey-Go-Run Reclamation | Perry Hall | MD | LF | * |
| BFI Elkridge Recyclery | Elkridge | MD | MRF | December 1999 to Present |
| Millenium | Baltimore | MD | MRF | December 1999 to Present |
| BFI Baltimore Processing Center | Baltimore | MD | MRF | July 1996 to Present |
| BFI Waste Services of Baltimore | Baltimore | MD | TS | December 1994 to Present |
| ERCA - Norris Farms LF | Baltimore | MD | CLF | Closed |
| BFI Hagerstown Recyclery | Hagerstown | MD | MRF | December 1981 to Present |
| Montgomery County | Derwood | MD | CLF | Closed |
| Oaks LF | Laytonsville | MD | CLF | Closed |
| Quarantine LF | Baltimore | MD | CLF | Closed |
| Solley Road LF | Glen Burnie | MD | CLF | Closed |
| Maine Organics - Ops & Trucking | Unity | ME | MRF | December 1999 to Present |
| New England Organics | Falmouth | ME | MRF | December 1999 to Present |
| Carleton Farms LF | Carleton | MI | LF | * |
| Forest Lawn Landfill | Three Oaks | MI | LF | April 1993 to Present |
| Republic Services of Northern MI - Whitefeather LF | Pinconning | MI | LF | August 2002 to Present |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Coldwater TS | Coldwater | MI | TS | * |
| Reliable Disposal of S. Haven | South Haven | MI | TS | May 2002 to Present |
| Republic Services - Cork Street TS | Kalamazoo | MI | TS | October 1999 to Present |
| Arbor Hills LF | Northville | MI | CLF | Closed |
| Arbor Hills Recyclery | Northville | MI | MRF | December 1999 to Present |
| B & R TS | Redford | MI | TS | December 1999 to Present |
| BFI of Western Michigan | Kalamazoo | MI | TS | December 1999 to Present |
| Detroit TS | Detroit | MI | TS | December 1999 to Present |
| Ford Assembly Plants TS | Wayne | MI | TS | December 1999 to Present |
| Kalamazoo Recylery | Kalamazoo | MI | MRF | December 1999 to Present |
| KVG LF | Climax | MI | LF | December 1999 to Present |
| Schaefer Road TS | Dearborn | MI | TS | December 1999 to Present |
| SMDA TS | Roseville | MI | TS | December 1999 to Present |
| Taymouth Landfill | Birch Run | MI | LF | * |
| Utica Ford TS | Utica | MI | TS | December 1999 to Present |
| Adrian LF | Adrian | MI | CLF | Closed |
| Adrian LF | Adrian | MI | LF | January 1997 to Present |
| Kalamazoo TS | Kalamazoo | MI | TS | December 1999 to Present |
| C & C LF | Marshall | MI | LF | June 1982 to Present |
| Central Sanitary LF | Pierson | MI | LF | February 1996 to Present |
| Citizens Disposal LF | Grand Blanc | MI | LF | October 1988 to Present |
| Community Recycling Services | Muskegon | MI | MRF | June 2003 to Present |
| Dinverno MRF | Detroit | MI | MRF | January 1988 to Present |
| Hillsdale TS | Hillsdale | MI | TS | December 1996 to Present |
| Lyon Development LF | New Hudson | MI | CLF | Closed |
| Manistee County LF | Manistee | MI | LF | May 1989 to Present |
| Oakland Heights Development | Auburn Hills | MI | LF | March 1997 to Present |
| Ohio Demo LF (C&D Only) | Toledo | MI | LF | August 1972 to Present |
| Ottawa County Farms LF | Coopersville | MI | LF | September 2000 to Present |
| Rockwood LF | Newport | MI | LF | August 1997 to Present |
| Sauk Trail Hills LF | Canton | MI | LF | December 1983 to Present |
| Southfield Transfer Station | Southfield | MI | TS | December 1997 to Present |
| Sunset Waste Services - Hamilton | Hamilton | MI | TS | April 1999 to Present |
| Tri-City TS | Kalamazoo | MI | TS | December 1999 to Present |
| Vienna Junction LF | Erie | MI | LF | August 1999 to Present |
| Hennepin Transfer, Inc. | Inver Grove Heights | MN | TS | * |
| Eden Prairie Recyclery | Eden Praire | MN | MRF | December 1999 to Present |
| Mall of America | Bloomington | MN | MRF | December 1999 to Present |
| Minden Transfer Station | St Cloud | MN | TS | December 1999 to Present |
| Woodlake LF | Medina | MN | CLF | Closed |
| BFI Brooklyn Park TS | Brooklyn Park | MN | TS | December 1999 to Present |
| BFI Flying Cloud TS | Eden Praire | MN | TS | March 1972 to Present |
| BFI Hennepin TS | Burnsville | MN | TS | March 1990 to Present |
| BFI Waste Services of the Twin Cities | Brooklyn Park | MN | TS | December 1999 to Present |
| BFI Waste Services of the Twin Cities | Inver Grove Heights | MN | MRF | April 1988 to Present |
| BFI Waste Services of Twin Cities | Minneapolis | MN | MRF | September 1992 to Present |
| Blaine TS | Blaine | MN | TS | December 2001 to Present |
| Flying Cloud LF | Eden Praire | MN | CLF | Closed |
| Bloomington TS | Bloomington | MN | TS | November 1997 to Present |
| Bloomington TS | Bloomington | MN | MRF | November 1997 to Present |
| Pine Bend LF | Inver Grove Heights | MN | LF | April 1991 to Present |
| Southwest Regional Sanitary LF | Jasper | MO | LF | March 2007 to Present |
| CWI - Potosi Transfer Station | Cadet | MO | TS | * |
| CWI of Missouri (Potosi) | Potosi | MO | TS | * |

# Table 16-2 (Continued)
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Bridgeton Transfer Station | Bridgeton | MO | TS | December 1999 to Present |
| Jefferson City TS | Jefferson City | MO | TS | December 1999 to Present |
| New Madrid | Dexter | MO | TS | December 1999 to Present |
| Saint Louis Recyclery | St Louis | MO | MRF | December 1999 to Present |
| Springfield Recyclery | Springfield | MO | MRF | December 1999 to Present |
| St Louis Waste TS | St Louis | MO | TS | December 1999 to Present |
| American Disposal Services - Ozarks | Springfield | MO | TS | February 1975 to Present |
| American Disposal Services - Reeds Spring | Reeds Spring | MO | TS | February 1975 to Present |
| American Disposal Services - Springfield | Springfield | MO | TS | February 1975 to Present |
| Backridge LF | LaGrange | MO | LF | December 1990 to Present |
| Bridgeton LF | Bridgeton | MO | LF | November 1985 to Present |
| Butler County LF Authority | Poplar Bluff | MO | LF | July 1980 to Present |
| Cass County TS | Harrisonville | MO | TS | Closed |
| Courtney Ridge LF | Sugar Creek | MO | LF | August 2000 to Present |
| Ellis-Scott LF | Clinton | MO | CLF | Closed |
| Jackson LF | Jackson | MO | CLF | Closed |
| Jackson TS | Jackson | MO | TS | October 1995 to Present |
| Jefferson City LF | Jefferson City | MO | LF | January 1998 to Present |
| Johnson County LF | Warrensburg | MO | CLF | Closed |
| Lamar LF (CLOSED SITE) | Lamar | MO | CLF | Closed |
| Lemons East Sanitary LF | Dexter | MO | LF | December 1992 to Present |
| Lemons LF West | Dexter | MO | CLF | Closed |
| Jefferson City TS | Jefferson City | MO | TS | January 1983 to Present |
| Midwest LF | Lonedell | MO | CLF | Closed |
| Missouri City LF | Liberty | MO | CLF | Closed |
| Missouri Pass LF | Maryland Heights | MO | CLF | Closed |
| Mo Pass (Yard Waste Transfer Station) | Maryland Heights | MO | TS | January 1988 to Present |
| Modern TS | Osage Beach | MO | TS | April 1999 to Present |
| Plattco LF | Parkville | MO | CLF | Closed |
| Prairieview Regional Waste Facility | Lamar | MO | LF | May 1997 to Present |
| Redbird LF | Arnold | MO | CLF | Closed |
| Show-Me Regional LF | Warrensburg | MO | LF | May 1991 to Present |
| Southeast LF | Kansas City | MO | CLF | Closed |
| St Louis TS | St. Louis | MO | TS | May 1986 to Present |
| St. Louis Jeffco L/F | Arnold | MO | CLF | Closed |
| Wayne County LF | Greenville | MO | CLF | Closed |
| BFI Biloxi Recyclery | Biloxi | MS | MRF | December 1999 to Present |
| BFI Biloxi TS | Biloxi | MS | TS | December 1999 to Present |
| BFI Vicksburg TS | Vicksburg | MS | TS | December 1999 to Present |
| MAGNOLIA C&D LF | Kiln | MS | LF | September 2005 to Present |
| Pleasant Hills LF | Olive Branch | MS | LF | July 1999 to Present |
| Three Rivers LF | Pontotoc | MS | LF | December 1999 to Present |
| BFI Marks TS | Marks | MS | TS | January 1994 to Present |
| BFI Waste Services of Hattiesburg | Hattiesburg | MS | TS | May 1993 to Present |
| BFI Waste Services of the Gulf Coast | Vancleave | MS | MRF | December 1999 to Present |
| BFI Biloxi TS | Biloxi | MS | TS | December 1999 to Present |
| Big River LF | Leland | MS | LF | October 1987 to Present |
| Gulf Pines LF | Biloxi | MS | CLF | Closed |
| Little Dixie LF | Ridgeland | MS | LF | August 1999 to Present |
| Missoula Recycling | Missoula | MT | MRF | * |
| BFI Waste Services of Missoula | Missoula | MT | MRF | December 1999 to Present |
| Boseman Recycle Now | Bozeman | MT | MRF | December 1999 to Present |
| Great Falls | Great Falls | MT | MRF | December 1999 to Present |
| Helena | Helena | MT | MRF | December 1999 to Present |

## Table 16-2
## List of Republic Services Solid Waste Sites in States Other Than Texas
## (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Billings Recycling | Billings | MT | MRF | June 2004 to Present |
| BFI Waste Services of Billings | Billings | MT | MRF | August 1994 to Present |
| Missoula LF | Missoula | MT | LF | March 1971 to Present |
| BFI Waste Services of Missoula | Missoula | MT | MRF | December 1999 to Present |
| East Carolina Environmental | Aulander | NC | LF | * |
| Foothills Environmental | Lenoir | NC | LF | * |
| Upper Piedmont Environmental | Rougemont | NC | LF | * |
| Uwharrie Environmental | Mt. Gilead | NC | LF | * |
| Bishop Road TS | Greensboro | NC | TS | * |
| GDS - Conover MRF | Conover | NC | TS | * |
| Moore County TS | Aberdeen | NC | TS | * |
| Overdale Road TS | Winston-Salem | NC | TS | * |
| Richmond County | Rockingham | NC | TS | * |
| BFI Waste Services of Winston-Salem | Winston Salem | NC | MRF | December 1999 to Present |
| CCC - Charlotte | Charlotte | NC | TS | December 1999 to Present |
| Fayetteville TS | Fayetteville | NC | TS | December 1999 to Present |
| Sampson County LF | Roseboro | NC | LF | December 1999 to Present |
| Anson County LF | Polkton | NC | LF | April 2000 to Present |
| BFI Raleigh Recyclery | Raleigh | NC | MRF | December 1990 to Present |
| Cary TS | Cary | NC | TS | July 1994 to Present |
| Charlotte Motor Speedway LF | Concord | NC | LF | December 1986 to Present |
| City of Durham TS | Durham | NC | TS | October 1997 to Present |
| Holly Springs LF | Holly Springs | NC | LF | May 1991 to Present |
| Holly Springs LF | Holly Springs | NC | CLF | Closed |
| Lake Norman LF | Stanley | NC | LF | November 1998 to Present |
| Randolph County TS | Asheboro | NC | TS | January 1998 to Present |
| Rocky Mount TS | Rocky Mountain | NC | TS | August 1999 to Present |
| Yadkin County TS | Yadkinville | NC | TS | September 1993 to Present |
| NENSWC LF | Clarkson | NE | LF | December 1999 to Present |
| Fremont LF | Fremont | NE | CLF | Closed |
| Norfolk LF | Norfolk | NE | CLF | Closed |
| MA/NH/VT Organics Operations | Chichester | NH | MRF | December 1999 to Present |
| BFI Hooksett Recyclery | Hooksett | NH | MRF | November 1990 to Present |
| ECDC LF Group - Mid Atlantic | Tinton Falls | NJ | LF | * |
| A.R.T.S. Recycling | Linden | NJ | MRF | December 1999 to Present |
| Garofalo Recycling & T/S | Cresskill | NJ | TS | December 1999 to Present |
| Mount Laurel | Mt Laurel | NJ | TS | December 1999 to Present |
| A.M.S. Transfer Station | Linden | NJ | TS | January 1999 to Present |
| Di Rese TS | Tenafly | NJ | TS | January 1984 to Present |
| Fairview Street TS | Fairview | NJ | TS | February 1995 to Present |
| Garofalo TS | Garfield | NJ | TS | January 2000 to Present |
| Giordano Recycling | Port Newark | NJ | MRF | January 1997 to Present |
| Giordano Recycling | Port Newark | NJ | MRF | January 1997 to Present |
| Monroe Township LF | Monroe | NJ | CLF | Closed |
| Pedricktown LF | Pedricktown | NJ | CLF | Closed |
| Pelham LF | Pelham | NJ | CLF | Closed |
| Pinelands Park LF | Egg Harbor | NJ | CLF | Closed |
| South Brunswick | Monmouth | NJ | CLF | Closed |
| Apex Regional LF | Las Vegas | NV | LF | * |
| Laughlin LF | Laughlin | NV | LF | * |
| Cheyenne TS & Environmental Technologies | North Las Vegas | NV | TS | * |
| R.S. of S Nevada Recycle Center | North Las Vegas | NV | MRF | * |
| ECDC Logistics Office Northeast | Harrison | NY | LF | * |
| Staten Island TS | Staten Island | NY | TS | * |
| Bronx TS | Bronx | NY | TS | December 1999 to Present |

# Table 16-2
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Brooklyn TS | Brooklyn | NY | TS | December 1999 to Present |
| Champion TS | Bayshore | NY | TS | December 1999 to Present |
| Hempstead TS | Merrick | NY | TS | December 1999 to Present |
| Menands Transfer Station | Menands | NY | TS | December 1999 to Present |
| Scott Avenue MRF | Brooklyn | NY | MRF | December 1999 to Present |
| Scott Avenue TS C&D | Brooklyn | NY | TS | December 1999 to Present |
| Shepherd Avenue MRF | Brookyn | NY | MRF | December 1999 to Present |
| Amsterdam LF | Fort Johnson | NY | CLF | Closed |
| BFI Schenectady TS | Schenectady | NY | TS | April 1993 to Present |
| BFI Southside TS | Depew | NY | TS | April 1975 to Present |
| Buffalo Recyclery | Buffalo | NY | MRF | February 1983 to Present |
| ERCA - Niagra Falls | Niagara Falls | NY | CLF | Closed |
| Fox Island TS | Port Chester | NY | TS | Closed |
| Hicksville MRF | Hicksville | NY | MRF | August 1997 to Present |
| Land Reclamation LF | Depew | NY | CLF | Closed |
| Mamaroneck TS | Mamaroneck | NY | TS | January 2000 to Present |
| Metro Enviro | Croton on the Hudson | NY | TS | March 2000 to Present |
| Mt. Kisco TS | Mt Kisco | NY | TS | August 1978 to Present |
| Niagara LF | Tonawanda | NY | CLF | Closed |
| Pine Avenue LF | Niagara Falls | NY | LF | January 1983 to Present |
| Recycling Industries Paper Division | Mamaroneck | NY | MRF | January 2000 to Present |
| Scott Avenue TS MSW | Brooklyn | NY | TS | June 1996 to Present |
| Selas TS | Holtsville | NY | TS | October 1989 to Present |
| Stanley Avenue TS | Brooklyn | NY | TS | June 1996 to Present |
| Thames Street TS | Brooklyn | NY | TS | October 1996 to Present |
| Watertown LF | Felts Mills | NY | CLF | Closed |
| Countywide R & D Landfill | East Sparta | OH | LF | * |
| Pine Grove Landfill | Amanda | OH | LF | * |
| Vienna Junction LF | Toledo | OH | LF | * |
| Ohio Demo LF (C&D Only) | Toledo | OH | LF | * |
| CSI Waste Services - Evansdale | Evansdale | OH | TS | * |
| National Serv-All Van Wert | Van Wert | OH | TS | * |
| Shelby County TS | Sidney | OH | TS | * |
| AWS Akron Recyclery | Akron | OH | MRF | December 1999 to Present |
| ERCA - Aber Road | Williamsburg | OH | CLF | Closed |
| Goshen Transfer | New Philadelphia | OH | TS | December 1999 to Present |
| Sandusky TS | Sandusky | OH | TS | January 1978 to Present |
| Bigfoot Run LF | Morrow | OH | CLF | Closed |
| Bobmeyer Road Demolition | Fairfield | OH | CLF | Closed |
| Bowers Phase II TS | Vickery | OH | TS | December 1990 to Present |
| Carbon Limestone LF | Lowellville | OH | LF | January 1999 to Present |
| Carbon Limestone TS | Lowellville | OH | TS | January 1999 to Present |
| Celina LF | Celina | OH | LF | December 1991 to Present |
| Cherokee Run LF | Bellefontaine | OH | LF | December 1997 to Present |
| Citrus LF | Malvern | OH | CLF | Closed |
| City of Amherst TS | Amherst | OH | TS | October 1998 to Present |
| CLD LF | Salem | OH | LF | January 1996 to Present |
| County Environmental Landfill of Wyandot | Carey | OH | LF | September 1996 to Present |
| Delaware TS | Delaware | OH | TS | February 1998 to Present |
| Duck Creek LF | Zanesville | OH | CLF | Closed |
| East Palestine LF | East Palestine | OH | CLF | Closed |
| Ford Road LF | Elyria | OH | CLF | Closed |
| Glenwillow LF | Glenwillow | OH | CLF | Closed |
| Glenwillow TS | Glenwillow | OH | TS | June 1996 to Present |
| Lorain Cnty Resource Recovery | Oberlin | OH | MRF | March 1992 to Present |

# Table 16-2
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Lorain Cnty Resource Recovery | Oberlin | OH | TS | March 1992 to Present |
| Lorain County II LF | Oberlin | OH | CLF | Closed |
| Lorain County LF | Oberlin | OH | LF | July 1986 to Present |
| Mansfield Transcyclery | Mansfield | OH | MRF | January 1999 to Present |
| Richland County TS | Mansfield | OH | TS | January 1999 to Present |
| Marion TS | Marion | OH | TS | Closed |
| Muskingum LF | Zanesville | OH | CLF | Closed |
| Oakland Marsh LF | Shiloh | OH | CLF | Closed |
| Ottawa County LF | Port Clinton | OH | LF | February 1974 to Present |
| Parris LF | Paris Township | OH | CLF | Closed |
| Robertsville C&D LF | Robertsville | OH | CLF | Closed |
| Ross Brothers TS | Mt Vernon | OH | TS | September 1996 to Present |
| Warner Hill LF | Garfield Heights | OH | CLF | Closed |
| Williams County LF | Bryan | OH | LF | December 1987 to Present |
| Willowcreek LF | Atwater | OH | CLF | Closed |
| Moore TS | Moore | OK | TS | December 1999 to Present |
| Stillwater Recycling | Stillwater | OK | MRF | October 2004 to Present |
| Stillwater Sanitary Landfill | Stillwater | OK | LF | October 2004 to Present |
| 51 St LF | Broken Arrow | OK | CLF | Closed |
| Alderson Regional LF | Alderson | OK | LF | September 1991 to Present |
| Broken Arrow LF | Broken Arrow | OK | LF | Closed |
| Canadian Valley LF | Shawnee | OK | CLF | May 1984 to Present |
| Clinton TS | Clinton | OK | TS | November 1993 to Present |
| BFI Cushing TS | Cushing | OK | TS | June 1986 to Present |
| Fillsand LF | Oklahoma City | OK | CLF | Closed |
| Newcastle LF | Newcastle | OK | LF | June 1997 to Present |
| Oklahoma City MRF | Oklahoma City | OK | MRF | July 1993 to Present |
| Perkins LF | Perkins | OK | CLF | Closed |
| Pocasset LF | Pocasset | OK | LF | June 1997 to Present |
| Porter LF | Porter | OK | LF | September 1998 to Present |
| Southeast (OKC) LF | Oklahoma City | OK | LF | June 1955 to Present |
| Talala LF | Talala | OK | CLF | Closed |
| Weatherford TS | Weatherford | OK | TS | June 1997 to Present |
| Agri-Tech of Oregon | Albany | OR | LF | * |
| Albany - Lebanon Sanitation | Albany | OR | LF | * |
| Peltier Real Estate | Corvallis | OR | LF | * |
| Allied Waste Transportation Services | Woodburn | OR | TS | December 1999 to Present |
| Coffin Butte LF | Corvallis | OR | LF1 | January 2000 to Present |
| Klamath Regional Disposal | Grants Pass | OR | TS | December 1999 to Present |
| BFI Metro Central TS & MRF | Portland | OR | MRF | June 1990 to Present |
| BFI Metro Central TS & MRF | Portland | OR | TS | June 1990 to Present |
| BFI Metro South TS | Oregon City | OR | TS | May 1982 to Present |
| Bio-Med of Oregon | Corvallis | OR | MRF | December 1999 to Present |
| Capitol Recycling & Disposal | Salem | OR | TS | June 1997 to Present |
| Grants Pass TS | Grants Pass | OR | TS | December 1999 to Present |
| Source Recycling | Albany | OR | MRF | July 1983 to Present |
| Valley Landfills Process and Recovery Center | Monmoth | OR | MRF | January 1997 to Present |
| Valley Landfills, Inc. | Monroe | OR | TS | January 1997 to Present |
| Valley View Landfill, Inc. | Corvallis | OR | LF | December 1991 to Present |
| Willamette Resources | Wilsonville | OR | MRF | October 1990 to Present |
| Willamette Resources TS | Wilsonville | OR | TS | October 1990 to Present |
| Modern Landfill | York | PA | LF | August 1997 to Present |
| McCusker/Ogborne Transfer | Chester | PA | TS | * |
| Quickway Transfer Station | Philadelphia | PA | TS | * |
| BFI Philadelphia TS | Philadelphia | PA | TS | December 1999 to Present |

## Table 16-2
## List of Republic Services Solid Waste Sites in States Other Than Texas
## (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Conestoga Landfill | Morgantown | PA | LF | July 1999 to Present |
| Philadelphia Recyclery | Philadelphia | PA | MRF | December 1999 to Present |
| BFI River Road TS | Conshohocken | PA | TS | November 1990 to Present |
| BFI TRC TS | Philadelphia | PA | TS | December 1988 to Present |
| BFI Waste Services of Bucks - Mont | Fountainville | PA | MRF | December 1998 to Present |
| BFI Waste Services of Philadelphia | Philadelphia | PA | MRF | April 1993 to Present |
| BFI Waste Services of Philadelphia | Philadelphia | PA | TS | April 1993 to Present |
| County Environmental LF | Leeper | PA | CLF | Closed |
| Forestlawn LF | Clearfield | PA | CLF | Closed |
| Greenridge Reclamation LF | Scottdale | PA | LF | August 2001 to Present |
| Imperial LF | Imperial | PA | LF | May 1973 to Present |
| King of Prussia Recyclery | King of Prussia | PA | MRF | December 1999 to Present |
| Mon Valley LF | Charleroi | PA | CLF | Closed |
| BFI North Smithfield TS | N Smitherfield | RI | TS | December 1999 to Present |
| Blackstone Valley Regional T/S | Pawtucket | RI | TS | December 1999 to Present |
| Standard Waste Services | Block Island | RI | TS | December 1999 to Present |
| BFI Waste Services of Rhode Island | North Smithfield | RI | TS | April 2001 to Present |
| Rose Hill Regional TS | South Kingstown | RI | TS | September 1989 to Present |
| Pepperhill C&D/Industrial Landfill | North Charleston | SC | LF | * |
| Spring Grove Landfill | North Charleston | SC | LF | * |
| Union County MSW Landfill | Enoree | SC | LF | * |
| Greenville TS | Duncan | SC | TS | December 1999 to Present |
| Anderson Regional LF | Belton | SC | LF | December 1997 to Present |
| Cherokee TS | Gaffney | SC | TS | August 1998 to Present |
| Ft. Mill TS | Ft. Mill | SC | TS | August 2001 to Present |
| Greer TS | Greer | SC | TS | December 2000 to Present |
| Jedburg LF | Jedburg | SC | CLF | Closed |
| Laurens County TS | Clinton | SC | TS | April 2000 to Present |
| Lee County LF | Bishopville | SC | LF | June 1997 to Present |
| Newberry County TS | Newberry | SC | TS | December 1993 to Present |
| Northeast Sanitary LF | Eastover | SC | LF | November 1996 to Present |
| White Street TS | Anderson | SC | TS | June 1993 to Present |
| Greenville Class II Landfill | Greenville | SC | LF | * |
| Northwest Tenn Disposal | Union City | TN | LF | * |
| Paris Landfill Station | Paris | TN | LF | * |
| Covington Waste | Covington | TN | TS | * |
| McKenzie Transfer Station | McKenzie | TN | TS | * |
| BFI Knoxville MRF | Knoxville | TN | MRF | December 1999 to Present |
| Chattanooga Transfer Station | Chattanooga | TN | TS | December 1999 to Present |
| JACKSON MADISON COUNTY C&D LANDFILL | Jackson | TN | LF | January 2006 to Present |
| JACKSON MADISON COUNTY LF | Jackson | TN | LF | January 2006 to Present |
| Memphis Recyclery | Memphis | TN | MRF | December 1999 to Present |
| Monroe County TS | Vonore | TN | TS | December 1999 to Present |
| AAA C&D TS | Nashville | TN | TS | August 1994 to Present |
| AAA M.S.W. | Nashville | TN | TS | August 1994 to Present |
| Carter Valley LF | Churchill | TN | LF | July 1985 to Present |
| Estill Springs TS | Estill Springs | TN | TS | January 1995 to Present |
| Fayetteville TS | Fayetteville | TN | TS | April 1995 to Present |
| Middle Point LF | Murfreesboro | TN | LF | October 1989 to Present |
| North Shelby LF | Millington | TN | LF | March 1997 to Present |
| Pulaski TS | Pulaski | TN | TS | May 1995 to Present |
| Safety Lights C&D LF | Memphis | TN | CLF | Closed |
| South Shelby LF | Memphis | TN | LF | May 1995 to Present |
| Sykes Road LF | Millington | TN | CLF | Closed |
| Twin Oaks LF | Knoxville | TN | CLF | Closed |

# Table 16-2
# List of Republic Services Solid Waste Sites in States Other Than Texas
# (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Geneva Transfer Station | Salt Lake City | UT | TS | December 1999 to Present |
| Salt Lake City Transfer Station | Salt Lake City | UT | TS | December 1999 to Present |
| Utah County Recyclery (CLOSED) | Lindon | UT | MRF | December 1999 to Present |
| WASATCH REGIONAL LANDFILL | Salt Lake City | UT | LF | August 2005 to Present |
| BFI Salt Lake Recyclery | Salt Lake City | UT | MRF | March 1985 to Present |
| ECDC Environmental | East Carbon | UT | LF | December 1997 to Present |
| Washington County LF | St. George | UT | LF | July 1993 to Present |
| 623 Landfill | Rockville | UT | LF | * |
| BFI Lorton Recyclery | Lorton | VA | MRF | December 1999 to Present |
| Norfolk Solid Waste TS | Norfolk | VA | TS | December 1999 to Present |
| Berryville LF | Berryville | VA | CLF | Closed |
| BFI Fluvanna Transcyclery | Fluvanna | VA | TS | November 1994 to Present |
| BFI Culpeper TS | Culpeper | VA | TS | May 1999 to Present |
| Roanoke TS | Roanoke | VA | TS | March 1994 to Present |
| BFI Goodwin TS | Yorktown | VA | TS | September 1999 to Present |
| BFI Westmoreland County TS | Montross | VA | TS | April 1994 to Present |
| Brunswick Waste Mgmt Facility | Lawrenceville | VA | LF1 | November 1996 to Present |
| Fredricksburg TS | Fredricksburg | VA | TS | May 1994 to Present |
| King and Queen Sanitary LF | Little Plymouth | VA | LF | April 1993 to Present |
| Old Dominion LF | Richmond | VA | LF | October 1992 to Present |
| Richmond LF | Richmond | VA | CLF | Closed |
| Roanoke Recyclery | Roanoke | VA | MRF | March 1994 to Present |
| Telegraph Road LF | Lorton | VA | CLF | Closed |
| Tidewater TS | Chesapeake | VA | TS | February 1985 to Present |
| Rockingham LF | Rockingham | VT | CLF | Closed |
| Roosevelt Associates | West Roosevelt | WA | LF | * |
| Roosevelt Intermodal | Roosevelt | WA | LF | * |
| B Z Corners Drop Box | Husum | WA | TS | December 1999 to Present |
| Black River Transfer | Renton | WA | TS | December 1999 to Present |
| Dallesport Drop Box TS | Dallesport | WA | TS | January 1990 to Present |
| Ferry County TS | Republic | WA | TS | October 1997 to Present |
| Goldendale Drop Box TS | Goldendale | WA | TS | December 1999 to Present |
| Othello TS | Othello | WA | TS | July 1995 to Present |
| Pend Oreille, Central County TS | Usk | WA | TS | December 1994 to Present |
| Pend Oreille, South County TS | Newport | WA | TS | December 1994 to Present |
| Rabanco Intermodal, Ltd. | Husum | WA | TS | August 1993 to Present |
| Rabanco Recycling Co. | Seattle | WA | MRF | January 1988 to Present |
| Rabanco Recycling Co. | Seattle | WA | TS | January 1985 to Present |
| Black River Transfer | Renton | WA | TS | August 1991 to Present |
| Recomp of Washington / RDC Ferndale | Ferndale | WA | TS | October 1998 to Present |
| Ritzville TS | Ritzville | WA | TS | May 1995 to Present |
| Roosevelt Regional Ash Monofill | Roosevelt | WA | LF | June 1990 to Present |
| Roosevelt Regional MSW LF | Roosevelt | WA | LF | June 1990 to Present |
| Kestrel Hawk Landfill | Racine | WI | LF | * |
| Mallard Ridge Landfill | Delavan | WI | LF | * |
| Allied Waste Services of Hayward | Hayward | WI | TS | December 1999 to Present |
| BFI Park Falls TS | Park Falls | WI | TS | December 1999 to Present |
| Germantown | Germantown | WI | TS | December 1999 to Present |
| Kenosha Recyclery | Kenosha | WI | MRF | December 1999 to Present |
| Muskego | Muskego | WI | TS | December 1999 to Present |
| West Allis TS | West Allis | WI | TS | December 1999 to Present |
| BFI Siren TS | Webster | WI | TS | June 1993 to Present |
| BFI Waste Services of Northwest Wisconsin | Park Falls | WI | TS | December 1994 to Present |
| Lake Area (Permit #2054) LF | Sarona | WI | CLF | Closed |
| Lake Area (Permit #3144) LF | Sarona | WI | CLF | Closed |

## Table 16-2
## List of Republic Services Solid Waste Sites in States Other Than Texas
## (as of November 2012)

| Facility Name | Location | | Facility Type | Dates of Operation[a] |
|---|---|---|---|---|
| Lake Area (Permit #3474) LF | Sarona | WI | LF | March 1998 to Present |
| Troy Area LF | East Troy | WI | CLF | Closed |
| Fairmont MRF | Fairmont | WV | MRF | December 1999 to Present |
| Short Creek LF | Short Creek | WV | LF | December 1999 to Present |
| Sycamore LF | Hurricane | WV | LF | June 2001 to Present |
| West Bank Sanitation | Jackson | WY | TS | January 2001 to Present |
| Campo Sur LF | Ponce | PR | LF | * |
| Ponce LF | Ponce | PR | LF | * |
| Salinas LF | Salinas | PR | LF | * |
| BFI Catano TS | Catano | PR | TS | December 1999 to Present |
| Cidra TS | Cidra | PR | TS | * |

LF = Active Landfill; CLF = Closed Landfill; TS = Transfer Station; MRF = Material Recovery Facility

[a] This list includes the approximate dates of operation of the facility. This includes the previous owners/operators of certain facilities prior to the facility being acquired by Republic Services, Inc., or its subsidiaries.

* Initial date of ongoing operation is not clear from site records.

## Table 16-3
## Regulatory Agencies for Republic Services Solid Waste Sites

Alabama Department of Environmental Management (ADEM)
P. O. Box 301463, Montgomery, AL 36130-1463

Arizona Department of Environmental Quality (ADEQ)
1100 West Washington Street, Phoenix, AZ 85007-2935

Arkansas Department of Environmental Quality (ADEQ)
Solid Waste Management Division
5301 North Shore Drive, North Little Rock, AR 72118-5317

California Integrated Waste Management Board (CIWMB)
Cal-EPA Building
1001 I Street, P.O. Box 4025, Sacramento, CA 95812-4025

Colorado Department of Public Health and Environment (CDPHE)
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South, Denver, CO 80246-1530

Connecticut Department of Environmental Protection (CDEP)
Materials and Waste Management
79 Elm Street, Hartford, CT 06106-5127

District Department of the Environment (DDOE)
51 N Street, NE 6th Floor, Washington, DC 20002

Florida Department of Environmental Protection (FDEP)
3900 Commonwealth Blvd., M.S. 49, Tallahassee, FL 32399

Georgia Department of Natural Resources
Environmental Protection Division (EPD)
2 Martin Luther King, Jr. Drive, Suite 1152 East Tower, Atlanta, GA 30334

Idaho Department of Environmental Quality (IDEQ)
1410 North Hilton, Boise, ID 83706

Illinois Environmental Protection Agency (IEPA)
1021 North Grand Avenue East, P.O. Box 19276, Springfield, IL 62794-9276

Indiana Department of Environmental Management (IDEM)
Indiana Government Center North
100 North Senate Avenue; Indianapolis, IN 46204-2251

Iowa Department of Natural Resources (IDNR)
502 East 9th Street, Des Moines, IA 50319-0034

Kansas Department of Health and Environment (KDHE)
Charles Curtis State Office Building
1000 Southwest Jackson, Topeka, KS 66612

Kentucky Energy and Environment Cabinet
Division of Waste Management, Department for Environmental Protection
200 Fair Oaks Lane, Frankfort KY 40601

Louisiana Department of Environmental Quality (LDEQ)
602 North Fifth Street, Baton Rouge, LA 70802

Maine Department of Environmental Protection (MDEP)
17 State House Station, Augusta, ME 04333-0017

Maryland Department of the Environment (MDE)
1800 Washington Boulevard, Baltimore, MD 21230

Massachusetts Department of Environmental Protection (MDEP)
One Winter Street, 2nd Floor, Boston, MA 02108

Michigan Department of Environmental Quality (MDEQ)
Waste Management Division
Constitution Hall, 525 West Allegan Street, P.O. Box 30473, Lansing, MI 48909-7973

Minnesota Pollution Control Agency (MPCA)
520 Lafayette Road North, St. Paul, MN 55155-4194

Mississippi Department of Environmental Quality (MDEQ)
Solid Waste Policy, Planning, and Grants Branch
515 East Amite Street, Jackson, MS 39201

Missouri Department of Natural Resources (MDNR)
Waste Management Program, Division of Environmental Quality
P.O. Box 176, Jefferson City, MO 65102

Montana Department of Environmental Quality (MDEQ)
1520 East Sixth Avenue, P.O. Box 200901, Helena, MT 59620-0901

Nebraska Department of Environmental Quality (NDEQ)
1200 "N" Street, Suite 400, P.O. Box 98922, Lincoln, NE 68509

Nevada Division of Environmental Protection (NDEP)
901 South Stewart Street, Suite 4001, Carson City, NV 89701-5249

New Hampshire Department of Environmental Services (NHDES)
Waste Management Division
29 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095

New Jersey Department of Environmental Protection (NJDEP)
401 East State Street, 7th Floor, East Wing, P.O. Box 402, Trenton, NJ 08625-0402

New York State Department of Environmental Conservation (NYSDEC)
Division of Solid and Hazardous Materials
625 Broadway, Albany, NY 12233-1010

North Carolina Department of Environment and Natural Resources (NCDENR)
1601 Mail Service Center, Raleigh, NC 27699-1601

Ohio Environmental Protection Agency (OEPA)
Division of Solid & Infectious Waste Management
50 West Town Street, Suite 700, Columbus, OH 43215

Oklahoma Department of Environmental Quality (ODEQ)
707 North Robinson, Oklahoma City, OK 73102

Oregon Department of Environmental Quality (ODEQ)
Waste Prevention and Management Division
811 Southwest Sixth Ave., Portland, OR 97204-1390

Pennsylvania Department of Environmental Protection (PDEP)
Rachel Carson State Office Building
400 Market Street, Harrisburg, PA 17101

Rhode Island Department of Environmental Management (RIDEM)
235 Promenade St., Providence, RI 02908-5767

South Carolina Department of Health and Environmental Control (SCDHEC)
2600 Bull St., Columbia, SC 29201

Tennessee Department of Environment and Conservation (TDEC)
401 Church St., L&C Tower, Nashville, TN 37243-0435

Utah Department of Environmental Quality (UDEQ)
Division of Solid and Hazardous Waste
288 North 1460 West, 4th Floor, P. O. Box 144880, Salt Lake City, UT 84114-4880

Vermont Department of Environmental Conservation (DEC)
Waste Management Division
103 South Main Street, West Office Building, Waterbury, VT 05671-0404

Virginia Department of Environmental Quality (VDEQ)
629 East Main Street, P.O. Box 1105, Richmond, VA 23218

Washington State Department of Ecology
P. O. Box 47600, Olympia, WA 98504-7600

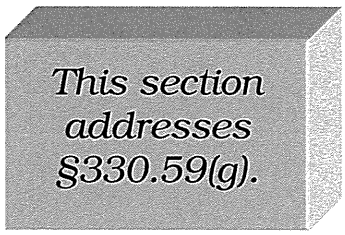
West Virginia Department of Environmental Protection (WVDEP)
Division of Water and Waste Management
601 57th Street SE, Charleston, WV 25304

Wisconsin Department of Natural Resources (WDNR)
101 South Webster Street, P.O. Box 7921, Madison, WI 53707-7921

Puerto Rico Department of Natural and Environmental Resources
P.O. Box 366147, San Juan, Puerto Rico 00936

# 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 page.



## NOTICE OF APPOINTMENT
## Agent for the Applicant

Toby Baker
Executive Director
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Baker:

This letter is to advise you that officials of City of Arlington, have duly appointed Sunanda Katragadda, Environmental Services Administrator, as their Agent. Sunanda Katragadda is hereby authorized to execute and deliver permit applications, permit modifications, and compliance related documentation for the City of Arlington Landfill, and any and all other documents as required in connection with Permit No. MSW-358C.

Sincerely,

Trey Yelverton
City Manager, City of Arlington

SWORN TO AND SUBSCRIBED BEFORE ME by Trey Yelverton on the 19th day of May, 2022, which witness my hand and seal of office.

STEPHANIE DIMAS
Notary Public, State of Texas
Comm. Expires 09-01-2025
Notary ID 129000418

Stephanie Dimas
Notary Public in and for the State of Texas

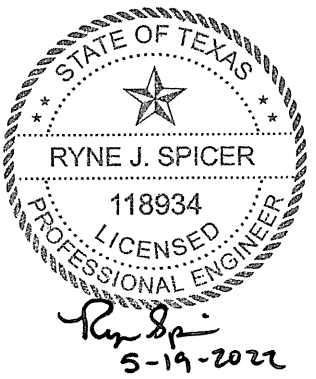
Stephanie Dimas
Printed Name

My Commission Expires 09/01/25

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## APPENDIX I/IIA
## FACILITY LAYOUT MAPS




Prepared for:

City of Arlington
and
Republic Waste Services of Texas, Ltd.

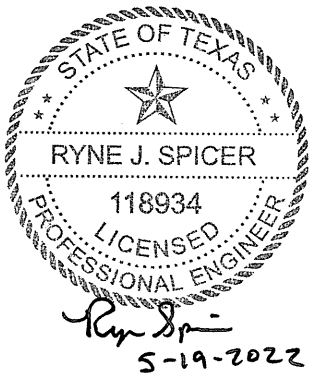
May 2022

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. 0023-404-11-104

This document intended for permitting purposes only.




# CONTENTS


| | |
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| DRAWING I/IIA.1 | Site Plan |
| DRAWING I/IIA.2 | Sector Development Plan |
| DRAWING I/IIA.3 | Typical Section A |
| DRAWING I/IIA.4 | Sector Development Plan I |
| DRAWING I/IIA.5 | Sector Development Plan II |
| DRAWING I/IIA.6 | Sector Development Plan III |
| DRAWING I/IIA.7 | Sector Development Plan IV |
| DRAWING I/IIA.8 | Sector Development Plan V |
| DRAWING I/IIA.9 | Sector Development Plan VI |
| DRAWING I/IIA.10 | Sector Development Plan VII |
| DRAWING I/IIA.11 | Landfill Completion Plan |
| DRAWING I/IIA.12 | Top of Liner/Overliner Plan |
| DRAWING I/IIA.13 | Existing Site Entrance Plan |
| DRAWING I/IIA.14 | Access Control Plan |


*This appendix addresses §330.61(d).*

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

N
0 400 800
SCALE IN FEET

MOSIER VALLEY ROAD
SCALEHOUSE/OFFICE FACILITY
EXISTING SITE ENTRANCE/EXIT ROAD
EXISTING CITIZENS CONVENIENCE CENTER
MAINTENANCE FACILITY
UNDEVELOPED LINER AREA
C.R.I.&P. RAILROAD
F.M. 157 NORTH COLLINS STREET
SECTOR 5B2
SECTOR 5A2
SECTOR 5B1
SECTOR 5A1
SECTOR 4
SECTOR 3
SECTOR 2
SECTOR 1 (PRE-SUBTITLE D AREA)
PRE-SUBTITLE D AREA/ UNDEVELOPED OVERLINER AREA
OVERLINER SECTOR 1A/2A
EXISTING GATE
HURRICANE CREEK
WEST FORK TRINITY RIVER

GP-1A GP-2 GP-3 GP-4 GP-5 GP-7 GP-8 GP-9 GP-10 GP-11 GP-12R GP-13 GP-16 GP-17 GP-18 GP-19 GP-20 GP-21 GP-22 GP-23 GP-24 GP-25 GP-26 GP-27 GP-28 GP-28A
MW-1 MW-2 MW-3 MW-8 MW-9 MW-10 MW-11 MW-16 MW-17 MW-18 MW-19 MW-20 MW-21 MW-22 MW-23 MW-24 MW-25 MW-26 MW-27 MW-29 MW-30 MW-31 MW-32 MW-33 MW-34 MW-35 MW-36 MW-37 MW-38 MW-39 MW-40 MW-41 MW-42 MW-43 MW-44 MW-45

N 6979500 N 6978000 N 6976500 N 6975000 N 6973500
E 2389500 E 2391000 E 2392500 E 2394000 E 2395500 E 2397000 E 2398500

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- SECTOR BOUNDARY
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- EXISTING FINAL COVER
- EXISTING FENCE
- SITE BENCHMARK (SEE NOTE 3)
- HISTORIC WASTE TO BE RELOCATED
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- MW-22 EXISTING GROUNDWATER MONITORING WELL (TO BE DECOMMISSIONED)
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE
- GP-28 EXISTING LANDFILL GAS MONITORING PROBE (TO BE DECOMMISSIONED)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. THE SITE BENCHMARK INFORMATION IS LISTED BELOW.

SITE BENCHMARK INFORMATION

| MONUMENT | NORTHING | EASTING | ELEVATION (FT-MSL) |
|---|---|---|---|
| 1 | 6979579.652 | 2398188.071 | 475.05 |

4. THE SEQUENCE OF SITE DEVELOPMENT IS PROVIDED ON DRAWINGS I/IIA.4 THROUGH I/IIA.10.
5. UNAUTHORIZED ACCESS TO THE EXISTING FILL AREA AND ENTRNACE FACILITY IS CONTROLLED WITH PERIMETER FENCING (MINIMUM 4-FOOT HIGH, 3-STRAND BARBED WIRE FENCE), GATED ENTRACNE AND NATURAL BARRIERS (DENSE FOLIAGE, VEGETATION, AND WATERWAYS). REFER TO DRAWING I/IIA.14 FOR ACCESS CONTROL PLAN.

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

DATE: 05/2022
FILE: 0023-404-96
CAD: A.1-SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

# MAJOR PERMIT AMENDMENT SITE PLAN

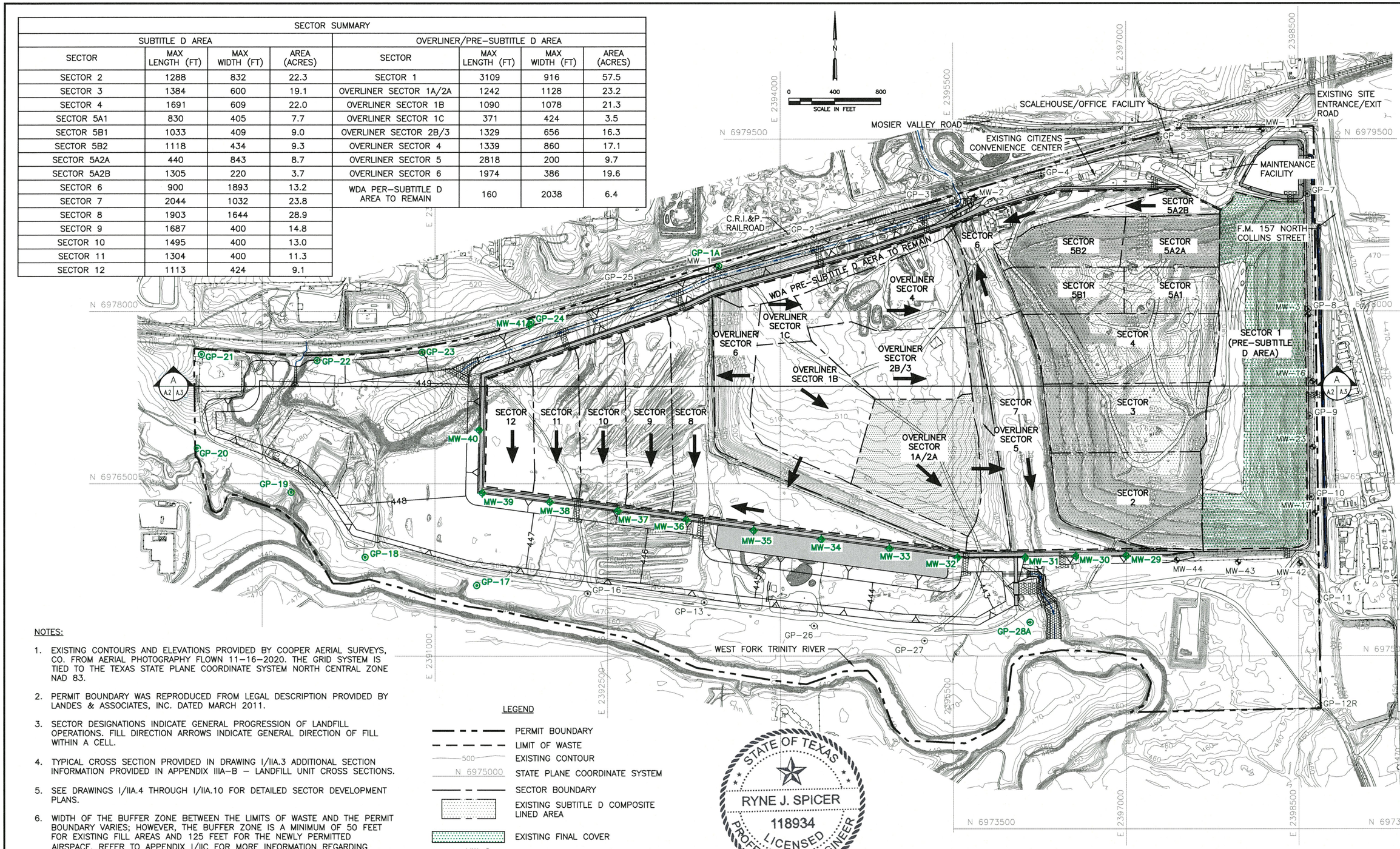
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIA.1

O:\0023\404\EXPANSION 2021\PARTS I-II\A.1-SITE PLAN.dwg, jwilson, 1:2

| SECTOR SUMMARY | | | | | | | |
|---|---|---|---|---|---|---|---|
| SUBTITLE D AREA | | | | OVERLINER/PRE–SUBTITLE D AREA | | | |
| SECTOR | MAX LENGTH (FT) | MAX WIDTH (FT) | AREA (ACRES) | SECTOR | MAX LENGTH (FT) | MAX WIDTH (FT) | AREA (ACRES) |
| SECTOR 2 | 1288 | 832 | 22.3 | SECTOR 1 | 3109 | 916 | 57.5 |
| SECTOR 3 | 1384 | 600 | 19.1 | OVERLINER SECTOR 1A/2A | 1242 | 1128 | 23.2 |
| SECTOR 4 | 1691 | 609 | 22.0 | OVERLINER SECTOR 1B | 1090 | 1078 | 21.3 |
| SECTOR 5A1 | 830 | 405 | 7.7 | OVERLINER SECTOR 1C | 371 | 424 | 3.5 |
| SECTOR 5B1 | 1033 | 409 | 9.0 | OVERLINER SECTOR 2B/3 | 1329 | 656 | 16.3 |
| SECTOR 5B2 | 1118 | 434 | 9.3 | OVERLINER SECTOR 4 | 1339 | 860 | 17.1 |
| SECTOR 5A2A | 440 | 843 | 8.7 | OVERLINER SECTOR 5 | 2818 | 200 | 9.7 |
| SECTOR 5A2B | 1305 | 220 | 3.7 | OVERLINER SECTOR 6 | 1974 | 386 | 19.6 |
| SECTOR 6 | 900 | 1893 | 13.2 | WDA PER–SUBTITLE D AREA TO REMAIN | 160 | 2038 | 6.4 |
| SECTOR 7 | 2044 | 1032 | 23.8 | | | | |
| SECTOR 8 | 1903 | 1644 | 28.9 | | | | |
| SECTOR 9 | 1687 | 400 | 14.8 | | | | |
| SECTOR 10 | 1495 | 400 | 13.0 | | | | |
| SECTOR 11 | 1304 | 400 | 11.3 | | | | |
| SECTOR 12 | 1113 | 424 | 9.1 | | | | |




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. SECTOR DESIGNATIONS INDICATE GENERAL PROGRESSION OF LANDFILL OPERATIONS. FILL DIRECTION ARROWS INDICATE GENERAL DIRECTION OF FILL WITHIN A CELL.
4. TYPICAL CROSS SECTION PROVIDED IN DRAWING I/IIA.3 ADDITIONAL SECTION INFORMATION PROVIDED IN APPENDIX IIIA–B – LANDFILL UNIT CROSS SECTIONS.
5. SEE DRAWINGS I/IIA.4 THROUGH I/IIA.10 FOR DETAILED SECTOR DEVELOPMENT PLANS.
6. 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 ZONE.
7. 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 2 NON–HAZARDOUS INDUSTRIAL SOLID WASTE, CLASS 3 NON–HAZARDOUS INDUSTRIAL SOLID WASTE, AND CERTAIN SPECIAL WASTES.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- SECTOR BOUNDARY
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- EXISTING FINAL COVER
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- MW–40 PROPOSED GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE
- GP–17 PROPOSED LANDFILL GAS MONITORING PROBE
- FILL DIRECTION (SEE NOTE 3)
- PERIMETER ACCESS ROAD
- 3H:1V SLOPE (TYPICAL)

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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- [ ] DRAFT
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DATE: 05/2022
FILE: 0023-404-96
CAD: A.2-SECTOR DEVELOPMENT PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |
| | | |
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# MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.2

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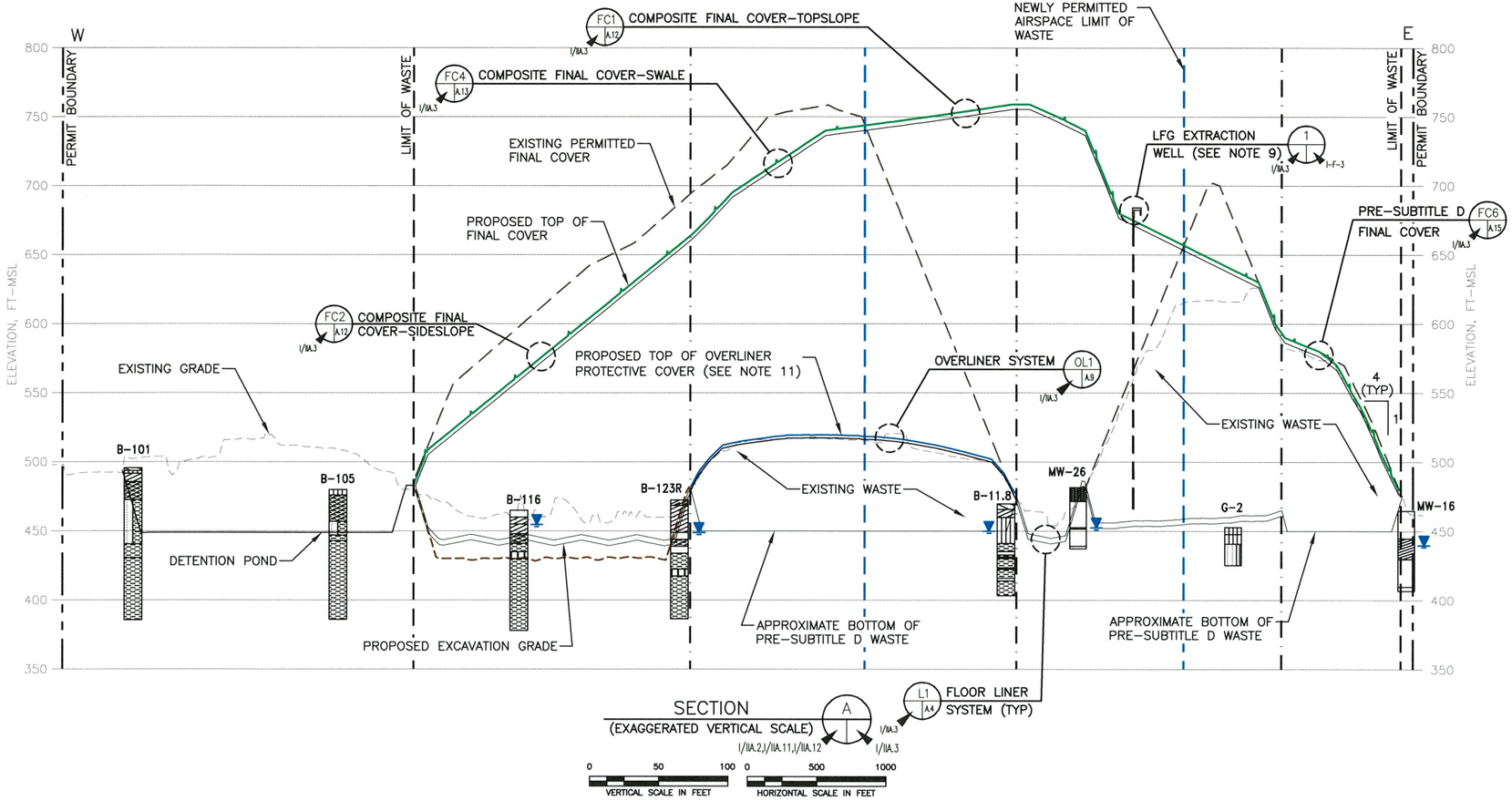
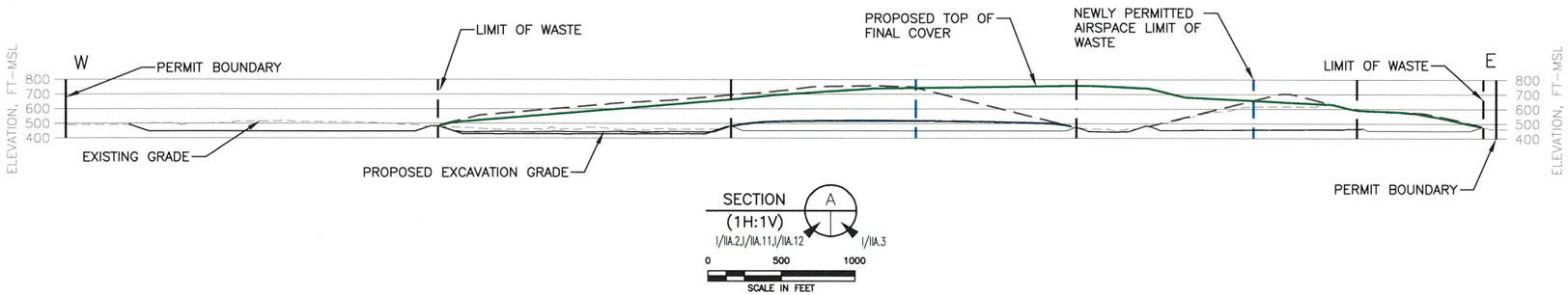



SECTION (EXAGGERATED VERTICAL SCALE) A

L1 FLOOR LINER SYSTEM (TYP)

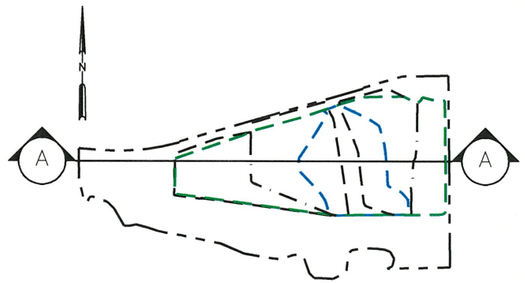
0 50 100 VERTICAL SCALE IN FEET

0 500 1000 HORIZONTAL SCALE IN FEET




SECTION (1H:1V) A

0 500 1000 SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE–SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- EXISTING PERMITTED FINAL COVER
- EXISTING PERMITTED EXCAVATION
- STATIC GROUNDWATER ELEVATION (FT–MSL)

CLAYEY SAND, SILTY SAND, SANDY CLAY, SHALEY CLAY, SANDSTONE AND SHALE, CLAY, SAND, SANDSTONE, SHALE, FILL, SILT, SANDY SILT, SILTSTONE, SANDSTONE AND SILTSTONE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF 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. 358C) 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 AT LCS SUMPS IS 424.5 FT–MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) INFORMATION.
11. REFER TO APPENDIX IIIA–A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE–SUBTITLE D AREA.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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FILE: 0023–404–11
CAD: A.3–CROSS SECTION A.DWG

DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

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AND
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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION A

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.3

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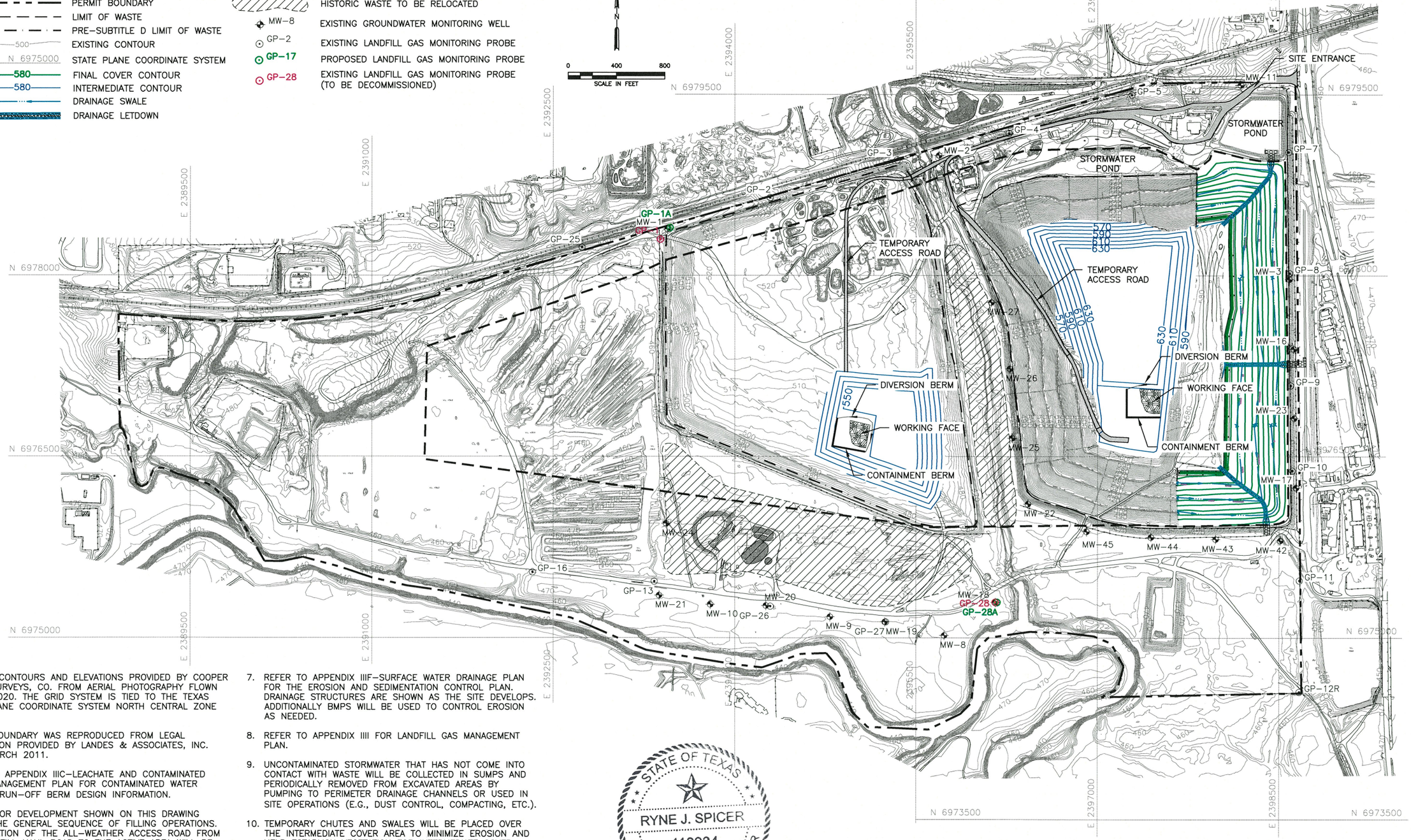
LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- HISTORIC WASTE TO BE RELOCATED
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE
- GP-28 EXISTING LANDFILL GAS MONITORING PROBE (TO BE DECOMMISSIONED)

N

0 400 800
SCALE IN FEET




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL-WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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-G 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-G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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0:\0023\404\EXPANSION 2021\PARTS I-IIA\A.4-Sequence 1.dwg, jwilson, 1:2

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DATE: 05/2022
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CAD: A.4-SECTOR DEVELOPMENT PLAN I.DWG

DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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AND
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# MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN I

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

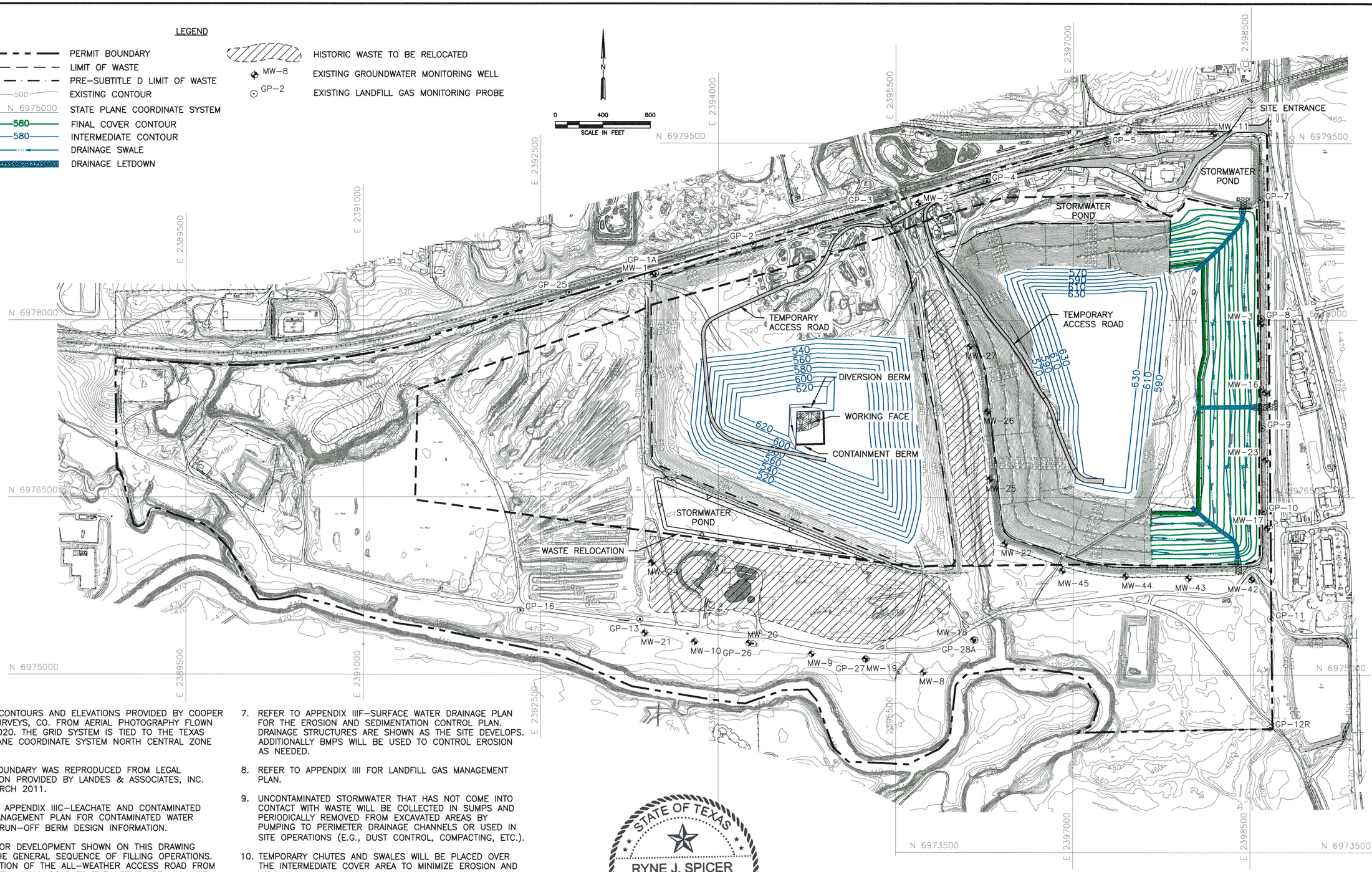
DRAWING I/IIA.4

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- HISTORIC WASTE TO BE RELOCATED
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN–ON/RUN–OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL–WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12–INCH THICK SOIL LAYER. REFER TO PART IV – SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL–WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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–G 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–G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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CAD: A.5–SECTOR DEVELOPMENT PLAN I.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

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# MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN II

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIA.5

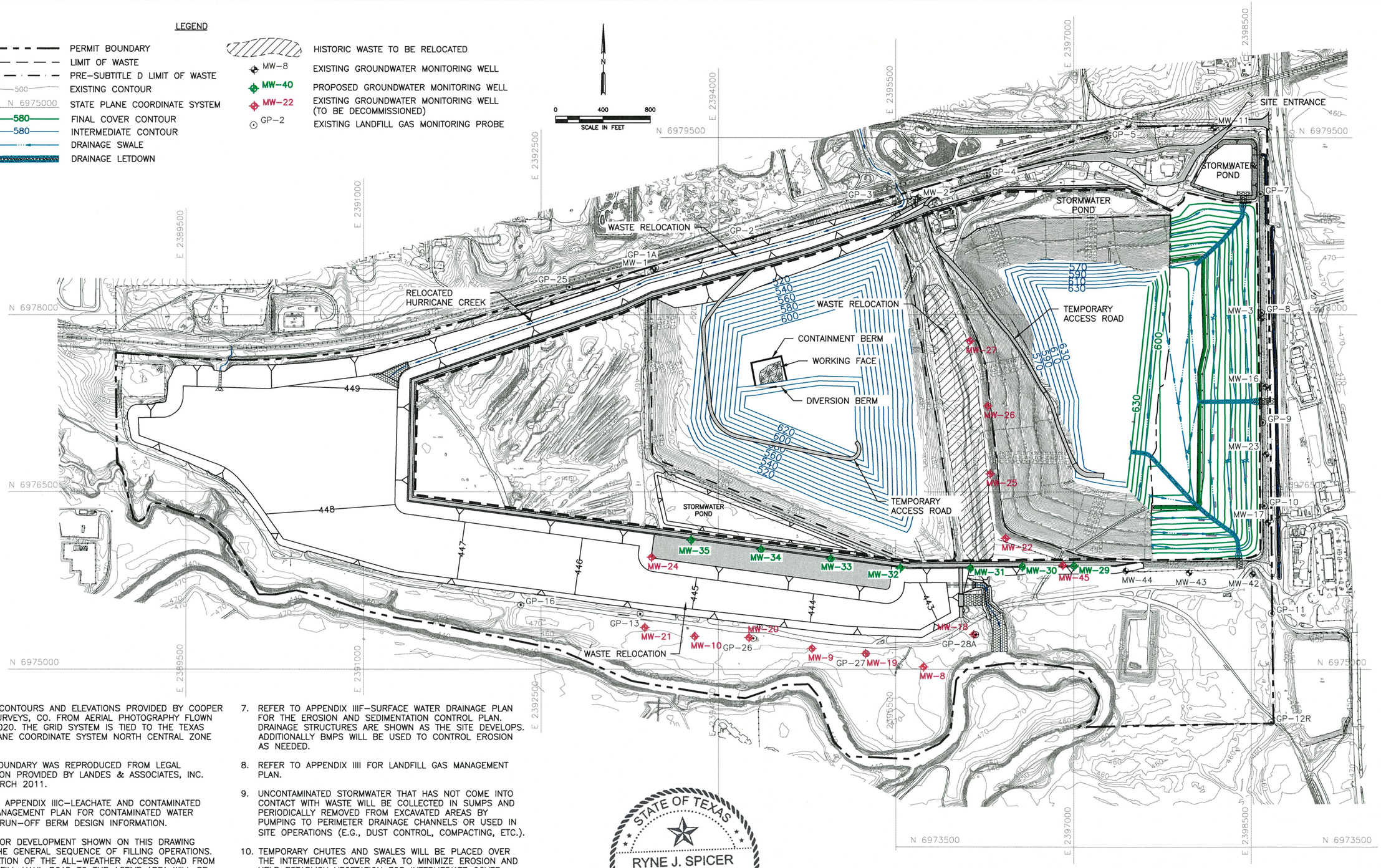
O:\0023\404\EXPANSION 2021\PARTS I–II\A.5–Sequence II.dwg, jwilson, 1:2

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- HISTORIC WASTE TO BE RELOCATED
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- MW–40 PROPOSED GROUNDWATER MONITORING WELL
- MW–22 EXISTING GROUNDWATER MONITORING WELL (TO BE DECOMMISSIONED)
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN–ON/RUN–OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL–WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12–INCH THICK SOIL LAYER. REFER TO PART IV – SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL–WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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–G 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–G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# SECTOR DEVELOPMENT PLAN III

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIA.6

O:\0023\404\EXPANSION 2021\PARTS I-II\A.6-Sequence III.dwg, jwilson, 1:2

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- HISTORIC WASTE TO BE RELOCATED
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- MW–40 PROPOSED GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE
- GP–17 PROPOSED LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET

SITE ENTRANCE
STORMWATER POND
RELOCATED HURRICANE CREEK
DIVERSION BERM
WORKING FACE
CONTAINMENT BERM
TEMPORARY ACCESS ROAD
STORMWATER POND

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN–ON/RUN–OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL–WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12–INCH THICK SOIL LAYER. REFER TO PART IV – SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL–WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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–G 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–G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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FILE: 0023–404–11
CAD: A.7–SECTOR DEVELOPMENT PLAN I.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

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TBPE REGISTRATION NO. F–3727

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AND
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# MAJOR PERMIT AMENDMENT
# SECTOR DEVELOPMENT PLAN IV

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIA.7

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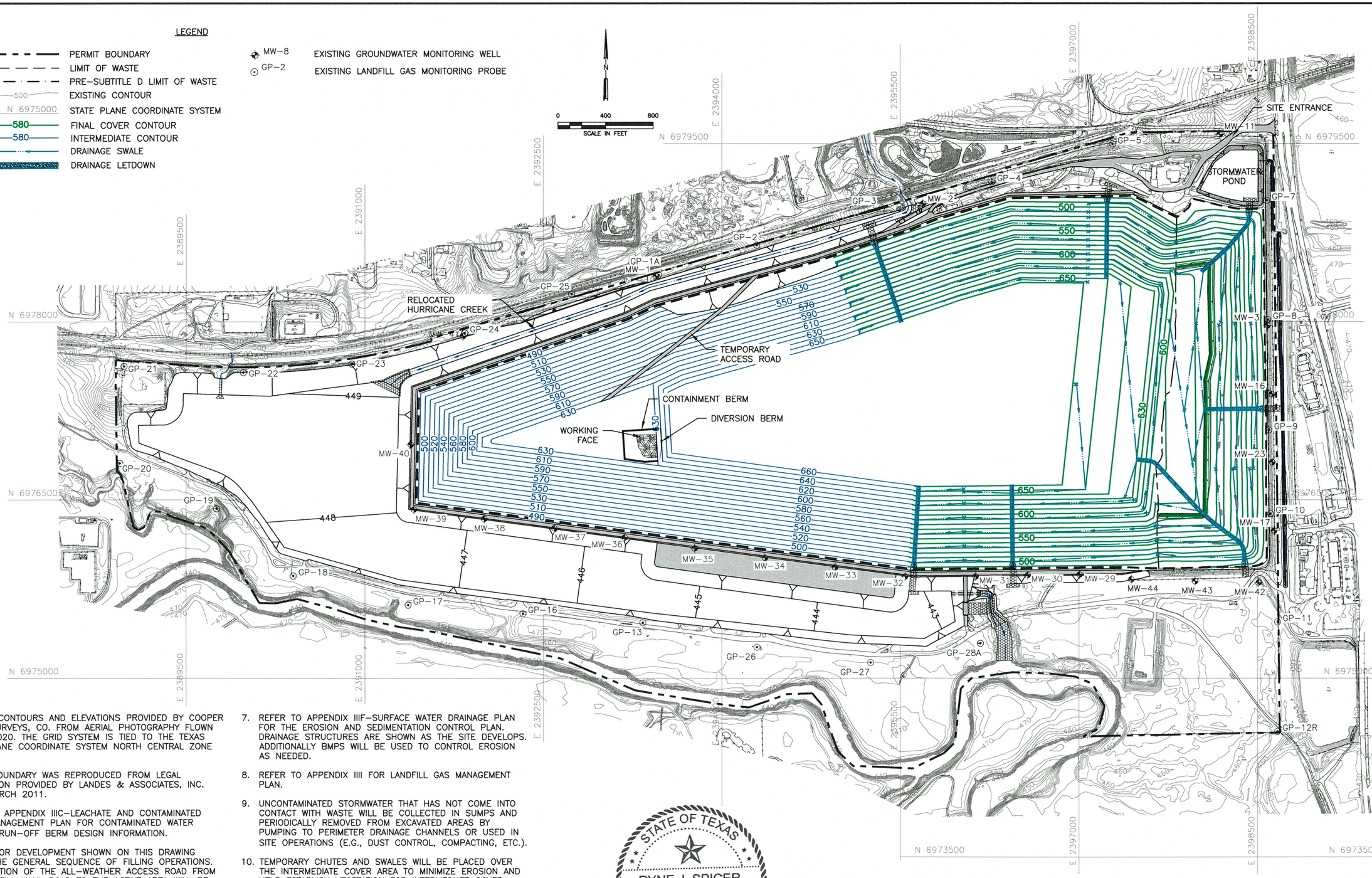
LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN–ON/RUN–OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL–WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12–INCH THICK SOIL LAYER. REFER TO PART IV – SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL–WEATHER ACCESS.
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10. 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–G 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–G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.8-SECTOR DEVELOPMENT PLAN I.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
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# MAJOR PERMIT AMENDMENT
# SECTOR DEVELOPMENT PLAN V

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.8

O:\0023\404\EXPANSION 2021\PARTS I-II\A.8-Sequence V.dwg, jwilson, 1:2

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET

N 6979500
N 6978000
N 6976500
N 6975000
N 6973500
E 2389500
E 2391000
E 2392500
E 2394000
E 2395500
E 2397000
E 2398500

SITE ENTRANCE
STORMWATER POND
RELOCATED HURRICANE CREEK
TEMPORARY ACCESS ROAD
CONTAINMENT BERM
WORKING FACE
DIVERSION BERM

GP-1A, GP-2, GP-3, GP-4, GP-5, GP-7, GP-8, GP-9, GP-10, GP-11, GP-12R, GP-13, GP-16, GP-17, GP-18, GP-19, GP-20, GP-21, GP-22, GP-23, GP-24, GP-25, GP-26, GP-27, GP-28A

MW-1, MW-2, MW-3, MW-11, MW-16, MW-17, MW-23, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW-37, MW-38, MW-39, MW-40, MW-42, MW-43, MW-44

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL-WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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-G 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-G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.9-SECTOR DEVELOPMENT PLAN I.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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| NO. | DATE | DESCRIPTION |
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# MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN VI

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.9

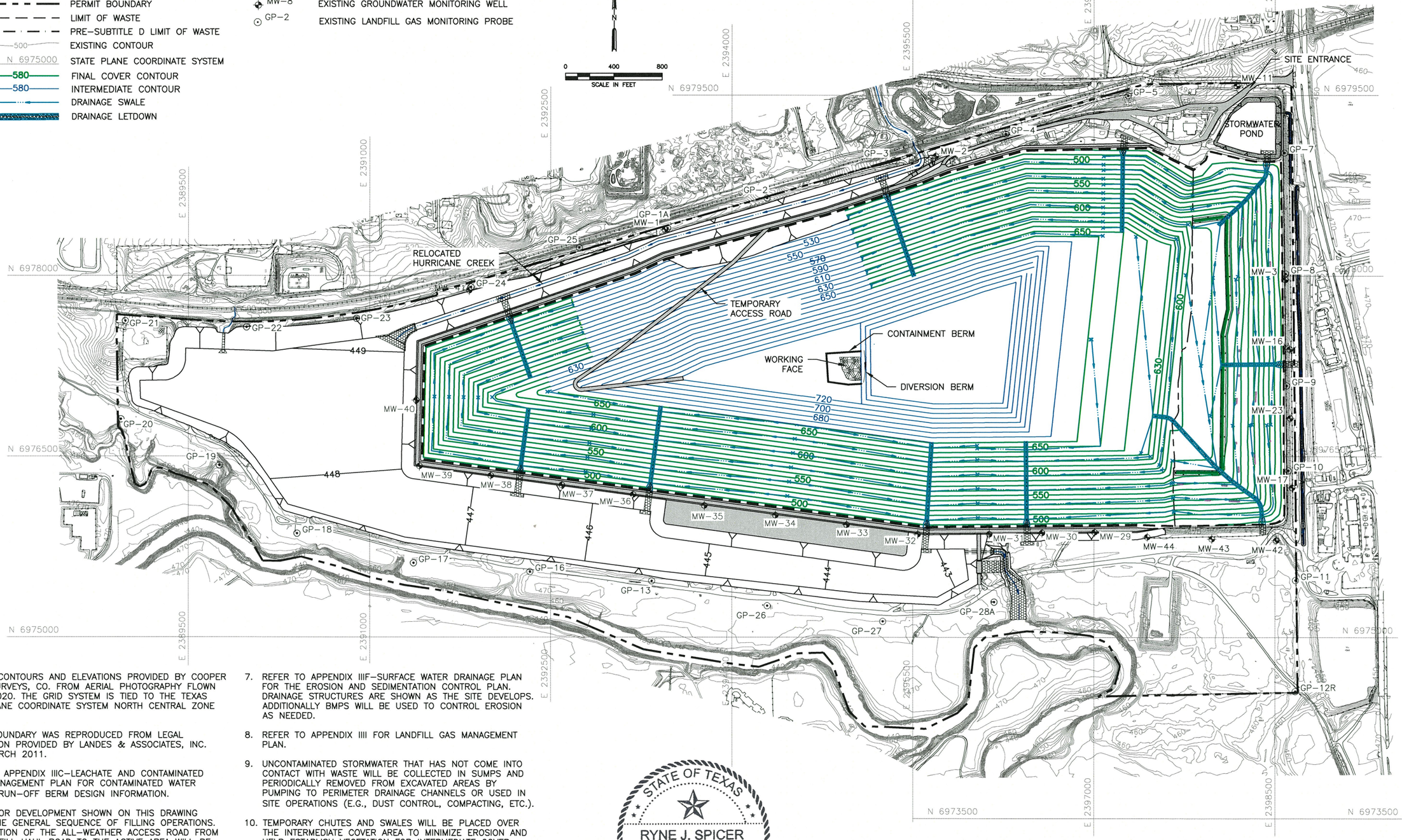
O:\0023\404\EXPANSION 2021\PARTS I-II\A.9-Sequence VI.dwg, jwilson, 1:2

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- 580 INTERMEDIATE CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE

N

0 400 800
SCALE IN FEET




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
3. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
4. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
5. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
6. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL-WEATHER ACCESS.
7. 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.
8. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
9. 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.).
10. 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-G 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-G.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.10-SECTOR DEVELOPMENT PLAN I.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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# MAJOR PERMIT AMENDMENT
# SECTOR DEVELOPMENT PLAN VII

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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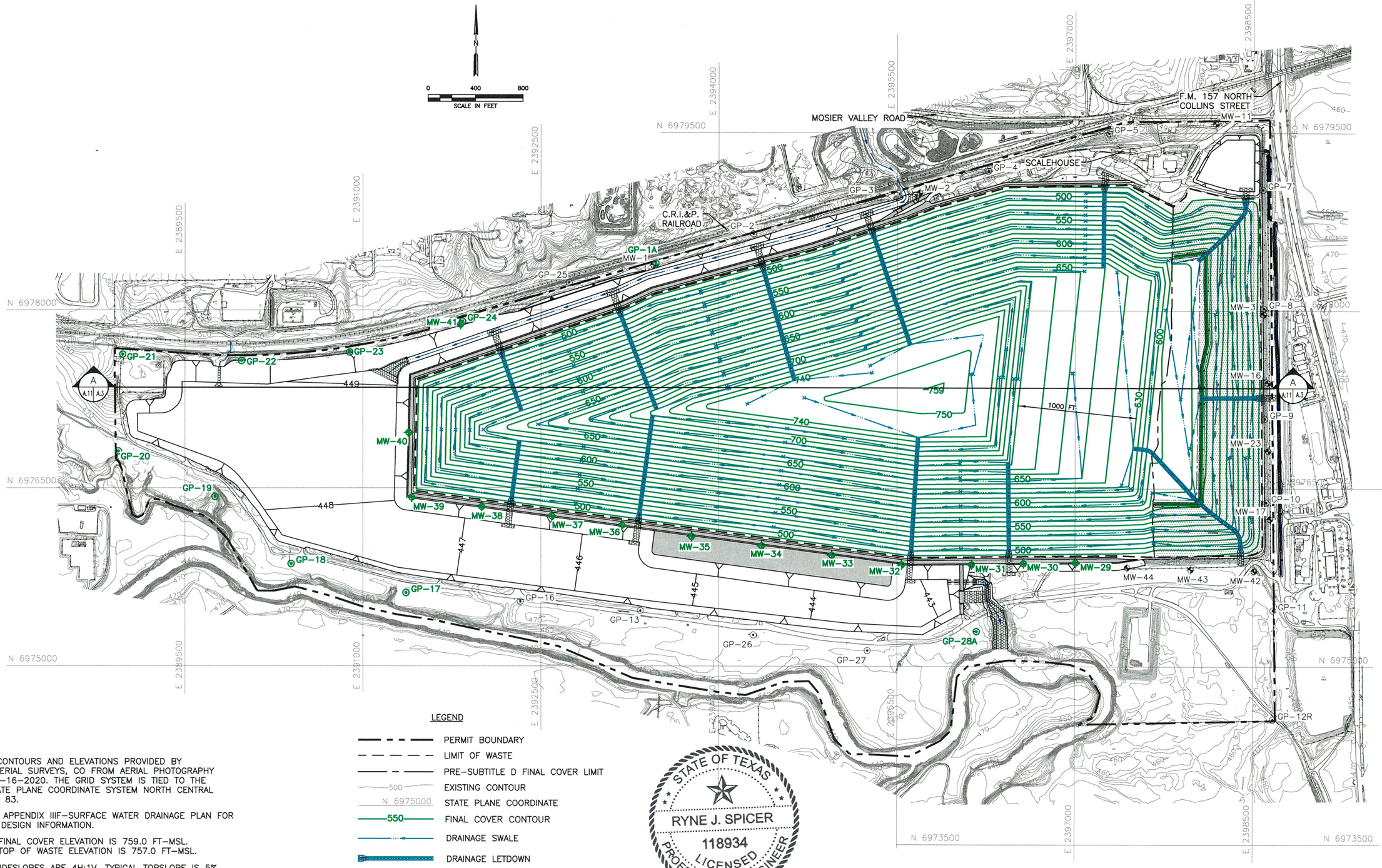
DRAWING I/IIA.10

O:\0023\404 EXPANSION 2021\PARTS I-II\A.10-Sequence VII.dwg, jwilson, 1:2




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 759.0 FT–MSL. MAXIMUM TOP OF WASTE ELEVATION IS 757.0 FT–MSL.
4. TYPICAL SIDESLOPES ARE 4H:1V. TYPICAL TOPSLOPE IS 5%.
5. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D FINAL COVER LIMIT
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 550 FINAL COVER CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- MW–40 PROPOSED GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE
- GP–17 PROPOSED LANDFILL GAS MONITORING PROBE

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023–404–96
CAD: A.11–COMPLETION PLAN.DWG

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

Weaver Consultants Group
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# MAJOR PERMIT AMENDMENT
# LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.11

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STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-17-2022

N
0 400 800
SCALE IN FEET

F.M. 157 NORTH COLLINS STREET
C.R.I.&P. RAILROAD
SCALEHOUSE

SECTOR 1 (PRE-SUBTITLE D AREA)
SECTOR 2
SECTOR 3
SECTOR 4
SECTOR 5
SECTOR 6
SECTOR 7
SECTOR 8
SECTOR 9
SECTOR 10
SECTOR 11
SECTOR 12
SECTOR 5A2B
SECTOR 5A2A
SECTOR 5B2
SECTOR 5B1
SECTOR 5A1
OVERLINER SECTOR 1A/2A
OVERLINER SECTOR 1B
OVERLINER SECTOR 1C
OVERLINER SECTOR 2B/3
OVERLINER SECTOR 4
OVERLINER SECTOR 5
OVERLINER SECTOR 6

GP-1A GP-2 GP-3 GP-4 GP-5 GP-7 GP-8 GP-9 GP-10 GP-11 GP-12R GP-13 GP-16 GP-17 GP-18 GP-19 GP-20 GP-21 GP-22 GP-23 GP-24 GP-25 GP-26 GP-27 GP-28A
MW-1 MW-2 MW-3 MW-11 MW-16 MW-17 MW-23 MW-29 MW-30 MW-31 MW-32 MW-33 MW-34 MW-35 MW-36 MW-37 MW-38 MW-39 MW-40 MW-41 MW-42 MW-43 MW-44

N 6979500 N 6978000 N 6976500 N 6975000 N 6973500
E 2389500 E 2391000 E 2392500 E 2394000 E 2395500 E 2397000 E 2398500

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 440 TOP OF LINER CONTOUR
- 506 TOP OF OVERLINER CONTOUR
- 510 AS-BUILT TOP OF LINER CONTOUR
- 448 APPROXIMATE TOP OF PRE-SUBTITLE D LINER (SEE NOTE 8)
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
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. ELEVATION OF DEEPEST EXCAVATION AT THE LCS SUMP IS 424.5 FT-MSL.
5. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.4 THROUGH I/IIA.7.
6. REFER TO APPENDIX IIIF FOR DRAINAGE DESIGN INFORMATION.
7. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
8. TOP OF PRE-SUBTITLE D LINER IS APPROXIMATE AND WAS REPRODUCED FROM CROSS-SECTIONS INCLUDED IN THE 1977 PERMIT APPLICATION PREPARED BY HENNINGTON, DURHAM & RICHARDSON, INC.

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.12-EXCAVATION/OVERLINER PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: CAM

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# MAJOR PERMIT AMENDMENT
# TOP OF LINER/OVERLINER PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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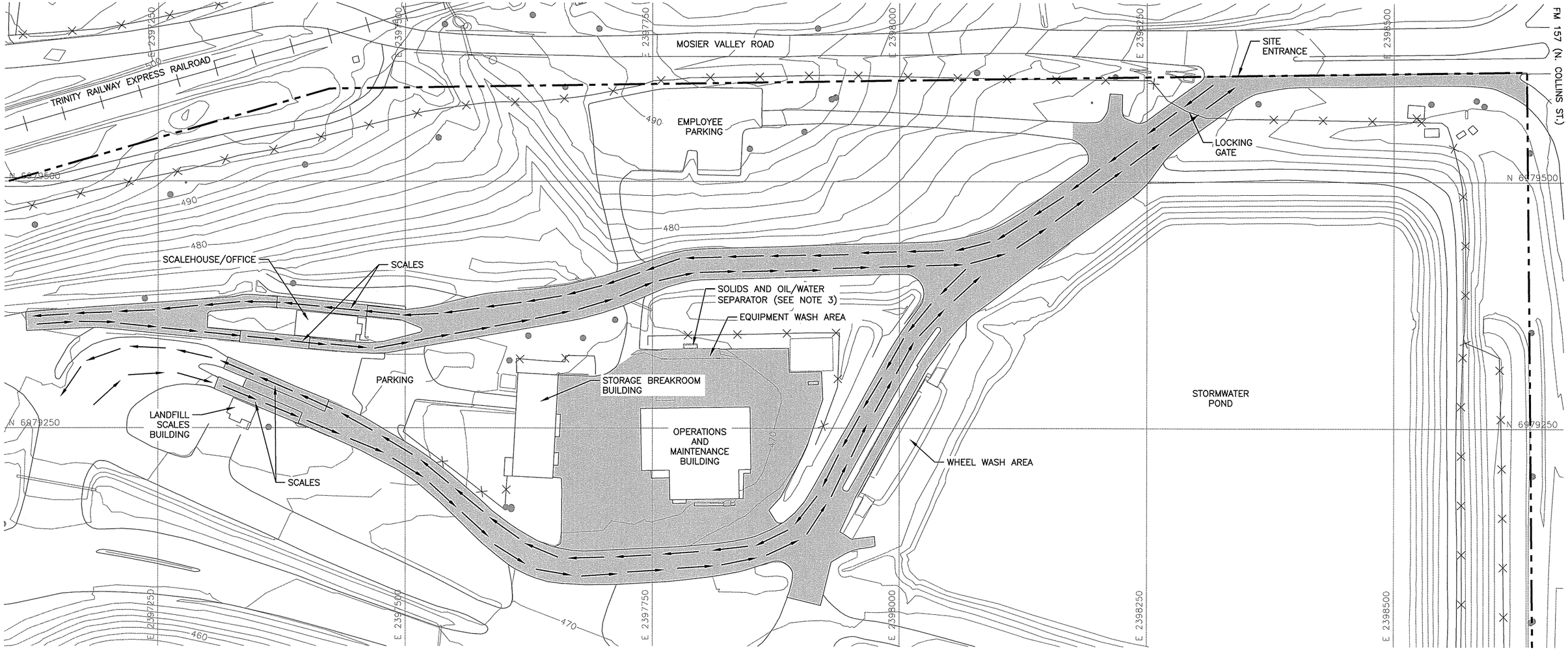


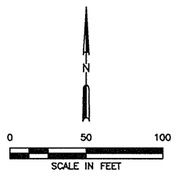


LEGEND

- PERMIT BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE SYSTEM
- PAVED AREA (SEE NOTE 2)
- EXISTING FENCE
- VEHICLE TRAFFIC DIRECTION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PAVED AREAS INSIDE THE PERMIT BOUNDARY HIGHLIGHTED. ALL WEATHER PAVING MAY BE PROVIDED USING ASPHALT, CONCRETE, OR GRAVEL OR A COMBINATION OF VARIOUS ALL WEATHER SURFACING.
3. SOLIDS AND OIL/WATER SEPARATOR USED FOR COLLECTION OF RUNOFF FROM THE EQUIPMENT WASH AREA ONLY. NO WASTE DISPOSAL ALLOWED INTO SEPARATOR.
4. ADDITIONAL INBOUND/OUTBOUND SCALES MAY BE ADDED TO THE SITE ENTRANCE TO FACILITATE CUSTOMER TRAFFIC.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-96
CAD: A.13-EXISTING ENTRANCE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
# EXISTING SITE ENTRANCE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING 1/IIA.13

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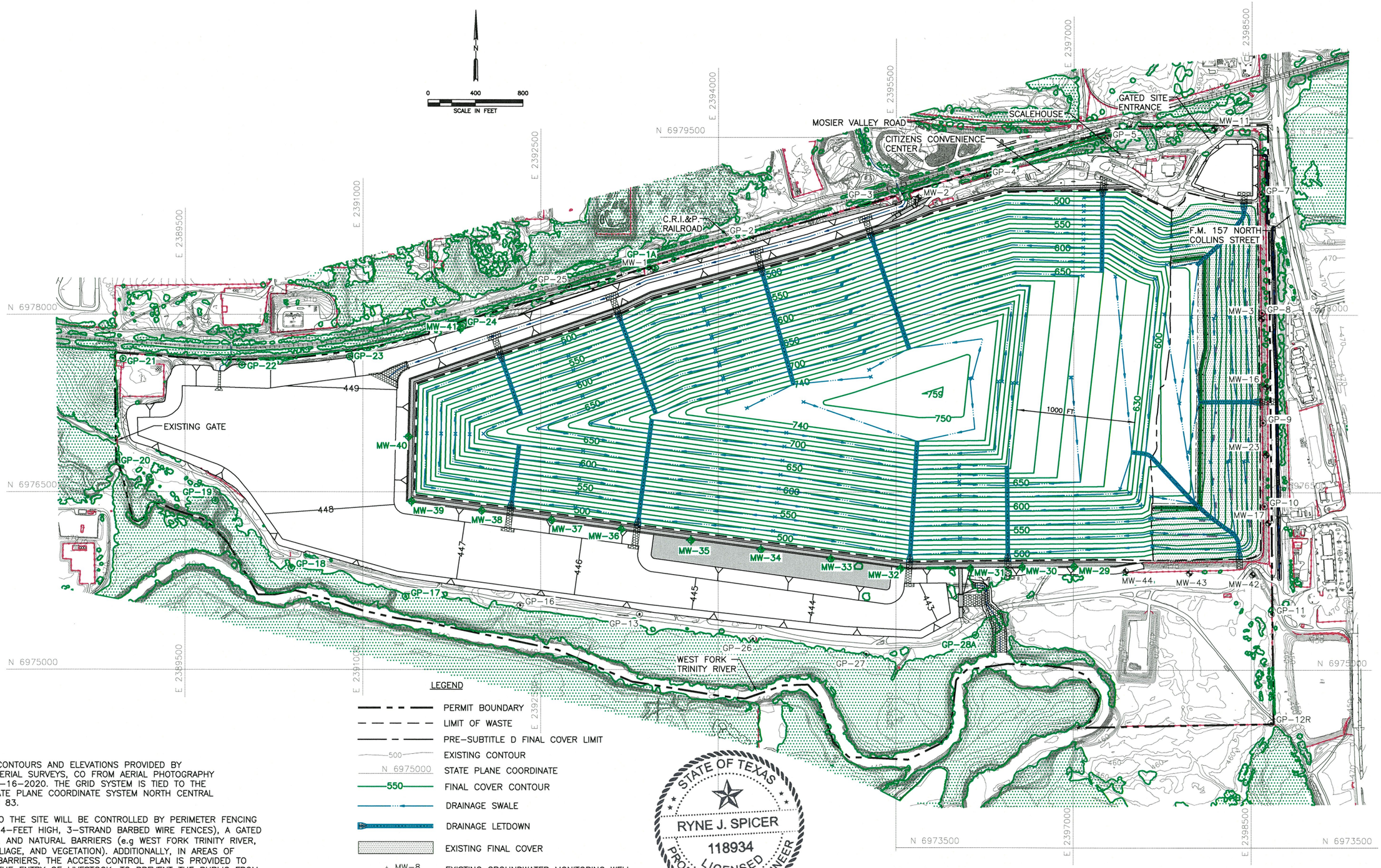


LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D FINAL COVER LIMIT
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 550 FINAL COVER CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- EXISTING FINAL COVER
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE
- EXISTING FENCE
- EXISTING TREES

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
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 WEST FORK TRINITY RIVER, 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.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-96
CAD: A.14-ACCESS CONTROL PLAN.DWG

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

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
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# MAJOR PERMIT AMENDMENT
# ACCESS CONTROL PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIA.14

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# 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

- April 13, 2022, FAA Determination of No Objection Letter.
- January 18, 2022, FAA Determination of No Hazard to Air Navigation Letters.
- December 1, 2021, WCG Request for Review Letter regarding hazards to air navigation and hazards to air traffic due to birds.

# APRIL 13, 2022, FAA NO OBJECTION LETTER

U.S. Department
of Transportation
**Federal Aviation Administration**

Federal Aviation Administration
Southwest Region, Airports Division
Safety and Standards Branch

10101 Hillwood Parkway
Fort Worth, Texas 76177

April 13, 2022

Adam Hart
Environmental Manager – South Area
Republic Waste Services of Texas Ltd.
800 Mosier Valley Road
Euless, TX 76040

**Subject: City of Arlington Landfill, Arlington, TX**
**Type I Landfill – Amendment Application**
**Operated by Republic Services of Texas, Ltd.**
**FAA File No. 20-017-TX**

This letter is in response to your December 1, 2021 letter advising us of the proposed City of Arlington Landfill permit amendment and subsequent January 18, 2022, FAA Determination of "No Hazard to Air Navigation" evaluation regarding the proposed site expansion of the City of Arlington Landfill Facility in Arlington, Texas.

Using coordinates 29 37' 26.13" N and 95 11' 29.09" W, we determined there is one private-owned, private use airport within 3.4 sm of the facility. There are no general aviation or air carrier airports within 5 miles of the facility. FAA expects the site to continue with working face of the landfill size restrictions, bird abatement program and on-going wildlife monitoring strategies currently in use.

We have no objection to the proposed expansion of the City of Arlington Landfill and continued operation as a Type I facility. Our position of no objection is based on the application of our guidance for hazardous wildlife attractants on or near airports FAA Advisory Circular 150/5200-33C.

This site has been assigned our file No. 20-017-TX. Please refer to this number in any future correspondence regarding this site. Thank you for coordinating this project with us. If there are any questions, you can contact me at 817-222-5671 or gary.loftus@faa.gov.

Sincerely,

GARY J LOFTUS

Digitally signed by GARY J LOFTUS
Date: 2022.04.13 09:38:16 -05'00'

Gary J. Loftus, A.A.E.
Airports Compliance Program Manager
Airport Certification Safety Inspector
FAA Southwest Region Airports Division

# JANUARY 18, 2022, FAA DETERMINATION OF NO HAZARD TO AIR NAVIGATION LETTERS

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

Aeronautical Study No.
2021-ASW-21455-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point A Top Dec |
| Location: | Arlington, TX |
| Latitude: | 32-48-05.40N NAD 83 |
| Longitude: | 97-06-32.70W |
| Heights: | 460 feet site elevation (SE)<br>299 feet above ground level (AGL)<br>759 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 07/18/2023 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.

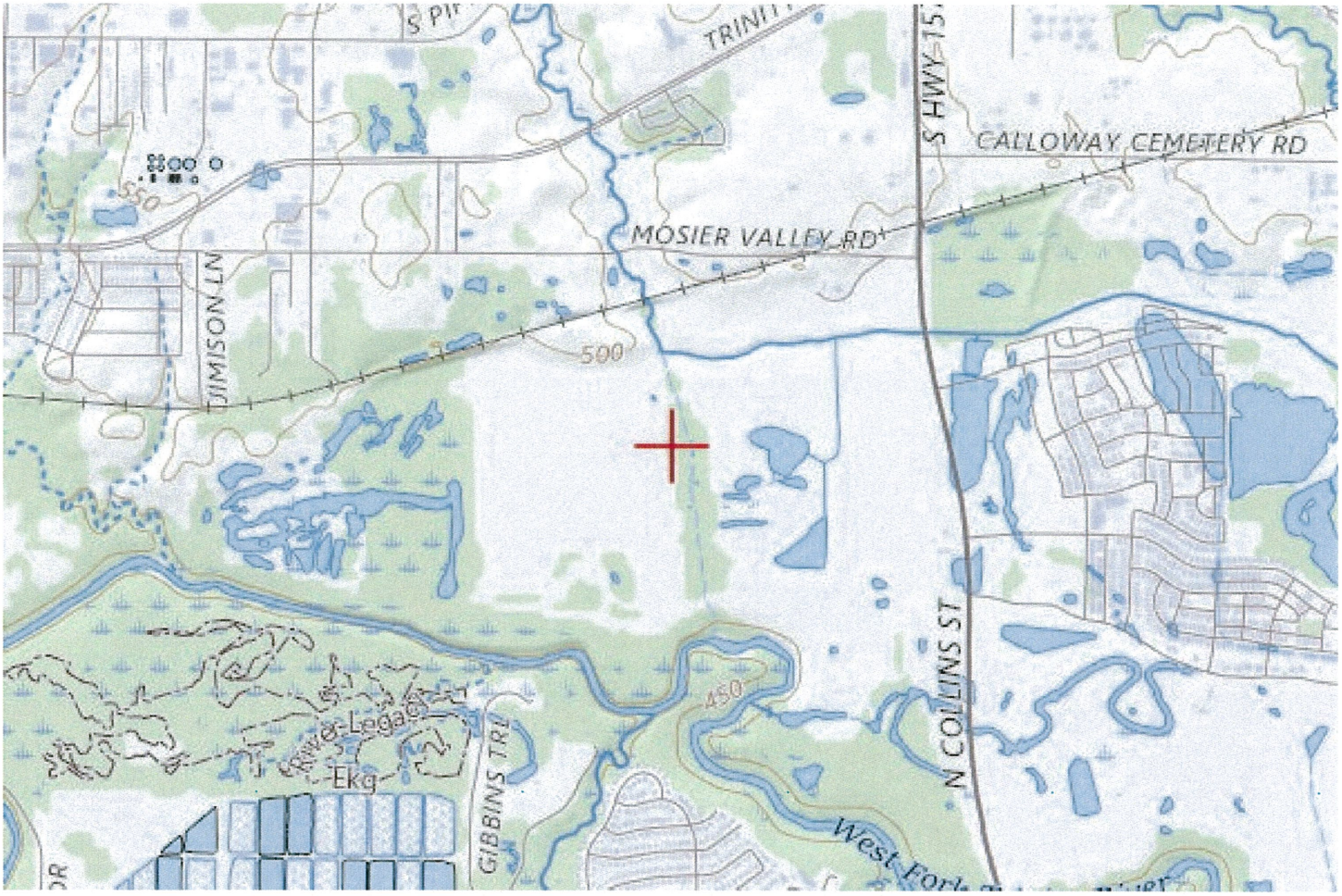
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ASW-21455-OE.

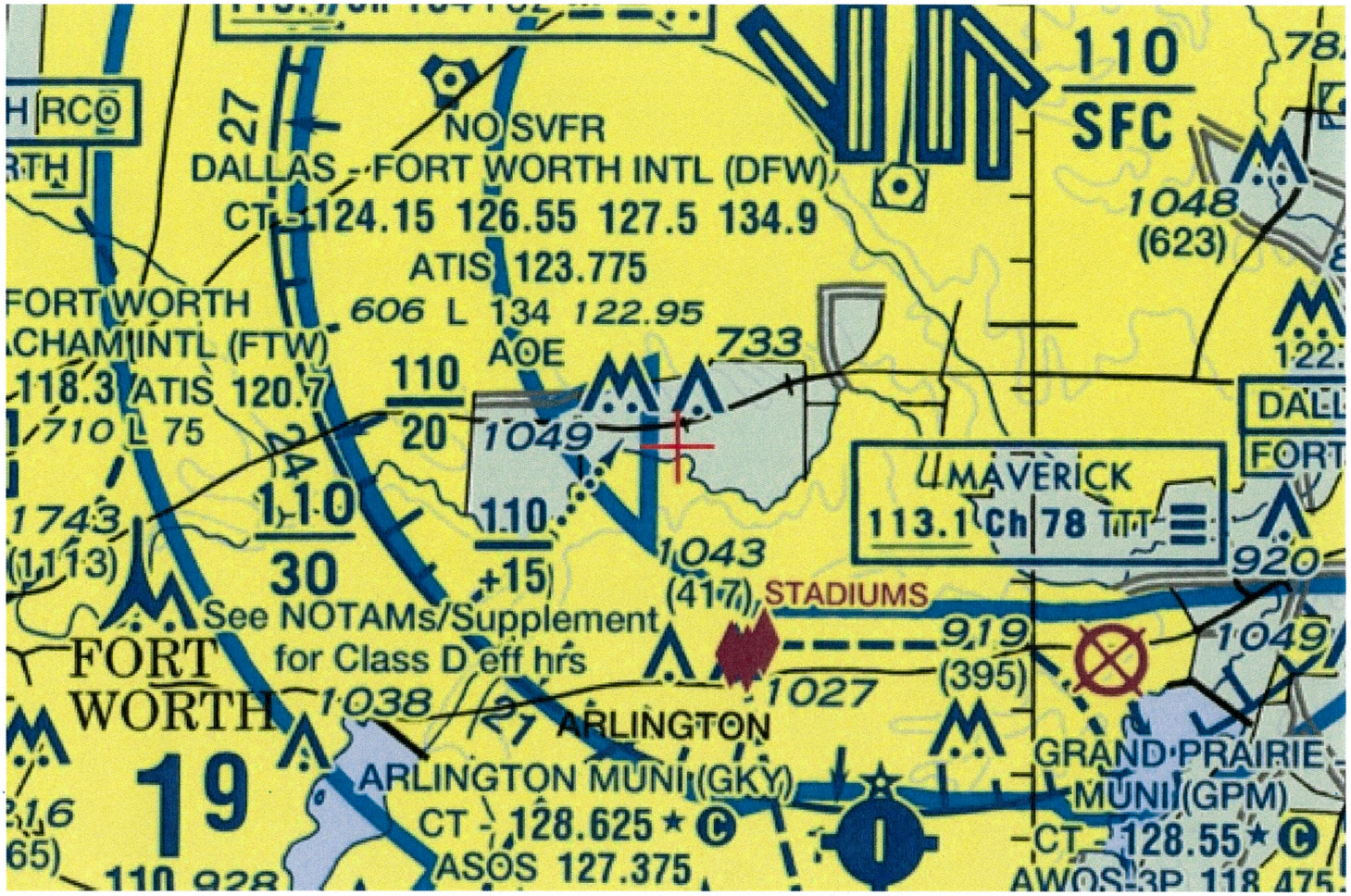
**Signature Control No: 503685071-508202062** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21455-OE**

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CT 124.15 126.55 127.5 134.9
ATIS 123.775
606 L 134 122.95
AOE
FORT WORTH
CHAM INTL (FTW)
118.3 ATIS 120.7
710 L 75
110
SFC
1048
(623)
733
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20
1049
110
30
110
+15
1743
(1113)
1043
(417)
STADIUMS
MAVERICK
113.1 Ch 78
920
See NOTAMs/Supplement
for Class D eff hrs
FORT
WORTH
1038
27
ARLINGTON
919
(395)
1027
1049
19
ARLINGTON MUNI (GKY)
CT 128.625
ASOS 127.375
GRAND PRAIRIE
MUNI (GPM)
CT 128.55
AWOS-3P 118.475

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

Aeronautical Study No.
2021-ASW-21514-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point H SW Crnr |
| Location: | Arlington, TX |
| Latitude: | 32-47-57.70N NAD 83 |
| Longitude: | 97-07-23.90W |
| Heights: | 450 feet site elevation (SE)<br>309 feet above ground level (AGL)<br>759 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 07/18/2023 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.


FHB-11

(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 2021-ASW-21514-OE.

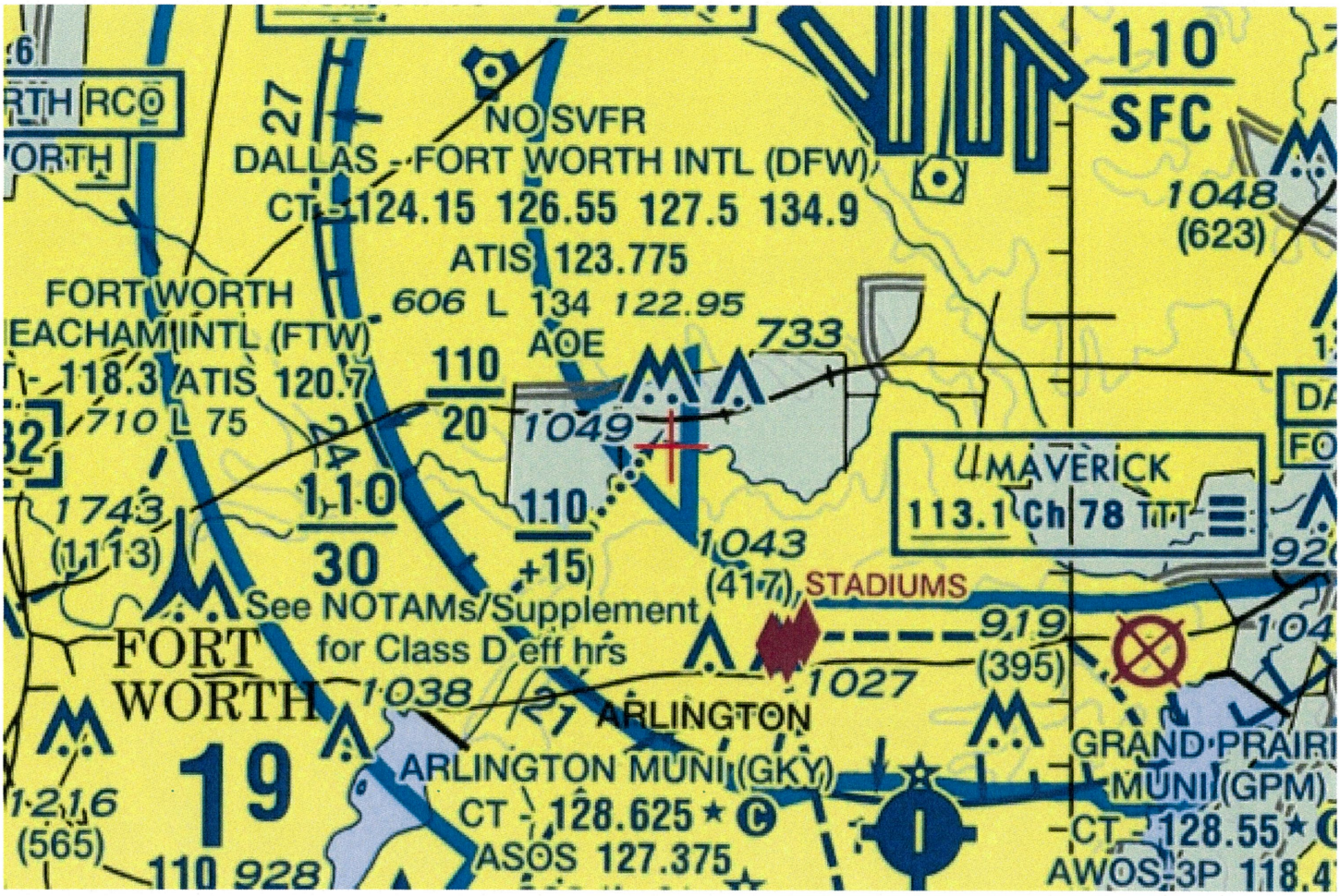
**Signature Control No: 503829524-508202057** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21514-OE**

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SFC
NO SVFR
DALLAS - FORT WORTH INTL (DFW)
CT 124.15 126.55 127.5 134.9
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FORT WORTH
EACHAM INTL (FTW)
118.3 ATIS 120.7
710 L 75
110
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1049
MAVERICK
113.1 Ch 78
1743
(1113)
110
30
110
+15
1043
(417)
STADIUMS
See NOTAMs/Supplement
for Class D eff hrs
919
(395)
FORT
WORTH
1038
1027
ARLINGTON
19
ARLINGTON MUNI (GKY)
CT 128.625
ASOS 127.375
1216
(565)
928
GRAND PRAIRIE
MUNI (GPM)
CT 128.55
AWOS-3P 118.4

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

Aeronautical Study No.
2021-ASW-21461-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point G NW Crnr |
| Location: | Arlington, TX |
| Latitude: | 32-48-06.20N NAD 83 |
| Longitude: | 97-07-23.70W |
| Heights: | 475 feet site elevation (SE)<br>284 feet above ground level (AGL)<br>759 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 07/18/2023 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.

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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 2021-ASW-21461-OE.

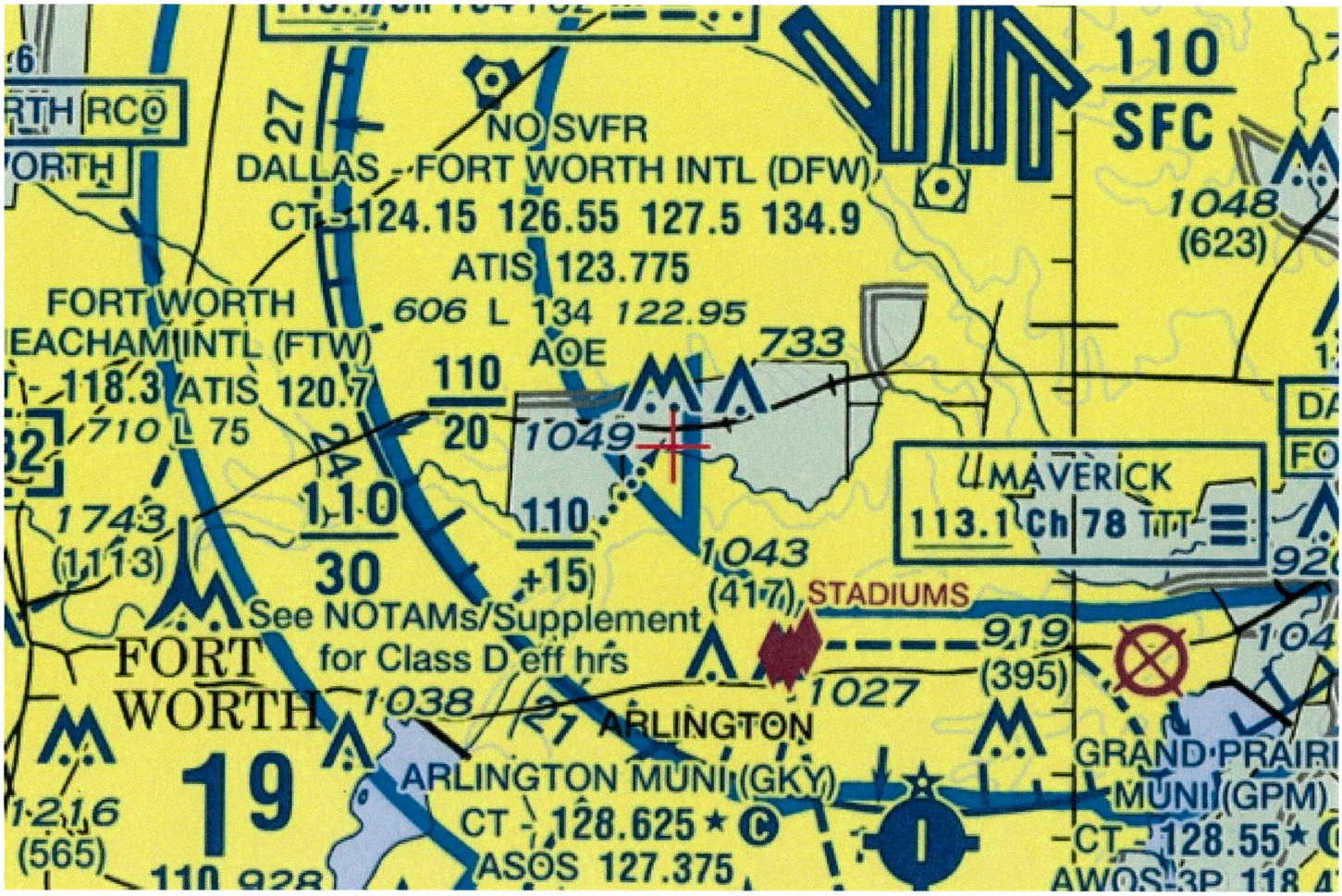
**Signature Control No: 503685079-508202059** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21461-OE**

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EACHAM (INTL (FTW)
118.3 ATIS 120.7
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1049
MAVERICK
113.1 Ch 78
1743
(1113)
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30
110
+15
1043
(417)
STADIUMS
See NOTAMs/Supplement
for Class D eff hrs
FORT
WORTH
1038
1027
919
(395)
ARLINGTON
19
ARLINGTON MUNI (GKY)
CT 128.625
ASOS 127.375
1216
(565)
GRAND PRAIRI
MUNI (GPM)
CT 128.55
AWOS-3P 118.4

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

Aeronautical Study No.
2021-ASW-21460-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point F North Cr |
| Location: | Arlington, TX |
| Latitude: | 32-48-21.60N NAD 83 |
| Longitude: | 97-06-25.90W |
| Heights: | 470 feet site elevation (SE)<br>289 feet above ground level (AGL)<br>759 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 07/18/2023 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.

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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 2021-ASW-21460-OE.

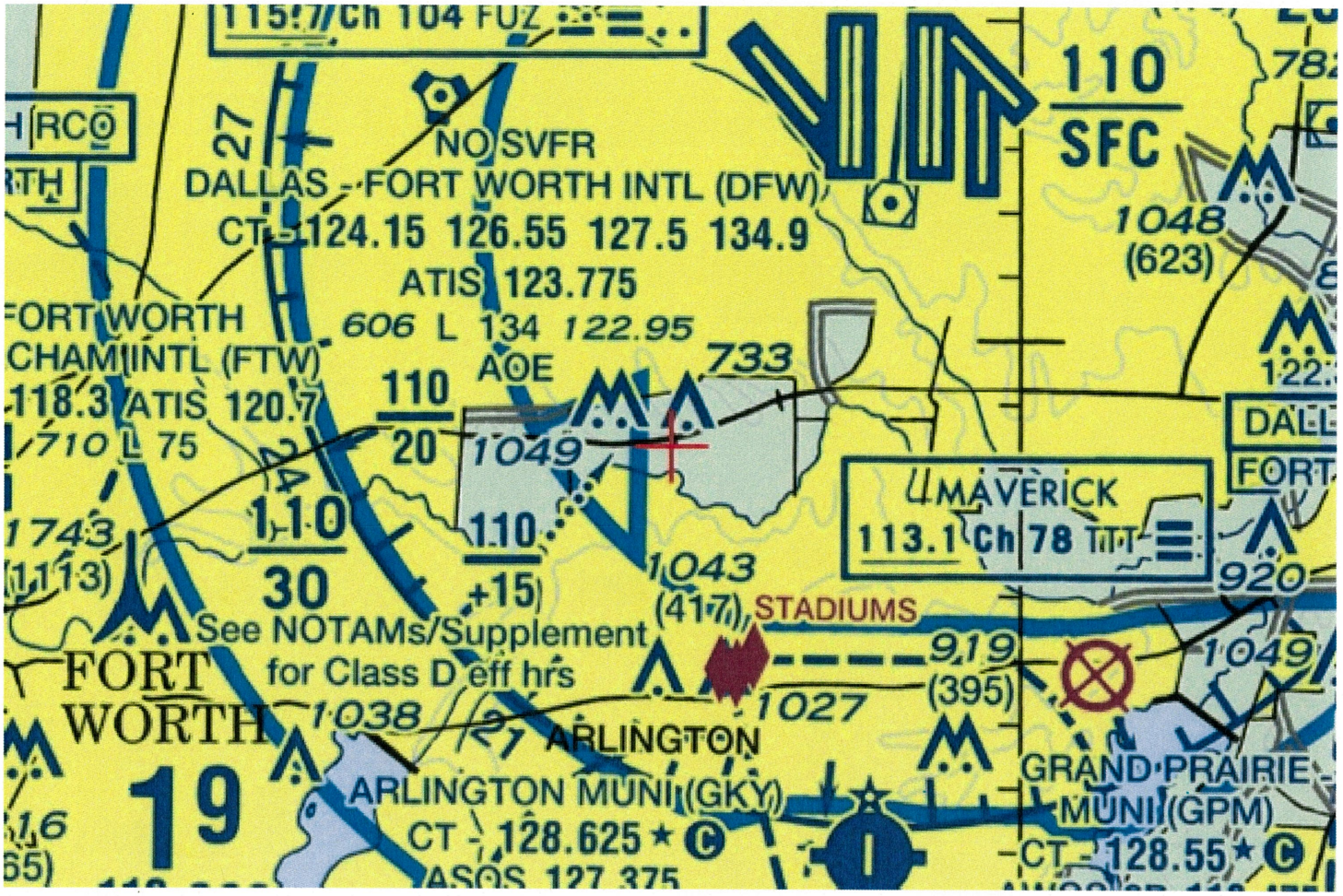
**Signature Control No: 503685076-508202056** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21460-OE**

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RCO
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DALLAS - FORT WORTH INTL (DFW)
CT 124.15 126.55 127.5 134.9
ATIS 123.775
606 L 134 122.95
AOE
733
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SFC
1048
(623)
FORT WORTH
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MAVERICK
113.1 Ch 78
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See NOTAMs/Supplement
for Class D eff hrs
FORT
WORTH
1038
27
ARLINGTON
919
(395)
1027
19
ARLINGTON MUNI (GKY)
CT 128.625
ASOS 127.375
GRAND PRAIRIE
MUNI (GPM)
CT 128.55
920
1049

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

Aeronautical Study No.
2021-ASW-21459-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point E North Cr |
| Location: | Arlington, TX |
| Latitude: | 32-48-21.60N NAD 83 |
| Longitude: | 97-06-13.90W |
| Heights: | 460 feet site elevation (SE)<br>299 feet above ground level (AGL)<br>759 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 07/18/2023 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.

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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.

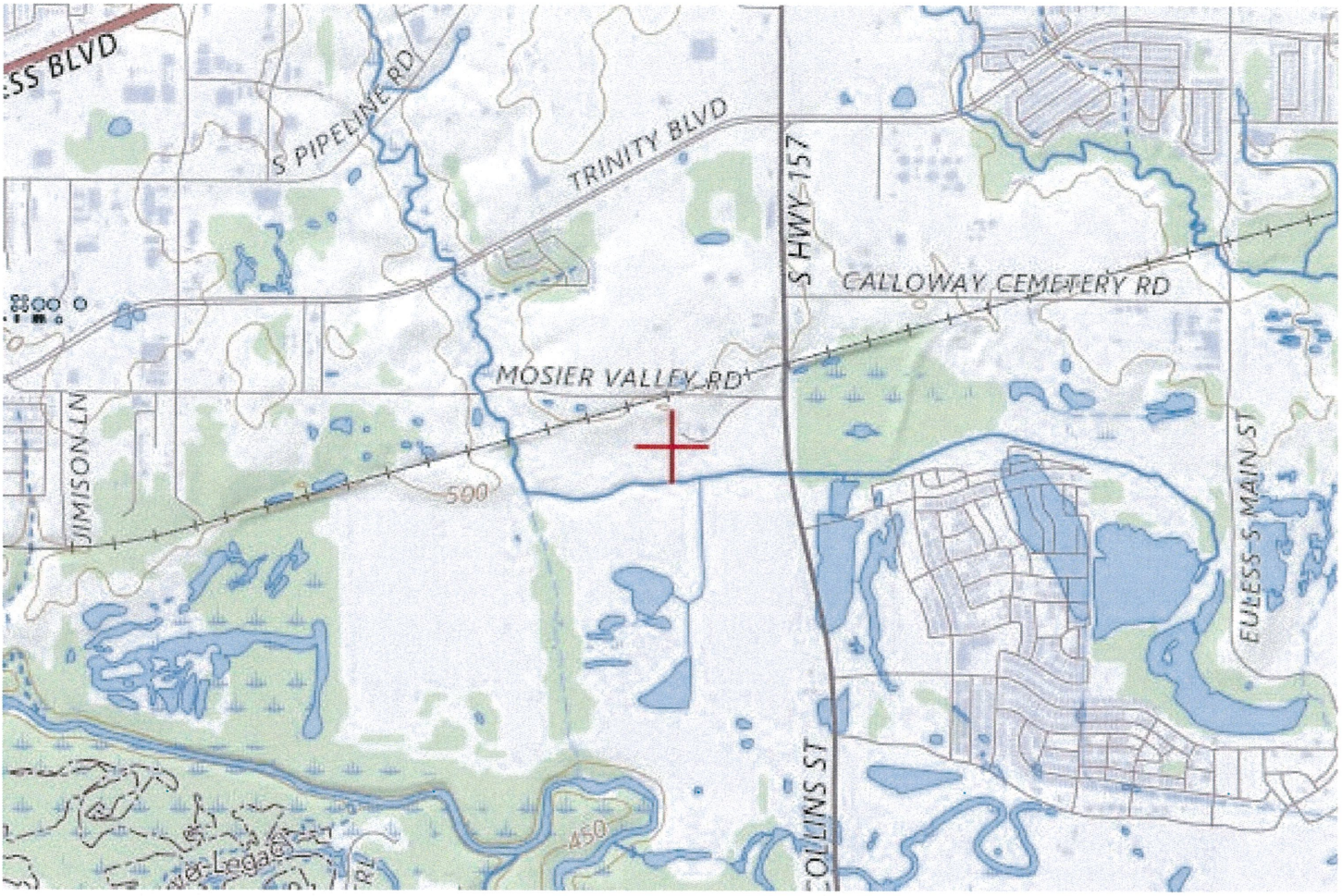
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ASW-21459-OE.

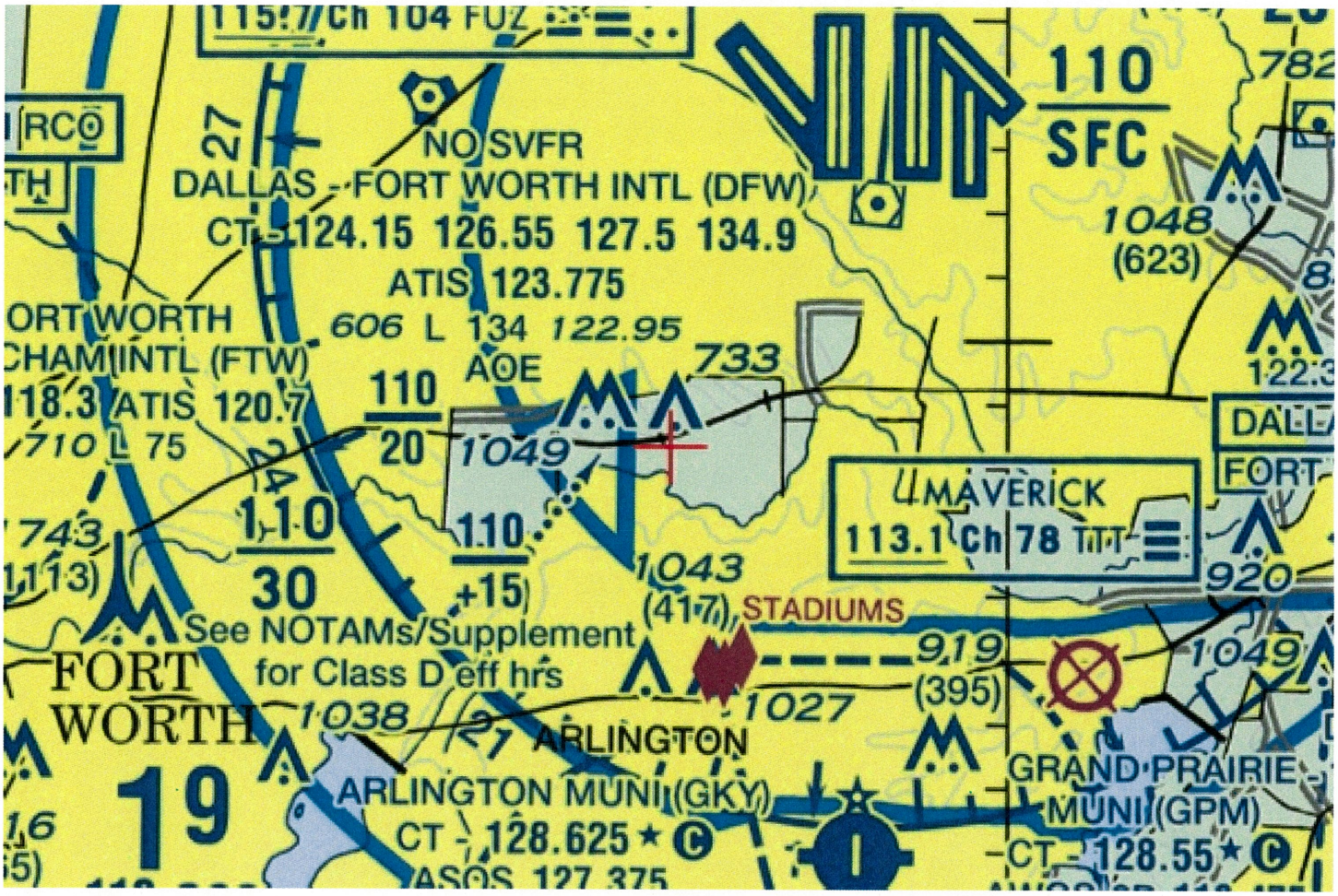
**Signature Control No: 503685075-508202061** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21459-OE**




115.7 Ch 104 FUZ
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NO SVFR
DALLAS - FORT WORTH INTL (DFW)
CT 124.15 126.55 127.5 134.9
ATIS 123.775
606 L 134 122.95
AOE
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SFC
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(623)
ORT WORTH
CHAM INTL (FTW)
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MAVERICK
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MUNI (GPM)
CT 128.55 ★ C
ASOS 127.375

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

Aeronautical Study No.
2021-ASW-21458-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point D NE Crnr |
| Location: | Arlington, TX |
| Latitude: | 32-48-20.30N NAD 83 |
| Longitude: | 97-06-01.50W |
| Heights: | 460 feet site elevation (SE)<br>299 feet above ground level (AGL)<br>759 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 07/18/2023 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.

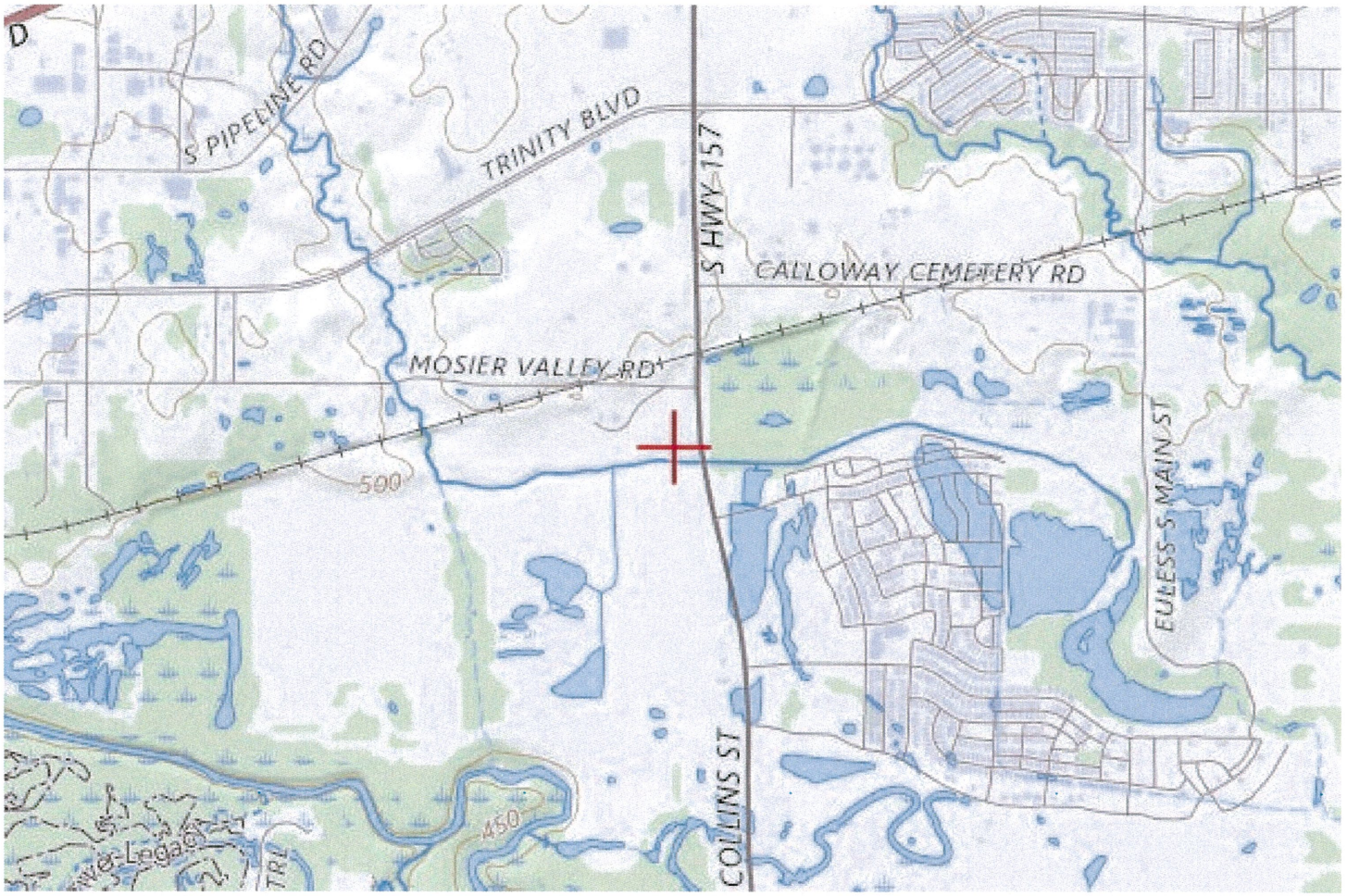
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ASW-21458-OE.

**Signature Control No: 503685074-508202055** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21458-OE**

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ATIS 123.775
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GRAND PRAIRIE
MUNI (GPM)
CT 128.55

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

Aeronautical Study No.
2021-ASW-21457-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

**** 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 City of Arlington Landfill - Point C SE Crnr |
| Location: | Arlington, TX |
| Latitude: | 32-47-51.70N NAD 83 |
| Longitude: | 97-06-01.70W |
| Heights: | 465 feet site elevation (SE)<br>294 feet above ground level (AGL)<br>759 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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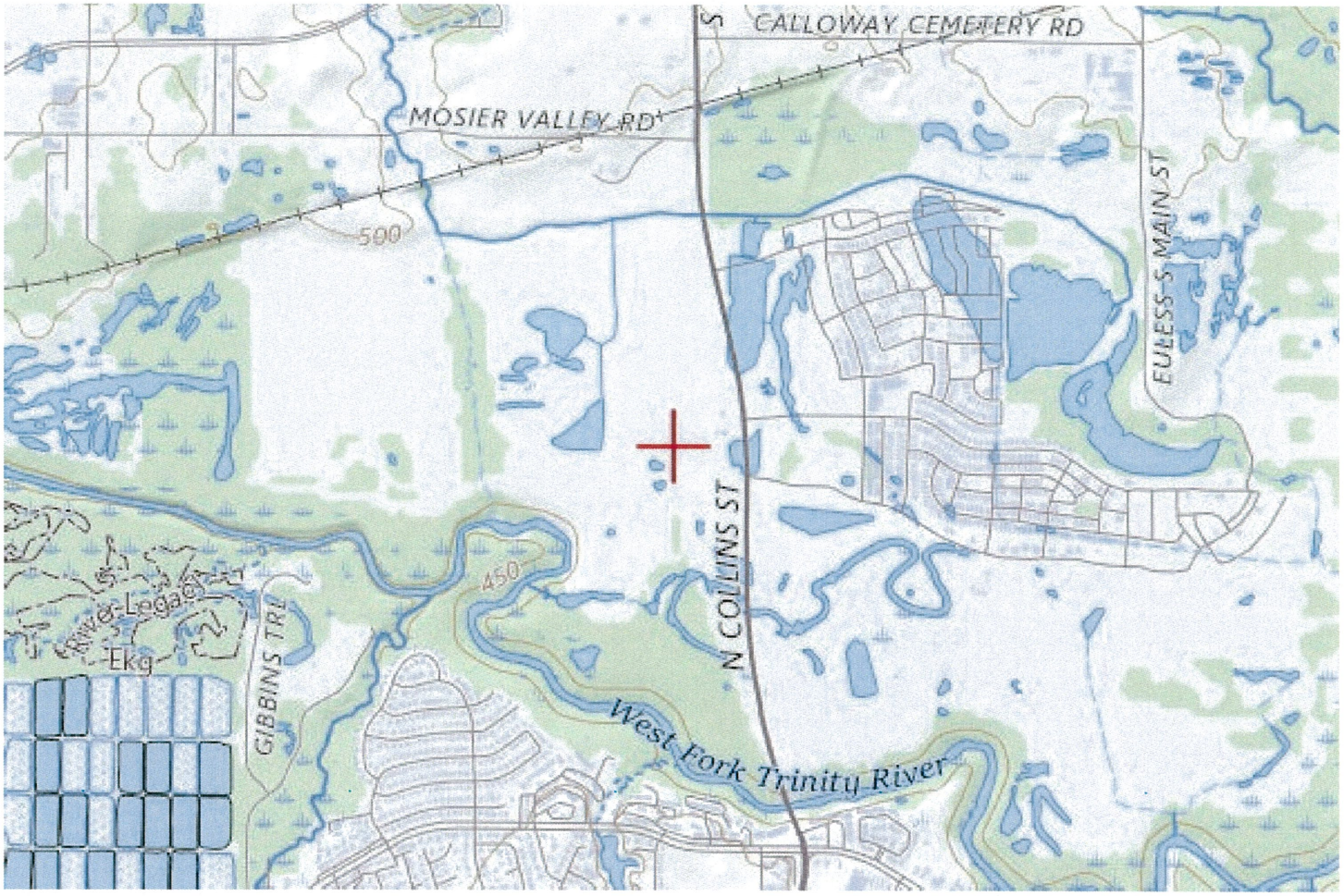
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ASW-21457-OE.

**Signature Control No: 503685073-508202060** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21457-OE**



**Sectional Map for ASN 2021-ASW-21457-OE**



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

Aeronautical Study No.
2021-ASW-21456-OE

Issued Date: 01/18/2022

Adam Hart
Republic Waste Services of Texas, LTD
2811 FM 1568
Campbell, TX 75422

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| Longitude: | 97-06-35.50W |
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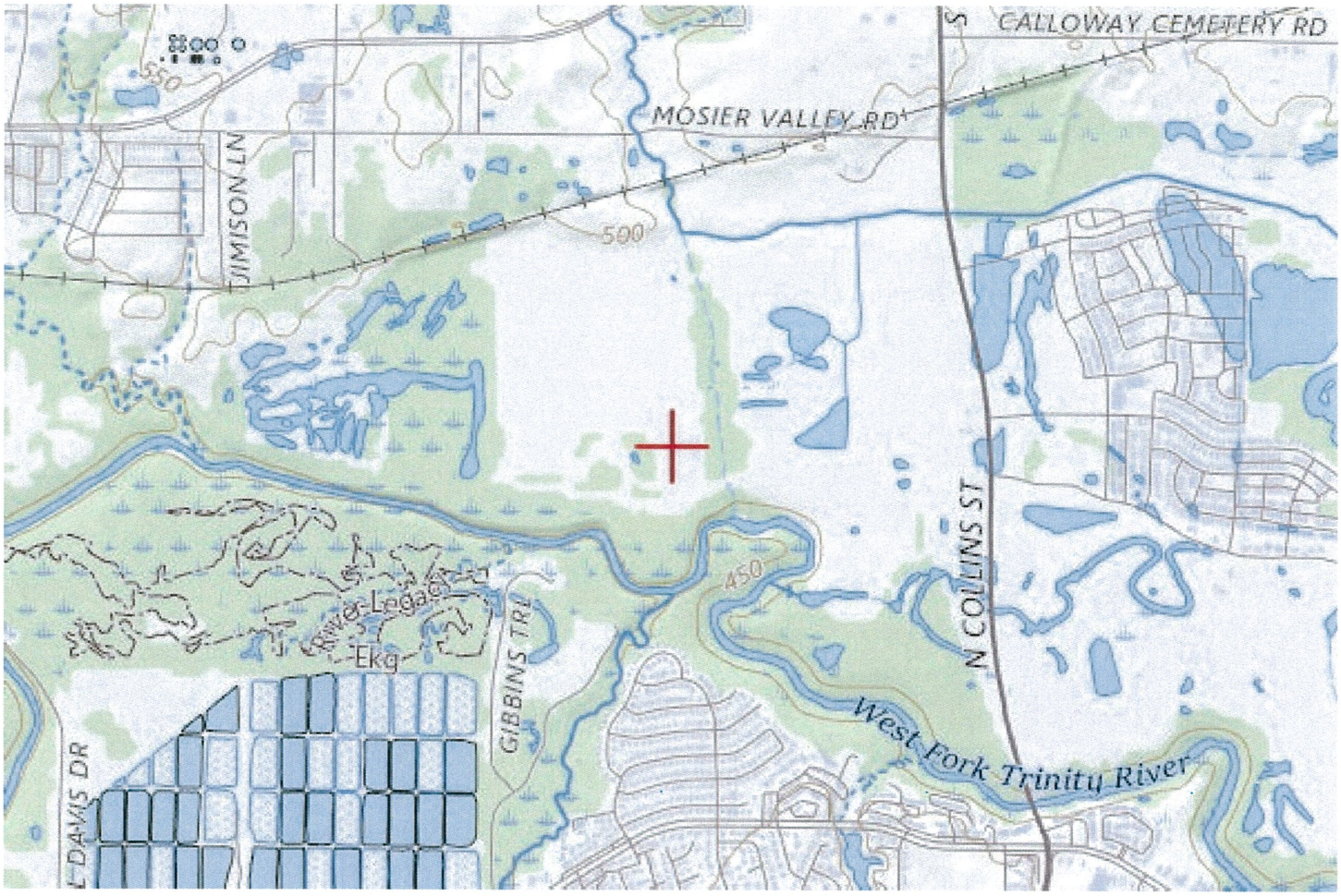
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ASW-21456-OE.

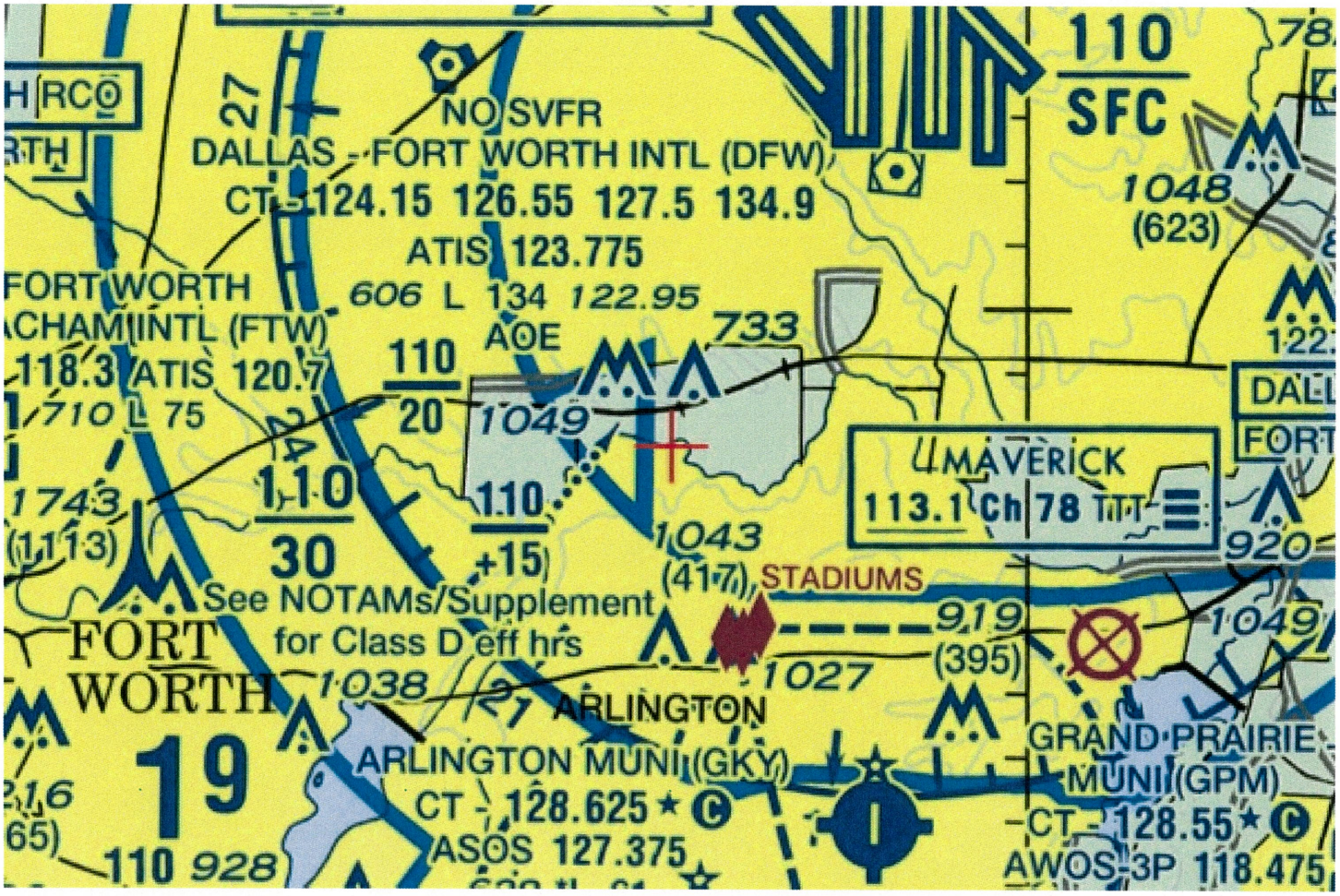
**Signature Control No: 503685072-508202058** ( DNE )
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

**TOPO Map for ASN 2021-ASW-21456-OE**

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CT 128.625
ASOS 127.375
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# DECEMBER 1, 2021, WCG REQUEST FOR REVIEW LETTER REGARDING HAZARDS TO AIR NAVIGATION AND HAZARDS TO AIR TRAFFIC DUE TO BIRDS

REPUBLIC SERVICES

City of Arlington Landfill - 800 Mosier Valley Road, Euless, TX 76040
o 817-317-2047 c 903-539-4065 RepublicServices.com

December 1, 2021

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 City of Arlington Landfill Permit Amendment
Tarrant County, Texas
File No. 2011-02TX

Dear Mr. Loftus:

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 an amended municipal solid waste facility permit coordinate with the FAA regarding the potential impact of the referenced project 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 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 runway shall be critically evaluated to determine if an incompatibility exists."*

To assist you in your determination, please find attached the following information.

- FAA Airport Vicinity Map. As shown, no airports (privately-owned or general service) are identified as located within the 10,000 foot radius of the landfill. Also as shown, the landfill facility is not within the six-mile radius of any small general service airport runway or within the five-mile radius of any large general public commercial airport runway. The closest general public commercial runway, the Dallas-Fort Worth International Airport (DFW Airport), is located approximately 5.5 miles northeast of the landfill facility.
- Project Summary and Site Location Maps.
- Proposed Landfill Completion Plan. This plan shows Points A through H, 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 A). However, Points B through H 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.

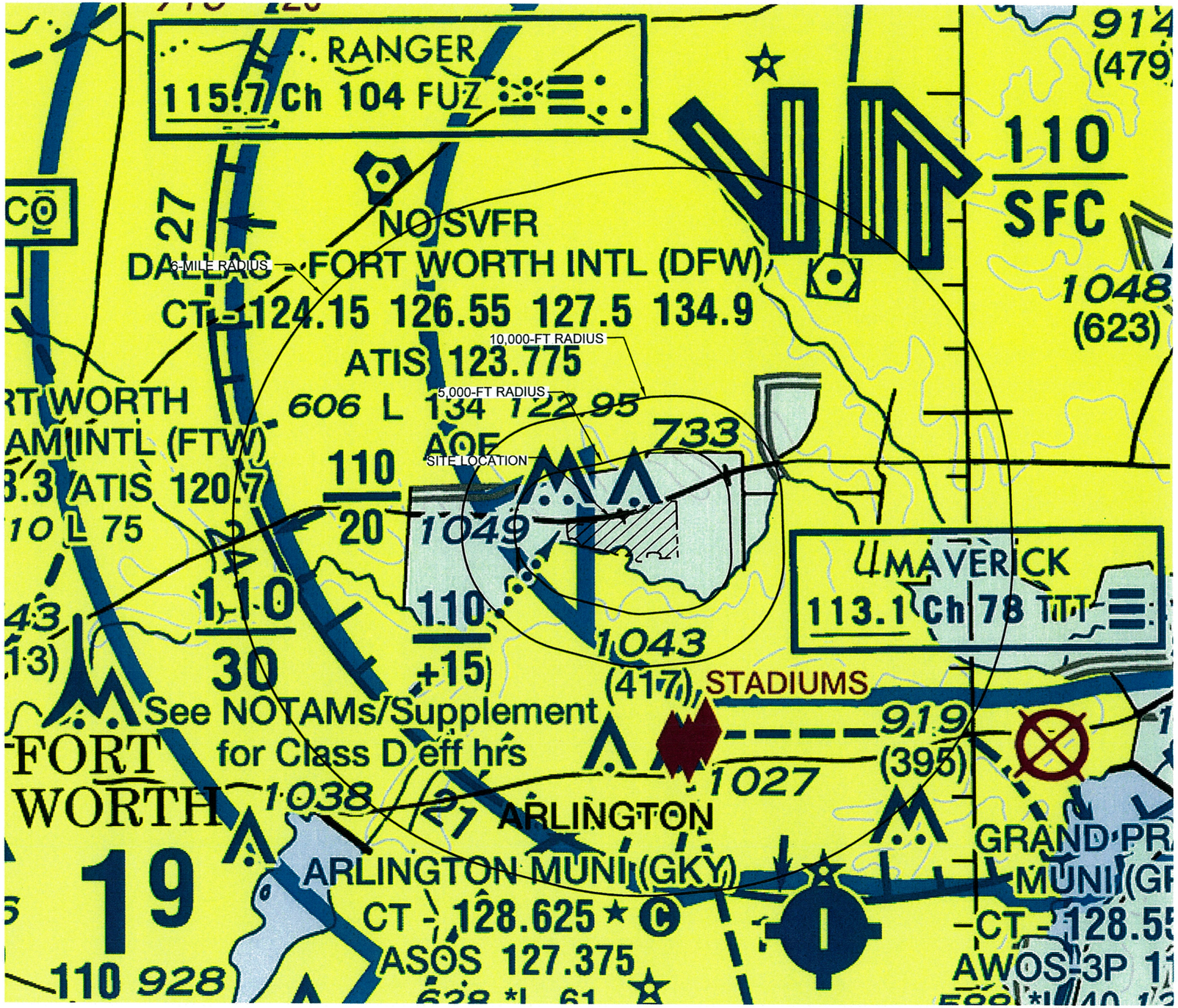
Sincerely,
**Republic Waste Services of Texas, Ltd.**

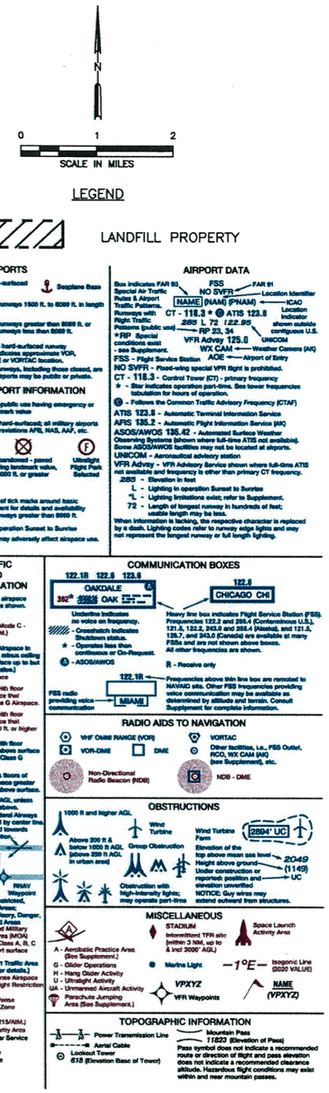
Adam Hart
Environmental Manager – South Area

Attachments: FAA Airport Vicinity Map
Project Summary and Site Location Maps
Landfill Completion Plan
FAA Aeronautical Studies

cc: Ryne J. Spicer, P.E., Weaver Consultants Group, LLC

# FAA AIRPORT VICINITY MAP




NOTES:

1. THIS MAP REPRODUCED FROM THE FAA DALLAS–FORT WORTH SECTIONAL AERONAUTICAL CHARTS DATED AUGUST 2021
2. THERE ARE NO PUBLIC AIRPORTS WITHIN A 10,000 FOOT RADIUS OF THE SITE.

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☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: FIG 1-AREA AIRPORTS.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

MAJOR PERMIT AMENDMENT
AREA AIRPORTS

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\FIG 1-AREA AIRPORTS.dwg, sford, 1:2

# PROJECT SUMMARY AND SITE LOCATION MAPS

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

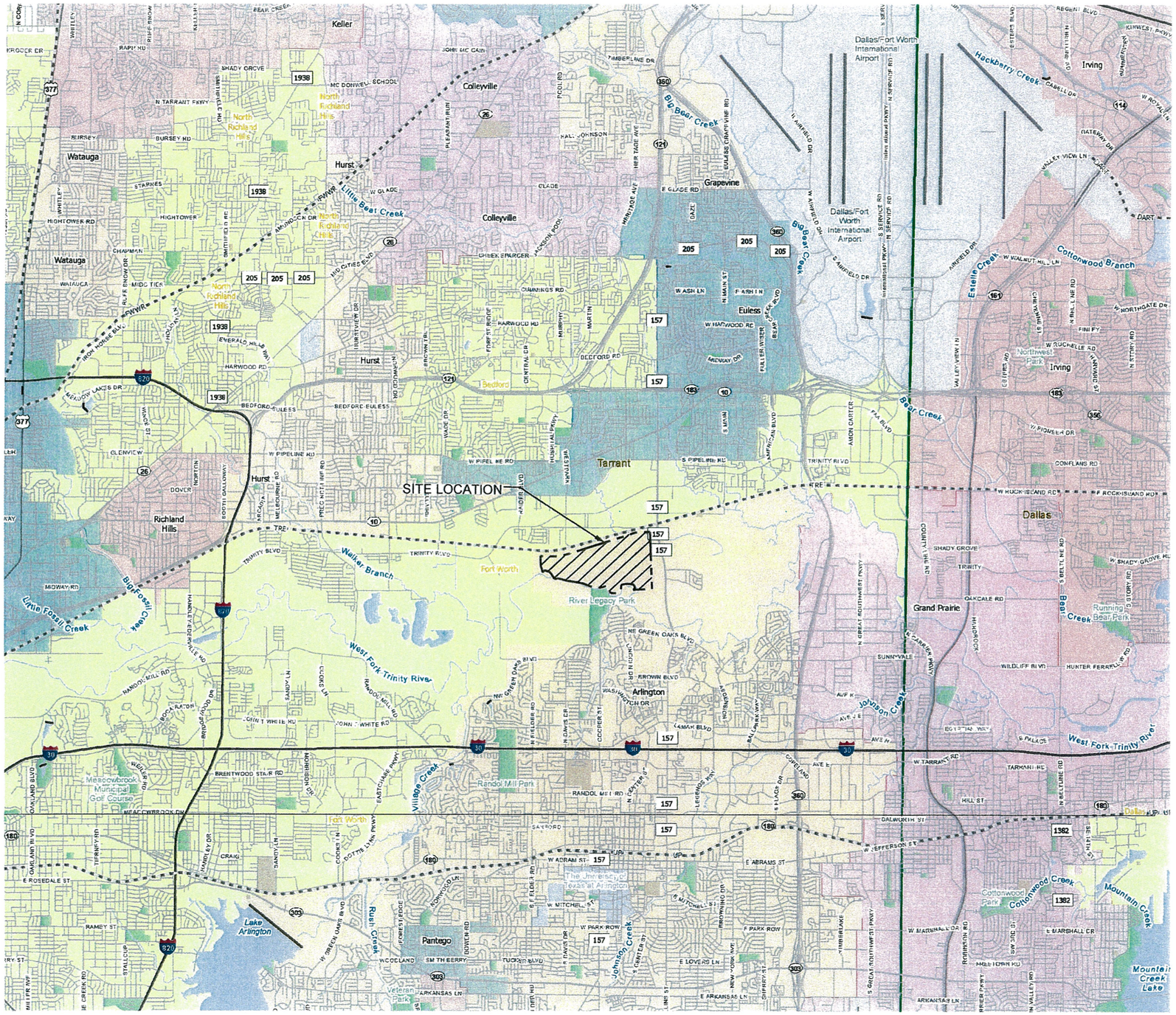
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

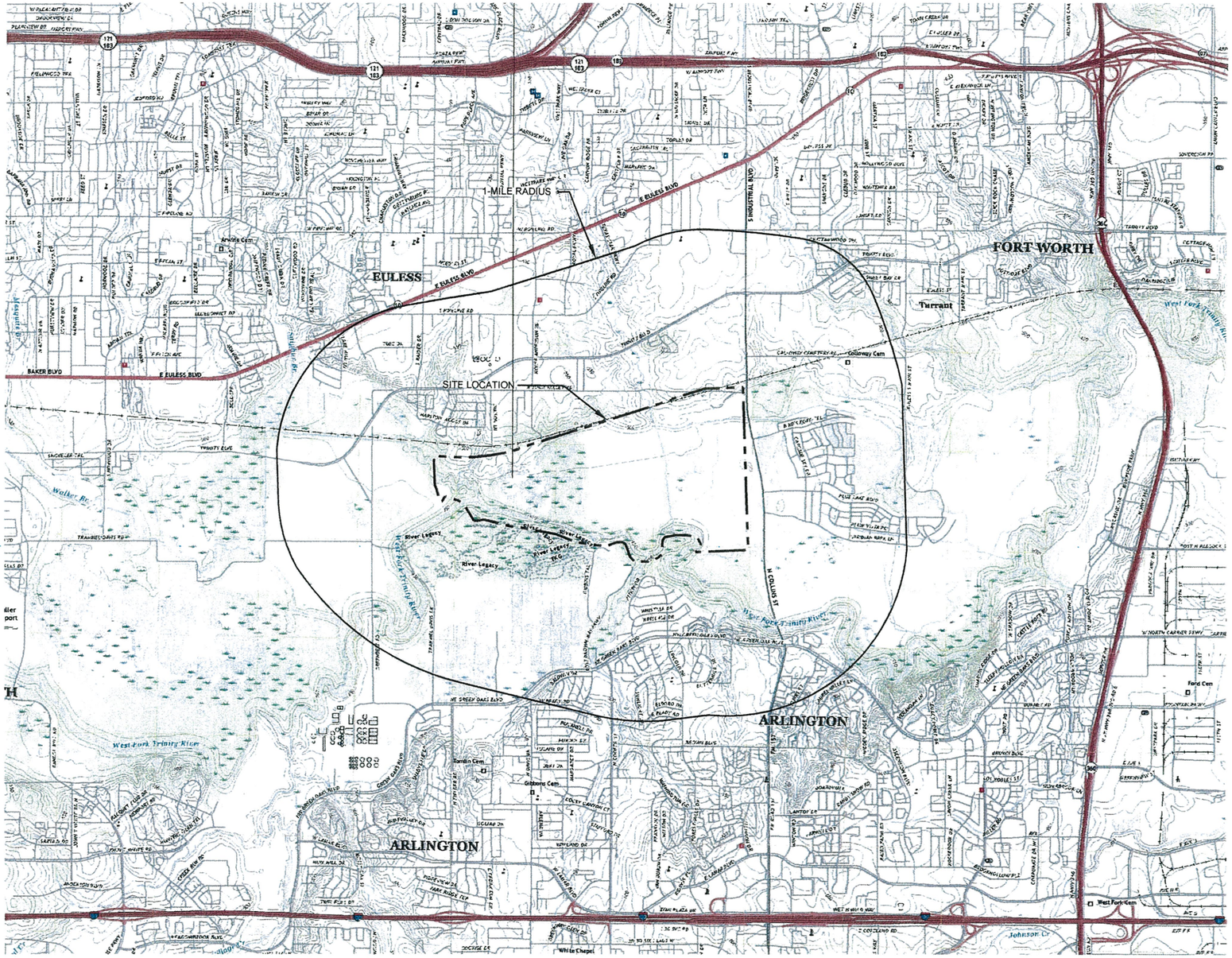
installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.


SITE LOCATION
Keller
Colleyville
Hurst
Watauga
Grapevine
Dallas/Fort Worth International Airport
Irving
Euless
Bedford
Richland Hills
Fort Worth
Arlington
Dallas
Grand Prairie
Pantego
Tarrant
Big Bear Creek
Little Bear Creek
Hackberry Creek
Estelle Creek
Cottonwood Branch
Bear Creek
Walker Branch
West Fork Trinity River
Little Fossil Creek
Big Fossil Creek
Village Creek
Johnson Creek
Mountain Creek
Lake Arlington
Mountain Creek Lake
River Legacy Park
Randol Mill Park
Cottonwood Park
Running Bear Park
Meadowbrook Municipal Golf Course
Veterans Park
Northwest Park
The University of Texas at Arlington
Trinity Blvd
N Tarrant Pkwy
Bursey Rd
Glade Rd
Harwood Rd
Pipeline Rd
Brown Blvd
Green Oaks Blvd
Randol Mill Rd
Brentwood Stair Rd
Meadowbrook Dr
Division St
Abram St
Pioneer Dr
Rockisland Rd
Shady Grove Rd
Oakdale Rd
Wildcliff Blvd
Hunter Ferrell Rd
Sunnyvale
Tarrant Rd
Hill St
Dalworth St
Jefferson St
Marshall Dr
Lovers Ln
Arkansas Ln
Park Row
Mitchell St
Ramey St
Roseadale St
Craig
Sandy Ln
Oakland Blvd
Tierney Rd
Meadowbrook Dr
Collins St
Cooper St
Center St
Davis Dr
Fielder Rd
Bowen Rd
Cravens Rd
Calloway Cemetery Rd
Pleasant Run
Precinct Line Rd
Melbourne Rd
Industrial Blvd
Main St
Ash Ln
Cummings Rd
Bedford Rd
Central Dr
Murphy
Martin
Harwood Rd
Forest Ridge
Brown Trl
Hurstview Dr
Hospital Pkwy
Westpark
Wade Dr
Industrial Blvd
Mid Cities Blvd
Smithfield Rd
Rufe Snow Dr
Midcities
Watauga
Chapman
Hightower
Hightower Rd
Starnes
Whitley
Rapid Rd
Kroger Dr
Shady Grove
Mc Donwell School
John Mc Cain
Timberline Dr
Heritage Ave
Daze
Eules Grapevine Rd
Airfield Dr
S Airfield Dr
W Airfield Dr
S Service Rd
N Service Rd
International Pkwy
Esters Blvd
Regent Blvd
Kinwest Pkwy
Cabell Dr
Gateway Dr
Valley View Ln
Dart
Walnut Hill Ln
Northgate Dr
Finley
W Rochelle Rd
N Belt Line Rd
E Belt Line Rd
Story Rd
Shady Grove Rd
Trinity
Belt Line Rd
Carrier Pkwy
Great Southwest Pkwy
Lamar Blvd
Ave E
Ave F
Ave J
Ave K
Eastchase Pkwy
Center St
Collins St
Cooper




0 2000 4000
SCALE IN FEET

LEGEND

ROAD CLASSIFICATION

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

PERMITTED PERMIT BOUNDARY

EULESS, TX
2019

HURST, TX
2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

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☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |
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# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 2

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\2 - GENERAL TOPO.dwg, rarrington, 1:2




N

0 1000 2000

SCALE IN FEET

LEGEND

PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |

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# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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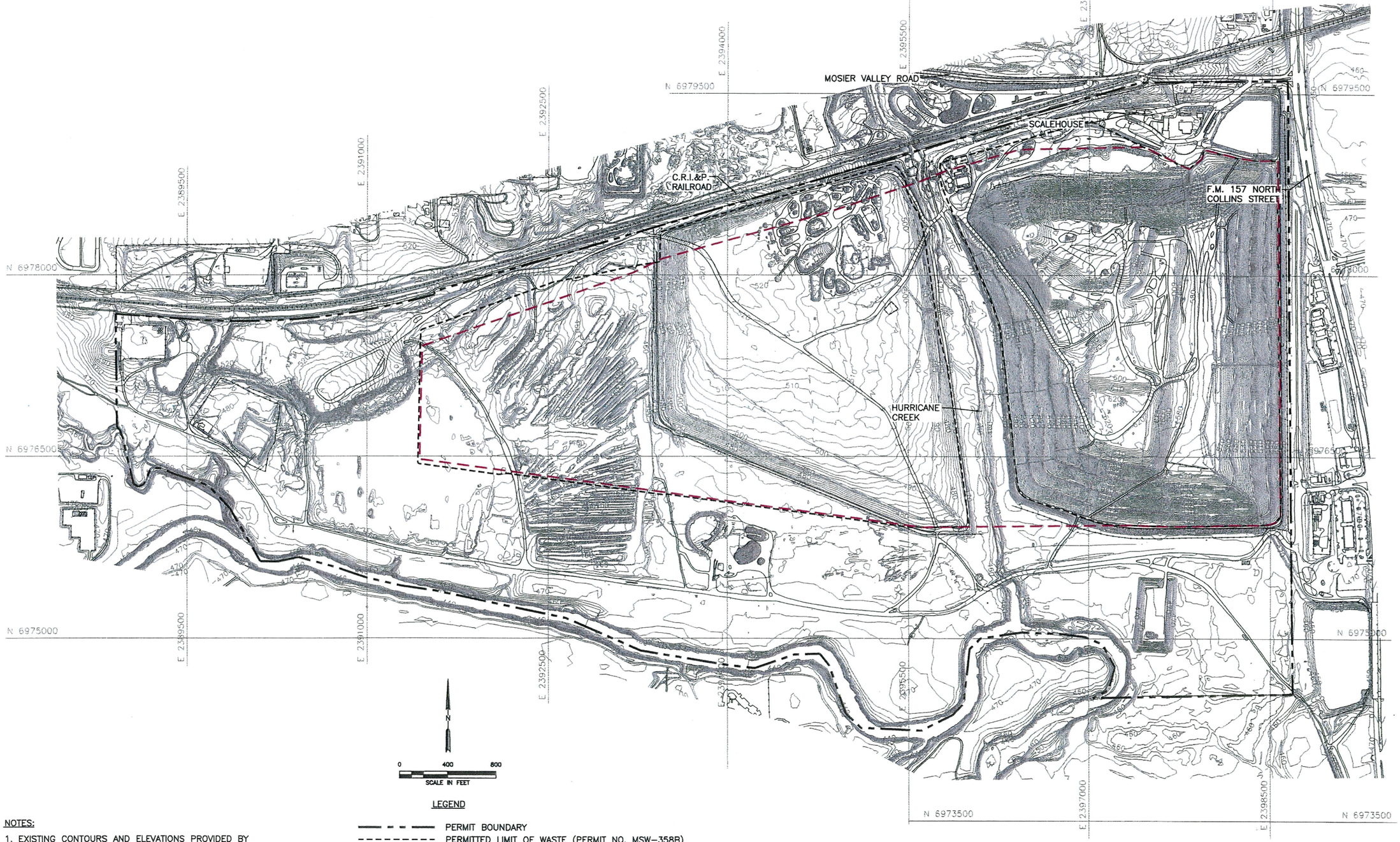
FIGURE 3

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\3-AERIAL PHOTOGRAPH.dwg, Farrington, 1:2




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM



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0:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\4-SITE PLAN.dwg, rarrington, 1:2

☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

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AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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| NO. | DATE | DESCRIPTION |
|---|---|---|
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| | | |

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# SITE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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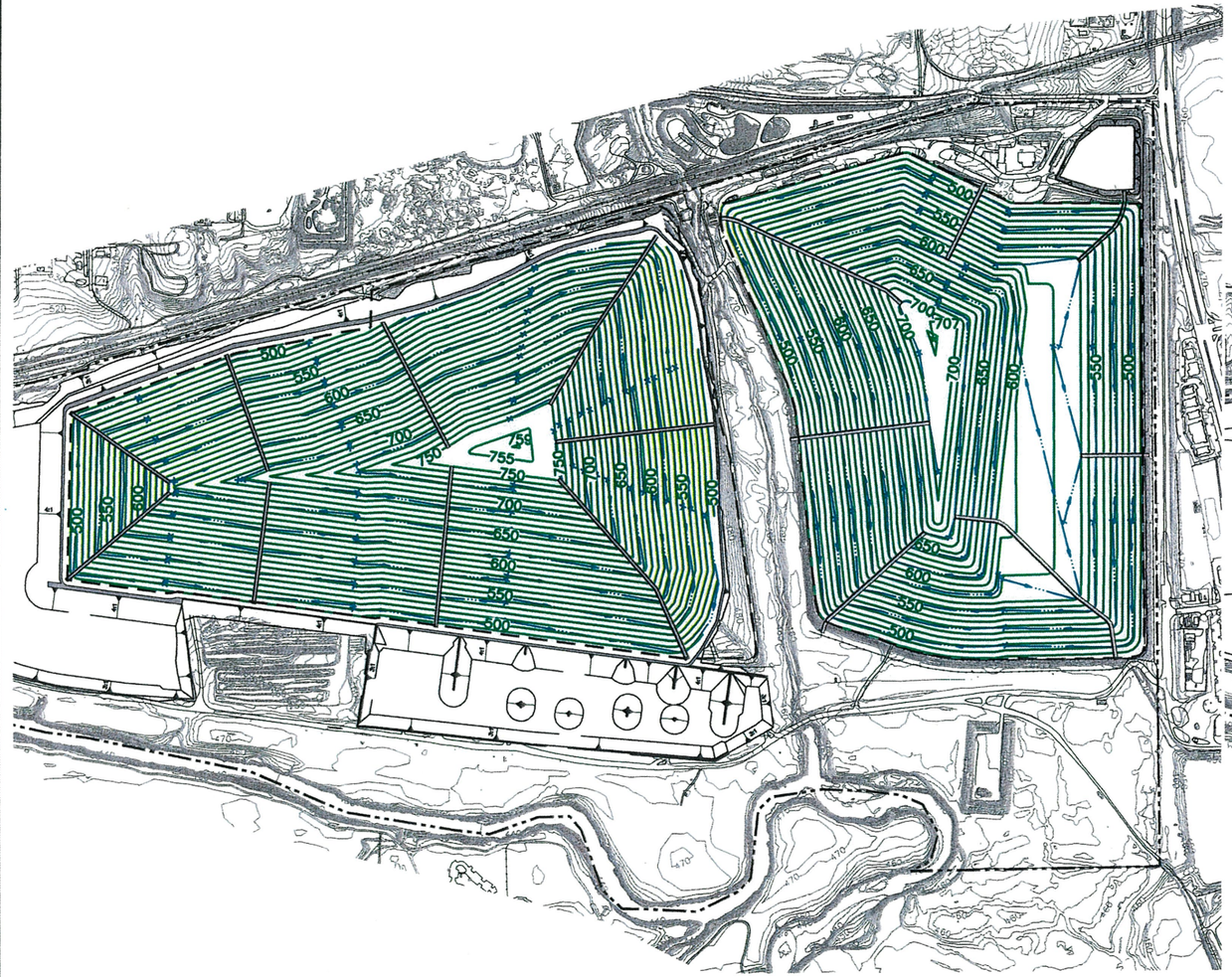
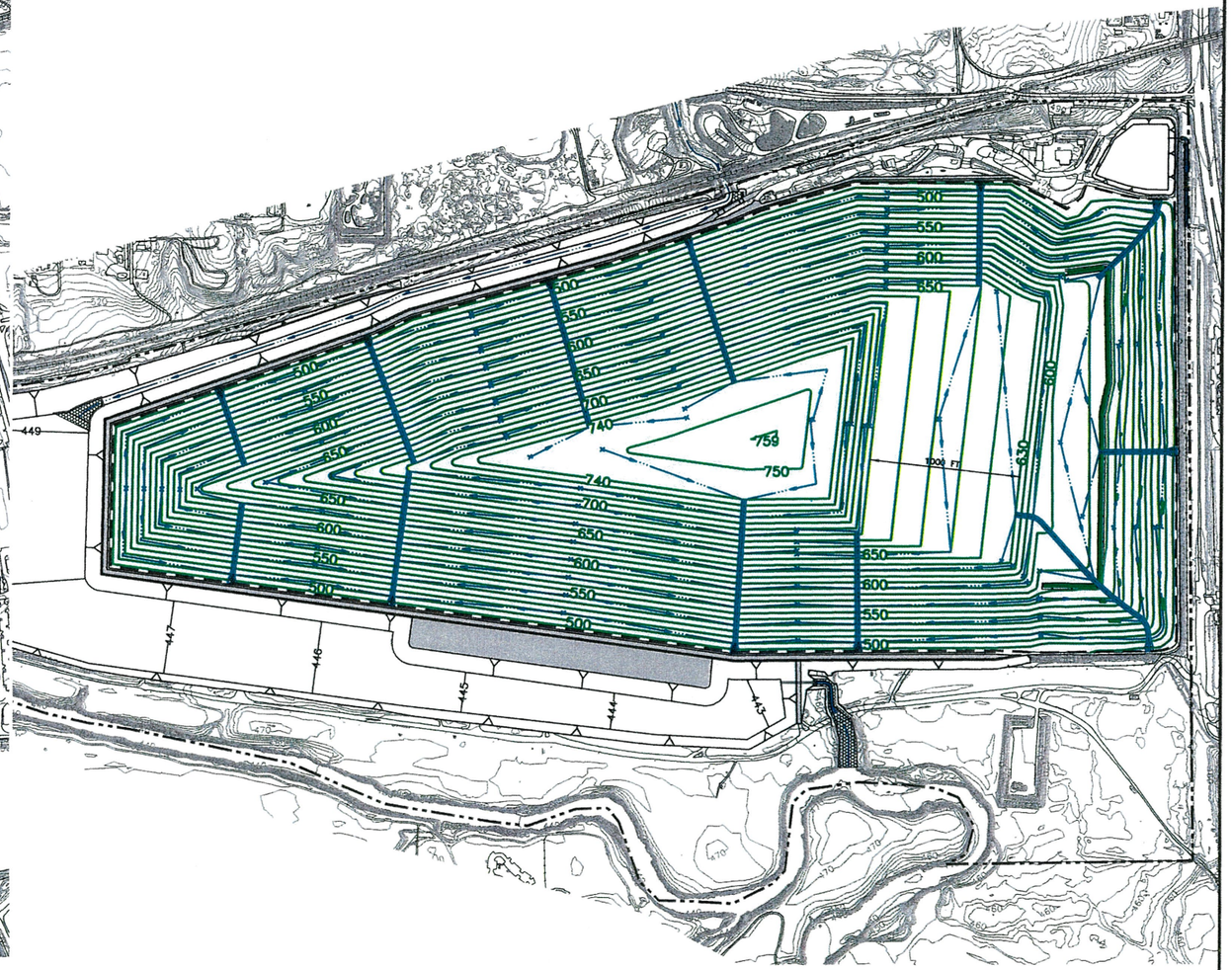
FIGURE 4




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN

N

0 500 1000
SCALE IN FEET

**GENERAL INFORMATION**

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW-358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW-358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT-MSL) | 740 (FT-MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT-MSL) | 759 (FT-MSL) |
| BUFFER AREA | 391.6 ACRES | 383.8 ACRES |



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☐ ISSUED FOR CONSTRUCTION

DATE: 08/2021
FILE: 0023-404-11
CAD: 5-FINAL COVER COMPARISON.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

PREPARED FOR
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AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
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# EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

FIGURE 5

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\5-FINAL COVER COMPARISON.dwg, rarrington, 1:2

# LANDFILL COMPLETION PLAN

POINT E–NORTH CORNER
N 32°48'21.6"
W 97°06'13.9"
EXISTING GRADE: 464.21 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT F–NORTH CORNER
N 32°48'21.6"
W 97°06'25.9"
EXISTING GRADE: 476.00 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT D–NORTHEAST CORNER
N 32°48'20.3"
W 97°06'1.5"
EXISTING GRADE: 482.81 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT G–NORTHWEST CORNER
N 32°48'06.2"
W 97°07'23.7"
EXISTING GRADE: 477.39 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT A–TOP DECK
N 32°48'5.4"
W 97°06'32.7"
EXISTING GRADE: 464.59 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT H–SOUTHWEST CORNER
N 32°47'57.7"
W 97°07'23.9"
EXISTING GRADE: 458.00 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT B–SOUTH CORNER
N 32°47'51.4"
W 97°06'35.5"
EXISTING GRADE: 478.10 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

POINT C–SOUTHEAST CORNER
N 32°47'51.7"
W 97°06'1.7"
EXISTING GRADE: 482.90 FT–MSL
MAX ELEV. OF LANDFILL: 759 FT–MSL
MAX ELEV. OF EQUIPMENT: 804 FT–MSL

SCALEHOUSE

1000 FT

N 6979500
N 6978000
N 6976500
N 6975000
N 6973500
E 2389500
E 2391000
E 2392500
E 2395000
E 2397000
E 2398500

N
0 400 800
SCALE IN FEET

LEGEND
- PERMIT BOUNDARY
- CONSTRUCTED LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN
- PERIMETER ACCESS ROAD

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO. FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

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DATE: 11/2021
FILE: 0023–404–96
CAD: FIG–1–COMPLETION PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: CAM

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|---|---|---|
| NO. | DATE | DESCRIPTION |
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# MAJOR PERMIT AMENDMENT COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE 1

O:\0023\404\EXPANSION 2021\PARTS I–II\PROJECT SUMMARY\COORDINATION LETTER\FIG 1–COMPLETION PLAN.dwg, jwilson, 1:2

# FAA AERONAUTICAL STUDIES

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point A Top Dec

Show Project Summary

### Case Status

| | | | |
|---|---|---|---|
| **ASN:** | 2021-ASW-21455-OE | **Date Accepted:** | 12/06/2021 |
| **Status:** | Work In Progress | **Date Determined:** | |
| | | **Letters:** | 12/06/2021 ADD |
| **Public Comments:** | None | **Documents:** | 12/07/2021 20211207094243214... |
| | | | Project Documents: None |

### Construction / Alteration Information

| | |
|---|---|
| **Notice Of:** | Alteration |
| **Duration:** | Permanent |
| ***if Temporary :*** | Months: Days: |
| **Work Schedule - Start:** | |
| **Work Schedule - End:** | |

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

| | |
|---|---|
| **Structure Type:** | LANDFILL \| Existing Municipal Solid Waste Landfill |
| **Structure Name:** | City of Arlington Landfill - Point A Top Dec |
| **FDC NOTAM:** | |
| **NOTAM Number:** | |
| **FCC Number:** | |
| **Prior ASN:** | |

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 48' 5.40" N |
| **Longitude:** | 97° 6' 32.70" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 460 (nearest foot) PASSED |
| **Structure Height (AGL):** | 299 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 5 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point B South Cr

Show Project Summary

### Case Status

**ASN:** 2021-ASW-21456-OE
**Status:** Work In Progress
**Public Comments:** None

**Date Accepted:** 12/06/2021
**Date Determined:**
**Letters:** 12/06/2021 ADD
**Documents:** 12/07/2021 20211207094243214...

Project Documents:
None

### Construction / Alteration Information

**Notice Of:** Alteration
**Duration:** Permanent
***if Temporary :*** Months: Days:
**Work Schedule - Start:**
**Work Schedule - End:**

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

**Structure Type:** LANDFILL | Existing Municipal Solid Waste Landfill
**Structure Name:** City of Arlington Landfill - Point B South Cr
**FDC NOTAM:**
**NOTAM Number:**
**FCC Number:**
**Prior ASN:**

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 47' 51.40" N |
| **Longitude:** | 97° 6' 35.50" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 465 (nearest foot) PASSED |
| **Structure Height (AGL):** | 294 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 13 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point C SE Crnr

Show Project Summary

### Case Status

**ASN:** 2021-ASW-21457-OE

**Status:** Work In Progress

**Public Comments:** None

**Date Accepted:** 12/06/2021

**Date Determined:**

**Letters:** 12/06/2021 ADD

**Documents:** 12/07/2021 20211207094243214...

Project Documents:
None

### Construction / Alteration Information

**Notice Of:** Alteration

**Duration:** Permanent

***if Temporary :*** Months: Days:

**Work Schedule - Start:**

**Work Schedule - End:**

***For temporary cranes-Does the permanent structure require separate notice to the FAA?***
***To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed.***
***If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

**Structure Type:** LANDFILL | Existing Municipal Solid Waste Landfill

**Structure Name:** City of Arlington Landfill - Point C SE Crnr

**FDC NOTAM:**

**NOTAM Number:**

**FCC Number:**

**Prior ASN:**

### Structure Details

**Latitude:** 32° 47' 51.70" N

**Longitude:** 97° 6' 1.70" W

**Horizontal Datum:** NAD83

**Site Elevation (SE):** 465 (nearest foot) PASSED

**Structure Height (AGL):** 294 (nearest foot)

**Current Height (AGL):** 18 (nearest foot)
**** For notice of alteration or existing provide the current AGL height of the existing structure.***
***Include details in the Description of Proposal***

**Minimum Operating Height (AGL):** (nearest foot)
**** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.***

**Requested Marking/Lighting:** None

***Other :***

**Recommended Marking/Lighting:**

**Current Marking/Lighting:** None

***Other :***

**Nearest City:** Arlington

**Nearest State:** Texas

**Description of Location:** The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas.
***On the Project Summary page upload any certified survey.***

**Description of Proposal:** Increase of permitted landfill waste disposal area.

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point D NE Crnr

Show Project Summary

### Case Status

**ASN:** 2021-ASW-21458-OE
**Status:** Work In Progress
**Public Comments:** None

**Date Accepted:** 12/06/2021
**Date Determined:**
**Letters:** 12/06/2021 ADD
**Documents:** 12/07/2021 20211207094243214...

Project Documents:
None

### Construction / Alteration Information

**Notice Of:** Alteration
**Duration:** Permanent
***if Temporary :*** Months: Days:
**Work Schedule - Start:**
**Work Schedule - End:**

***For temporary cranes-Does the permanent structure require separate notice to the FAA?***
***To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed.***
***If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

**Structure Type:** LANDFILL | Existing Municipal Solid Waste Landfill
**Structure Name:** City of Arlington Landfill - Point D NE Crnr
**FDC NOTAM:**
**NOTAM Number:**
**FCC Number:**
**Prior ASN:**

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 48' 20.30" N |
| **Longitude:** | 97° 6' 1.50" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 460 (nearest foot) PASSED |
| **Structure Height (AGL):** | 299 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 23 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

Federal Aviation Administration

## Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

### Details for Case : City of Arlington Landfill - Point E North Cr

Show Project Summary

**Case Status**

| | | | |
|---|---|---|---|
| **ASN:** | 2021-ASW-21459-OE | **Date Accepted:** | 12/06/2021 |
| **Status:** | Work In Progress | **Date Determined:** | |
| | | **Letters:** | 12/06/2021 ADD |
| **Public Comments:** | None | **Documents:** | 12/07/2021 20211207094243214... |
| | | | Project Documents: None |

**Construction / Alteration Information**

| | |
|---|---|
| **Notice Of:** | Alteration |
| **Duration:** | Permanent |
| ***if Temporary :*** | Months: Days: |
| **Work Schedule - Start:** | |
| **Work Schedule - End:** | |

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

**Structure Summary**

| | |
|---|---|
| **Structure Type:** | LANDFILL \| Existing Municipal Solid Waste Landfill |
| **Structure Name:** | City of Arlington Landfill - Point E North Cr |
| **FDC NOTAM:** | |
| **NOTAM Number:** | |
| **FCC Number:** | |
| **Prior ASN:** | |

**Structure Details**

| | |
|---|---|
| **Latitude:** | 32° 48' 21.60" N |
| **Longitude:** | 97° 6' 13.90" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 460 (nearest foot) PASSED |
| **Structure Height (AGL):** | 299 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 4 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

**Proposed Frequency Bands**

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point F North Cr

Show Project Summary

### Case Status

**ASN:** 2021-ASW-21460-OE
**Status:** Work In Progress
**Public Comments:** None

**Date Accepted:** 12/06/2021
**Date Determined:**
**Letters:** 12/06/2021 ADD
**Documents:** 12/07/2021 20211207094243214...

Project Documents:
None

### Construction / Alteration Information

**Notice Of:** Alteration
**Duration:** Permanent
***if Temporary :*** Months: Days:
**Work Schedule - Start:**
**Work Schedule - End:**

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

**Structure Type:** LANDFILL | Existing Municipal Solid Waste Landfill
**Structure Name:** City of Arlington Landfill - Point F North Cr
**FDC NOTAM:**
**NOTAM Number:**
**FCC Number:**
**Prior ASN:**

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 48' 21.60" N |
| **Longitude:** | 97° 6' 25.90" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 470 (nearest foot) PASSED |
| **Structure Height (AGL):** | 289 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 6 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point G NW Crnr

Show Project Summary

### Case Status

| | | | |
|---|---|---|---|
| **ASN:** | 2021-ASW-21461-OE | **Date Accepted:** | 12/06/2021 |
| **Status:** | Work In Progress | **Date Determined:** | |
| | | **Letters:** | 12/06/2021 ADD |
| **Public Comments:** | None | **Documents:** | 12/07/2021 20211207094243214... |
| | | | Project Documents: None |

### Construction / Alteration Information

| | |
|---|---|
| **Notice Of:** | Alteration |
| **Duration:** | Permanent |
| ***if Temporary :*** | Months: Days: |
| **Work Schedule - Start:** | |
| **Work Schedule - End:** | |

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

| | |
|---|---|
| **Structure Type:** | LANDFILL \| Existing Municipal Solid Waste Landfill |
| **Structure Name:** | City of Arlington Landfill - Point G NW Crnr |
| **FDC NOTAM:** | |
| **NOTAM Number:** | |
| **FCC Number:** | |
| **Prior ASN:** | |

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 48' 6.20" N |
| **Longitude:** | 97° 7' 23.70" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 475 (nearest foot) PASSED |
| **Structure Height (AGL):** | 284 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 2 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next →

# Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

**Project Name:** REPUB-000682539-21 **Sponsor:** Republic Waste Services of Texas, LTD

## Details for Case : City of Arlington Landfill - Point H SW Crnr

Show Project Summary

### Case Status

**ASN:** 2021-ASW-21514-OE
**Status:** Work In Progress
**Public Comments:** None

**Date Accepted:** 12/07/2021
**Date Determined:**
**Letters:** None
**Documents:** 12/07/2021 20211207094243214...

Project Documents:
None

### Construction / Alteration Information

**Notice Of:** Alteration
**Duration:** Permanent
***if Temporary :*** Months: Days:
**Work Schedule - Start:**
**Work Schedule - End:**

***For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.***

**State Filing:**

### Structure Summary

**Structure Type:** LANDFILL | Existing Municipal Solid Waste Landfill
**Structure Name:** City of Arlington Landfill - Point H SW Crnr
**FDC NOTAM:**
**NOTAM Number:**
**FCC Number:**
**Prior ASN:**

### Structure Details

| | |
|---|---|
| **Latitude:** | 32° 47' 57.70" N |
| **Longitude:** | 97° 7' 23.90" W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 450 (nearest foot) PASSED |
| **Structure Height (AGL):** | 309 (nearest foot) |
| **Current Height (AGL):** ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal* | 8 (nearest foot) |
| **Minimum Operating Height (AGL):** ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.* | (nearest foot) |
| **Requested Marking/Lighting:** | None |
| ***Other :*** | |
| **Recommended Marking/Lighting:** | |
| **Current Marking/Lighting:** | None |
| ***Other :*** | |
| **Nearest City:** | Arlington |
| **Nearest State:** | Texas |
| **Description of Location:** *On the Project Summary page upload any certified survey.* | The site is located west of FM 157 (North Collins Street) and south of Mosier Valley Road in the City of Arlington, Tarrant County, Texas. |
| **Description of Proposal:** | Increase of permitted landfill waste disposal area. |

### Proposed Frequency Bands

| Low Freq | High Freq | Freq Unit | ERP | ERP Unit |
|---|---|---|---|---|

← Previous Back to Search Result Next

# COORDINATION WITH
# TEXAS HISTORICAL COMMISSION

- January 13, 2022, THC Review Letter.
- December 1, 2021, Request Letter requesting THC concurrence that no historic properties are affected by the landfill.

# JANUARY 13, 2022, THC REVIEW LETTER

## Spicer, Ryne

**To:** Hart, Adam; Edwards, Jason
**Subject:** RE: Section 106 Submission

**From:** noreply@thc.state.tx.us <noreply@thc.state.tx.us>
**Sent:** Thursday, January 13, 2022 8:17 PM
**To:** Hart, Adam <AHart2@republicservices.com>; reviews@thc.state.tx.us; matthew.udenenwu@tceq.texas.gov
**Subject:** Section 106 Submission

Note that (noreply@thc.state.tx.us) is an external email. Report suspicious emails by clicking on "Report Phishing"

TEXAS HISTORICAL COMMISSION
*real places telling real stories*

**Re:** Project Review under the Antiquities Code of Texas
**THC Tracking #202204438**
**Date:** 01/13/2022
City of Arlington Landfill
west of State Hwy 157 (Collins St)

**Description:** amendment to permit to expand landfill

Dear Client:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), pursuant to review under the Antiquities Code of Texas.

The review staff, led by Arlo McKee, has completed its review and has made the following determinations based on the information submitted for review:

### Archeology Comments

- No effect on identified archeological sites or other cultural resources. However, if cultural materials are encountered during project activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Arlo.McKee@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

**Please do not respond to this email.**

cc: matthew.udenenwu@tceq.texas.gov</p

# DECEMBER 1, 2021, WCG REQUEST FOR REVIEW LETTER

REPUBLIC SERVICES

City of Arlington Landfill - 800 Mosier Valley Road, Euless, TX 76040
o 817-317-2047 c 903-539-4065 RepublicServices.com

December 1, 2021

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 City of Arlington Landfill Permit Amendment
Tarrant 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 an 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 Republic Waste Services of Texas, Ltd. and the City of Arlington to expand the City of Arlington Landfill located in Tarrant County, Texas. The City of Arlington Landfill was expanded in February 2014. As part of the expansion, the landfill permit boundary was increased from 551 acres to 774 acres. In November 2008, AR Consultants, Inc. conducted an archaeological survey of the expanded landfill permit boundary area. This study resulted in the recording of three prehistoric shell lens middens and hearth sites. The Texas Historic Commission accepted the findings of the 2008 investigation and concluded that these areas were outside limits of future site development. The permit amendment application that is being prepared does not increase the landfill permit boundary nor does it propose any excavation within the areas identified in the 2008 AR Consultants study; thus it is our assessment that no adverse effects will occur to any historic areas. The following are provided to assist you in your determination.

- A Project Summary and Site Location Maps.
- A report prepared by AR Consultants, Inc. dated November 2008.

To verify compliance with 30 TAC §330.61(o), we will need to include a letter from the Texas Historical Commission within 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.

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,
**Republic Waste Services of Texas, Ltd.**

Adam Hart
Environmental Manager – South Area

Attachments: Attachment 1 – Project Summary and Location Maps
Attachment 2 – Cultural Resources Investigation Report, November 2008, AR Consultants, Inc.

cc: Ryne J. Spicer, P.E., Weaver Consultants Group, LLC

# ATTACHMENT 1

# PROJECT SUMMARY AND LOCATION MAPS

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

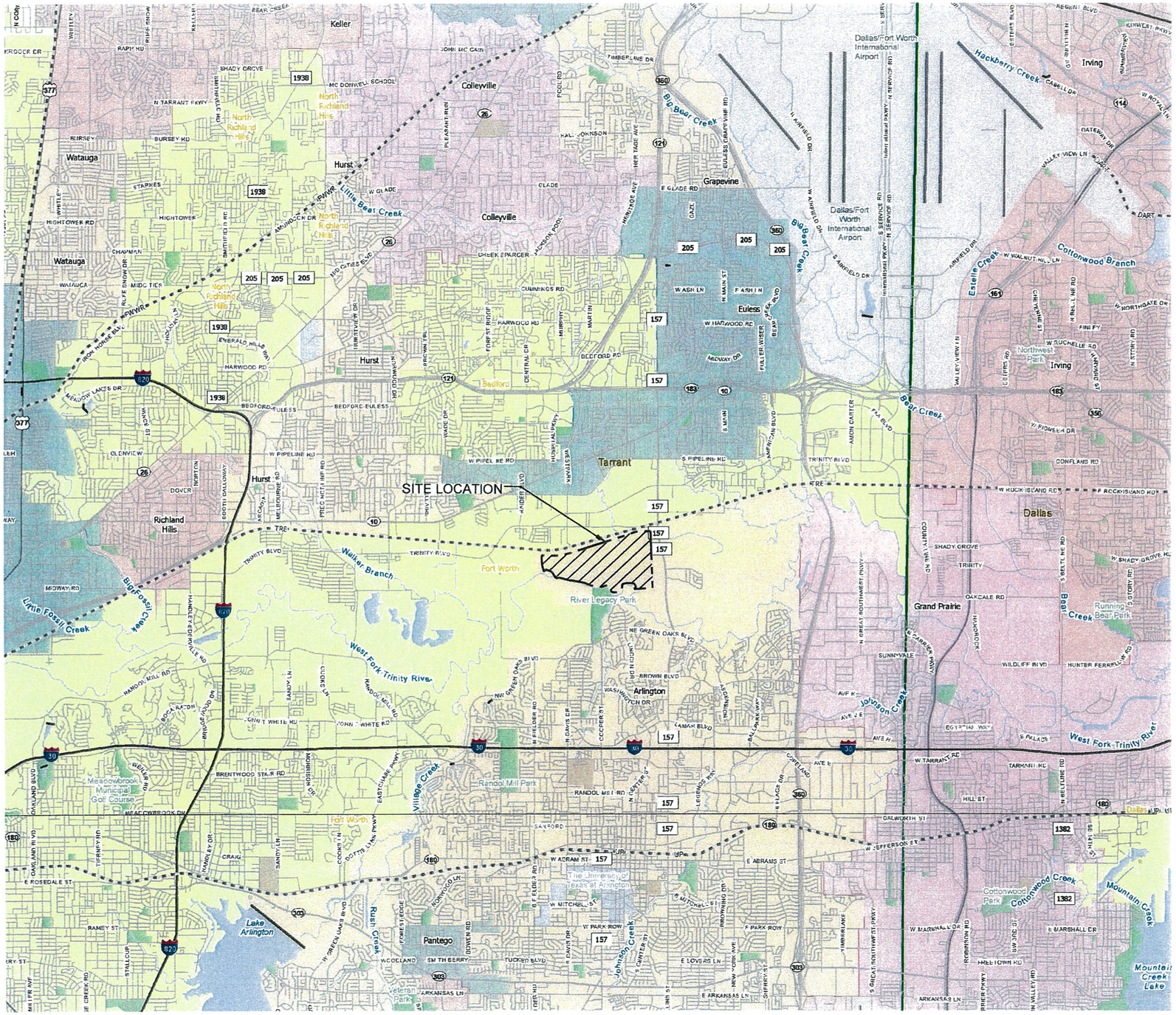
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington 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
SCALE IN MILES

LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\1 - SITE LOCATION.dwg, farrington, 1:2

☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 1-SITE LOC.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

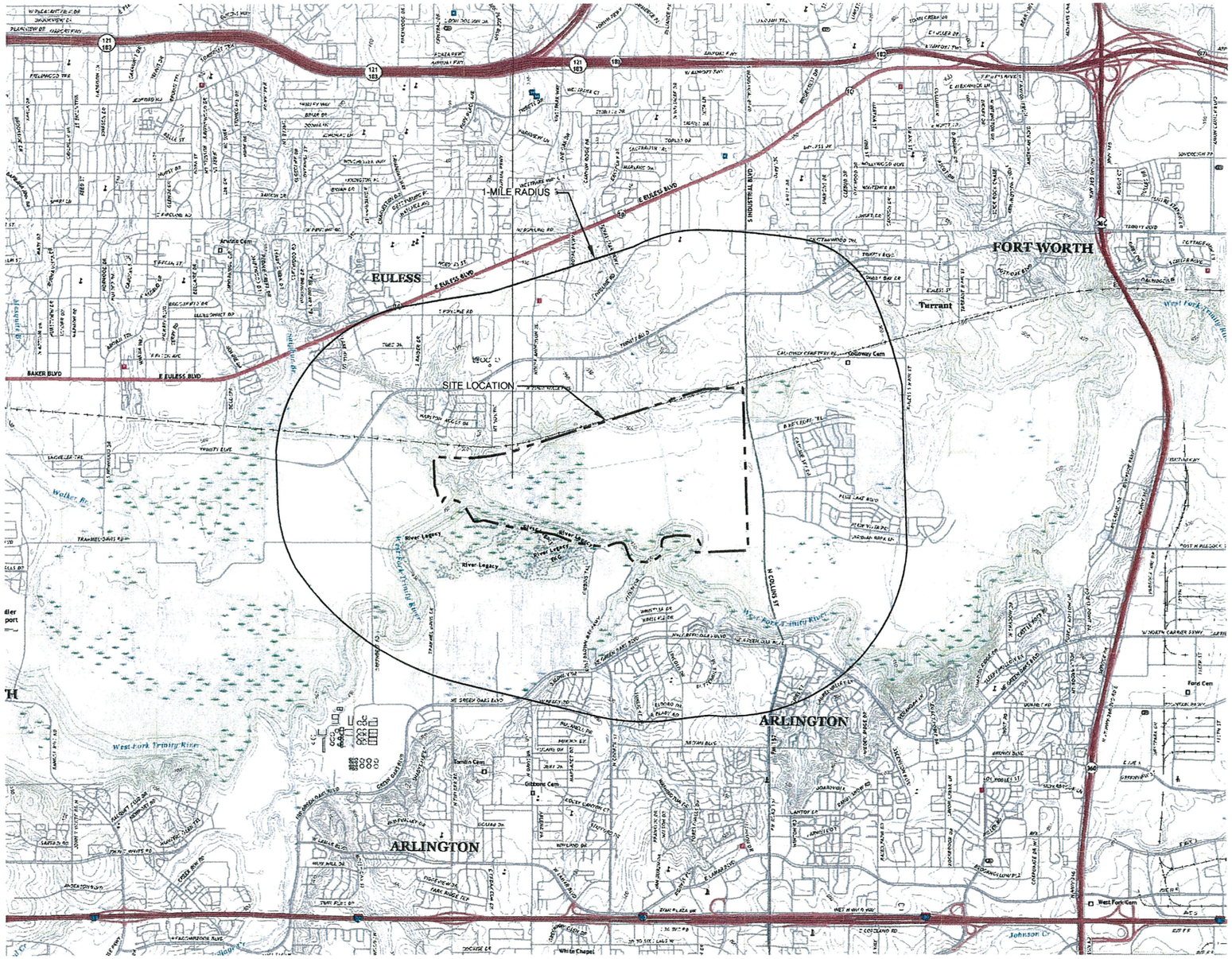
Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1




N

0 2000 4000

SCALE IN FEET

LEGEND

ROAD CLASSIFICATION

Expressway — Local Connector

Secondary Hwy — Local Road

Ramp — 4WD

Interstate Route — US Route — State Route

PERMITTED PERMIT BOUNDARY

EULESS, TX
2019

HURST, TX
2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

0:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\2 - GENERAL TOPO.dwg, rarrington, 1:2

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☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 2




N

0 1000 2000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\3-AERIAL PHOTOGRAPH.dwg, rarrington, 1:2

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☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |

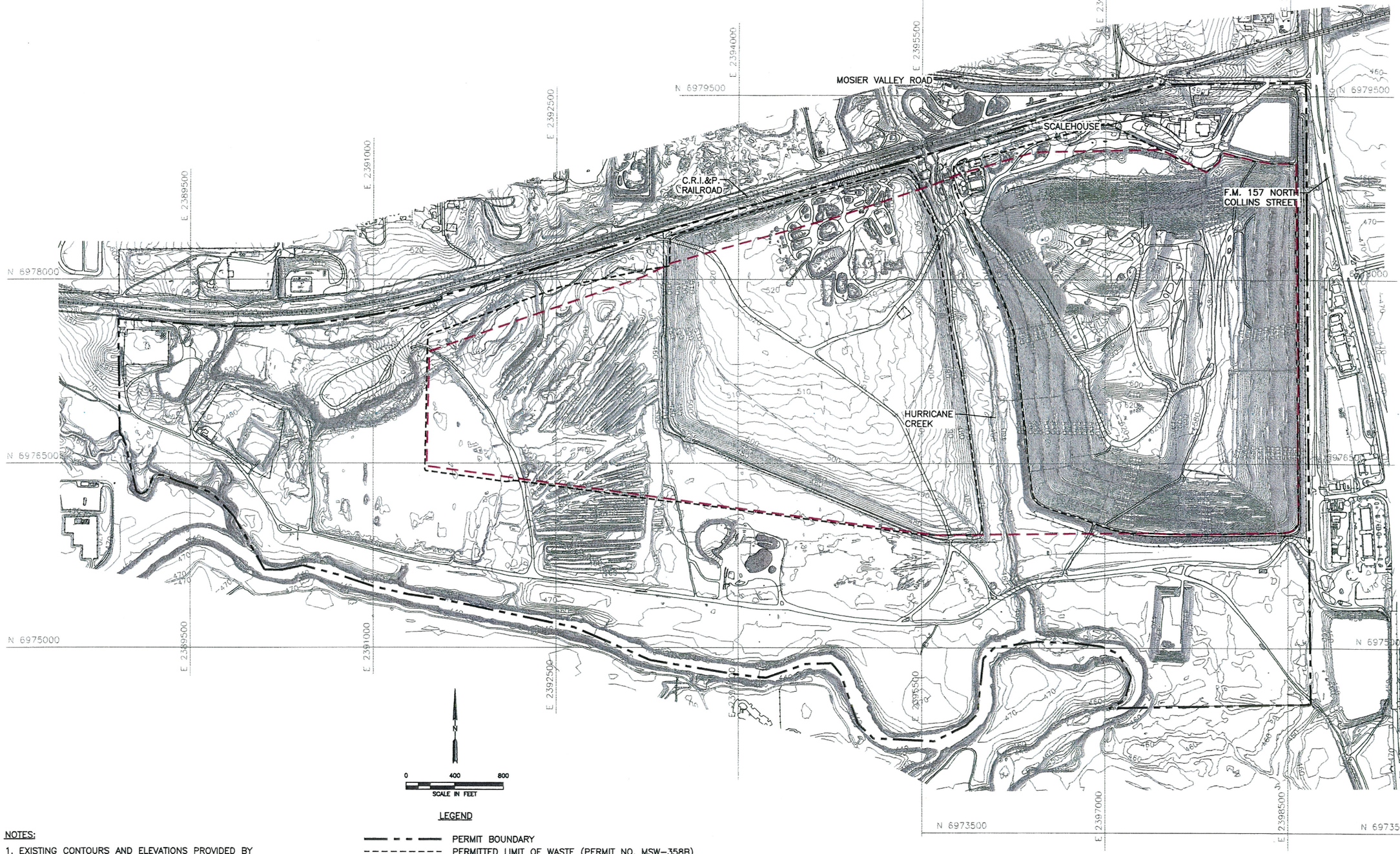
Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 3




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW–358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW–358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM



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0:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\4-SITE PLAN.dwg, rarrington, 1:2

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

DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

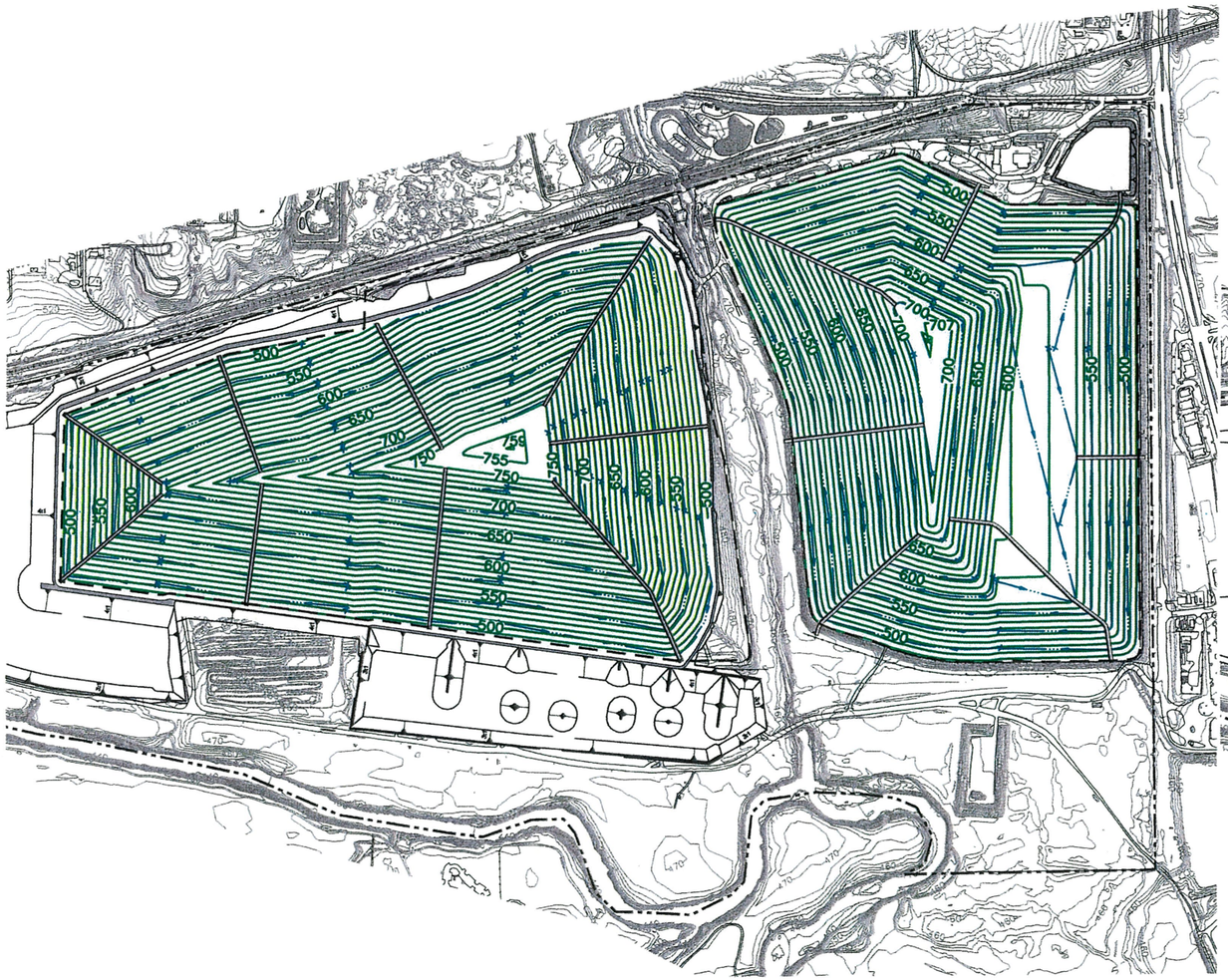
| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

# SITE PLAN

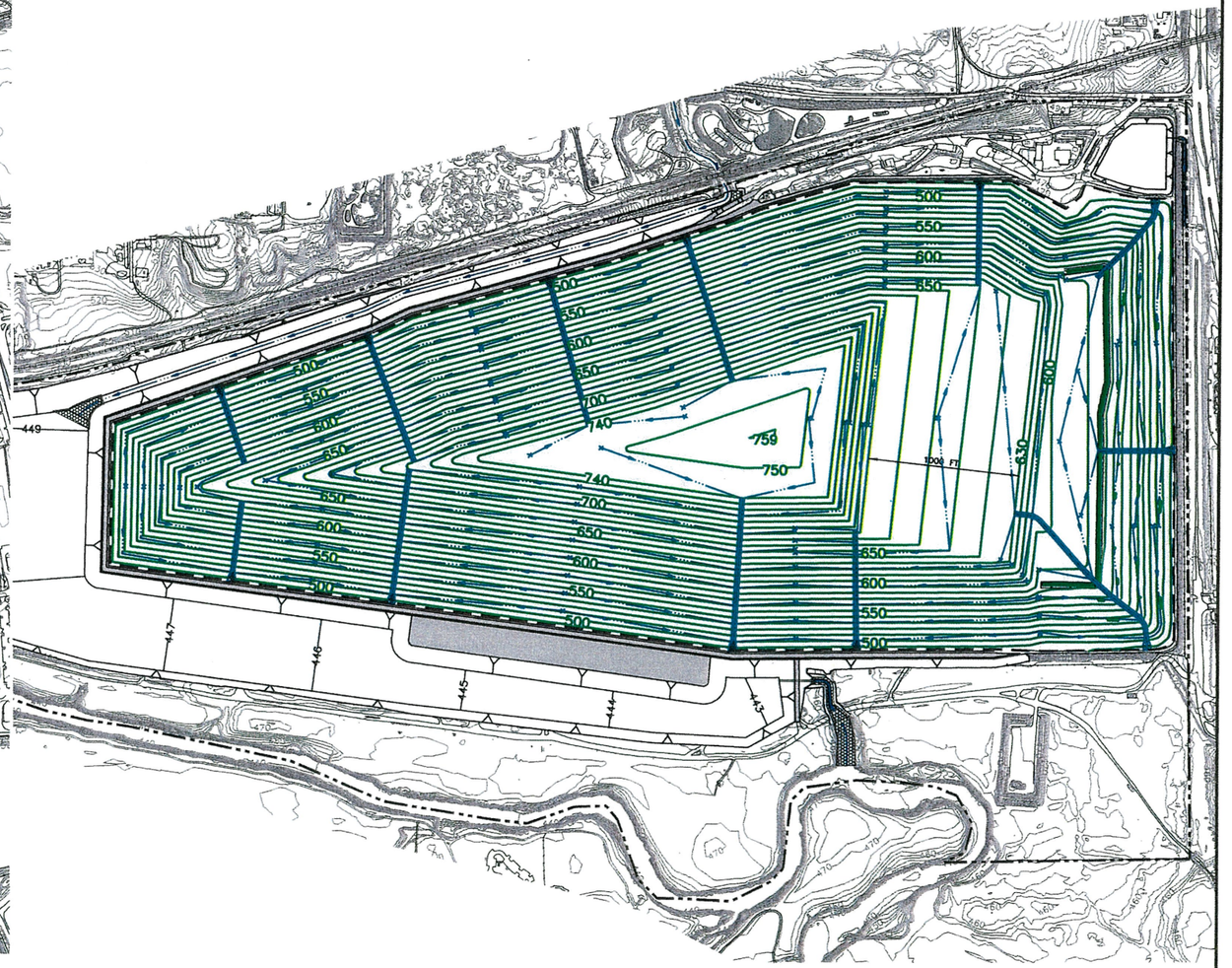
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 4




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN

N

0 500 1000
SCALE IN FEET

**GENERAL INFORMATION**

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW-358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW-358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT-MSL) | 740 (FT-MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT-MSL) | 759 (FT-MSL) |
| BUFFER AREA | 391.6 ACRES | 383.8 ACRES |



☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 08/2021
FILE: 0023-404-11
CAD: 5-FINAL COVER COMPARISON.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
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| | | |
| | | |
| | | |

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727
WWW.WCGRP.COM

# EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

FIGURE 5

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\5-FINAL COVER COMPARISON.dwg, rarrington, 1:2

# ATTACHMENT 2

# CULTURAL RESOURCES INVESTIGATION REPORT, AR CONSULTANTS, INC., DATED NOVEMBER 2008

AR Consultants, Inc.

Archaeological and Environmental Consulting
11020 Audelia Road, Suite C105, Dallas, TX 75243
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# *ARCHAEOLOGICAL SURVEY WITHIN THE CITY OF ARLINGTON LANDFILL, TARRANT COUNTY, TEXAS*

Texas Antiquities Permit Number 5041

Jesse Todd, MS, MA

Backhoe Descriptions by
Lance K. Trask, BS

Submitted to:

**KBA ENVIROSCIENCE, LTD.**
101 East Southwest Parkway, Suite 114
Lewisville, Texas 75067

Submitted by:

**AR CONSULTANTS, INC.**
11020 Audelia Road, Suite C105
Dallas, Texas 75243-9085

Cultural Resources Report 2008-88
November 26, 2008

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## *TARRANT COUNTY, TEXAS*

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# ABSTRACT

The City of Arlington through Republic Waste Management is proposing to expand the existing landfill capacity. The landfill is located just west of State Highway 157 (Collins Street) and north of the West Fork of the Trinity River and south of the existing railroad line that is situated at the north edge of the floodplain. The City has recently acquired 194 acres of land west of the existing landfill for the purpose of landfill expansion. However, much of this land was impacted by sand and gravel mining operations, and is too disturbed to warrant any cultural resource exploration. The study area consists of approximately 105 acres which is situated along the north bank of the West Fork and include the lower reaches of Walker Branch as well as the hill just to north which has historically been used as a dirt bike track. Although, neither the City of Arlington nor Republic Waste Management intends to utilize the study area, they decided that "due diligence" was required; therefore, an intensive pedestrian archaeological survey of the study area was required.

The archaeological survey was conducted by AR Consultants, Inc. for KBA EnviroScience, Ltd. which is managing the environmental permitting for the City of Arlington and Republic Waste Management. During the survey, 25 backhoe trenches and 28 shovel tests were excavated. The survey resulted in the recording of three prehistoric shell lens middens and hearth sites (41TR227, 228 and 229).

Sites 41TR227, 228 and 229 may be eligible for nomination to the National Register of Historic Places since their extent and content is not totally known. Should future excavation occur in the area, these sites should be investigated further.

However, since the City of Arlington and Republic Waste Management have maintained that there are no plans to excavate in the study area in the future, we make no other recommendations.

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# INTRODUCTION

The City of Arlington through Republic Waste Services of Texas, Ltd. (Republic) is proposing to expand the existing landfill capacity. The site is located just west of State Highway (SH) 157 (Collins Street) and north of the West Fork of the Trinity River and south of the existing railroad line that is situated at the north edge of the floodplain (Figure 1). The entire land fill site including the land recently acquired for expansion covers approximately 745 acres, and 650 of the acres are included in either the active or closed landfill cells or in a gravel pit area [the West Expansion Area] that is just west of the West Disposal Area and the western of two Historic Fill Areas. The remaining 105 acres are situated along the north bank of the West Fork and include the lower reaches of Walker Branch. This area that includes Walker Branch is west of the West Expansion Area, and is referred to as the Surber Tract. The northern part of the Surber Tract, which has historically been used as a dirt bike track, was not included in the survey area. Although, neither the City of Arlington nor Republic Waste Services intends to utilize the study area, they decided that "due diligence" was required; therefore, an intensive pedestrian archaeological survey of the study area was required.

During the later part of October of 2008, AR Consultants, Inc. conducted an intensive pedestrian archaeological survey of the proposed landfill extension as a component of the 404 Individual Permit application to the US Army Corps of Engineers. The work was coordinated for KBA EnviroScience, Ltd. which is managing the environmental permitting for Republic Waste Services and the City of Arlington. The purpose of the archaeological survey was to determine if cultural materials older than 50 years were present, and, if so, make recommendations about their significance and how they might be impacted by construction.

The cultural resource investigation was required because the City of Arlington is a political entity of the State of Texas and Texas Antiquities Permit Number 5041 was issued for the archaeological survey. In addition, since the landfill site is to be placed within the West Fork of the Trinity River's floodplain, it falls within the jurisdiction of the Fort Worth District of the US Army Corps of Engineers. Relevant federal legislation includes the National Historic Preservation Policy Act of 1966, as amended (PL-96-515), the National Environmental Act of 1969 (PL-90-190), the Archeological and Historical Preservation Act of 1974, as amended (PL-93-291), the Clean Water Act, as amended PL92500 and the Rivers and Harbors Act of 1899. The Archeology Division of the Texas Historical Commission not only will review this report as the State Agency, but also as the Section 106 review agency.

This report is written in accordance with the guidelines for reports adopted by the Archeology Division of the Texas Historical Commission, and developed by the Council of Texas Archeologists (N.D.). The following report presents a brief description of the natural setting of the project area, followed by a discussion of the archaeology and history. A chapter on the research design and methodology employed in the investigation is then followed by the results of the field investigation. The report concludes with recommendations followed by the references cited.

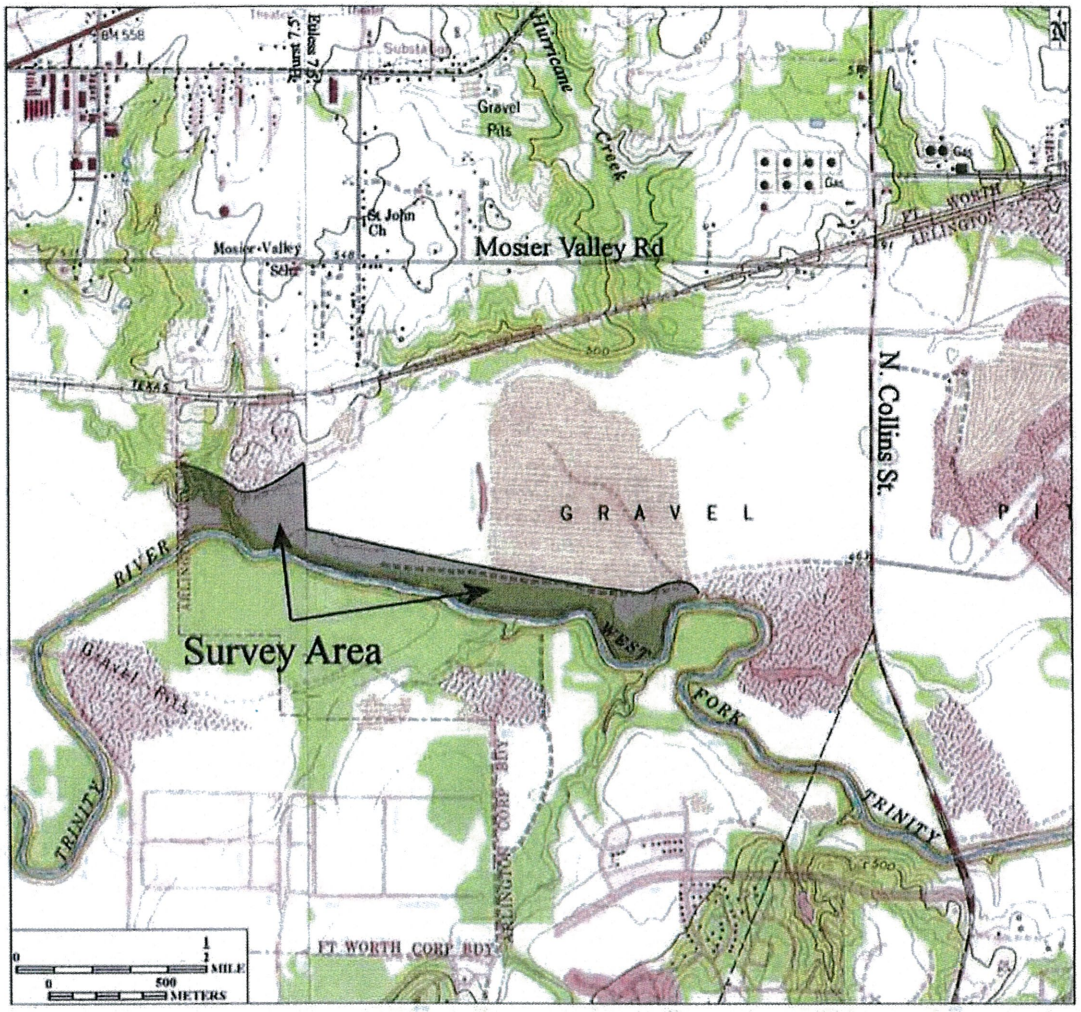


Figure 1. Proposed Arlington Landfill expansion plotted on portions of the Euless and Hurst, Texas 7.5' USGS maps.

Administrative Information:

| | |
|---|---|
| Sponsor: | City of Arlington with KBA EnviroScience, Ltd. managing the environmental permitting |
| Review Agency: | Archeology Division of the Texas Historical Commission and the Fort Worth District, U.S. Army, Corps of Engineers |
| Principal Investigator: | Jesse Todd, MS, MA |
| Field Crew: | Jeff Craver, Brett Lang, Lance K. Trask and Todd |
| Project Man-days: | November, 4, 5, 6 and 7, 2008 |
| Acres Surveyed: | approximately 105 |
| Sites Investigated: | |
| Prehistoric: | 41TR227, 228 and 229 |
| Historic: | none |
| Curation: | no artifacts curated |

## NATURAL ENVIRONMENT

The study area is located on the north bank of the West Fork floodplain and on a ridge overlooking the West Fork. The study area lies in the Crosstell-Gasil-Rader and Frio-Trinity Soil Associations (Ressel 1981:General Soils Map). The Crosstell-Gasil-Rader consists of nearly level to sloping upland loams whereas the Trinity-Frio contains nearly level floodplain clays. The upland ridge consists of Silawa fine sandy loam with 3 to 8 percent slopes and loamy Arents and the West Fork's floodplain contains frequently flooded Trinity clay. The quarry area consists of frequently flooded Arents and frequently flooded Pulexas fine sandy loam is located between the quarry area and the upland ridge (Ressel 1981:Sheet 32) The B horizon for the Silawa series is described as being 6 inches (9 cm) (Ressel 1981:107) below the ground surface.

The underlying geology consists of the Eagle Ford Shale Formation which is covered by Quaternary age terraces along the proposed pipeline route (Bureau of Economic Geology 1988). The channel of the West Fork is mapped as containing Quaternary alluvium.

The West Fork has incised a wide floodplain through both Lower Cretaceous- and Upper Cretaceous-aged bedrock and reached its lowest base level about 18,000 years ago (Ferring 1986:Figure 4). Since then, it has alluviated as carrying capacity varied and aggradation increased. The meandering channel has left behind a series of sloughs and cut-off meanders which apparently stabilized about 2,000 years ago (Ferring in Shaunessy, Jurney, and Yedlowski 1994:5). These geological processes have buried a complex web of channel and levee deposits which span the past 20,000 years.

Remnants of a bottomland hardwood forest occur in the West Fork floodplain and in a pre-1900 condition it would have provided habitat for deer, quail, dove, rabbit, squirrel, raccoon and other animals (Jurney 1988; Martin 1988; Ressel 1981:57). The bottomland hardwood forest is a western extension of the forest from downstream on the Trinity (US Fish and Wildlife Service 1985). In its native state, elm and post oak were the dominant trees, along with hackberry and Spanish oak. Various fruit and nut producing species included bur oak, red haw, walnut, pecan, gum bumelia and mulberry. Upland tree cover outside of the valley was composed primarily of post oak and blackjack oak (Peter and Jurney 1988).

A consensus about the paleoenvironmental conditions of North-Central Texas over the past 12,000 years has not been reached. Discussions by Prikryl (1993), Ferring (1990), Humphrey and Ferring (1994) and Brown (1998) offer disparate interpretations based on different analytical approaches. Todd (1999) investigated the snails in 10 cm levels from backhoe trenches from the Rough Green site (41TR162) across the river from the study area and concluded that the environment had not changed appreciably from the Late Archaic to the Late Prehistoric.

## REVIEW OF WEST FORK FLOODPLAIN STUDIES

This chapter reviews archaeological investigations and soil studies in the floodplain of the West Fork of the Trinity River between Fort Worth and Dallas over the past fifteen years as they have a bearing upon the potential for finding buried prehistoric sites in the study area along the West Fork. The presentation begins with the on the east side of Fort Worth and ends just east of the study area. A prehistoric chronology, based on Prikryl (1990), and an added historic period, for North Central Texas is presented below to provide the reader with a time framework for the previous occupation discussed below.

| | |
|---|---|
| Historic European | A.D. 1800 to Present |
| Protohistoric | A.D. 1600 to A.D. 1800 [Historic Native American] |
| Late Prehistoric | A.D. 700 to A.D. 1600 |
| Late | A.D. 1400 to A.D. 1600 |
| Middle | A.D. 1000 to A.D. 1400 |
| Early | A.D. 700 to A.D. 1000 |
| Archaic | 6,000 B.C. to A.D. 700 |
| Paleo-Indian | ca. 11,000 B.C. to 6,000 B.C. |

Archaeological Investigations

The First Street Bridge site (41TR138) is located on the east side of Fort Worth (Largent, Hunt and Peters 1991). The site consists of four concentrations of mussel shell and/or burned rock on the south bank of the West Fork. The site deposit extends from one to four meters below the surface in what the authors refer to as a deposit topped with the West Fork paleosol. The site shows evidence of repeated occupation and inundation which is common for sites on the West Fork, although few had been documented.

The River Bend site (41TR68) was located on the north side of the West Fork midway between the Gateway section and the mouth of Village Creek. The site was tested in 1987 (Peter 1987) and is an example of a specialized foraging camp that was repeatedly reoccupied between AD 850 and 1350. Low quantities of artifacts and virtually no curated tools were found, although a wealth of burned rock and mussels shells were present. Faunal remains included bones of deer, bison, rabbit, frog and turtle, but it was concluded that the large mammals were butchered elsewhere (Peter 1987:32). Four rock features were uncovered and radiocarbon dates of AD 1200±50 (Beta-22487) and AD 1330±100 (Beta-22488) were obtained from charcoal. Archaeomagnetism yielded dates between AD 1350 and 1450.

AR Consultants, Inc. (Todd and Skinner 2002) conducted an archaeological reconnaissance of four areas for the creation of wetland mitigation banks. Despite intensive investigation, no cultural materials were found in the survey areas. One site, however, that consisted of mussel shell, fire-cracked rock and bone that was approximately 100 m long and 3 m below the surface, was found eroding from the bank of the West Fork outside one of the survey areas.

River Legacy Park is a City of Arlington park that extends west from SH 157 (Collins Street) almost to Greenbelt Road and is situated along the south side of the West Fork channel. Ferring's survey of the park area (1994) located four prehistoric sites (41TR143-146) exposed in the riverbank. He also described the Old Bridge Geologic Section from the south bank of the West Fork to just east of the Rough Green site (Skinner and Caran 1997; Skinner, Caran and Trask 1999). The Old Bridge section includes four units (A-D). Unit A consists of laterally accreted sands and silts and is related to the Sanger Alloformation which is mid-Holocene in age (10,000 to 5,000 B.P.). A moderately developed soil with a thick A-horizon is present at the top of Unit A. Unit B consists of calcareous silts and clays with a prominent buried soil on top of the unit. This has been termed the West Fork Paleosol. All of the recorded river bank sites are contained in this unit from near its top to four meters below the surface. Unit C consists of discontinuously exposed younger channel fills that are inset onto Units A and/or B. Unit D consists of recent alluvium that covers all exposures of units B and C.

Two sites were discovered by AR Consultants, Inc. (Todd and Skinner 2003) during an archaeological survey of the proposed expansion of MacArthur/Meyers Road north of US 30. Site 41DL426 was discovered in the West Fork's floodplain and consists of mussel shell, fire-cracked rock, bone and a charcoal and ash lens. Site 41DL425 was recorded on the south bank of Bear Creek just north of the West Fork. The site contains at least two shell lens overlying one another. Bone, charcoal, freshwater mussel shells, fire-cracked rock, four pieces of lithic debris and an unusual deer antler tool were recovered during test excavations.

Two prehistoric sites were located during the survey of a pipeline that crossed the western part of River Legacy Park and continues north across the river before connecting with a Trinity River Authority (TRA) pipeline (Skinner and Caran 1997). The Rough Green site (41TR162) was discovered by shovel testing and was defined using augering and backhoe trenching. The site is a massive shell midden that contains the only recorded post hole along the West Fork. A deeply buried prehistoric site, 41TR164, was located by backhoe trenching. Extensive testing at Rough Green (Skinner, Caran and Trask 1999) found Late Archaic and Early Late Prehistoric occupations situated along the overbank levee paralleling Walker Branch before the West Fork pirated the creek. It was concluded that the primary function of the site was to collect bur oak acorns, although evidence of hunting deer and other mammals and gathering freshwater mollusks was found in the site deposit.

In 1994, the Archaeology Research Program (ARP) of Mercyhurst College recorded two sites (41TR141 and 142) east of FM 157 in the West Fork floodplain (Shaunessy, Jurney and Yedlowski 1994:1). Both sites are located along an old meander of the West Fork. Testing at site 41TR141 yielded a Middle to Late Archaic Palmillas dart point, as well as other artifactual and ecofactual materials. Subsequent testing of site 41TR142 and other floodplain deposits for buried cultural horizons was conducted in 1996 by Geoarch Consultants (Ferring and Byers 1996). Testing revealed the presence of an abandoned meander belt system in the floodplain west of site 41TR142. The site was shown to contain a preserved Late Archaic deposit over an area of about 20,500 square meters. The

floodplain site is considered to be the largest such site in the West Fork below Lake Bridgeport (Ferring and Byers 1996:12). Mussel shell and animal bone are present in addition to lithic artifacts and fire-cracked rock.

Testing of additional prehistoric sites (41TR167) was conducted by the Texas Department of Transportation in conjunction with planning for a hiking and biking trail between FM 157 and Highway 360 (Ellis 1998). The site is described as an example of a "...zone containing a large number of 'localities' (Binford 1980) where small-scale, limited-function resource exploitation events occurred (Ellis 1998:11)." The upper part of the site sediment column is described as an A-horizon that has no clear evidence of the West Fork Paleosol. A single radiocarbon date from the lower part of the occupation was dated at A.D. 900 but was not associated with temporally diagnostic chipped stone tools.

Downstream and also on the north side of the West Fork, Geo-Marine, Inc. found a buried prehistoric site reported as 41TR174 with the limits of a proposed pipeline route designated as WF-11B by the Trinity River Authority (Burson, Hunt, Peter and Shanabrook 2000). After a records search, the authors realized that their new site was probably part of Ellis' site, 41TR167, which has been radiocarbon dated to about a thousand years ago. At site 41TR174, cultural materials were found from 48 to 200 cm below the surface. This zone was described as the West Fork Paleosol and a radiocarbon date from near the base of the paleosol was dated A.D. 330±50 (Beta-131368).

AR Consultants, Inc. (Todd 2007) recorded probably the smallest site on the West Fork. Site 41DL449 was located east of Roy Orr Boulevard and on the north bank of the West Fork. The site consisted of seven mussel shells and two pieces of bone. The site was located approximately 100 cm below surface (bs) and was removed during the deep testing for a proposed pipeline route.

Previous Investigations

Sites and surveys discussed in this portion of the report are plotted on Figure 2. Previously discussed sites and surveys are not repeated here. All non-referenced data is from the Texas Archeological Sites Atlas (2008).

Geo-Marine, Inc. (Tiné 2002) investigated approximately 33 acres west of SH 157 (Collins Street) and north of the West Fork, and in 1990, CMTA investigated a small area west of Collins Street and south of the railroad track. No archaeological sites were found in either survey. Approximately 315 acres were surveyed for the Environmental Protection Agency and the Texas Department Water Resources south of and adjacent to Trammel Davis Road and west of and adjacent to Greenbelt Road in 1983 but no sites were recorded. North of the study area, AR Consultants (Whorton and Skinner 1995) investigated 275 acres for a golf course and sports complex. During the survey, the Tom Coble homestead (41TR153) was recorded.

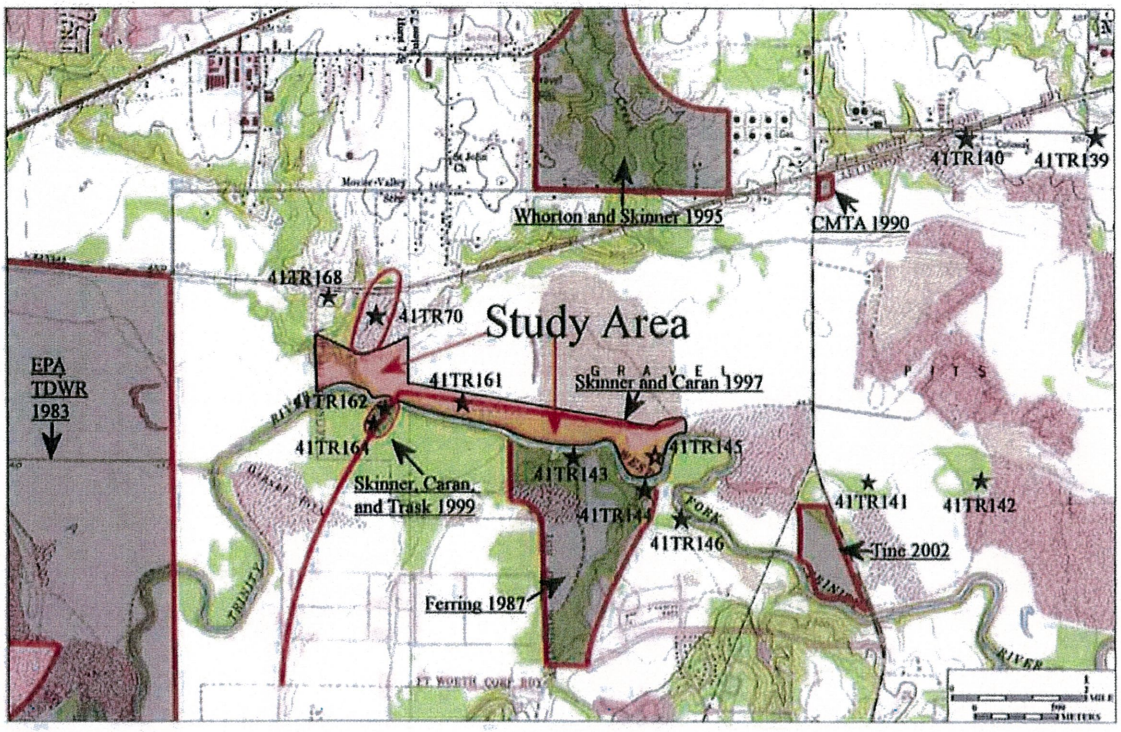


Figure 2. Previous investigations in the vicinity of the study area.

Sites 41TR139 and 140 west of Collins Street also were recorded during the Mercyhurst archaeological survey (Shaunessy, Jurney and Yedlowski 1994). Site 41TR139 consists of a surface lithic scatter that contained dart points, performs and bifaces that were Archaic in age while site 41TR140 contained Archaic-aged flakes, dart points, bone and mussel shell buried approximately a meter below the ground surface.

Sites 41TR70 and 41TR168 are located north of the northwestern portion of the study area. Site 41TR70 consists of a surface probable base camp that ranges in age from the Early Archaic to Late Prehistoric times although most of the artifacts found by local collectors dated to the Late Archaic. The site is remarkable in that a large amount of manos and metates were present. Site 41TR168 consists of a surficial lithic scatter with fire-cracked rock and ground stone fragments. Its time frame is unknown.

Site 41TR161 is the only tested site in the study area (Skinner and Caran 1997:22-23). The site was located 2.55 meters below the surface during trenching and consists of a burned limestone and sandstone rock hearth. A block of earth was removed and screened for artifacts but none were found. The site was found during the placement of four trackhoe trenches along the northern border of the study area.

# RESEARCH DESIGN & METHODOLOGY

Regular flooding of the West Fork floodplain and the destruction of the floodplain and the extensive quarrying of floodplain sediments eliminated historic occupation as a major focus for this investigation. The following research questions were posed to be answered at the time this project was begun.

> -It was expected that sediments containing evidence of prehistoric occupation would be found buried under the recent floodplain sediments along the north bank of the West Fork and that the most recent of these site deposits would be found more than a meter below the present surface and associated with the top of the West Fork Paleosol.
>
> -It was further expected that a deeper occupation would be found and would provide evidence of earlier visitation to the drainage edge.
>
> -It was further expected that sites would be located adjacent to the present channels in settings including the floodplain and buried levees, all within one hundred meters of the channels. While we recognize that most of this study area is within the 100 meter limit, this question is relevant to all research within the West Fork floodplain.

The West Fork of the Trinity River has been shown to have a good potential for containing buried prehistoric archaeological resources (Ferring 1990). Ferring (1986:108) states that sites with better preservation potentials are those that occur either above or below the West Fork paleosol. Although lateral channel movement of the West Fork may have destroyed some sites, this movement, along with siltation, is likely to have buried prehistoric sites under the present surface.

The 105-acre study was investigated by both shovel and deep testing as recommended by the Council of Texas Archeologists (2002). Shovel tests were supplemented by the use of a 4-inch barrel auger. The clayey soils were not screened but were broken manually and examined for cultural materials as were the pit walls. Backhoe trenches were excavated to approximately 3 meters below the ground surface and were about 5 meters wide since they were stepped according to OSHA standards. Soil profiles were described following the procedures developed by Vogel (2002) and photographs were taken. The trenches ranged from triangular to roughly square in shape to insure safety and this also allowed the archaeologists to be able to view more area than a narrow trench would have provided. Photographs of the study area were taken as were notes on the topography, vegetation and other relevant data. We attempted to determine the boundary of site 41TR145 using deep testing.

# RESULTS

This portion of the report is broken into several sections. The study area is described first and is followed by a discussion of the survey. Conclusions derived from the survey end the chapter. Shovel tests and backhoe trenches are described generally in the text, but specific information is provided in Tables 1 and 2 and Appendix A. Backhoe and shovel test locations are plotted on Figures 10 and 11

## The Survey area

The general survey area consists of generally level to gently undulating terrain. Vegetative zones ranged from grassland (Figure 3) to open forested areas to heavily vegetated areas (Figure 4). Trees include oak, burr oak, hackberry, elm, cottonwood, salt cedar and western soapberry. Understory vegetation includes grama grasses, johnson grass, hog brush, prickly pear cactus, blood weed, saw greenbriar, grape vine and other grass species. Ground visibility ranged from less than 5 to 100 percent and eye-height visibility averaged 30 meters.



Figure 3. Grassland north of the West Fork of the Trinity River near Walker Branch.



Figure 4. Heavily forested area north of West Fork.

The Survey

The survey was broken into two sections: Walker Branch and west and east of Walker Branch.

*Walker Branch and west*

The survey began at the City of Arlington/Fort Worth boundary where a pipeline route crosses Walker Branch. The drainage has eroded extensively when compared to the 1959 USGS map and has been heavily disturbed.

Push piles (Figure 5), buried concrete blocks (Figure 6) and a concrete/gravel road (Figure 7) are present along the northeast bank. An earthen berm (Figure 8) is located along the southwest bank. Walker Branch is approximately 5 meters deep (Figure 9) and at least 5 meters wide. Water ranging in depth from 0.25 to one meter deep was flowing in a sandy clay substrate that contained limestone and hematite gravel bars. No knappable lithic materials were found in the gravel bars and no buried cultural deposits were noted in the vertical to sloping creek bank walls. Two mussel shells that possibly were subfossil were found and these probably eroded from some location upstream.



Figure 5. Push pile containing dirt, concrete and wood along Walker Branch. View is to the northwest.



Figure 6. The white line in the push pile is a concrete block on northeast bank of Walker Branch.



Figure 7. Concrete/gravel road where Walker Branch flows into West Fork. View is to the east.



Figure 8. Earthen berm along southwest bank of Walker Branch. View is to the northeast.



Figure 9. Mr. Brett Lang is standing on the southwest bank of Walker Branch. The photographer is standing in the channel.

Ten culturally sterile shovel tests (1-10) were excavated along Walker Branch (Figure 10). Two shovel tests (1 and 3) encountered sandstone bedrock at 29 and 11 cm bs, respectively. Hematite sandstone outcrops to the north of the study area. Generally in shovel tests 2, 4, 5 and 6, clay overlaid brown clay subsoil which in turn overlaid a brown silty clay which may be the laminae zones found in the backhoe trenches along the West Fork along the northeast bank. Shovel test was placed on the west bank of Walker Branch where it flows into the West Fork and the shovel test uncovered 84 cm of sandy, loamy clay. Shovel tests 8 to 10 were excavated along the creek's southwest bank and clay overlaid clay subsoil. Most likely, the upper soil horizon was removed during the construction of the berm along the creek.

Three shovel tests (11-13) where placed along the West Fork west of Walker Branch (Figure 10). It appears that a flood deposit overlies the grayish-brown topsoil in shovel test 11 and a brown subsoil underlies the topsoil that ranges generally about 37 cm bs. Shovel test 11 may have encountered the West Fork Paleosol due to the presence of calcium carbonate. If so, it was the shallowest depth found during the survey.

After the shovel testing was completed, backhoe trench 25 (Appendix 1) was excavated northwest of the concrete road (Figure 10). The results of the testing indicate that an alluvial deposit overlies the laminated bank of Walker Branch. It appears, based upon the banks and shovel tests, that laminae are present along the northeast and portions of the

southwest bank of the creek. The depositional process may also be a result of the West Fork's intrusion/confluence with Walker Branch.

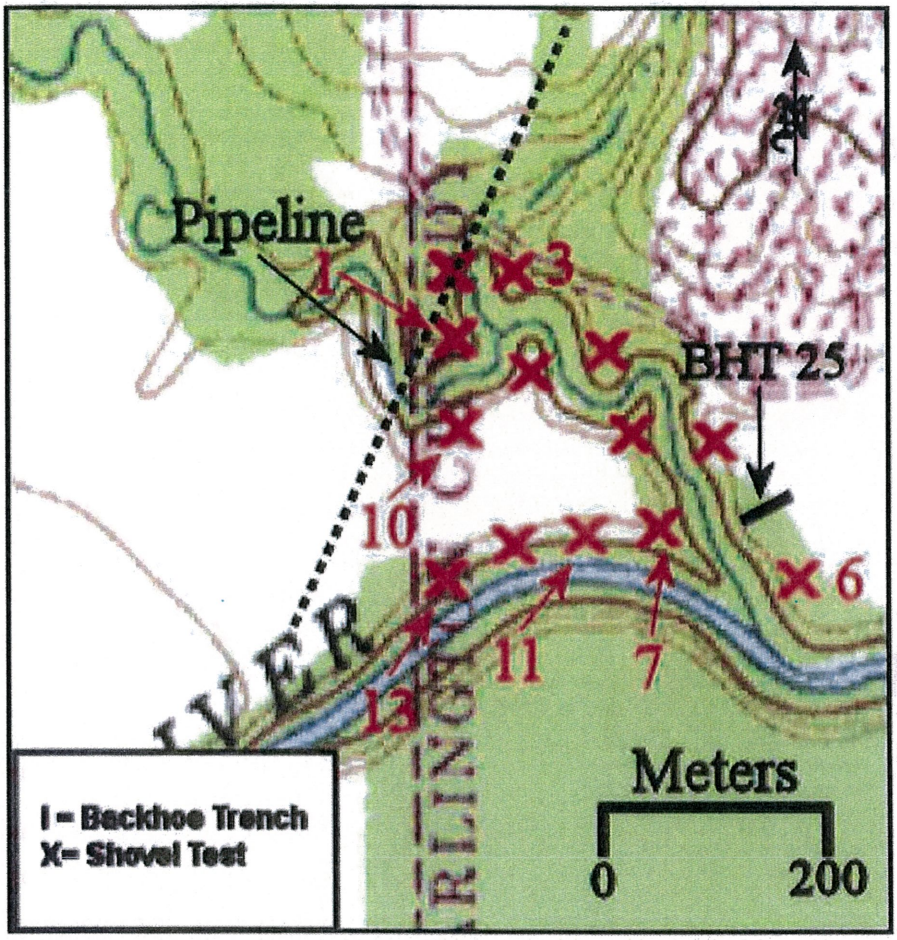


Figure 10. Shovel test and backhoe trench locations along and west of Walker Branch plotted on a portion of the Hurst, Texas 7.5' USGS map.

To summarize, no cultural materials older than 50 years were found on the ground surface, uncovered in 13 shovel tests and one backhoe trench or discovered in the creek bank walls during the survey of Walker Branch and the West Fork west of Walker Branch.

*East of Walker Branch*

Twenty-four backhoe trenches and fifteen shovel tests (14-28) were excavated east of Walker Branch (Figure 11). Interestingly, backhoe trenches 1, 3-7, 23 and 24 mainly encountered laminae (Figure 12) instead of the expected clay (Appendix 1). The presence of the laminae in backhoe trenches 3-7 indicate a bend in the river that subsequently has been filled by sediment. The West Fork Paleosol (Figure 13) was uncovered at an

average of approximately 90 cm bs along the west bank of the West Fork but at about 55 cm north of the bank. The total thickness of the palesol appears to be uniform (approximately 60 cm) from the bank north although this can not be stated with surety because the backhoe trenches north of the bank were excavated into the West Fork Paleosol to determine if portions of an archaeological site were present. During the deep testing, three prehistoric archaeological sites were recorded and are discussed below.

As previously mentioned, fifteen culturally sterile shovel tests (14-28) were excavated along the north bank of the West Fork (Table 1). Only shovel test 21 was excavated to total auger depth (174 cm) because it was placed in laminated sediments. None of the rest of the shovel tests encountered the West Fork Paleosol due to the compactness and hardness of the dry clay.

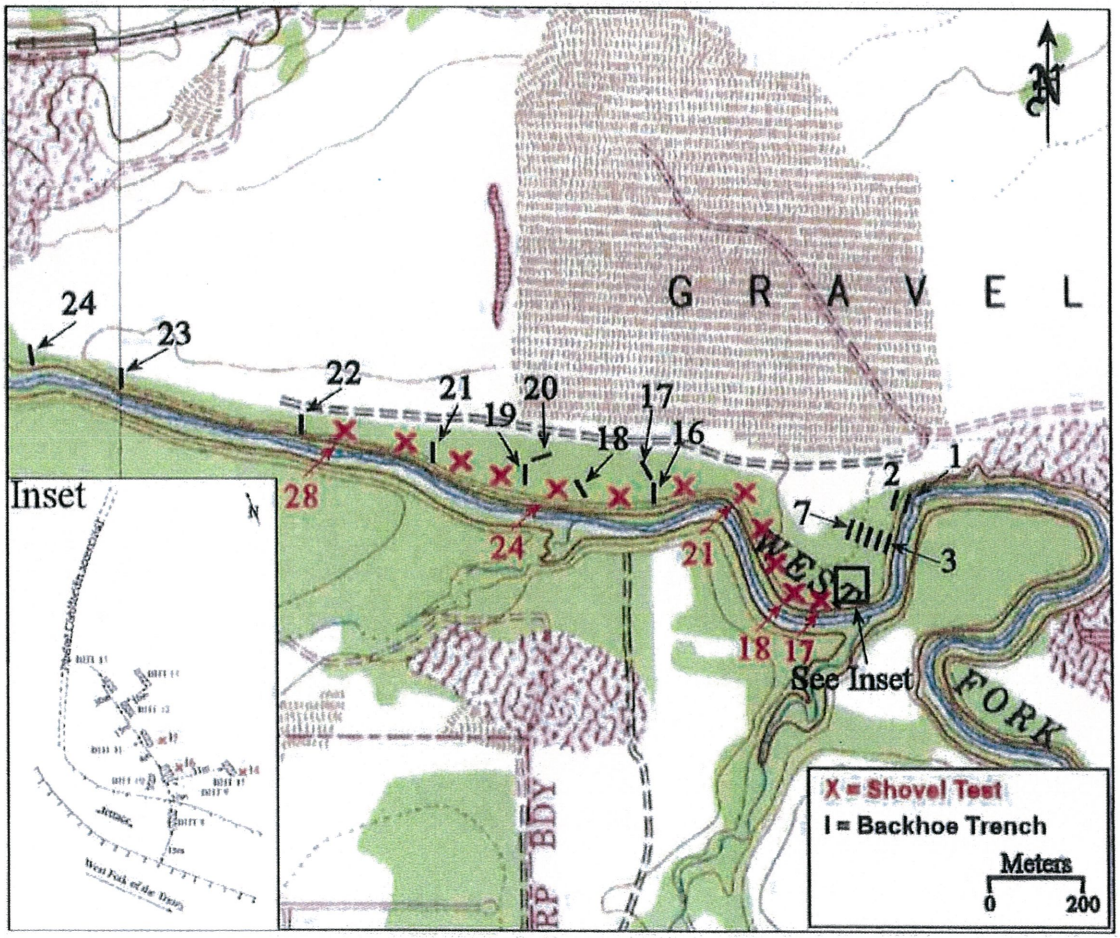


Figure 11. Shovel test and backhoe trench locations east of Walker Branch plotted on a portion of the Arlington, Texas 7.5' USGS map. TT1-TT4 are plotted from Skinner and Caran (1997).



Figure 12. Soil profile from backhoe trench 3 illustrating the typical silt, clay and sand laminae uncovered in the backhoe trenches. The whole profile is laminae except for the upper 31 cm. View is to southeast.

Prehistoric archaeological sites

During the deep testing along the north bank of the West Fork, three prehistoric sites (41TR227, 228 and 229) containing freshwater mussel shell (Figure 14), some deer bone, a turtle carapace fragment, dispersed charcoal and flecks of daub and fire-cracked rock were recorded. The site locations are plotted on Figure 15. The sites were found either on top or in the West Fork Paleosol.

Site 41TR227 (Figure 16) consists of multiple buried shell lens midden and hearths. The uppermost portion of the site was discovered at 67 cm bs and the lowest was 117 cm bs. Site 41TR228 (Figure 17) was uncovered in backhoe trench 18 at 122 cm bs and at 150 cm bs in backhoe trench 19 and consists of multiple buried shell lens middens and hearths. Site 41TR229 (Figure 18) consists of a 10 cm thick shell lens midden that was uncovered at 107 cm bs in backhoe trench 21.

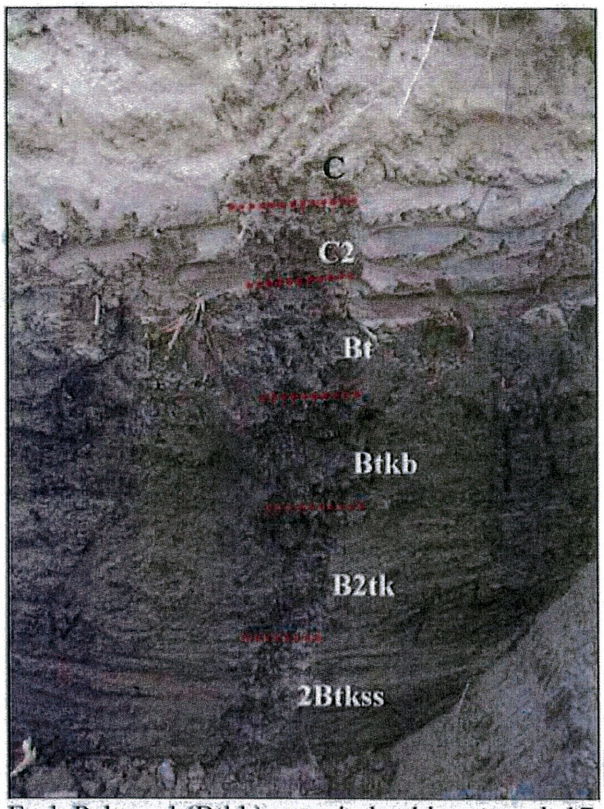


Figure 13. West Fork Paleosol (Btkb) zone in backhoe trench 17. View is to the southwest.



Figure 14. Shell lens uncovered at 82 cm bs in backhoe trench 9. View is to the southeast.

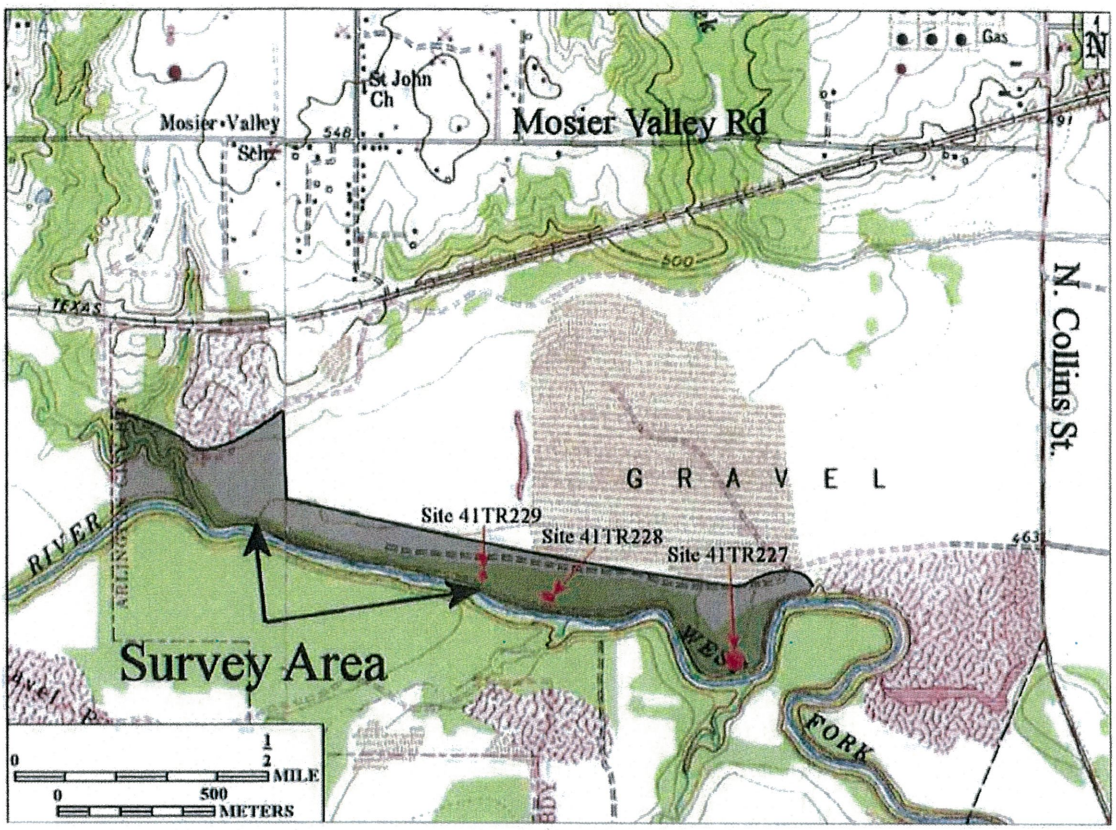


Figure 15. Prehistoric sites recorded for this project. Shown on a portion of the Euless 7.5' USGS map.

Except for site 41TR229, representative freshwater mussel valves and bone were collected. Recovered artifacts consist of a *Plectomerus dombeyanus* left valve and 12 left and 8 right *Fusconaia flava* valves from site 41TR229 at 107 cm bs in backhoe trench 21. From site 41TR 228, 2 bone fragments (probably deer) and 3 right and 1 left *Fusconaia flava* valves, a left valve from an *Amblema plicata* and a right valve from a *Lampsilis hdyiana* were collected. Charcoal was collected from backhoe trench 9 in site 41TR227 at 113 cm bs and a *Terrapene* carapace at 126 cm bs. Fifty freshwater mussel shells were collected from backhoe trench 9 at 82 cm bs which constitute 6 species. The species and valve count are: *Amblema plicata* (6 right, 3 left), *Obliqueria reflexa* (1 right), *Lampsilis hydiana* (4 left), *Tritogonia verrucosa* (2 right, 1 left), *Plectomerus dombeyanus* (5 left, 5 right) and *Fusconaia flava* (8 left and 14 right). These freshwater mussel species are present in numerous archaeological sites along the West Fork. Samples of charcoal at 113 cm bs and shell at 82cm bs from Trench 9 were submitted to Beta-Analytic for AMS dating. The shell at 82 cm dated from 1520 to 1330 BP which is from AD 430 to 620 (Beta 251819) and the charcoal dated to BP 920 to 730 which is from AD 1030 to 1220 (Beta 251820).

We believe that the radiocarbon date for the shell is not correct because it is higher in the section and has an older date than that of the date for the charcoal which we accept. The sample must have been contaminated.

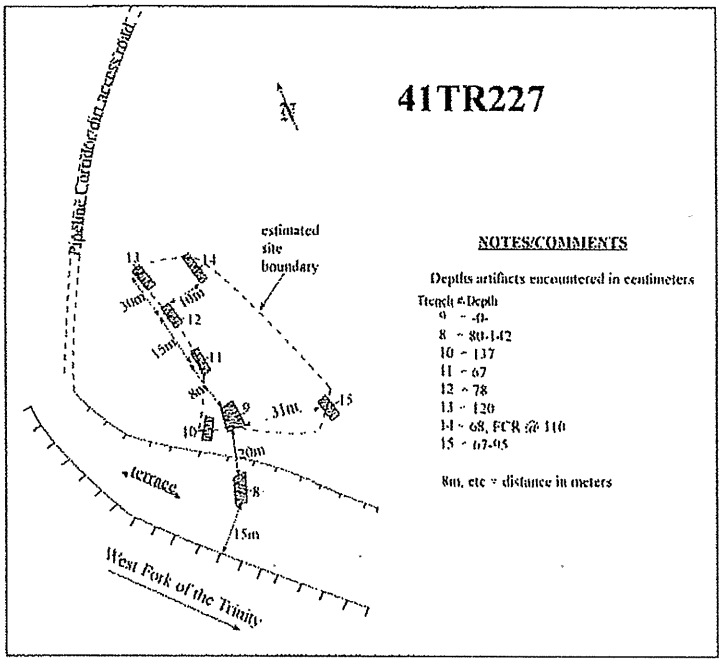


Figure 16. Plan map for site 41TR227.

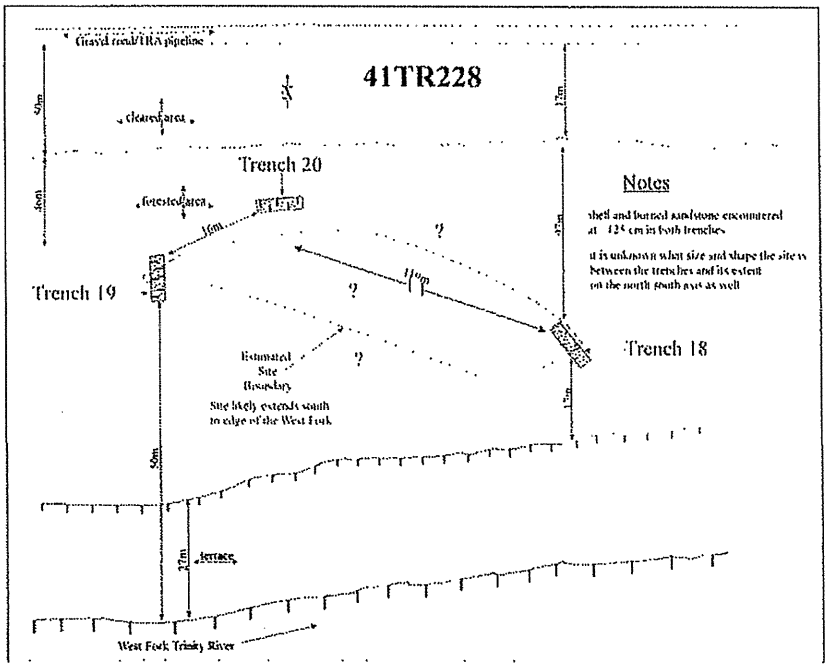


Figure 17. Plan map for site 41TR228.

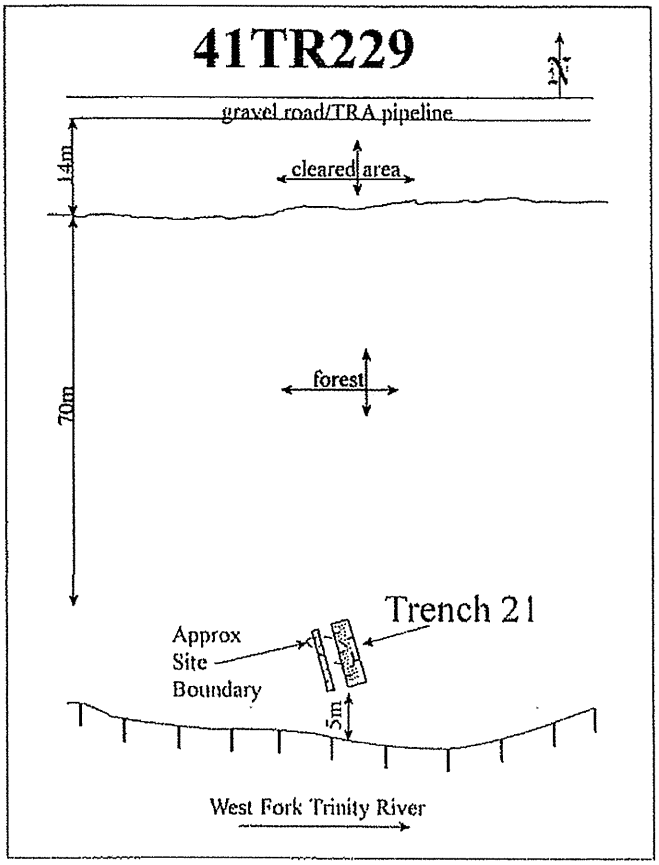


Figure 18. Plan map for site 41TR229.

Conclusions

As expected, buried prehistoric sites were discovered during the deep testing along the West Fork. The absence of a prehistoric archaeological site along Walker Branch near the West Fork may be a result of the area filling with alluvium as indicated in the profiles of backhoe trenches 24 and 25. The Rough Green site (41TR162) which was found south of the West Fork and adjacent to Walker Branch was found in a sand/sandy loam (Skinner et al. 1999:24) which was not found in the shovel tests along Walker Branch.

Interestingly, the West Fork Paleosol appears to be absent in Trackhoe trenches 1 and 4 as described by Caran (Skinner and Caran 1997:20, 23). The upward fining sequences probably are analogous to the laminae recorded in the backhoe trenches close to the trackhoe locations.

Site 41TR145 was not located during the deep testing. Backhoe trenches 3 through 7 were placed in the area where the site was placed on the Texas Archeological Sites Atlas. Also, the bank of the river was walked in the vicinity of the site and no cultural materials were seen eroding out. The site may have eroded away due to flooding of the river over time or may have been poorly located.

Sites 41TR227, 228 and 229 are similar to site 41TR167 which Ellis (1998) recorded southeast of the study area. Ellis (1998:4-5) characterized 41TR167 as being a series of shell lens and hearths "distributed in widely variable and horizontal densities" and this description fits the sites recorded during this survey. Like site 41TR167, our sites contained many human introduced artifacts such as shell, bone and fire-cracked rock; however, site 41TR167 contained a few human made artifacts whereas none were found during our survey.

The date from 113 cm in Backhoe trench 5 ranges from AD 1030 to 1220 (BP920 to 730) and this falls within the range of radiocarbon dates for the West Fork Paleosol as shown in Table 2 (Todd and Skinner 2003:.

Table 2. Radiocarbon dates for sites and geological settings for the West Fork Paleosol in the Trinity River floodplain.

| Site/Geologic area | Age (yrs B.P.) | Correction/ Calibration | Depth (cm) | Material | Reference |
|---|---|---|---|---|---|
| Village Creek | 1,825±70 | d | | soil humate | Ferring 1988 |
| | 4,151±100 | d | | soil humate | |
| | 900±80 | | 115 – 130 | soil humate | Caran 1990 |
| | 2510±90 | | 175 – 195 | soil humate | |
| | 4,970±80 | | 367 – 382 | soil humatae | |
| Aubrey Clovis | 1,650±50 | c,d | | soil humate | Ferring 2000b:46 |
| | 2,070±70 | c,d | | soil humate | |
| | 3,580±70 | c,d | | soil humate | |
| | 4,525±60 | c,d | | soil humate | |
| 41DN99 | 528±70 | d | | charcoal | Ferring 1990a |
| | 1,268±70 | d | | charcoal | |
| | 1,406±80 | d | | charcoal | |
| 41CO144 | 759±70 | d | | charcoal | Ferring 1990a |
| | 1,282±90 | d | | charcoal | |
| Locality RRG-1 | 1,298±60 | d | | soil humate | Ferring 1986 |
| 41DL12 | 731±80 | d | | charcoal | |
| Gateway Park | 1,406±100 | d | ~ 60 | soil humate | Ferring 1986 |
| Riverbend | 2,810±70 | | 75 | charcoal | Peter 1987 |
| Dallas Floodway Extension | 1,360±70 | | 210 – 230 | low carbon sediment | Cliff et. al. 1998 |
| | 1330±60 | | 310 – 370 | low carbon sediment | |
| | 5,360±50 | | 230 – 240 | organic sediment | |
| | 3,620±40 | | 230 – 240 | organic sediment | |
| Dallas Floodway Extension | 1,000±50 | | 130 – 140 | soil/ash | Buysse 2000 |
| | 2,380±70 | | 220 – 240 | soil | |
| | 2,750±60 | | 245 – 255 | soil | |
| | 2,140±60 | | 370 – 385 | charcoal | |
| | 1,420±60 | | 170 – 180 | soil | |
| | 3,050±60 | | 270 – 280 | soil | |

| | | | | | |
|---|---|---|---|---|---|
| | 480±40 | | 170 | charcoal | |
| | 970±40 | | 170 – 173 | charcoal | |
| | 1,660±50 | | 150 – 155 | soil | |
| | 1,390±50 | | 100 – 110 | soil | |
| | 2,460±50 | | 190 – 210 | soil | |
| 41TR174 | 1,730±50 | | 130 | charcoal | |
| 41DL12 | 1,140±70 | | 300 | | Ferring 1986 |
| Rough Green (41TR162) | 2,018±53 | | 230 – 268 | | Skinner, Caran and |
| (41TR164) | 5,100±70 | | 230 – 268# | | Trask 1999 |
| 41DL499 | 910±40 | | 100 | shell | Todd 2007 |

* Correction/Calibration: c – corrected for delta C-13
d – dendrochronological calibration

Table 1. Shovel test descriptions.

| ST No. | Depth (cm) | Description* |
|---|---|---|
| 1 | 0-29 | Brown (10YR4/3) loamy clay containing gravel and asphalt |
| | 29+ | Hematite sandstone bedrock |
| 2 | 0-35 | Brown (7.5YR4/3) loamy clay |
| | 35-67 | Dark grayish-brown (10YR4/2) clay |
| | 67-110 | Brown (10YR5/3) clay |
| | 110-130+ | Very dark grayish-brown (10YR3/2) clay |
| 3 | 0-11 | Brown (7.5YR4/4) sandy clay |
| | 11+ | Hematite sandstone bedrock |
| 4 | 0-89+ | Very dark gray (10YR3/1) clay |
| 5 | 0-35 | Dark grayish-brown loamy clay |
| | 35-55 | Brown clay |
| | 55-127+ | Brown clay |
| 6 | 0-45 | Dark grayish-brown loamy clay |
| | 45-65 | Brown clay |
| | 65-88+ | Brown clay |
| 7 | 0-84+ | Brown very sandy loamy clay |
| 8 | 0-30 | Very dark gray clay |
| | 30-85+ | Dark grayish-brown clay |
| 9 | 0-52 | Dark gray (10YR4/1) clay |
| | 52-77+ | Very dark gray clay |
| 10 | 0-32 | Very dark gray clay |
| | 32-66 | Dark grayish-brown clay |
| | 66-91+ | Very dark grayish-brown clay |
| 11 | 0-35 | Dark grayish-brown clay |
| | 35-57 | Grayish-brown (10YR5/2) clay |
| | 57-70+ | Very dark gray clay containing CaCO3 |
| 12 | 0-35 | Grayish-brown loamy clay |
| | 35-77+ | Brown clay |
| 13 | 0-37 | Grayish-brown loamy clay |
| | 37-42 | Brown clay |
| | 42-67+ | Very dark grayish-brown clay |
| 14 | 0-31 | Very dark grayish-brown clay |
| | 31-63 | Brown sandy silty clay |
| | 63-76+ | Black (10YR2/1) clay |
| 15 | 0-27 | Very dark grayish-brown clay |
| | 27-60 | Brown sandy silty clay |

| | | |
|---|---|---|
| | 60-70+ | Very dark grayish-brown clay |
| 16 | 0-17 | Very dark grayish-brown clay |
| | 17-73 | Brown sandy silty clay |
| | 73-85+ | Very dark grayish-brown clay |
| 17 | 0-33 | Very dark gray clay |
| | 33-52+ | Dark grayish-brown clay |
| 18 | 0-30 | Very dark grayish-brown clay |
| | 30-82+ | Brown sandy clay |
| 19 | 0-32 | Very dark grayish-brown clay |
| | 32-73 | Brown clay |
| | 73-90 | Brown clay |
| | 90-112 | Dark gray clay |
| 20 | 0-28 | Very dark gray clay |
| | 28-65 | Brown clay |
| | 65-88+ | Very dark grayish-brown clay |
| 21 | 0-35 | Very dark gray clay |
| | 35-174+ | Brown silty clay |
| 22 | 0-7 | Very dark gray clay |
| | 7-100 | Brown silty clay |
| | 100-110+ | Mixture of brown and very dark gray clay |
| 23 | 0-85 | Brown sandy clay |
| | 85-97+ | Dark brown (10YR3/3) clay |
| 24 | 0-34 | Very dark grayish-brown clay |
| | 34-85 | Brown sandy clay |
| | 85-97+ | Dark grayish-brown clay |
| 25 | 0-35 | Very dark grayish-brown clay |
| | 35-77 | Brown sandy clay |
| | 77-88+ | Dark grayish-brown clay |
| 26 | 0-44 | Very dark grayish-brown clay |
| | 44-81 | Brown sandy clay |
| | 81-103+ | Dark grayish-brown clay |
| 27 | 0-7 | Very dark grayish-brown clay |
| | 7-47 | Brown sandy, silty clay |
| | 47-63 | Dark grayish-brown clay |
| | 63-79+ | Very dark brown (10YR2/2) clay |
| 28 | 0-31 | Very dark grayish-brown clay |
| | 31-63 | Brown sandy, silty clay |
| | 63-76+ | Black clay |

* Note: Munsell Color Chart Numbers listed only first time used.

## RECOMMENDATIONS

Based upon the results of the archaeological survey, we believe that sites 41TR227, 228 and 229 may be eligible for nomination to the National Register of Historic Places since their extent and content is not totally known. Should future excavation occur in the area, these sites should be investigated further.

However, since the City of Arlington and Republic Waste Services of Texas have maintained that there are no plans to excavate in the study area in the future, we make no other recommendations.

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# BACKHOE TRENCH DESCRIPTIONS

# ALONG THE WEST FORK

| BHT No. | Depth (cm) | Zone | Horizon | Description* |
|---|---|---|---|---|
| 1 | 0-22 | I | A | Dark grayish-brown (10YR4/2) loamy clay; slightly hard; moderate; fine subangular blocky; abundant roots and rootlets; snail shell fragments; clear and abrupt |
| | 22-77 | II | Bt | Very dark grayish-brown (10YR3/2) clay; hard; slightly hard; fine subangular blocky; few clay films thin on ped faces; abundant rootlets; clear and abrupt |
| | 77-298+ | III | C | Laminae of silt and clay |
| 2 | 0-31 | I | A | Dark grayish-brown loamy clay; soft; moderate to slightly hard; fine subangular blocky; snail shell fragments; abundant rootlets; Abrupt and smooth |
| | 31-63 | II | C | Pale brown (10YR6/3-4) sandy silty clay; soft; weak; single grained; abundant rootlets; clear and smooth |
| | 63-212 | III | BC | Brown (10YR4/3) clay with silt inclusions; hard; slightly hard; fine to medium subangular blocky; very thin clay films on ped faces; less than 1% CaCO3; snail shell fragments; few fine rootlets; abrupt and smooth |
| | 212-230 | IV | Btkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 50 percent CaCO3; abundant snail shells; few fine rootlets; clear and smooth (West Fork Paleosol) |
| | 230-280+ | V | Btkss | Brown (10YR5/3) sandy clay with dark gray (10YR4/1) clay inclusions; moderate to strong; moderate; medium columnar; few thin clay films on ped faces and pore linings; beginning of slickensides; 60 % CaCO3 filaments |
| 3 | 0-31 | I | A | Very dark grayish-brown silty clay with 15% pale brown silt pockets; moderately weak; slightly hard; very fine subangular blocky; snail shell fragments; abundant roots; abrupt and smooth |
| | 31-270+ | II | C | Laminae of silt and clays |
| 4 | 0-36 | I | A | Very dark grayish-brown silty clay with 15% pale brown silt pockets; moderately weak; slightly hard; very fine subangular blocky; snail shell fragments; abundant roots; abrupt and smooth |
| | 36-264+ | II | C | Laminae of silt and clays |
| 5 | 0-38 | I | A | Very dark grayish-brown clay; moderate; hard; fine to medium subangular blocky; many clay films thick on ped faces and pore linings; snail shell fragments; abundant roots; clear and smooth |
| | 38-51 | II | Bt | Dark grayish-brown clay; strong; slightly hard; fine subangular blocky; clay films continuous on ped faces, pore linings and bridges; snail shell fragments; abundant rootlets; clear and smooth |
| | 51-70 | III | BC | Dark grayish-brown clay with 7 to 10% pockets of brown silt; strong; slightly hard; fine subangular blocky; clay films common on ped faces and pore linings; snail shell fragments; few fine rootlets; clear and smooth |
| | 70-92 | IV | B2t | Very dark grayish-brown clay; moderate; slightly hard; medium subangular blocky; many clay films moderately thick on ped faces and pore linings; snail shell |

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| | | | | fragments; few fine rootlets; abrupt and clear |
| | 92-300+ | V | C | Laminae of silt and clay |
| 6 | 0-55 | I | A | Very dark gray clay(10YR3/1) clay; moderately strong; hard; medium subangular blocky; few to common clay films on ped faces and pore linings; snail shell fragments common; abundant roots; gradual and smooth |
| | 55-270 | II | C | Laminae of silt and clay |
| | 55-285+ | III | C1 | Unconsolidated very fine grained sand |
| 7 | 0-25 | I | A | Very dark grayish-brown clay; moderately strong; hard; medium subangular blocky; few to common clay films on ped faces and pore linings; snail shell fragments common; abundant roots; abrupt and clear |
| | 25-128 | II | C | Laminae of silts and sands |
| | 128-310+ | III | C1 | Laminae of silts and clays |
| 8 | 0-37 | I | A | Dark grayish-brown (10YR4/2) loamy clay; slightly hard; moderate; fine subangular blocky; abundant roots and rootlets; snail shell fragments; clear and smooth |
| | 37-150+ | II | C | Laminae of silt and clay |
| 9 | 0-24 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 24-57 | II | AB | Yellowish-brown (10YR5/4) loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 57-87 | III | Bt | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth<br>At 85 cm bs have shell concentration with charcoal |
| | 87-145 | IV | Btkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 3 to 5 percent CaCO3; abundant snail shells; few fine rootlets; clear and smooth (West Fork Paleosol)<br>At 88 cm bs have shell concentration with a deer bone<br>At 126 cm bs, have a shell concentration with terrapene carapace fragment |
| | 145-175 | V | 2Btk | Very dark grayish-brown clay; strong; hard; fine subangular blocky; thin clay films are few to common on ped faces and pore linings; 3 to 5% CaCO3 filaments; nodules rare; few fine rootlets; gradual and smooth |
| | 175-258 | VI | 3Bt | Dark grayish brown clay; strong; hard; medium subangular blocky; many moderately thick clay films on ped faces and pore linings; some slickensides; clear and smooth |
| | 258-297+ | VII | BC | Brown silty clay; moderate to strong; slightly hard; medium columnar; very few thin clay films on pore linings |
| 10 | 0-22 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 22-53 | II | CB | Yellowish-brown (10YR5/4) loamy clay and dark |

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| | | | | grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 53-88 | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth<br>At 85 cm bs have shell concentration with charcoal |
| | 88-149 | IV | B2tkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 3 to 5 percent CaCO3; abundant snail shells; few fine rootlets; clear and smooth (West Fork Paleosol)<br>At 88 cm bs have shell concentration with a deer bone<br>At 126 cm bs, have a shell concentration with terrapene carapace fragment |
| | 149-176 | V | B21tk | Very dark grayish-brown clay; strong; hard; fine subangular blocky; thin clay films are few to common on ped faces and pore linings; 3 to 5% CaCO3 filaments; nodules rare; few fine rootlets; gradual and smooth |
| | 176-263 | VI | Btss | Dark grayish brown clay; strong; hard; medium subangular blocky; many moderately thick clay films on ped faces and pore linings; some slickensides; clear and smooth |
| | 263-287+ | VII | 2Bt | Brown silty clay; moderate to strong; slightly hard; medium columnar; very few thin clay films on pore linings |
| 11 | 0-24 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 24-58 | II | AC | Yellowish-brown loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 58-67+ | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Shell and fire-cracked rock at 67 cm bs |
| 12 | 0-22 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 22-61 | II | AC | Yellowish-brown loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 61-78+ | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Shell and fire-cracked rock at 78 cm bs |
| 13 | 0-25 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay |

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| | | | | films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 25-60 | II | AC | Yellowish-brown loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 60-120+ | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Shell and fire-cracked rock at 120 cm bs |
| 14 | 0-27 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 27-51 | II | AC | Yellowish-brown loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 51-110+ | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Shell at 68 cm bs<br>Fire-cracked rock at 110cm bs |
| 15 | 0-33 | I | A | Very dark grayish-brown silty clay; silty clay; moderate; slightly hard; fine subangular blocky; very few thin clay films on pore linings; snail shell fragments; abundant rootlets; abrupt and smooth |
| | 33-54 | II | AC | Yellowish-brown loamy clay and dark grayish-brown clay; strong; very hard; fine granular; snail shell fragments; many fine rootlets; gradual and smooth |
| | 54-99+ | III | Btkb | Very dark grayish-brown clay; strong; hard; medium subangular blocky; clay films common and moderately thick on ped faces and pore linings; beginnings of CaCO3; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Shell and fire-cracked rock from 67-95 cm bs |
| 16 | 9-12 | VII | A | Brown silty clay; moderate to strong; slightly hard; medium columnar; very few thin clay films on pore linings |
| | 12-53 | II | AC | Yellowish-brown clayey loam; moderately strong; hard; coarse subangular blocky; few fine rootlets; gradual and smooth |
| | 53-114 | III | Btkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 2 % CaCO3 filaments; abundant snail shells; few fine rootlets; clear and smooth (West Fork Paleosol) |
| | 114-125+ | IV | B2kb | Dark grayish-brown clay; very strong; very hard; fine to medium prismatic; clay films continuous and moderately thick on ped faces, pore linings and bridges, 50% CaCO3, few fine rootlets |
| 17 | 0-31 | I | C | Brown (10YR4-5/3) silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; |

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| | | | | abundant roots; clear and smooth |
| | 31-77 | II | C2 | Yellowish-brown clayey loam; moderately strong; hard; coarse subangular blocky; few fine rootlets; gradual and smooth |
| | 77-104 | III | Bt | Brown silty clay; strong; very hard; medium subangular blocky; very few thin clay films on ped faces; colloidal stains on grains; less than 1% CaCO3; snail shell fragments; clear and smooth |
| | 104-228 | IV | Btkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 3-5 % CaCO3 filaments; abundant snail shells; few fine rootlets; clear and smooth (West Fork Paleosol) |
| | 228-247 | V | B2tk | Dark grayish-brown clay; very strong; very hard; fine to medium subangular blocky; clay films common and thin on ped faces and pore linings; 50% CaCO3; few fine rootlets; clear and smooth |
| | 247-301+ | VI | 2Btkss | Brown clay; strong; very hard; fine to medium prismatic; clay films continuous on ped faces, pore linings and bridges; slickensides present; 50% CaCO3; few fine rootlets |
| 18 | 0-48 | I | C | Brown (10YR4-5/3) silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; abundant roots; clear and smooth |
| | 48-90 | II | C1 | Brown (10YR4-5/3) silty clay; moderately strong; very hard; snail shell fragments; abundant roots; gradual and smooth |
| | 90-140 | III | Btkb | Very dark grayish-brown (10YR3/2) clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 3-5 % CaCO3 filaments; abundant snail shells; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>At 122, 125 and 126, small scatters of charcoal, bone and mussel shell |
| | 140-169 | IV | 2Btk | Dark yellowish-brown (10YR/4) clay; strong; very hard; medium angular blocky; few thin films on pore linings; 25 to 30% CaCO3; few fine rootlets; gradual and smooth |
| | 169-230 | V | 2Btkss | Dark yellowish-brown clay; strong; very hard; fine to medium subangular blocky; many moderately thick clay films on ped faces; slickensides; 10% CaCO3; few rootlets; clear and smooth |
| | 230-298+ | VI | BC | Yellowish-brown silty clay to brown clay; strong; very hard; fine subangular blocky; many moderately thick clay films on ped faces and pore linings |
| 19 | 0-55 | I | C | Brown silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; abundant roots; clear and smooth |
| | 55-120 | II | C1 | Brown silty clay; moderately strong; very hard; snail shell fragments; abundant roots; gradual and smooth |
| | 120-130+ | III | Btkb | Very dark grayish-brown clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; 3-5 % CaCO3 filaments; abundant snail shells; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>At 120-125 126 cm bs, charcoal, fire-cracked rock and |

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| | | | | mussel shell present |
| 20 | 0-43 | I | A | Brown silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; abundant roots; clear and smooth |
| | 43-94 | II | A1 | Brown silty clay; moderately strong; very hard; snail shell fragments; abundant roots; gradual and smooth |
| | 94-128+ | III | Btkb | Very dark grayish-brown clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; very few CaCO3 filaments; abundant snail shells; few fine rootlets; gradual and smooth (West Fork Paleosol) |
| 21 | 0-27 | I | A | Brown silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; abundant roots; clear and smooth |
| | 27-55 | II | AC | Yellowish-brown silty clay; moderately strong; hard; medium subangular blocky; abundant roots; diffuse and smooth |
| | 55-140 | III | Btkb | Very dark grayish-brown clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; very few CaCO3 filaments; abundant snail shells; few fine rootlets; gradual and smooth (West Fork Paleosol)<br>Mussel shell and burned clay at 107 cm bs |
| | 140-214 | IV | 2Btk | Brown clay; very strong; very hard; medium columnar; clay films are many, moderately thick and on ped faces and pore linings; some slickensides; 25-30% CaCO3, few rootlets; gradual and smooth |
| | 214-259 | V | 21Btk | Yellowish-brown clay; very strong; very hard; fine to medium prismatic; clay films common and moderately thick on ped faces; minimal slickenside development |
| 22 | 0-29 | I | C | Brown silty clay; weak; hard; medium to coarse subangular blocky; snail shell fragments; abundant roots; clear and smooth |
| | 29-57 | II | C1 | Dark yellowish-brown very fine sandy, silty clay; moderate; slightly hard; fine to medium angular; fine rootlets clear and smooth |
| | 57-96 | III | Bt | Dark grayish-brown clay; moderate; hard; fine columnar; clay films are common and moderately thick on ped faces, pore linings and some bridges; very few fine rootlets; clear and smooth |
| | 96-144 | IV | B/C | Alternating band of fine grained sand and very dark grayish-brown clay; moderate; hard; fine subangular blocky; clay films are few to common on ped faces and pore linings; few fine rootlets; clear and smooth |
| | 144-165 | V | Btkss | Very dark grayish-brown to very dark grayish-brown clay; moderate; hard; fine to medium angular blocky; clay films continuous and thick on ped faces, pore linings and bridges; slickensides; 3-5% CaCO3 filaments; very fine rootlets; clear and smooth |
| | 165-203 | VI | Btkb | Very dark grayish-brown clay; very strong; very hard; medium angular blocky; clay films thin and common on ped faces and pore linings; very few CaCO3 filaments; abundant snail shells; few fine rootlets; clear and irregular (West Fork Paleosol) |
| | 203-236 | VII | 2Btk | Dark brown clay; moderate; slightly hard; fine |

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| | | | | subangular blocky; few thin clay films on ped faces and pore linings; small filaments of CaCO3; abrupt and irregular |
| | 236-246 | VIII | B2Tk | Yellowish-brown clay; strong; hard to very hard; medium columnar; many clay films, moderately thick on ped faces and pore linings; 5% CaCO3 filaments; clear and smooth |
| | 246-283 | IX | B21tk | Dark yellowish-brown silty clay; strong; hard; fine angular blocky; clay films few to common and moderately thick on ped faces and pore linings; horizon boundary hard to interpret |
| | 283-304+ | X | 3Btss | Brown clay; very strong; hard; fine angular blocky; continuous and thick clay films on ped faces, pore linings and bridges; slickensides |
| 23 | 0-40 | I | C | Very dark grayish-brown to brown slightly silty clay; moderate; hard; fine subangular blocky; few thin clay films on ped faces and pore linings; abundant roots; clear and smooth |
| | 40-63 | II | C1 | Dark grayish-brown to brown silty clay; moderately weak; slightly hard; fine subangular blocky; clear and smooth |
| | 63-298+ | III | 2C | Laminae of unconsolidated silts and sands |
| 24 | 0-229 | I | C | Laminae of unconsolidated silts and sands |
| | 229-303+ | II | Bt | Very dark grayish-brown clay; strong; hard to very hard; fine to medium subangular blocky; many clay films, moderately thick on ped faces, pore linings and brides |
| 25 | 0-60 | I | A | Very dark grayish-brown (10YR3/2) clay; moderate; hard; fine subangular blocky; clay films common and moderately thick on ped faces and pore linings; abrupt and smooth |
| | 60-294+ | II | C | Laminae consisting of and containing pockets of silt and sand |

* Note Munsell Color Chart Numbers listed only first time used.

RECEIVED
2/19/09

# AR Consultants, Inc.

Archaeological and Environmental Consulting
11020 Audelia Road, Suite C105, Dallas, TX 75243
Phone: (214) 368-0478
Fax: (214) 221-1619
E-mail: arcdigz@aol.com

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January 9, 2009

DRAFT REPORT ACCEPTABLE
Please submit 20 final report copies.
for F. Lawerence Oaks
State Historic Preservation Officer
Date 2/13/09
Track#
By

Mr. Ed Baker, Archeologist
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

NO HISTORIC PROPERTIES AFFECTED
PROJECT MAY PROCEED
for F. Lawerence Oaks
State Historic Preservation Officer
Date 2/13/09
Track#

Dear Ed:

The City of Arlington through Republic Waste Management is proposing to expand the existing landfill capacity. The landfill is located just west of State Highway 157 (Collins Street) and north of the West Fork of the Trinity River and south of the existing railroad line that is situated at the north edge of the floodplain. Approximately 105 acres of the 194 is undisturbed and the 105 acres was tested by intensive pedestrian archaeological survey, shovel testing supplemented by augering and by backhoe trenching although the City of Arlington and Republic Waste Management maintain that they do not intend to utilize the study area. However, they decided that "due diligence" was required and the Archeology Division of the Texas Historical Commission issued Texas Antiquities Permit Number 5041 for the archaeological survey. The archaeological survey was conducted by AR Consultants, Inc. for KBA EnviroScience, Ltd. which is managing the environmental permitting for the City of Arlington and Republic Waste Management.

Enclosed is the draft report of the archaeological survey titled *Archaeological Survey within the City of Arlington Landfill, Tarrant County, Texas* for your review. During the survey, 25 backhoe trenches and 28 shovel tests were excavated. The survey resulted in the recording of three prehistoric shell lens middens and hearth sites (41TR227, 228 and 229). Sites 41TR227, 228 and 229 may be eligible for nomination to the National Register of Historic Places since their extent and content is not totally known. Should future excavation occur in the area, these sites should be investigated further.

However, since the City of Arlington and Republic Waste Management have maintained that there are no plans to excavate in the study area in the future, we make no other recommendations.

We request that the Archeology Division of the Texas Historical Commission concur with our recommendations.

If you have questions, please contact me at either 214.368.0478 or 214.769.0859.

Sincerely,

Jesse Todd, MS, MA
Senior Research Archaeologist

Encl.: draft copy of cultural resources report

# COORDINATION WITH
# TEXAS DEPARTMENT OF TRANSPORTATION

- Refer to Appendix I/IID for May 19, 2022, Request for Review Letter and Traffic Study

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# COORDINATION WITH
# TEXAS PARKS AND WILDLIFE DEPARTMENT

- January 12, 2022, TPWD Review Letter.
- December 1, 2021, WCG Request for Review Letter.

# JANUARY 12, 2022, TPWD REVIEW LETTER

TEXAS PARKS & WILDLIFE

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Carter P. Smith
Executive Director

January 12, 2022

Mr. Adam Hart
Republic Waste Services of Texas, Ltd.
City of Arlington Landfill
800 Mosier Valley Road
Euless, TX 76040

RE: City of Arlington Landfill Major Permit Amendment, Tarrant County

Dear Mr. Adam Hart:

Texas Parks and Wildlife Department (TPWD) has reviewed the Biological Assessment Report provided by Republic Waste Services of Texas, Ltd. (Republic) regarding the proposed reconfiguration of the City of Arlington Landfill.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see Texas Parks and Wildlife Code (PWC) section 12.0011. Please refer to TPWD project number 47935 in return correspondence regarding this project.

**Future Project Submittals**

*Electronic submittal:* For greater efficiency, TPWD Wildlife Habitat Assessment Program (WHAB) prefers that projects be submitted electronically to WHAB@tpwd.texas.gov. Projects submitted electronically receive a receipt that the project has been received by TPWD.

**Project Description**

Weaver Consultants Group, LLC is preparing a permit amendment application on behalf of Republic and the City of Arlington to expand the existing municipal solid waste landfill located in Tarrant County, Texas. The City of Arlington proposes to reconfigure the existing City of Arlington Landfill which will require relocation of Hurricane Creek to the west in order to combine two disposal areas that are separated by Hurricane Creek into one contiguous disposal area. Although the permit boundary will not be changed, the permitted limit of waste will change.

**TPWD Review**

As the state agency with primary responsibility for protecting the state's fish and wildlife resources, in accordance with the authority granted by Texas Parks and Wildlife Code (PWC) section 12.0011, TPWD provides the following comments and recommendations to minimize potential adverse impacts to the state's fish and wildlife resources, including rare, threatened and endangered species, in association with the proposed project.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800

www.tpwd.texas.gov

**Federal Law: Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling, purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts, or nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Within the project area, potential impacts to migratory birds may occur during disturbance of existing vegetation and bare ground that may harbor active bird nests, including nests that may occur in grass, shrubs and trees and on bare ground including gravel pads and roads.

> **Recommendation:** TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March 15 through September 15, to avoid adverse impacts to breeding birds. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends surveying the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. TPWD generally recommends a 150-foot buffer of vegetation remain around active nests until the eggs have hatched and the young have fledged; however, the size of the buffer zone depends on various factors and can be coordinated with the local or regional USFWS office.

Sky glow because of light pollution can have negative impacts on wildlife and ecosystems by disrupting natural diurnal and nocturnal behaviors such as migration, reproduction, nourishment, rest, and cover from predators.

> **Recommendation:** As bird protection measures, TPWD recommends designing the project's lighted areas to contain the minimum amount of permanent night-time lighting needed for safety and security. TPWD recommends minimizing the Project's contribution toward skyglow by focusing light downward, with full cutoff luminaries to avoid emitting light above the horizontal, and to use dark-sky friendly lighting that is illuminated only when needed, down-shielded, as bright as needed, and minimizes blue light emissions. Lighting technologies, beneficial management practices (BMP), and other dark sky resources can be found at the International Dark-Sky Association and McDonald Observatory websites.

**Federal Law: Clean Water Act**

Section 404 of the Clean Water Act (CWA) establishes a federal program to regulate the discharge of dredge and fill material into the waters of the U.S., including wetlands. The United States Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) are responsible for regulating water resources under this act. Although isolated wetlands may not be applicable to the USACE permitting process, both jurisdictional and non-jurisdictional waters play an essential role in providing habitat for wildlife and helping to protect water quality.

According to topographic maps, Hurricane Creek is a perennial stream that discharges to West Fork Trinity River at the southern permit boundary. The project submittal did not identify the Section 404 jurisdictional status of waters and wetlands to be impacted by the proposed project and did not provide the Section 404 Permit Number approving the proposed creek relocation. Project materials did not indicate a mitigation plan for impacts to waters of the U.S.

**Recommendation:** TPWD recommends avoiding development within streams and wetlands. Because the proposed project would have impacts to waterways or associated wetlands, the project must be coordinated with the Regulatory Branch of the Fort Worth District of the USACE at (817) 886-1731 pursuant to the CWA, including permitting, jurisdictional determinations, delineations, and mitigation. TPWD should be provided with the Section 404 permit information to ensure adequate protection of state fish and wildlife resources. Section 404 permit information should be submitted to Tom Heger, TPWD – Inland Fisheries Division at Tom.Heger@tpwd.texas.gov.

**Federal Law: Endangered Species Act**

Federally listed animal species and their habitat are protected from take on any property by the Endangered Species Act (ESA). Take of a federally listed species can be allowed if it is incidental to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Take of a federally listed species or its habitat without allowance from USFWS is a violation of the ESA. The Biological Assessment Report submitted with the project materials identified and assessed potential project impacts to the federally listed species that are identified as occurring in Tarrant County by the USFWS Information Planning and Consultation website and indicated that no impacts to federally listed species will occur due to the proposed project.

The Biological Assessment Report did not identify federal candidate species or species currently proposed for federal listing. Although ESA protections are not provided to candidate species or species proposed for listing, it is prudent to acknowledge these species when conducting sensitive resource assessments and to consider project actions to avoid or minimize potential impacts to the species.

In December 2020, the USFWS determined that ESA listing for the monarch butterfly (*Danaus plexippus*) was warranted; however, listing was precluded by higher priority listing actions. Currently, the monarch butterfly is a candidate for listing and the USFWS will review the species status annually until a proposal for listing is developed.

Significant declines in the population of migrating monarch butterflies have led to widespread concern about this species and other native insect pollinator species due to reductions in native floral resources. To support pollinators and migrating monarchs, TPWD encourages the establishment of native wildflower habitats on private and public lands. Establishing wildflower habitats in land reclamation of landfill sites can contribute to pollinator conservation and can provide habitat for a diverse community of pollinators, providing food, breeding, or nesting opportunities. By acting as refugia for pollinators in otherwise inhospitable landscapes, this habitat can contribute to the

maintenance of healthy ecosystems and provide ecological services. Resources regarding pollinators can be found on TPWD's Native Pollinator, Monarch Butterfly, and Pollinator Bioblitz webpages.

**Recommendation:** To contribute to pollinator conservation efforts, TPWD encourages Republic and the City of Arlington revegetate landfill areas with vegetation that provides habitat for monarch butterflies and other pollinator species. Species appropriate for the project area can be found by accessing the Lady Bird Johnson Wildflower Center, working with TPWD biologists to develop an appropriate list of species, or utilizing resources found at the Monarch Watch website or the Xerces Society's Guidelines webpage

In November 2021, the USFWS announced the alligator snapping turtle (*Macrochelys temminckii*) as proposed threatened, wherever found. The alligator snapping turtle is typically associated with deep water, using shallower water in early summer and transitioning to deeper water late summer through mid-winter. They spend most of their time in water except when nesting on land within 200 meters from water. The alligator snapping turtle is known to occur within the West Fork Trinity River adjacent to the project area. There is potential for the alligator snapping turtle to occur in Hurricane Creek and potential for the project to impact the alligator snapping turtle, which is also a state threatened species.

**Comment:** To ensure protection of the alligator snapping turtle, please refer to the sections below regarding *State Law: State listed Species* and *State Law: Aquatic Resources.* Data regarding the presence of alligator snapping turtles in Hurricane Creek resulting from site assessments or relocation activities should be provided to the USFWS– Arlington Ecological Services at (817) 277-1100 and TPWD.

**State Law: Chapter 64, Birds**

PWC section 64.002, regarding protection of nongame birds, provides that no person may catch, kill, injure, pursue, or possess a bird that is not a game bird. PWC section 64.003, regarding destroying nests or eggs, provides that, no person may destroy or take the nests, eggs, or young and any wild game bird, wild bird, or wild fowl.

**Recommendation:** To minimize potential impacts to avian species, please review the *Migratory Bird Treaty Act* section above for recommendations as they are also applicable for compliance with PWC.

**State Law: State Listed Species**

PWC regulates state listed threatened and endangered animal species. The capture, trap, take, or killing of state listed threatened and endangered animal species is unlawful unless expressly authorized under a permit issued by USFWS or TPWD. The TPWD online application identifying rare, threatened, and endangered species by county (RTEST) provides information regarding state listed threatened and endangered species with potential to occur within each county in Texas, as well as other rare species considered Species of Greatest Conservation Need (SGCN). The Biological Assessment Report indicates that TPWD RTEST was used to identify state listed

species potentially occurring in Tarrant County. However the Biological Assessment Report indicates the timber rattlesnake (*Crotalus horridus*) as state threatened. Please note the timber rattlesnake is no longer state threatened because it was delisted and is now considered SGCN.

TPWD also maintains location specific records of known occurrences for SGCN, threatened, and endangered species within the Texas Natural Diversity Database (TXNDD), and these data are available by request. A TPWD review of the TXNDD indicates known occurrences of the state listed threatened alligator snapping turtle adjacent to the permit boundary in West Fork Trinity River.

Please note that the TXNDD is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Please note that absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records. For questions regarding a record or to obtain digital data, please visit the TXNDD webpage for guidance.

Aquatic State Listed Threatened Species: The Biological Assessment Report indicates that habitat is not present, and no impact would occur to any state listed threatened aquatic species. However, the Biological Assessment Report did not investigate the impacts to aquatic resources that may occur due to relocation of Hurricane Creek and did not present information regarding surveys conducted within Hurricane Creek or characteristics of Hurricane Creek that eliminate it as habitat for state listed aquatic resources. Of concern to TPWD include potential impacts to state-listed threatened alligator snapping turtle, sandbank pocketbook (*Lampsilis satura*), Louisiana pigtoe (*Pleurobema riddellii*), and Texas heelsplitter (*Potamilus amphichaenus*), as well as common native aquatic wildlife that are subject to other state law regarding aquatic resources. Project activities involving work within streams and dewatering activities may impact state listed aquatic resources if occurring within the project area.

> **Recommendation:** TPWD recommends Republic and the City of Arlington protect state listed threatened aquatic resources during construction activities. Because the proposed project would require work within Hurricane Creek, the project should be coordinated with the TPWD Kills and Spills Team (KAST) for appropriate authorization and to ensure protection of native aquatic wildlife, see *Aquatic Resources* section below for more information.

**State Law: Aquatic Resources**

PWC section 1.011 grants TPWD authority to regulate and conserve aquatic animal life of public waters. Texas Administrative Code (TAC) section 57.157 regulates take of mussels, including mussels that are not state listed. TPWD regulates the introduction

and stocking of fish, shellfish, and aquatic plants into public waters of the state under PWC 12.015, 12.019, and 66.015 and TAC 52.101-52.105, 52.202, and 57.251-57.259.

Dewatering activities can impact aquatic resources through stranding fish and mussels. Other harmful construction activities can trample, dredge or fill areas exhibiting stationary aquatic resources such as plants and mussels. Relocating aquatic life to an area of suitable habitat outside the project footprint avoids or reduces impacts to aquatic life. Relocation activities are done under the authority of a TPWD *Permit to Introduce Fish, Shellfish or Aquatic Plants into Public Waters* with an approved Aquatic Resource Relocation Plans (ARRP). The permit allows for movement (i.e., introduction, stocking, transplant, relocation) of aquatic species in waters of the state. ARRPs are used to plan resource handling activities and assist in the permitting process. If dewatering activities and other project related activities cause mortality to fish and wildlife species, then the responsible party would be subject to investigation by the TPWD KAST and will be liable for the value of lost resources under the authority of PWC sections 12.0011 (b) (1) and 12.301.

**Recommendation:** TPWD recommends that impact avoidance measures for aquatic organisms, including all native fish and freshwater mussel species, regardless of state listing status, be considered during project planning and construction activities.

**Recommendation:** When dewatering, excavating, filling, or trampling activities are involved in project activities or affecting Hurricane Creek, TPWD recommends relocating native aquatic resources, including fish, mussels, and alligator snapping turtles, in conjunction with a *Permit to Introduce Fish, Shellfish or Aquatic Plants into Public Waters* and an ARRP. The ARRP should approved by the department 30 days prior to activity within project waters or resource relocation and submitted with an application for a no-cost permit. ARRPs can be submitted to Bregan Brown TPWD Region 2 KAST available at Kirian.Brown@tpwd.texas.gov and 903-566-2518.

Project materials do not describe the sediment control plan for runoff water during operation from the landfill site prior to establishment of final vegetative cover.

**Recommendation:** Until permanent vegetative cover is established, surface runoff water should pass through on-site sediment catchment basins prior to discharge to Hurricane Creek.

**State Law: Stream Disturbance Permits**

A permit under PWC chapter 86 may be required for disturbance of marl, sand, gravel, shell or mudshell within streams of the state. Information regarding such permits can be found on the TPWD website.

**Recommendation:** Because Hurricane Creek is proposed for disturbance, Republic and the City of Arlington should contact Tom Heger, TPWD – Inland Fisheries Division at Tom.Heger@tpwd.texas.gov to determine if a TPWD *Marl,*

*Sand, Gravel, Shell, and Mudshell Permit* is needed for the proposed project and for permit application forms and additional information.

**State Law: Aquatic Invasive Species**

Per TAC chapter 57, it is an offense for any person to possess, transport, or release into the water of this state any species, hybrid of a species, subspecies, eggs, seeds, or any part of any species defined as a harmful or potentially harmful exotic fish, shellfish, or aquatic plant. This rule applies not only to zebra mussels (*Dreissena polymorpha*) (live or dead) and their larvae but also to any species or fragments thereof designated as harmful or potentially harmful under this subchapter (e.g., giant salvinia, hydrilla, Eurasian watermilfoil). The full list of prohibited species can be found on the TPWD webpage regarding prohibited aquatic species.

Because the proposed project involves work within a stream, equipment and other vehicles coming in contact with surface waters could transport aquatic invasive species where mud, plant debris, or water accumulate.

**Recommendation:** TPWD recommends preparing and following an aquatic invasive species (AIS) transfer prevention plan which outlines BMP for preventing inadvertent transfer of aquatic invasive plants and animals on project equipment and materials. To minimize the risk of transporting aquatic invasive species, TPWD recommends Republic and its contractors review and adhere to the AIS BMP identified in the ARRP guidelines packet and the *TPWD Clean/Drain/Dry Procedures and Zebra Mussel Decontamination Procedures for Contractors Working in Inland Public Waters.*

**Species of Greatest Conservation Need**

In addition to federal and state listed species, TPWD tracks SGCN and natural plant communities and actively promotes their conservation. TPWD considers it important to evaluate and, if feasible, minimize impacts to SGCN and their habitat to reduce the likelihood of endangerment and preclude the need to list as threatened or endangered in the future.

RTEST identifies the following SGCN flora and fauna with potential to occur in Tarrant County. These species could be impacted due to construction, operation, and maintenance activities if suitable habitat or the species occur at the project site. General habitat descriptions for these species are included on the RTEST list:

| Taxon | Scientific Name | Common Name | GRank[1] | SRank[2] |
|---|---|---|---|---|
| Amphibians | Anaxyrus woodhousii | Woodhouse's toad | G5 | SU |
| Amphibians | Pseudacris streckeri | Strecker's chorus frog | G5 | S3 |
| Birds | Haliaeetus leucocephalus | bald eagle | G5 | S3B,S3N |
| Birds | Charadrius montanus | mountain plover | G3 | S2 |
| Birds | Leucophaeus pipixcan | Franklin's gull | G5 | S2N |

| | | | | |
|---|---|---|---|---|
| Birds | Sternula antillarum athalassos | interior least tern | G4T3Q | S1B |
| Birds | Athene cunicularia hypugaea | western burrowing owl | G4T4 | S2 |
| Birds | Calamospiza melanocorys | Lark Bunting | G5 | S4B |
| Birds | Calcarius ornatus | Chestnut-collared Longspur | G5 | S3 |
| Fish | Hybognathus nuchalis | Mississippi silvery minnow | G5 | S4 |
| Mammals | Myotis velifer | cave myotis bat | G4G5 | S2S3 |
| Mammals | Perimyotis subflavus | tricolored bat | G2G3 | S2 |
| Mammals | Eptesicus fuscus | big brown bat | G5 | S5 |
| Mammals | Lasiurus borealis | eastern red bat | G3G4 | S4 |
| Mammals | Lasiurus cinereus | hoary bat | G3G4 | S4 |
| Mammals | Nyctinomops macrotis | big free-tailed bat | G5 | S3 |
| Mammals | Sylvilagus aquaticus | swamp rabbit | G5 | S5 |
| Mammals | Cynomys ludovicianus | black-tailed prairie dog | G4 | S3 |
| Mammals | Ondatra zibethicus | Muskrat | G5 | S5 |
| Mammals | Mustela frenata | long-tailed weasel | G5 | S5 |
| Mammals | Spilogale putorius | eastern spotted skunk | G4 | S1S3 |
| Mammals | Conepatus leuconotus | western hog-nosed skunk | G4 | S4 |
| Mammals | Puma concolor | mountain lion | G5 | S2S3 |
| Reptiles | Deirochelys reticularia miaria | western chicken turtle | G5T5 | S2S3 |
| Reptiles | Terrapene carolina | eastern box turtle | G5 | S3 |
| Reptiles | Terrapene ornata | western box turtle | G5 | S3 |
| Reptiles | Apalone mutica | smooth softshell | G5 | S3 |
| Reptiles | Ophisaurus attenuatus | slender glass lizard | G5 | S3 |
| Reptiles | Plestiodon septentrionalis | Prairie Skink | G5 | S5 |
| Reptiles | Thamnophis sirtalis | common garter snake | G5 | S2 |
| Reptiles | Thamnophis sirtalis annectens | Texas garter snake | G5T4 | S1 |
| Reptiles | Crotalus horridus | timber (canebrake) rattlesnake | G4 | S4 |
| Reptiles | Sistrurus tergeminus | western massasauga | G3G4 | S3 |
| Insects | Bombus pensylvanicus | American bumblebee | G3G4 | SNR |
| Insects | Pogonomyrmex comanche | Comanche harvester ant | G2G3 | S2 |
| Plants | Echinacea atrorubens | Topeka purple-coneflower | G3 | S3 |

| | | | | |
|---|---|---|---|---|
| Plants | Physaria engelmannii | Engelmann's bladderpod | G4 | S3 |
| Plants | Astragalus reflexus | Texas milk vetch | G3 | S3 |
| Plants | Dalea hallii | Hall's prairie clover | G3 | S2 |
| Plants | Pediomelum reverchonii | Reverchon's scurfpea | G3 | S3 |
| Plants | Crataegus viridis var. glabriuscula | Sutherland hawthorn | G5T3T4 | S3 |
| Plants | Agalinis auriculata | earleaf false foxglove | G3 | SH |
| Plants | Agalinis densiflora | Osage Plains false foxglove | G3 | S2 |
| Plants | Yucca necopina | Glen Rose yucca | G1G2 | S3 |
| Plants | Carex shinnersii | Shinner's sedge | G3 | S2 |

[1]GRank is the NatureServe global conservation status rank.
[2]SRank is the NatureServe subnational or state level conservation status rank.
See NatureServe's website for specific global and state ranking definitions.

The Biological Assessment Report did not include potential SGCN that may occur within the project site. The primary native habitats proposed for impact at the project site include wetlands, Hurricane Creek, and associated riparian habitats. The TXNDD indicates known occurrences of eastern box turtles and eastern spotted skunks less than one mile from the project site.

**Recommendation:** TPWD recommends that precautions be taken to avoid impacts to SGCN flora and fauna when planning the project and if encountered in the project area during construction or operation activities. TPWD also recommends the implementation of the following BMP to avoid or minimize potential impacts to wildlife resources potentially occurring at the construction site:

1. TPWD recommends informing employees and contractors of the potential for state-listed threatened species or SGCN to occur in the project area. Contractors should be advised to avoid impacts to all wildlife that are encountered.

2. Wildlife observed during construction should be allowed to safely leave the site or be translocated by a permitted individual to a nearby area with similar habitat that would not be disturbed during construction. TPWD recommends that any translocations of reptiles be the minimum distance possible no greater than one mile, preferably within 100-200 yards from the initial encounter location. For purposes of relocation, surveys, monitoring, and research, terrestrial state listed species may only be handled after obtaining authorization through the TPWD Wildlife Permits Office. TPWD recommends that consultants obtain such authorization and serve as on-site biological monitors if encounters of state listed threatened terrestrial wildlife are likely.

3. Small vertebrates including snakes, lizards, toads, and mice fall into trenches and become trapped. Wildlife unable to escape from trenches are susceptible to loss from backfilling activities, exposure to elements, starvation, dehydration, and predation by other wildlife. Where trenching or other excavation is involved,

TPWD recommends minimizing the length of trenches left open at any given time during construction. Trenches left open for more than two daylight hours should be inspected for the presence of trapped wildlife prior to backfilling. If trenches cannot be backfilled the day of initial trenching, then escape ramps, in the form of short lateral trenches or wooden planks sloping to the surface at an angle of less than 45 degrees, should be installed at least every 90 meters.

4. For soil stabilization and revegetation of disturbed areas within the proposed project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Hydromulch containing plastic ingredients and plastic mesh matting should be avoided.

5. To aid in the scientific knowledge of a species' status and current range, TPWD encourages reporting encounters of protected and rare species to the TXNDD according to the data submittal instructions found at the TPWD Texas Natural Diversity Database: Submit Data webpage. An additional method for reporting observations of species is through the iNaturalist community app where plant and animal observations are uploaded from a smartphone. The observer then selects to add the observation to specific TPWD Texas Nature Tracker Projects appropriate for the taxa observed, including Herps of Texas, Birds of Texas, Texas Eagle Nests, Texas Whooper Watch, Mammals of Texas, Rare Plants of Texas, Bees & Wasps of Texas, Terrestrial Mollusks of Texas, Texas Freshwater Mussels, Fishes of Texas, and All Texas Nature.

TPWD appreciates the opportunity to provide input on the proposed project. Thank you for considering the fish and wildlife resources of Texas. If you have any questions, please contact me at Karen.Hardin@tpwd.texas.gov or (903) 322-5001.

Sincerely,

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/47935

# DECEMBER 1, 2021, WCG REQUEST FOR REVIEW LETTER

REPUBLIC SERVICES

City of Arlington Landfill – 800 Mosier Valley Road, Euless, TX 76040
o 817-317-2047 m 903-539-4065 republicservices.com

December 1, 2021

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 City of Arlington Landfill Major Permit Amendment
Tarrant 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 is preparing a permit amendment application on behalf of Republic Waste Services of Texas, Ltd. and the City of Arlington to expand the existing municipal solid waste landfill located in Tarrant County, Texas. 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 Weaver Consultants Group, LLC in November 2021.

The site has operated as a landfill for over 40 years. As discussed in the attached assessment report, the site does not provide habitat for and would not likely be occupied by any federally listed and state listed threatened and endangered species.

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 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,
**Republic Waste Services of Texas, Ltd.**

Adam Hart
Environmental Manager – South Area

Attachment: Attachment 1 – Project Summary and Site Location Maps
Attachment 2 – Biological Assessment Report

cc: Ryne J. Spicer, P.E., Weaver Consultants Group, LLC

# ATTACHMENT 1

# PROJECT SUMMARY AND SITE LOCATION MAPS

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

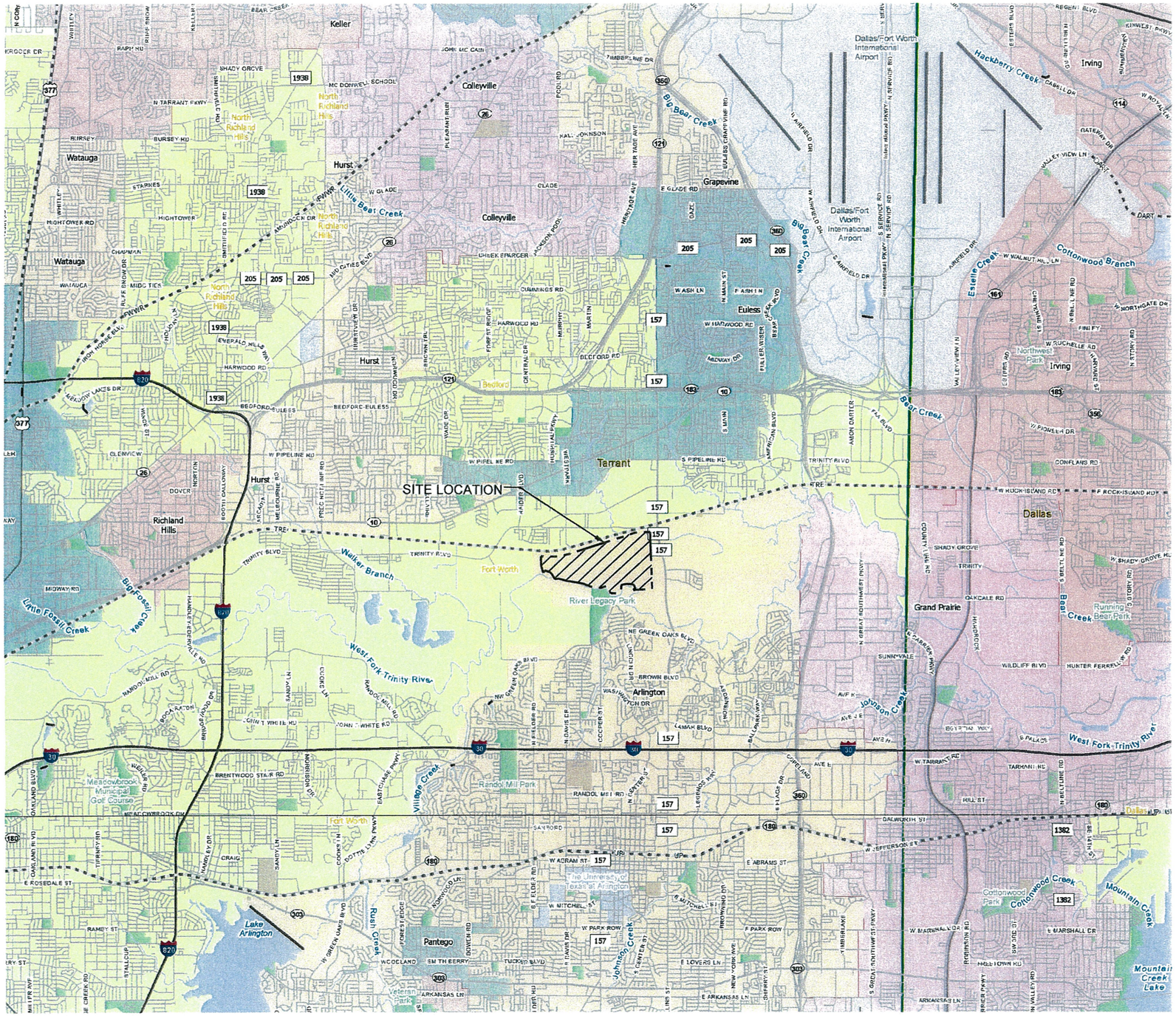
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.




LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 1-SITE LOC.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

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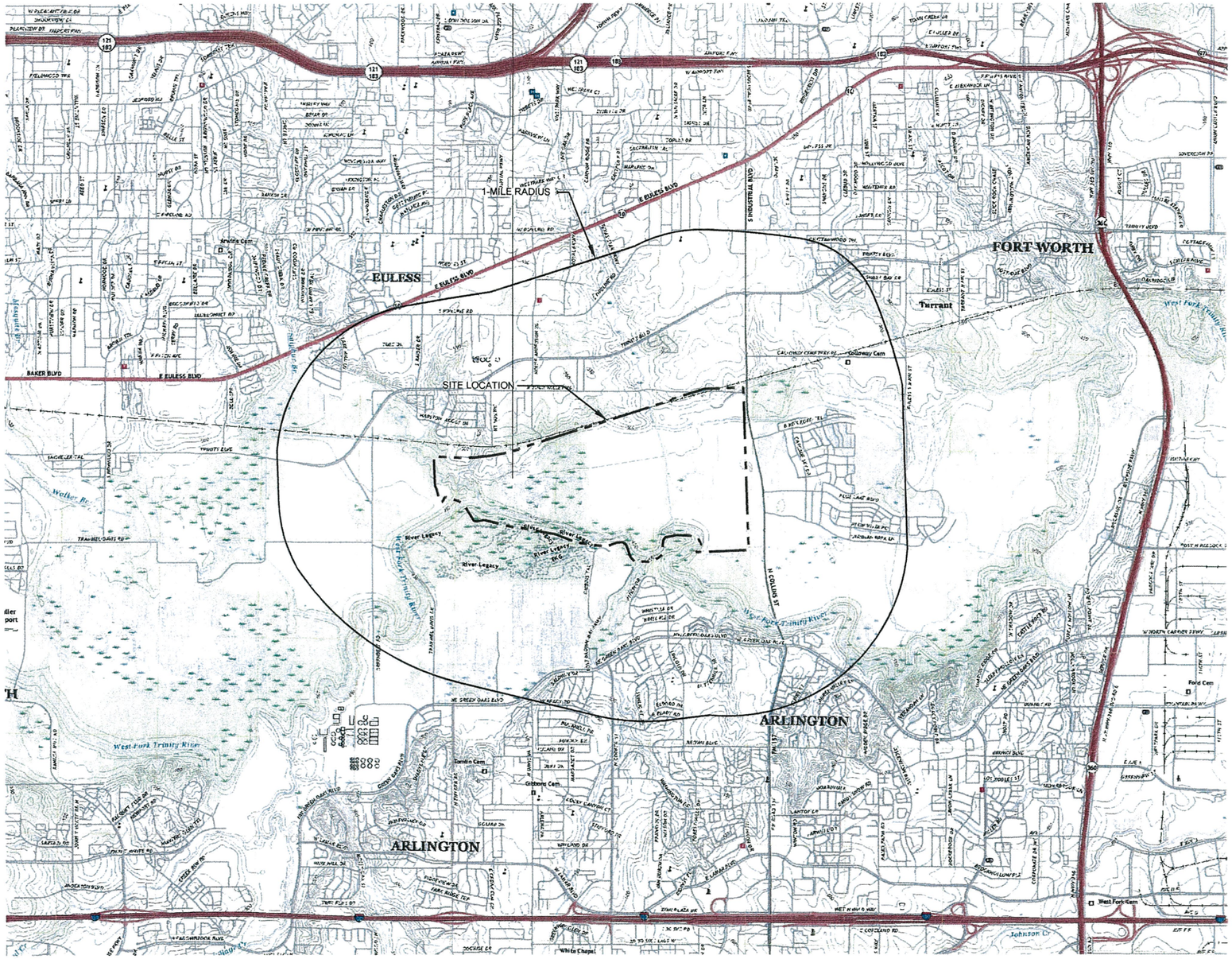


N

0 2000 4000

SCALE IN FEET

LEGEND

ROAD CLASSIFICATION

| | |
|---|---|
| Expressway | Local Connector |
| Secondary Hwy | Local Road |
| Ramp | 4WD |

Interstate Route | US Route | State Route

PERMITTED PERMIT BOUNDARY

EULESS, TX
2019

HURST, TX
2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JOW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
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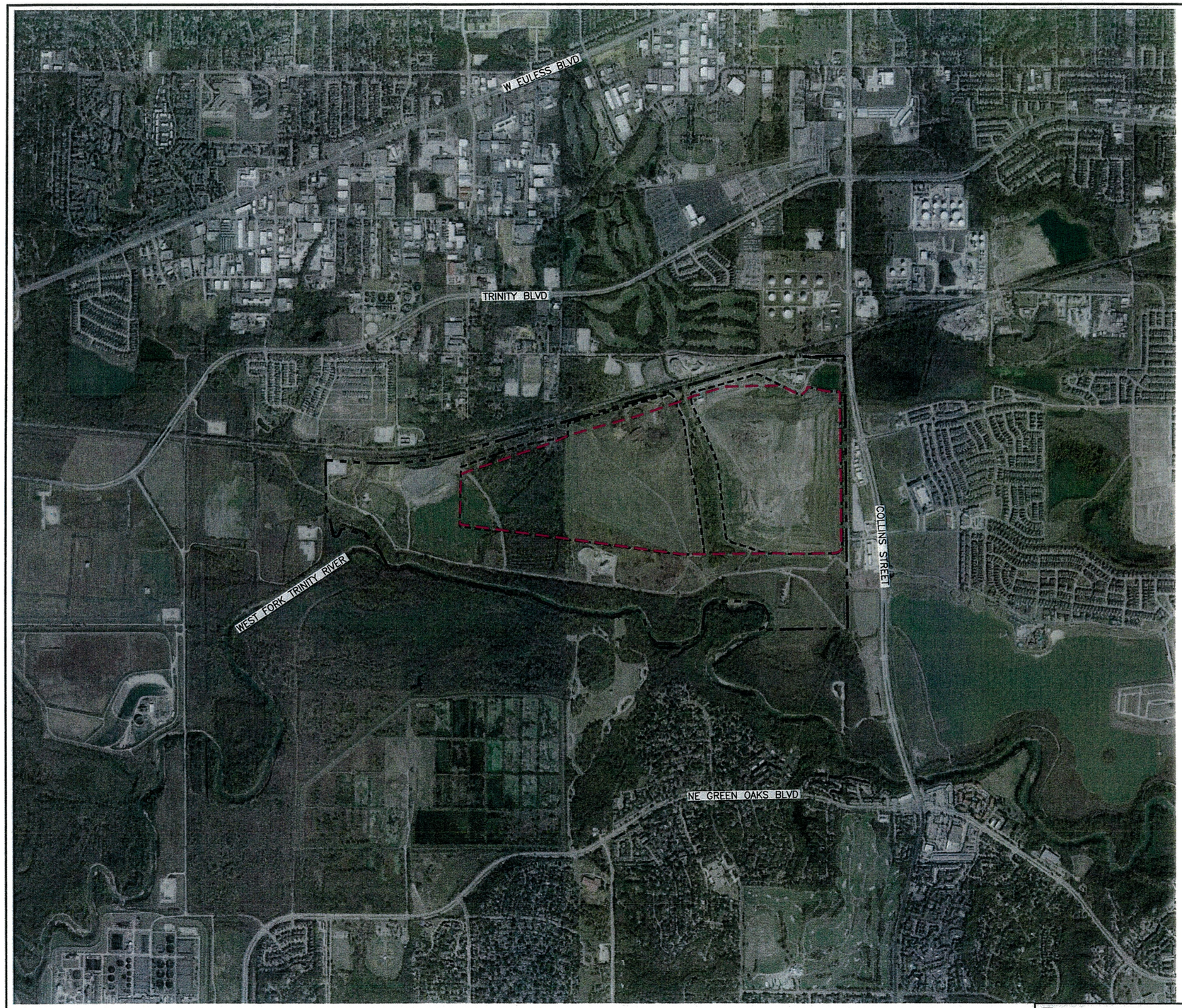
# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 2

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0 1000 2000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
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# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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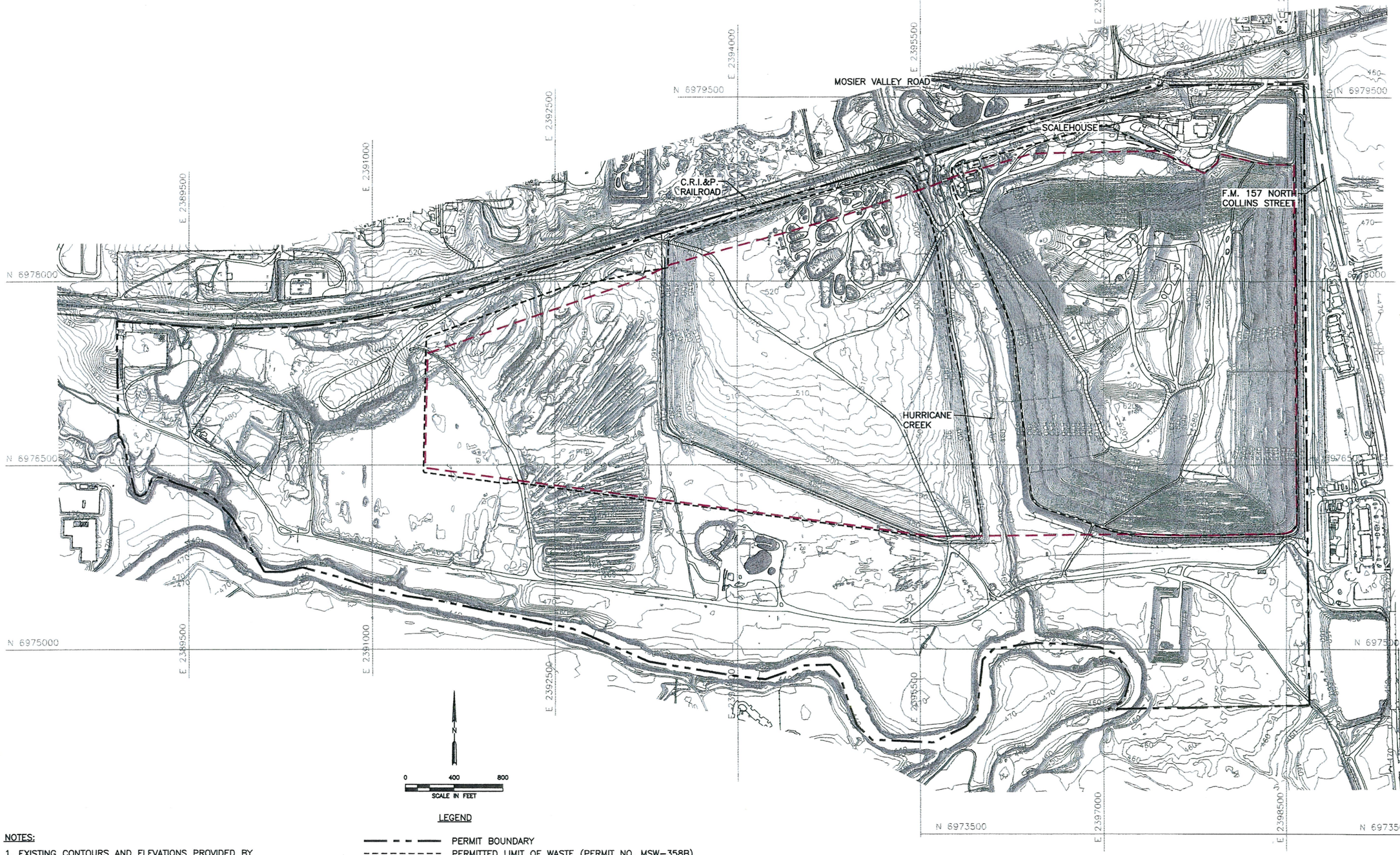
FIGURE 3




LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
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# SITE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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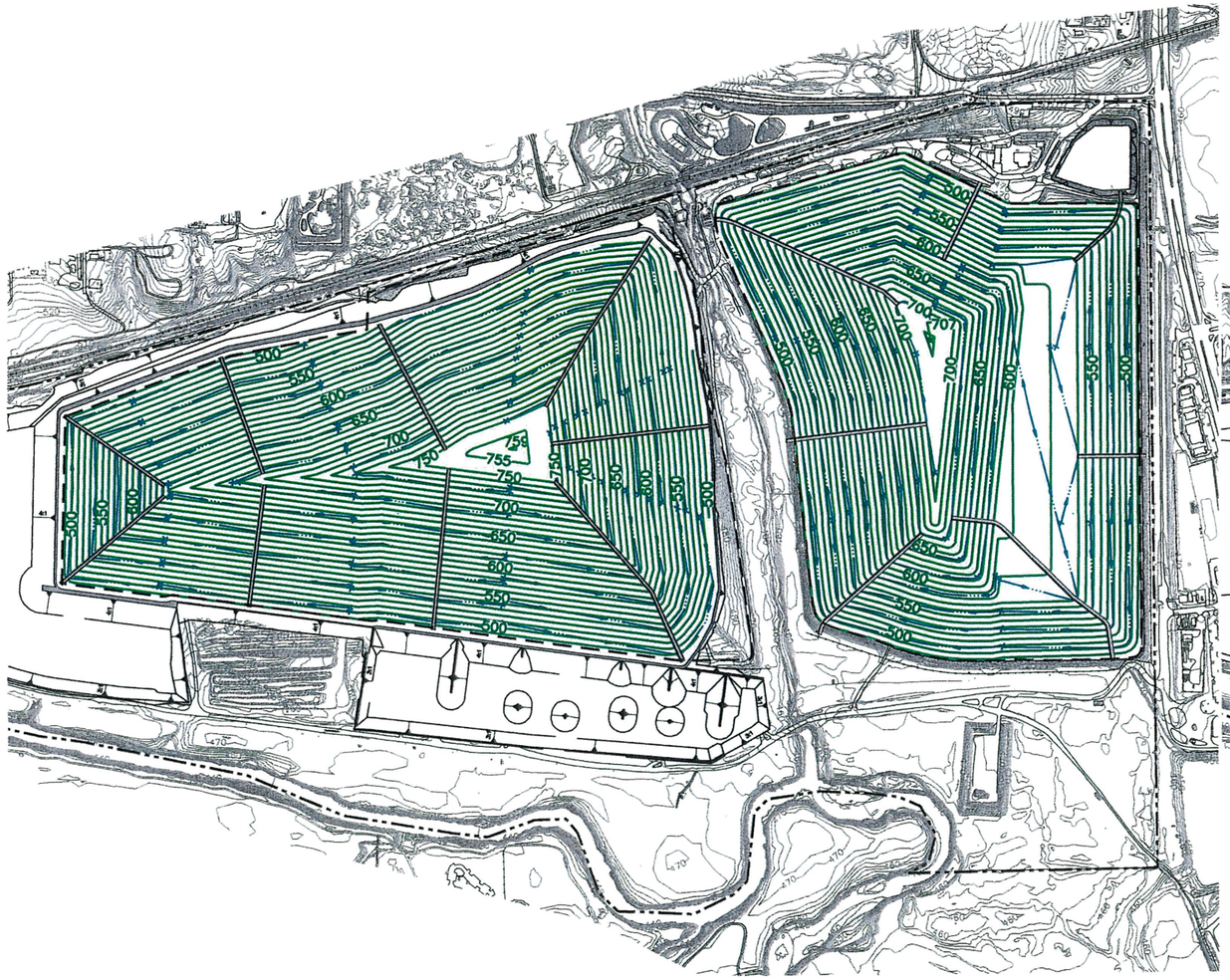
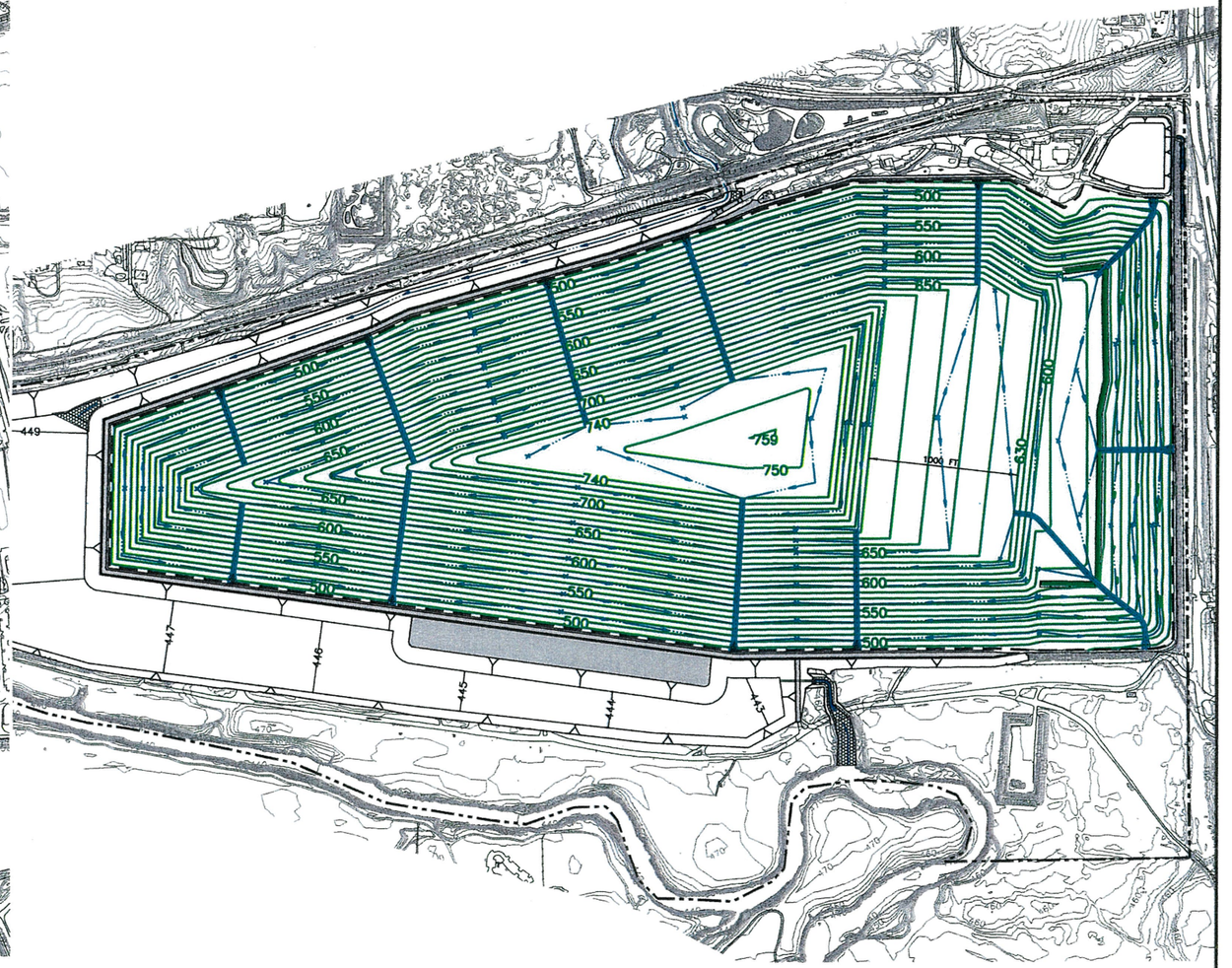
FIGURE 4

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\4-SITE PLAN.dwg, rarrington, 1:2




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN

N

0 500 1000
SCALE IN FEET

**GENERAL INFORMATION**

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW–358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW–358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT–MSL) | 740 (FT–MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT–MSL) | 759 (FT–MSL) |
| BUFFER AREA | 391.6 ACRES | 383.8 ACRES |



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CAD: 5–FINAL COVER COMPARISON.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

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# EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE 5

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# ATTACHMENT 2

# BIOLOGICAL ASSESSMENT REPORT

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

# BIOLOGICAL ASSESSMENT REPORT FOR PROPOSED CITY OF ARLINGTON LANDFILL RECONFIGURATION

Prepared for

City of Arlington
And
Republic Waste Services of Texas, Ltd.

December 2021

Prepared by

**Weaver Consultants Group, LLC**
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0023-404-11-95

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| 5 | CONCLUSIONS | 5 |
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# 1 INTRODUCTION

The purpose of this document is to assess the effects of the proposed City of Arlington Landfill reconfiguration on federal- and state-listed threatened and endangered species that may occur in the project area. The City of Arlington Landfill is located in Tarrant County, Texas, on the west side State Highway 157 in the City of Arlington.

# 2 HABITAT DESCRIPTION

The project is located at the boundary between the Cross Timbers and Prairies and Blackland Prairies ecoregions of Texas (Diggs, G.M., Jr., et al., 2006; Correll and Johnston, 1979). Land use in the Cross Timbers and Prairies is variable but is dominated by urban development with a mixture of ranching and farming. The dominant grasses are little bluestem (*Schizachyrium scoparium* var. *frequens*), big bluestem (*Andropogon gerardi*), Indian grass (*Sorghastrum avenaceum*), switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), tall dropseed (*Sporobolus asper*), Texas wintergrass (*Stipa leucotricha*). Brush species and weedy annuals/perennials have invaded the area.

Land use in the Blackland Prairies ecoregion is variable, with a mixture of ranching and farming. The climax vegetation communities consist of herbaceous species dominated by little bluestem but with other species such as big bluestem, Indian grass, switchgrass, hairy grama, tall dropseed, and side-oats grama present as well. Tree species consist of post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), other oak species, cedar elm (*Ulmus crassifolia*), pecan (*Carya illinoinensis*), bois d'arc (*Maclura pomifera*), and mesquite (*Prosopis glandulosa*).

Vegetation observed during field visits consisted of cottonwood (*Populus deltoids*), cedar elm, green ash (*Fraxinus pennsylvanica*), sugar hackberry (*Celtis laevigata*), giant ragweed (*Ambrosia trifida*), southern dewberry (*Rubus trivialis*), Johnsongrass (*Sorghum halepense*), Bermudagrass (*Cynodon dactylon*), partridge pea (*Chamaecrista* fasciculata), common broomweed (*Gutierrezia dracunculoides*), sumpweed (*Iva annua*), and other species indicative of the region as well as disturbed areas.

# 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 Tarrant County.

The USFWS lists one endangered species and two threatened species as occurring in Tarrant County (**Table 1**). No critical habitat for any federally threatened or endangered species occurs in the project area.

In addition to federally listed species, the TPWD lists one endangered species and 10 threatened species as occurring in Tarrant County (**Table 1**).

# 4 SPECIES DESCRIPTIONS

The piping plover and red knot should be considered only for wind energy projects within the migratory route of these species. The whooping crane and is considered migratory through this area. Although migratory species occasionally stop over at points along their migratory routes, use of the project area would be highly unlikely due to the current land uses of the site.

Habitat for the black rail and white-faced ibis is not present on the site. Therefore, the proposed project would have no impact on these two species.

The black bear is not expected to occur in the region. The proposed project would not impact this species.

Three mollusks are state-listed as threatened and include the Louisiana pigtoe, sandback pocketbook, and Texas heelsplitter. Appropriate habitat was not found within the project area.

The alligator snapping turtle is a state-listed species that is considered as potentially occurring in Tarrant County. Appropriate 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 Tarrant County, nor has critical habitat been designated in the project area for any threatened and endangered species. The landfill reconfiguration 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, M.D. Reed, and R.J. O'Kennon. 2006. *Illustrated Flora of East Texas.* Botanical Research Institute of Texas and Austin College. Fort Worth, Texas.

# ATTACHMENT A

# TABLE 1 – LIST OF THREATENED AND ENDANGERED SPECIES POTENTIALLY OCCURRING IN TARRANT COUNTY

# THREATENED & ENDANGERED SPECIES TABLE

## Table 1

### Possible Effects To Listed Species Potentially Occurring Within The Project Area (Tarrant County, Texas)

| Common Name *(Scientific Name)* | State Status | Federal Status | Description of Suitable Habitat | Unique, Critical, or Designated Habitat | Effects Discussion |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| Black Rail (*Laterallus jamaicensis*) | T | T | 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*. | No | No impact; habitat not present |
| Piping Plover (*Charadrius melodus*) | T | T | Found on sandy lakeshores, dunes and beaches | 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 |
| 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 |
| **Mammals** | | | | | |
| Black Bear (*Ursus americanus*) | T | Not listed | Found within bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas. | No | No impact; habitat not present |
| **Mollusks** | | | | | |
| Louisiana Pigtoe (*Pleurobema riddellii*) | T | | Found in streams and moderate-size rivers, usually in flowing water on substrates of mud, sand, and gravel; not generally found in impoundments; Neches, Sabine, and Trinity river basins | No | No impact; habitat not present |
| Sandbank Pocketbook (*Lampsilis satura*) | T | Not listed | Found in small streams and large rivers in slow to moderate current in sandy mud to sand and gravel substrate. | No | No impact; habitat not present |
| Texas Heelsplitter (*Potamilus amphichaenus*) | T | | Found in stream with quiet waters in mud or sand and also in reservoirs; Neches, Sabine and Trinity river basins | No | No impact; habitat not present |

## Table 1 (Continued)

## Possible Effects to Listed Species Potentially Occurring Within the Project Area (Tarrant County, Texas)

| Common Name *(Scientific Name)* | State Status | Federal Status | Description of Suitable Habitat | Unique, Critical, or Designated Habitat | Effects Discussion |
|---|---|---|---|---|---|
| **Reptiles** | | | | | |
| Alligator Snapping Turtle (*Macrochelys temminckii*) | T | | Found in perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; usually in water with mud bottom and abundant aquatic vegetation | No | No impact to the species as a whole |
| 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 |
| Timber Rattlesnake (*Crotalus horridus*) | T | | Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground cover | No | No impact |

Note:

E – Endangered T – Threatened DL – Delisted Taxon, recovered, being monitored first five years

# COORDINATION WITH
# U.S. ARMY CORPS OF ENGINEERS

- May 16, 2022, WCG Request for Changes to Project Number SWF-2010-0056 Letter.

# MAY 16, 2022, WCG REQUEST FOR CHANGES TO PROJECT NUMBER SWF-2010-00056 LETTER

Weaver Consultants Group

May 16, 2022

Mr. Neil Lebsock
Branch Chief, Compliance & Enforcement Branch
Fort Worth District
U.S. Army Corps of Engineers
819 Taylor Street, Room 3A37
P.O. Box 17300
Fort Worth, Texas 76102-0300

Re: Request for Changes to Project Number SWF-2010-00056
City of Arlington Landfill
Tarrant County, Texas

Dear Mr. Lebsock:

The purpose of this letter is to demonstrate coordination with the U.S. Army Corps of Engineers (USACE), consistent with Title 30 Texas Administrative Code (TAC) §330.61(m)(2). This regulation requires that a permit applicant for an expansion of a municipal solid waste facility demonstrate that the facility has a USACE permit for use of any wetlands areas and identify wetlands located within the facility boundary.

Weaver Consultants Group is preparing a permit amendment application on behalf of the City of Arlington (Applicant and Owner) and Republic Waste Services of Texas, Ltd. (Authorized Agent and Operator) to reconfigure the existing City of Arlington Landfill located in Tarrant County, Texas. A comparison of the existing and proposed post-development landfill completion plan is presented in Attachment 1. A project summary is presented in Attachment 2. The following subsections provides an overview of the existing permit and proposed changes for Project Number SWF-2010-00056.

**Existing Permit Information (Project Number SWF-2010-00056)**

The permit was issued on November 21, 2014, authorizing the permanent filling and excavation of approximately 86 acres of water of the U.S. associated with the City of Arlington Landfill Expansion Project (TCEQ Permit No. 358B). The permit associated with Project Number SWF-2010-00056 is included in Attachment 3. The jurisdictional waters were formed during previous sand and gravel mining operations. Excerpts from the original delineation, prepared by KBA EnviroScience, Ltd., is included in Attachment 4.

**Proposed Changes to Project Number SWF-2010-00056**

- Additional Impacts – The proposed post-development condition of the landfill will require (1) excavation of additional waters of the U.S. previously delineated as forested wetland and open water and (2) relocation of Hurricane Creek. These areas are shown in Attachment 1.

- Off-Site Mitigation – The existing project conditions authorized a combination of both on-site and off-site mitigation. The proposed changes would require purchasing mitigation bank credits only in lieu of on-site mitigation.

We would like to set up a meeting to discuss (1) assignment of a new USACE project manager and (2) amending the permit to reflect additional impacts and off-site mitigation, as described above.

Your assistance with this matter is sincerely appreciated. Please feel free to contact me at 817-946-7379 (mobile) or pmckone@wcgrp.com (email) to discuss.

Sincerely,
**Weaver Consultants Group, LLC**

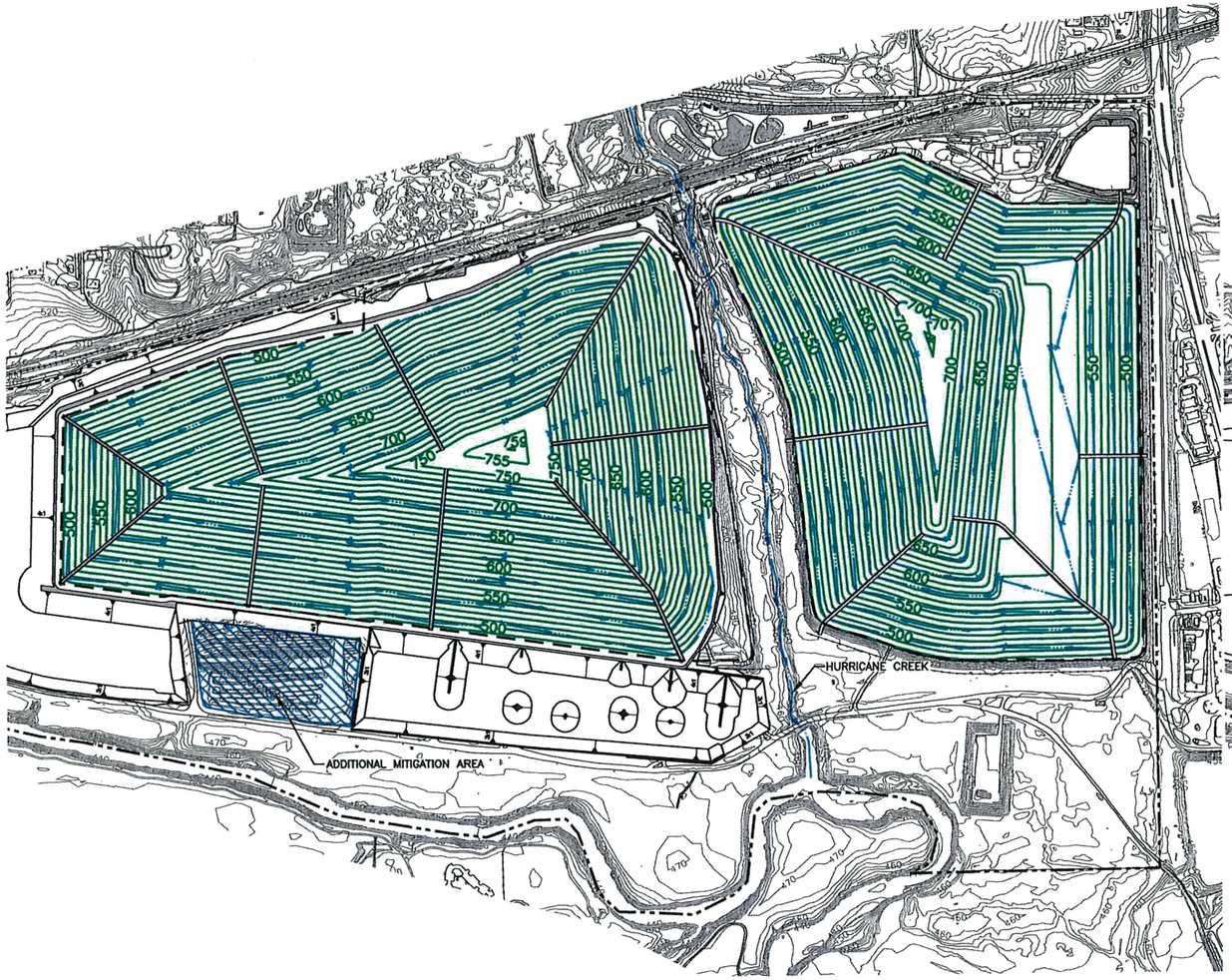
Peter D. McKone, CWB
Senior Project Director

Attachments: Attachment 1: Post-Development Comparison Map
Attachment 2: Project Summary and Site Location Maps
Attachment 3: Existing Permit (Project Number SWF-2010-00056)
Attachment 4: Excerpts from Previous Investigation

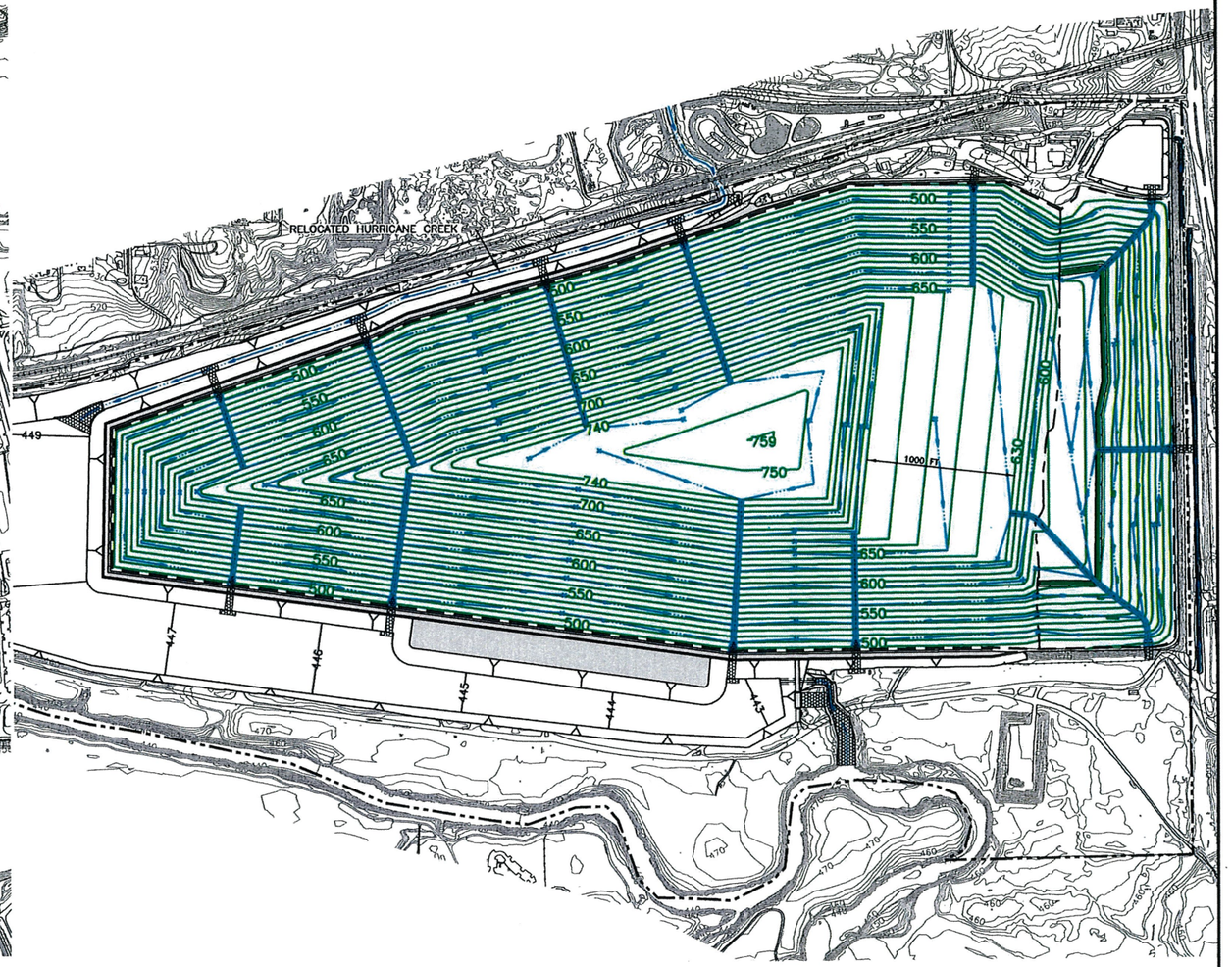
cc: Adam Hart, Environmental Manager, Republic Services
Sunanda Katragadda, Environmental Administrator, City of Arlington
Jason Edwards, P.E., Weaver Consultants Group
Ryne Spicer, P.E., Weaver Consultants Group

# ATTACHMENT 1

# POST-DEVELOPMENT COMPARISON MAP




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN
- ADDITIONAL MITIGATION AREA

N

0 500 1000
SCALE IN FEET

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FILE: 0023–404–11
CAD: 1–COMPARISON.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

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# EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE 1



P:\Solid waste\Republic\Arlington\Expansion 2020\USACE\Initial Coordination\1-COMPARISON MAP.dwg, rspicer, 1:2

# ATTACHMENT 2

# PROJECT SUMMARY AND SITE LOCATION MAPS

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

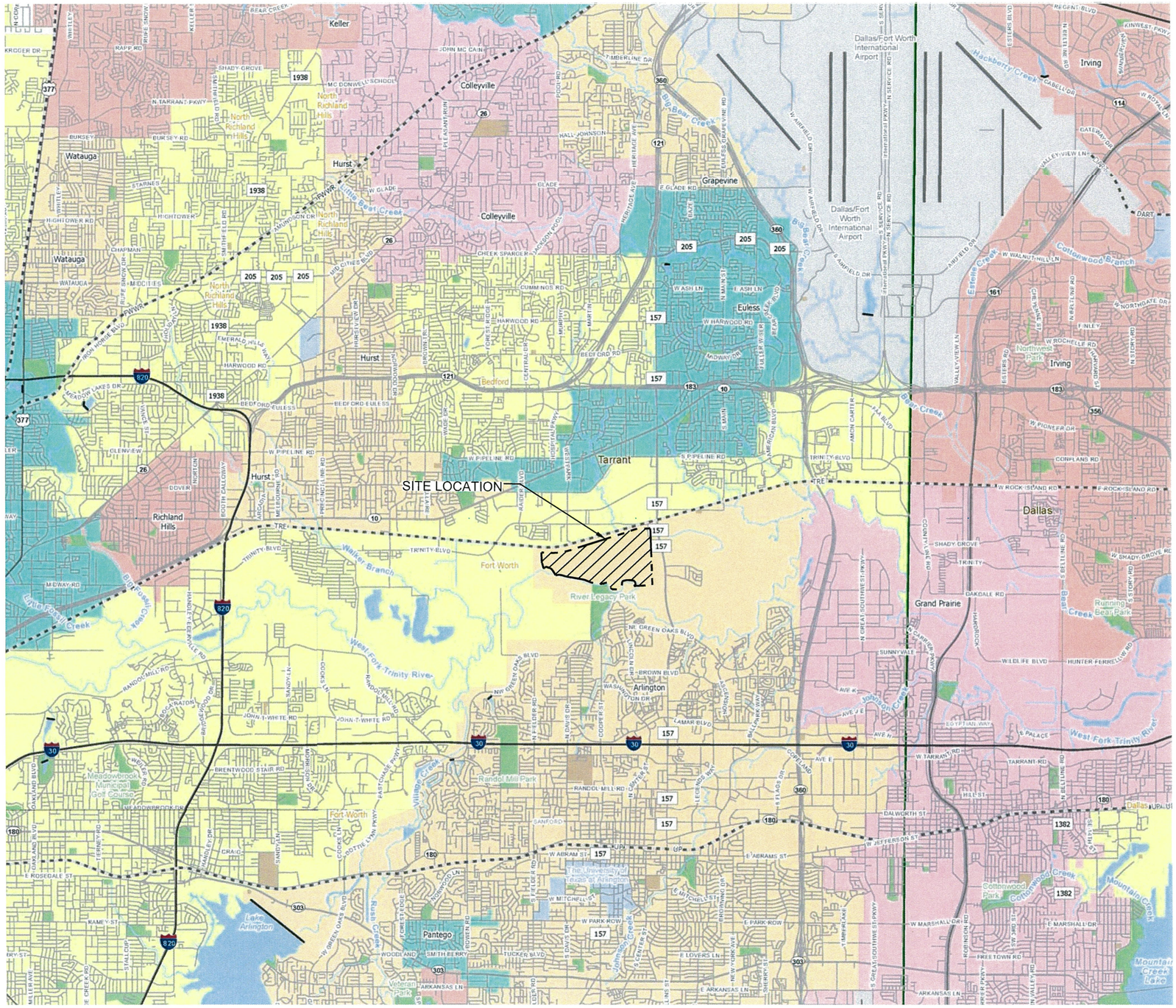
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington 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

SCALE IN MILES

N

LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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FILE: 0023-404-11
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DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

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# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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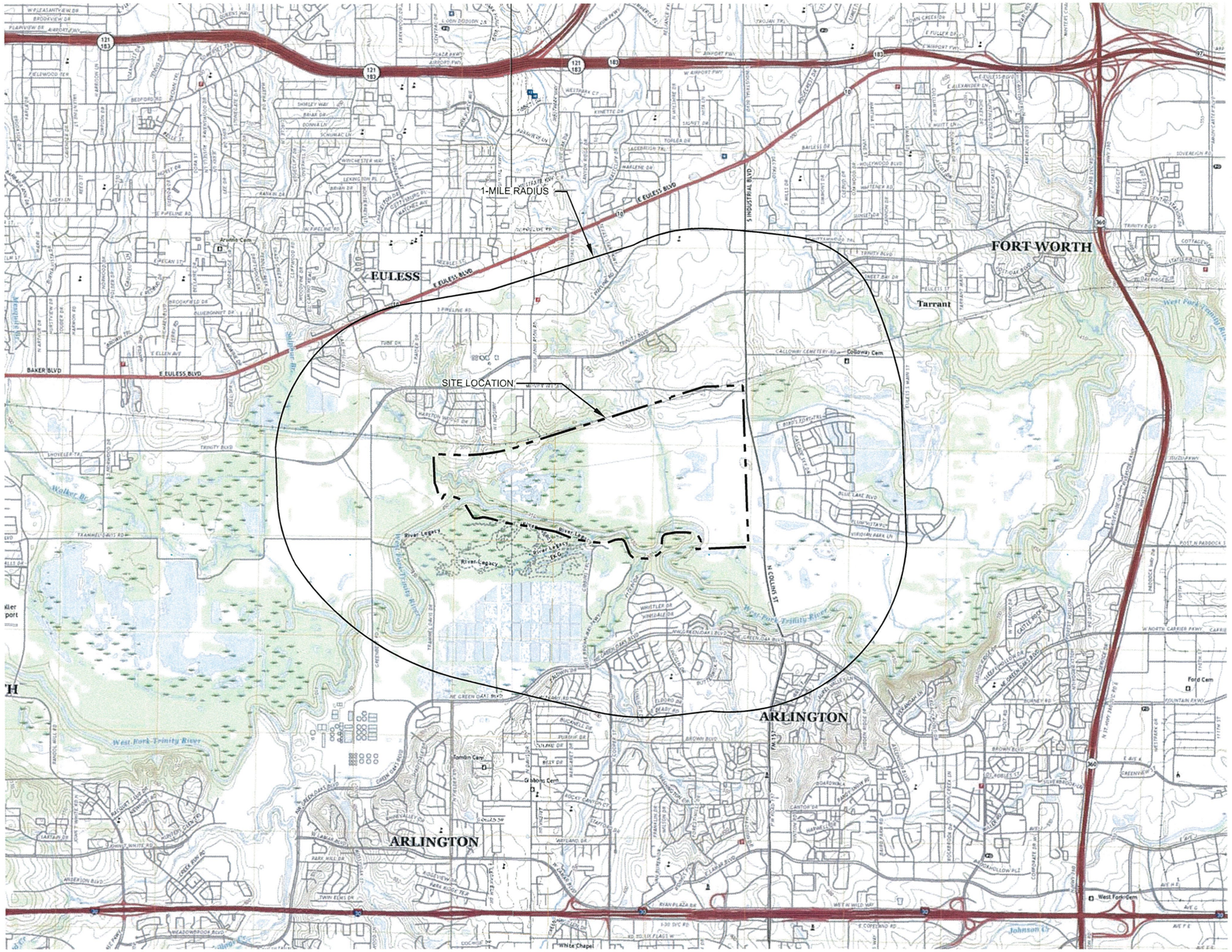
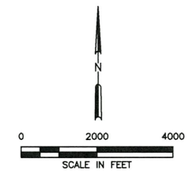
FIGURE 1

O:\0023\404\EXPANSION 2021\PARTS I-IV\PROJECT SUMMARY\COORDINATION LETTER\1 - SITE LOCATION.dwg, rspicer, 1:2




LEGEND

**ROAD CLASSIFICATION**

| | |
|---|---|
| Expressway | Local Connector |
| Secondary Hwy | Local Road |
| Ramp | 4WD |

Interstate Route · US Route · State Route

PERMITTED PERMIT BOUNDARY

**EULESS, TX** 2019

**HURST, TX** 2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

0:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\2 - GENERAL TOPO.dwg, rspicer, 1:2

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☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |
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| | | |
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# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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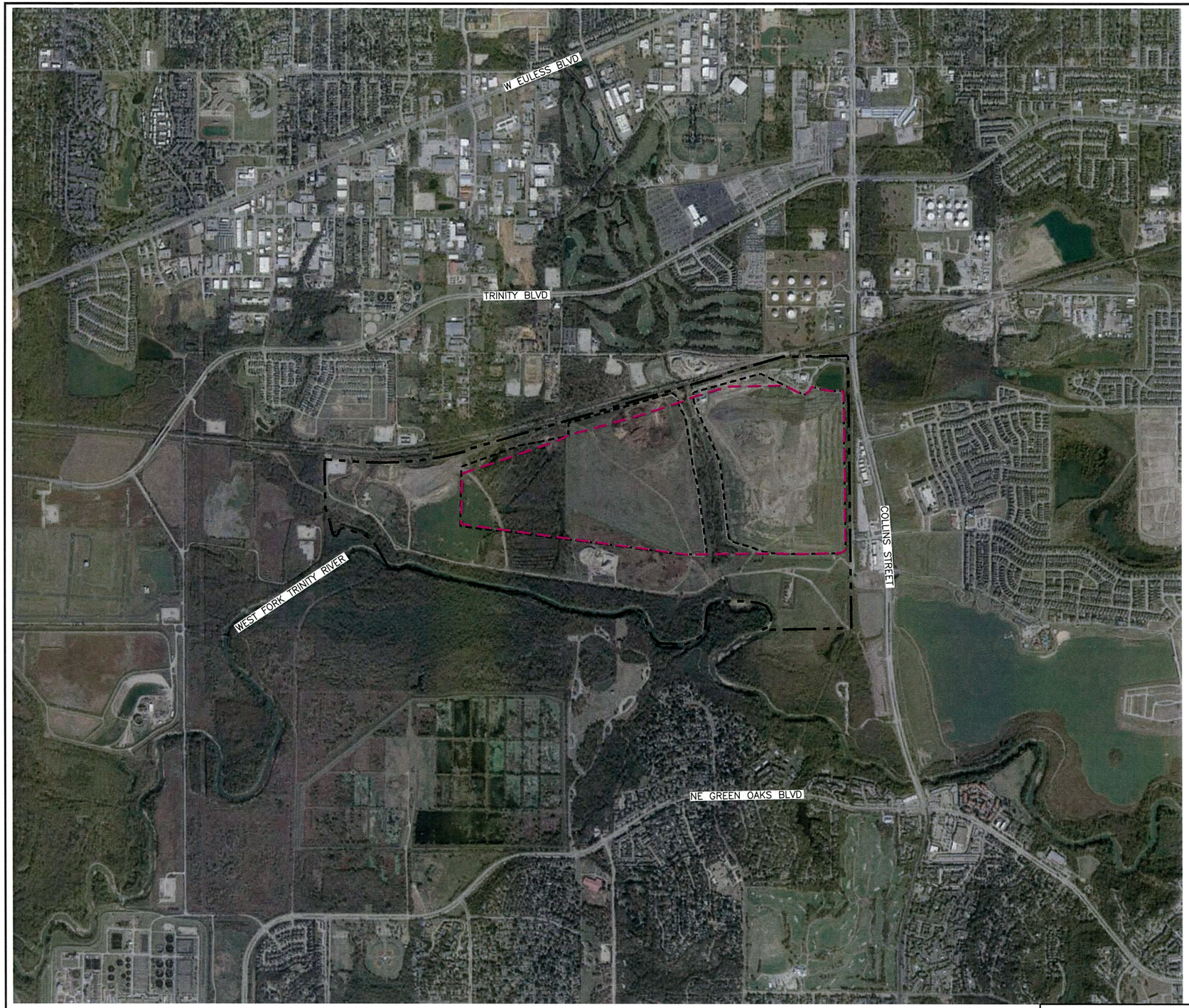
FIGURE 2




N

0 1000 2000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

0:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\3-AERIAL PHOTOGRAPH.dwg, rspicer, 1:2

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FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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| | | |
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# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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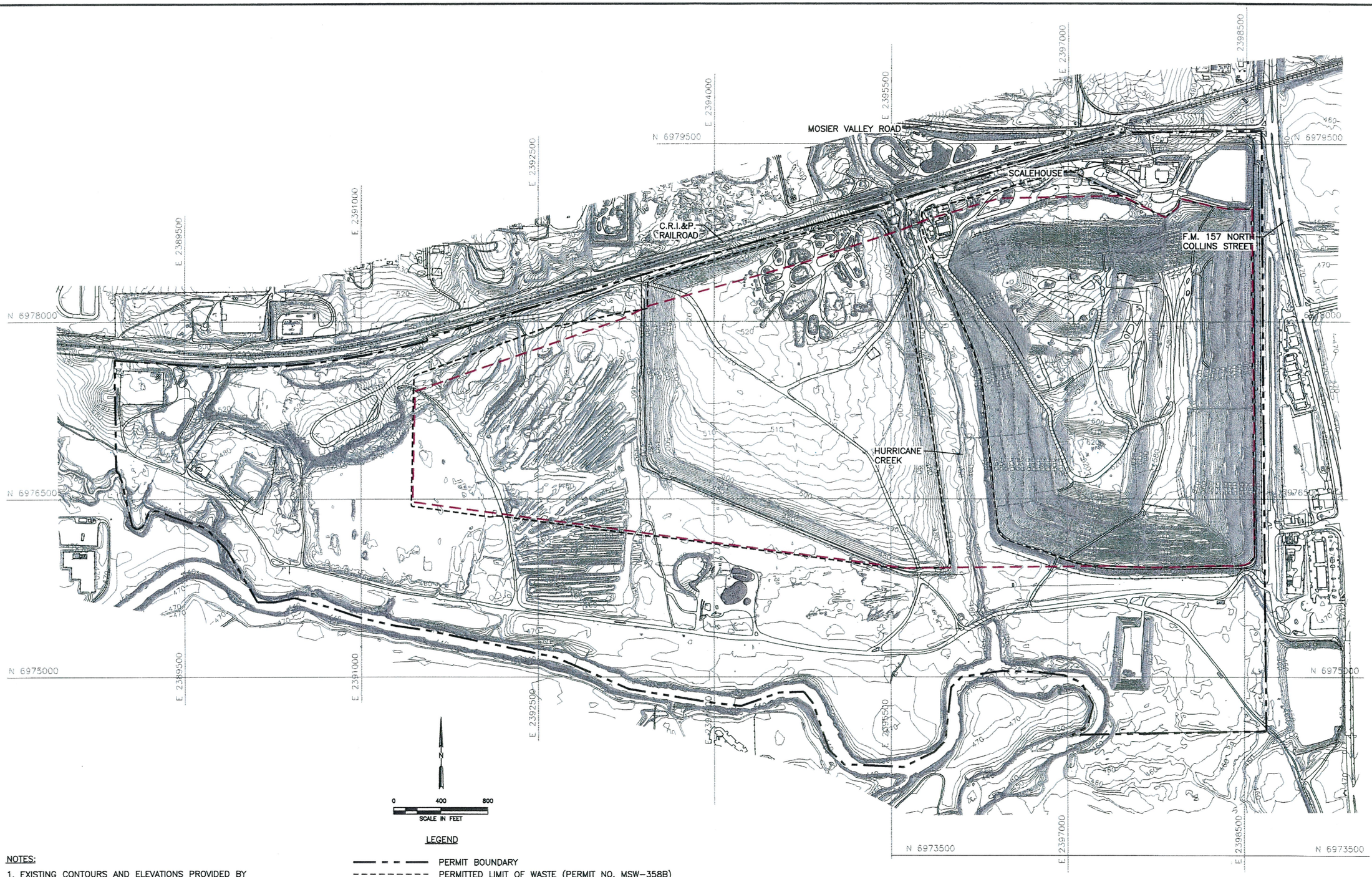
FIGURE 3




LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

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AND
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|---|---|---|
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# SITE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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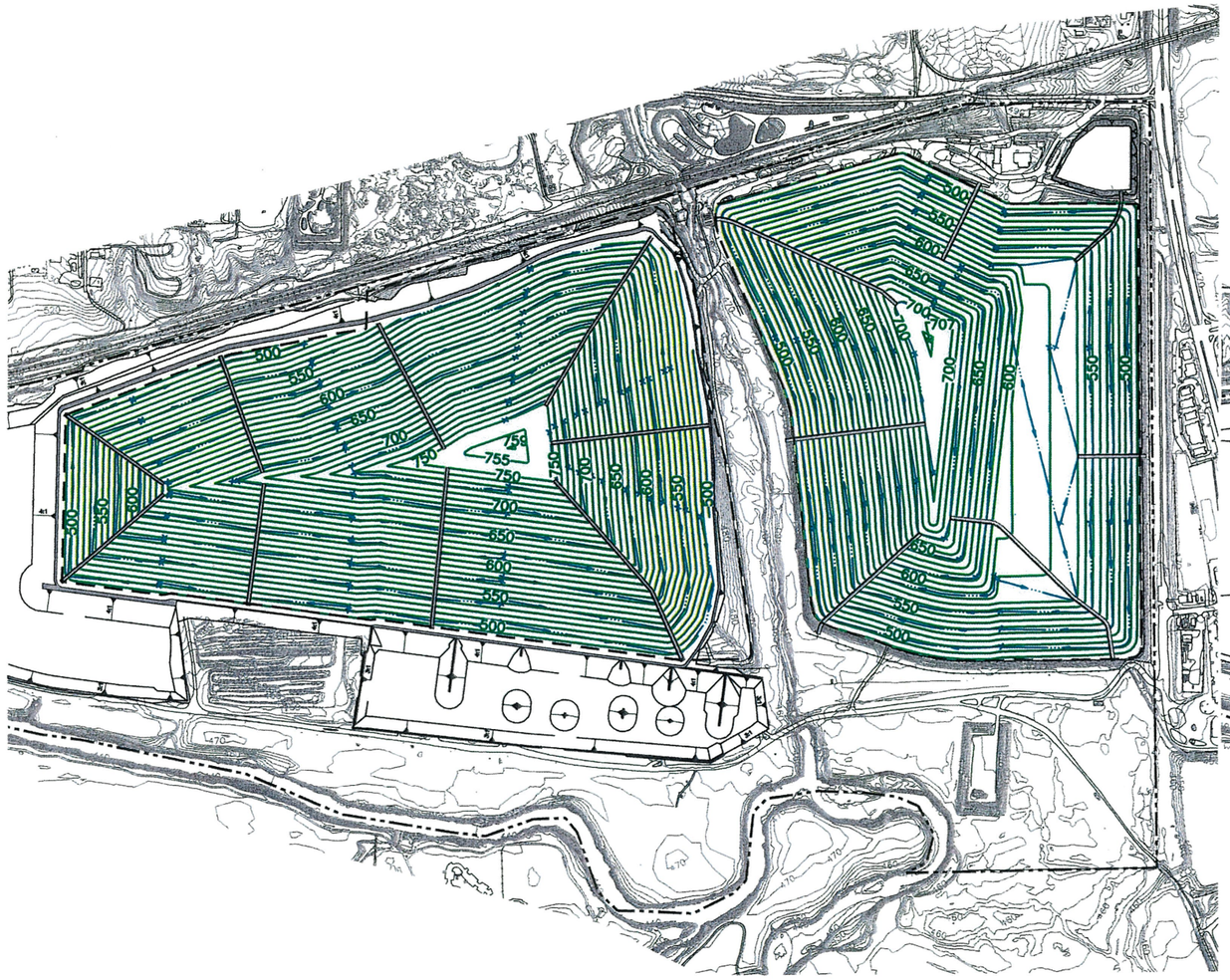
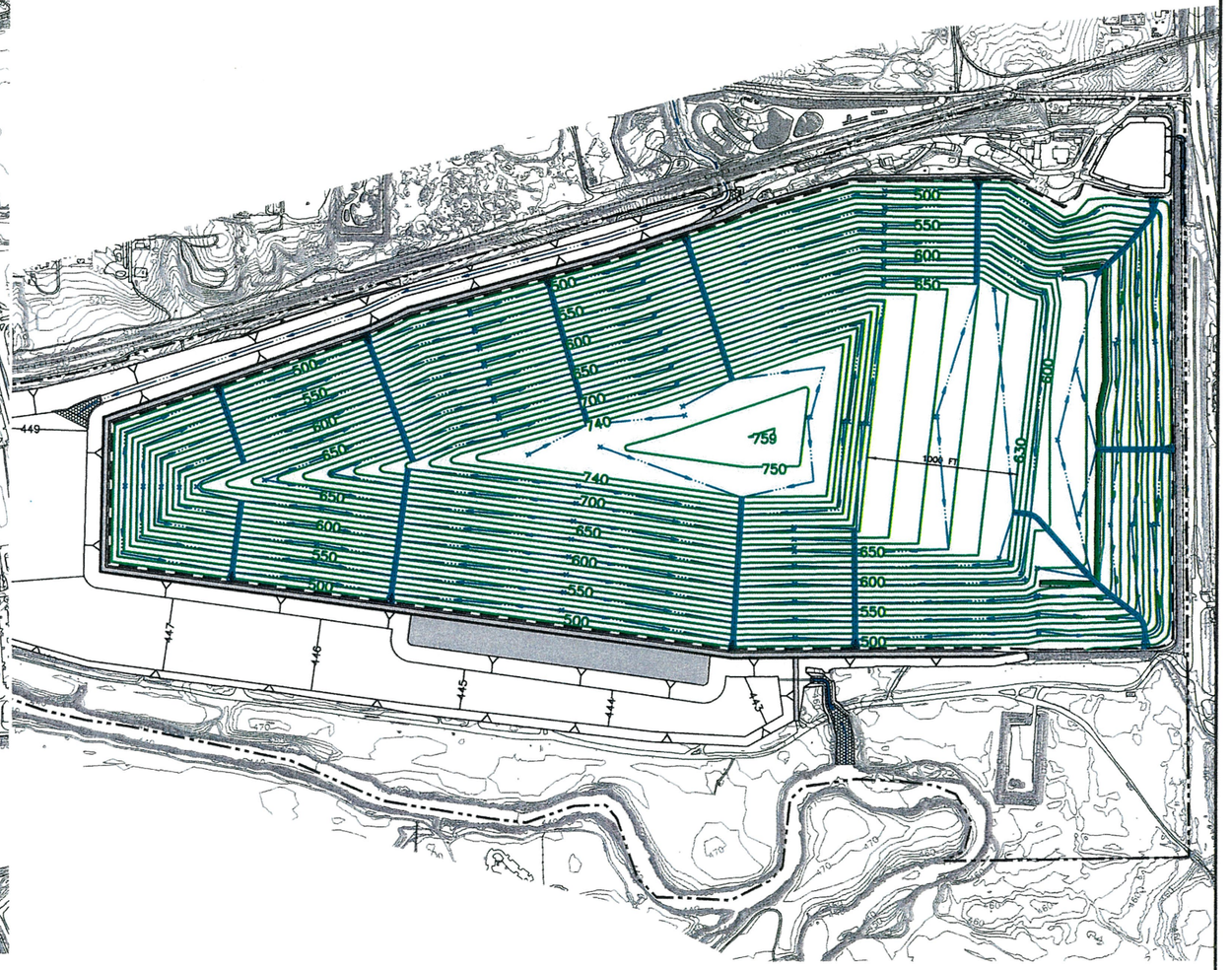
FIGURE 4

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\4-SITE PLAN.dwg, rarrington, 1:2




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW–358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN

N

0 500 1000
SCALE IN FEET

**GENERAL INFORMATION**

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW–358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW–358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT–MSL) | 740 (FT–MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT–MSL) | 759 (FT–MSL) |
| BUFFER AREA | 391.6 ACRES | 383.8 ACRES |



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DATE: 08/2021
FILE: 0023-404-11
CAD: 5-FINAL COVER COMPARISON.DWG
DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

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# EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE 5

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\5-FINAL COVER COMPARISON.dwg, rarrington, 1:2

# ATTACHMENT 3

# EXISTING PERMIT (PROJECT NUMBER SWF-2010-00056)

**DEPARTMENT OF THE ARMY**
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF

November 21, 2014

Regulatory Division

SUBJECT: Project Number SWF-2010-00056, City of Arlington Landfill Expansion

Mr. Steve Cooke
Public Works and Transportation
City of Arlington
101 West Abrams
P.O. Box 90231 MS 01-0300
Arlington, Texas 76004-3231

Mr. Cooke:

You are hereby authorized under Section 404 of the Clean Water Act to the City of Arlington to discharge dredged and fill material into waters of the United States associated with the construction of the City of Arlington Landfill Expansion Project, located in Arlington, Tarrant County, Texas, in accordance with Permit Number SWF-2010-00056. A copy of the permit is enclosed.

To use this permit, the person responsible for the project must ensure that the work is conducted in accordance with the terms and conditions of the permit. We caution you to submit revised drawings to us for approval prior to construction should any changes be found necessary in either the location or plans for the work. Approval of revised plans may be granted if they are found not contrary to the public interest.

This permit should not be considered as an approval of the design features of any structure authorized or an implication that such construction is considered adequate for the purpose intended. It does not authorize any damage to private property, invasion of private rights, or any infringement of federal, state, or local laws or regulations.

We appreciate your interest in our nation's water resources, and your cooperation in complying with our regulatory program. If you have questions in the future, please contact Mr. David Madden at the address above or telephone (817)886-1741.

Sincerely,

for Stephen L Brooks
Chief, Regulatory Branch

Enclosures

Copies Furnished / with enclosure:

Mr. David Galindo
Director, Office of Water Quality (MC-150)
Water Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Mr. Tom Heger
Resource Protection Division
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Ms. Debra Bills
Field Supervisor
U.S. Fish and Wildlife Service
2005 NE Green Oaks Blvd., Suite 140
Arlington, Texas 76006

Ms. Sharon Parrish
Chief, Marine and Wetlands Section (6WQ-EM)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202

## DEPARTMENT OF THE ARMY PERMIT

Permittee City of Arlington, Tarrant County, Texas

Permit No. SWF-2010-00056

Issuing Office Fort Worth District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: *To discharge approximately 1,800,000 cubic yards of dredged or fill material into waters of the United States associated with the construction of the City of Arlington Landfill Expansion Project. Elements of the project include the excavation of detention basins and landfill cells, as well as the construction of levees along the south, west, and north boundaries of the landfill expansion. The proposed expansion of the City of Arlington would involve the permanent filling and excavation of approximately 86 acres of waters of the United States.*

Project Location: *The project area is located at the 790-acre City of Arlington Landfill at 800 Mosier Valley Road in the City Arlington, Tarrant County, Texas. The property is bordered by North Collins Street/FM 157 to the east, the West Fork Trinity River to the south, the Arlington-Fort Worth city boundary to the west, and the Trinity Railway Express commuter railway and Mosier Valley Road to the north. The proposed expansion of the City of Arlington Landfill would be located on the western portion of the existing landfill property at Latitude North 32.8002, Longitude West: -97.1203 on the Hurst and Euless, Texas 7.5-minute USGS quadrangle maps in the USGS Hydrologic Unit 12030102.*

Permit Conditions: *In accordance with the general conditions [and the special conditions] below, the attached Sheets 1-17of 17 dated Nov. 4, 2014 and Texas Commission on Environmental Quality Section 401 Water Quality Certification, Pages 1-3 of 3, dated November 4, 2014.*

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2029. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance

with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archaeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: SEE PAGE 4 (Special Conditions)
Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(x) Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Steve Cooke — 11/17/14

(PERMITTEE(s)) Mr. Steve Cooke
City of Arlington (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

21 Nov 2014

(DISTRICT ENGINEER) (DATE)
(FOR)
W. Neil Craig, III, P.E.
Lieutenant Colonel, Corps of Engineers

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

Special Conditions
Permit Number SWF-2010-00056

(1) *The permittee shall implement and abide by the mitigation plan titled "Mitigation Plan for the City of Arlington Landfill Expansion, Arlington, Tarrant County, Texas," prepared for City of Arlington and Republic Waste Services of Texas , Ltd. by KBA EnviroScience, Ltd., dated October 21, 2014. Completion of all elements of this mitigation plan is a requirement of this permit.*

(2) *The permittee shall debit 13.5 credits from the Trinity River Mitigation Bank in compliance with the provisions of the "Mitigation Banking Instrument Agreement, Trinity River Mitigation Bank, Ltd., Tarrant County, Texas, Permit Application No.: 199800370," dated February 2001, revised August 2002. This debit shall compensate off-site for unavoidable adverse project impacts that would not be compensated by permittee-responsible on-site mitigation. The permittee shall complete the mitigation bank transaction and provide documentation to the USACE-FW that the transaction has occurred prior to commencing any ground-disturbing activity within waters of the United States.*

**WORK DESCRIPTION:** As described in the public notice dated January 10, 2011, and the October 9, 2014, Environmental Assessment and Statement of Findings.

**SPECIAL CONDITIONS:** None

**GENERAL: This certification, issued pursuant to the requirements of Title 30, Texas Administrative Code, Chapter 279, is restricted to the work described in the October 9, 2014, Environmental Assessment and Statement of Findings and shall be concurrent with the Corps of Engineers (COE) permit.** This certification may be extended to any minor revision of the COE permit when such change(s) would not result in an impact on water quality. The Texas Commission on Environmental Quality (TCEQ) reserves the right to require full joint public notice on a request for minor revision. The applicant is hereby placed on notice that any activity conducted pursuant to the COE permit which results in a violation of the state's surface water quality standards may result in an enforcement proceeding being initiated by the TCEQ or a successor agency.

**STANDARD PROVISIONS:** These following provisions attach to any permit issued by the COE and shall be followed by the permittee or any employee, agent, contractor, or subcontractor of the permittee during any phase of work authorized by a COE permit.

1. The water quality of wetlands shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, and Numerical Criteria.

2. The applicant shall not engage in any activity which will cause surface waters to be toxic to man, aquatic life, or terrestrial life.

3. Permittee shall employ measures to control spills of fuels, lubricants, or any other materials to prevent them from entering a watercourse. All spills shall be promptly reported to the TCEQ by calling the State of Texas Environmental Hotline at 1-800-832-8224.

4. Sanitary wastes shall be retained for disposal in some legal manner. Marinas and similar operations which harbor boats equipped with marine sanitation devices shall provide state/federal permitted treatment facilities or pump out facilities for ultimate transfer to a permitted treatment facility. Additionally, marinas shall display signs in appropriate locations advising boat owners that the discharge of sewage from a marine sanitation device to waters in the state is a violation of state and federal law.

5. Materials resulting from the destruction of existing structures shall be removed from the water or areas adjacent to the water and disposed of in some legal manner.

6. A discharge shall not cause substantial and persistent changes from ambient conditions of turbidity or color. The use of silt screens or other appropriate methods is encouraged to confine suspended particulates.

7. The placement of any material in a watercourse or wetlands shall be avoided and placed there only with the approval of the Corps when no other reasonable alternative is available. If work within a wetland is unavoidable, gouging or rutting of the substrate is prohibited. Heavy equipment shall be placed on mats to protect the substrate from gouging and rutting if necessary.

8. Dredged Material Placement: Dredged sediments shall be placed in such a manner as to prevent any sediment runoff onto any adjacent property not owned by the applicant. Liquid runoff from the disposal area shall be retained on-site or shall be filtered and returned to the watercourse from which the dredged materials were removed. Except for material placement authorized by this permit, sediments from the project shall be placed in such a manner as to prevent any sediment runoff into waters in the state, including wetlands.

9. If contaminated spoil that was not anticipated or provided for in the permit application is encountered during dredging, dredging operations shall be immediately terminated and the TCEQ shall be contacted by calling the State of Texas Environmental Hotline at 1-800-832-8224. Dredging activities shall not be resumed until authorized by the Commission.

10. Contaminated water, soil, or any other material shall not be allowed to enter a watercourse. Noncontaminated storm water from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.

11. Storm water runoff from construction activities that result in a disturbance of one or more acres, or are a part of a common plan of development that will result in the disturbance of one or more acres, must be controlled and authorized under Texas Pollutant Discharge Elimination System (TPDES) general permit TXR150000. A copy of the general permit, application (notice of intent), and additional information is available at:
http://www.tceq.texas.gov/permitting/stormwater/wq_construction.html or by contacting the TCEQ Storm Water & Pretreatment Team at (512) 239-4671.

12. Upon completion of earthwork operations, all temporary fills shall be removed from the watercourse/wetland, and areas disturbed during construction shall be seeded, riprapped, or given some other type of protection to minimize subsequent soil erosion.

Any fill material shall be clean and of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters.

13. Disturbance to vegetation will be limited to only what is absolutely necessary. After construction, all disturbed areas will be revegetated to approximate the pre-disturbance native plant assemblage.

14. Where the control of weeds, insects, and other undesirable species is deemed necessary by the permittee, control methods which are nontoxic to aquatic life or human health shall be employed when the activity is located in or in close proximity to water, including wetlands.

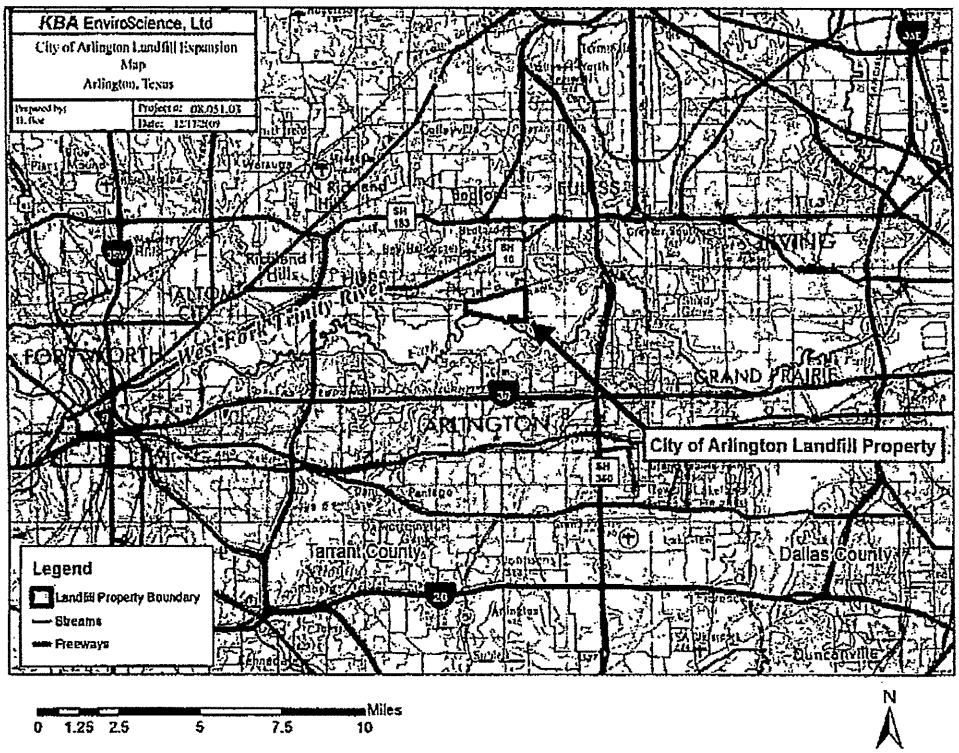
15. Concentrations of taste and odor producing substances shall not interfere with the production of potable water by reasonable water treatment methods, impart unpalatable flavor to food fish including shellfish, result in offensive odors arising from the water, or otherwise interfere with reasonable use of the water in the state.

16. Surface water shall be essentially free of floating debris and suspended solids that are conducive to producing adverse responses in aquatic organisms, putrescible sludge deposits, or sediment layers which adversely affect benthic biota or any lawful uses.

17. Surface waters shall be essentially free of settleable solids conducive to changes in flow characteristics of stream channels or the untimely filling of reservoirs, lakes, and bays.

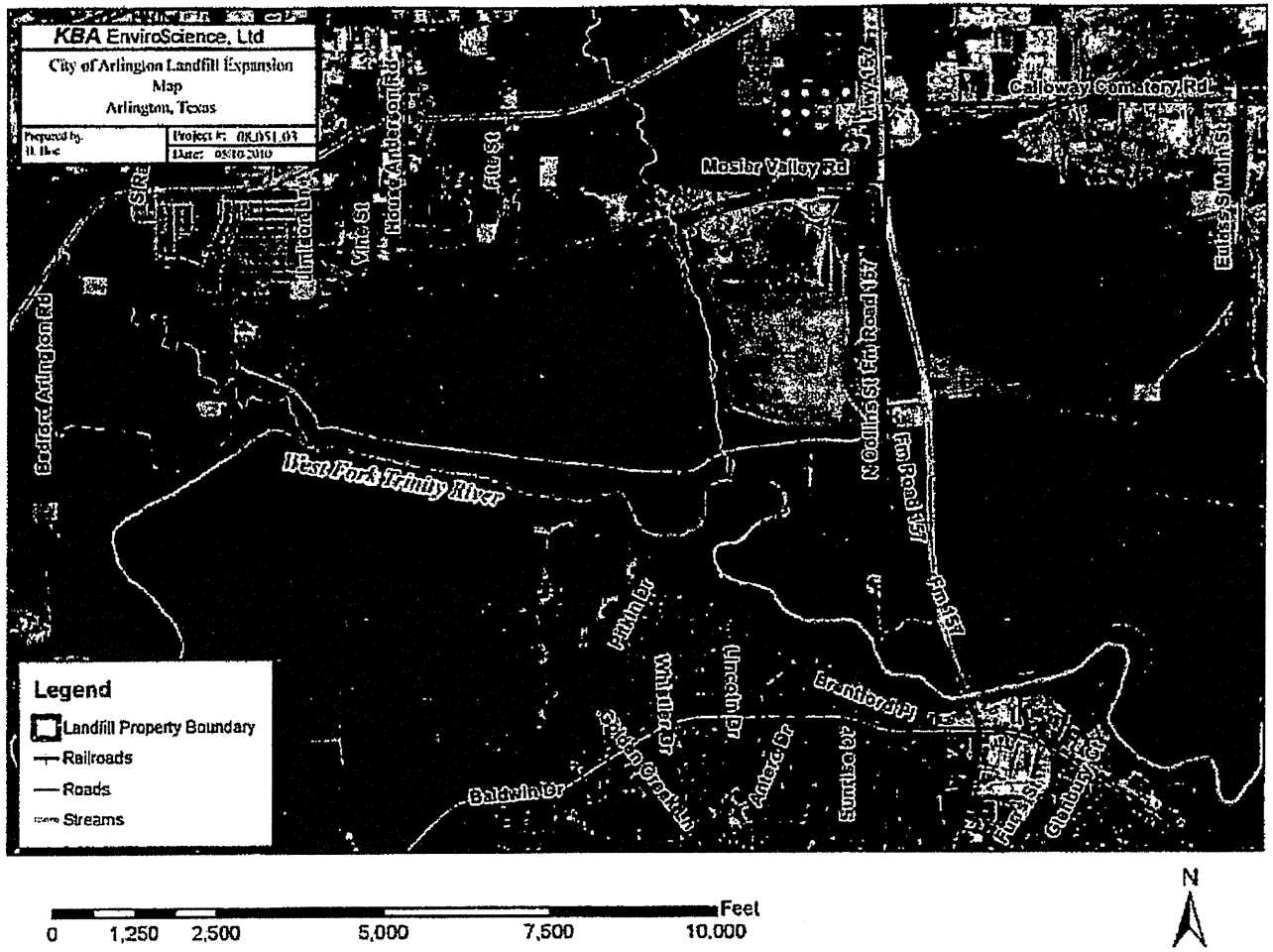
18. The work of the applicant shall be conducted such that surface waters are maintained in an aesthetically attractive condition and foaming or frothing of a persistent nature is avoided. Surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse.

19. This certification shall not be deemed as fulfilling the applicant's/permittee's responsibility to obtain additional authorization/approval from other local, state, or federal regulatory agencies having special/specific authority to preserve and/or protect resources within the area where the work will occur.

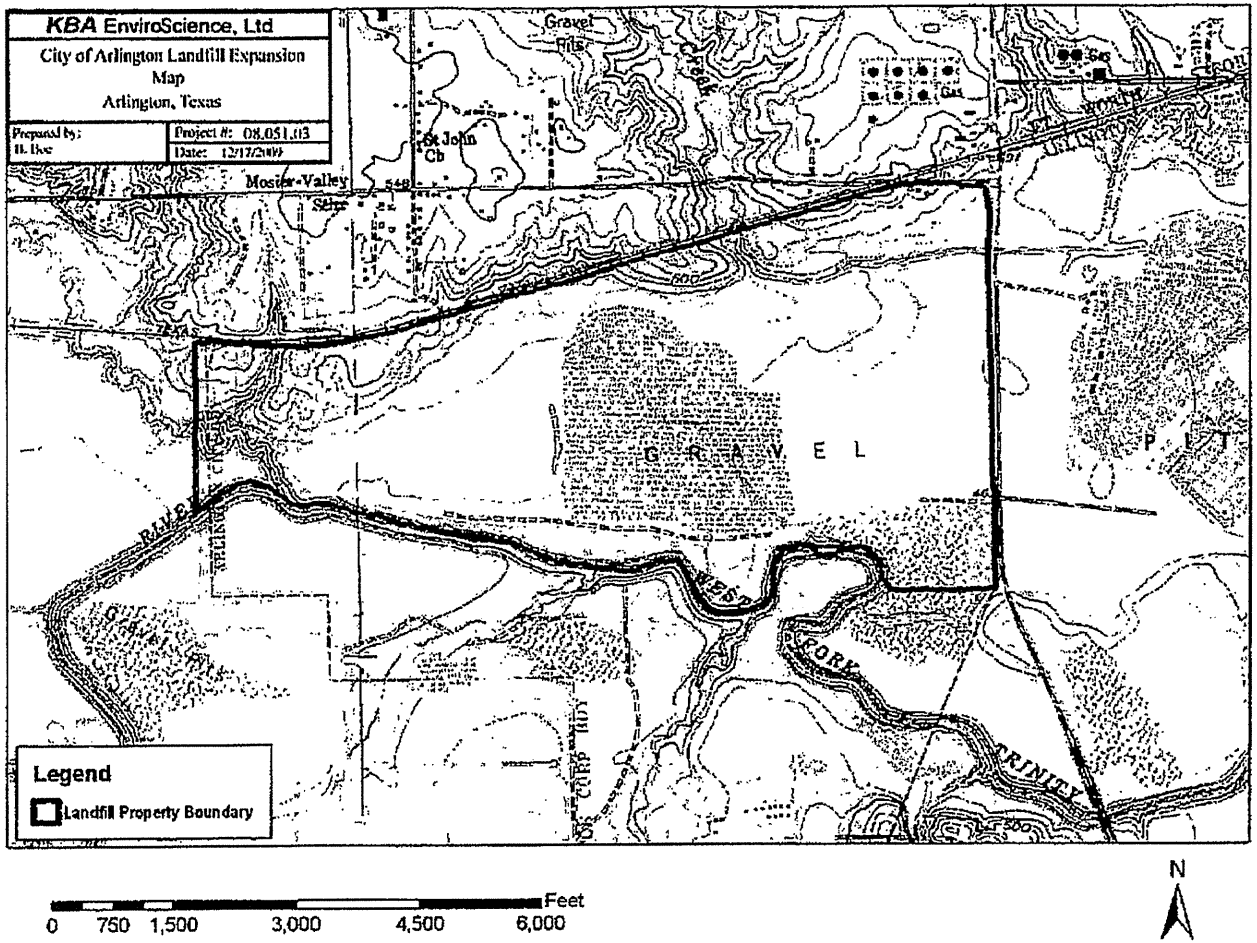



**Sheet 1 of 17**: Site Location Map for the City of Arlington Landfill, Arlington, Tarrant County, Texas (Base Map Source: USGS 1:250,000 Topographic Map, TNRIS. 2007).

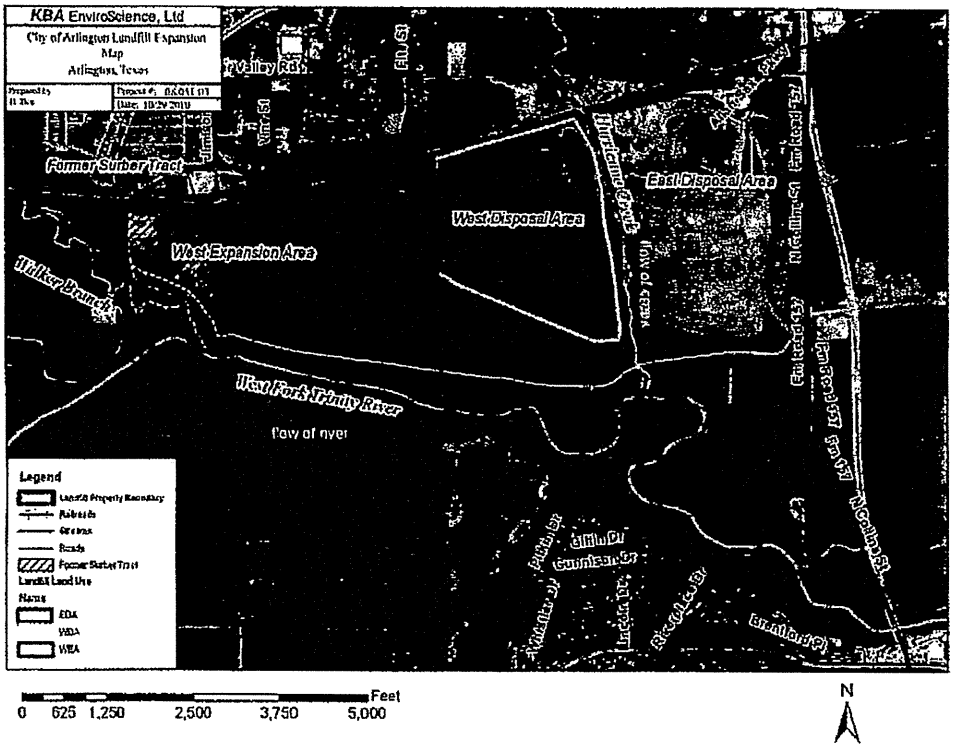
November 4, 2014




**Sheet 2 of 17**: 2008 NAIP Image of the City of Arlington Landfill, Arlington, Texas (Base Map Source: NRCS 2009).

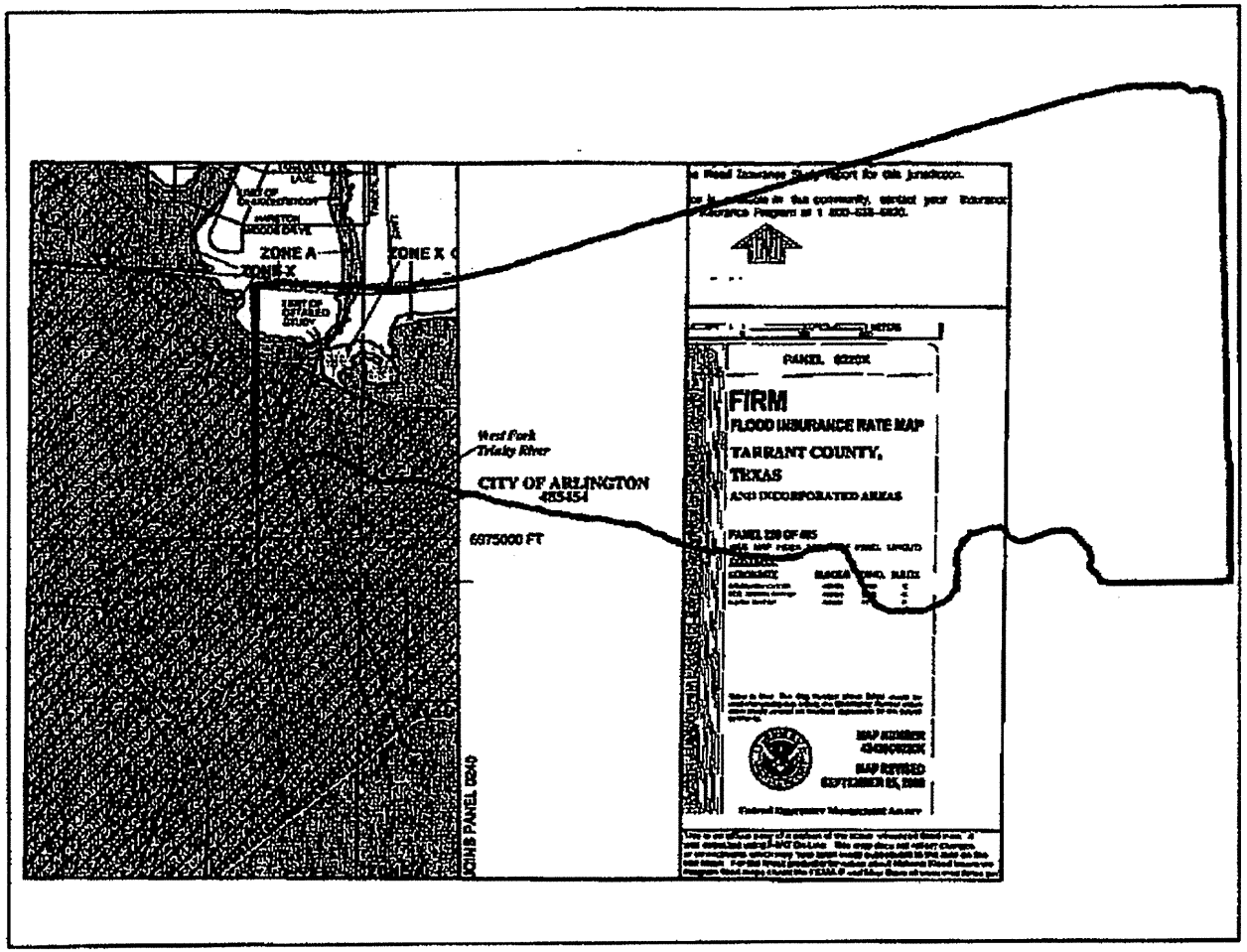



**Sheet 3 of 17**: USGS Topographic Map (Euless and Hurst Quadrangles. 1959, Photorevised 1981) of the City of Arlington Landfill. Arlington, Texas (Base Map Source: TNRIS 2007).

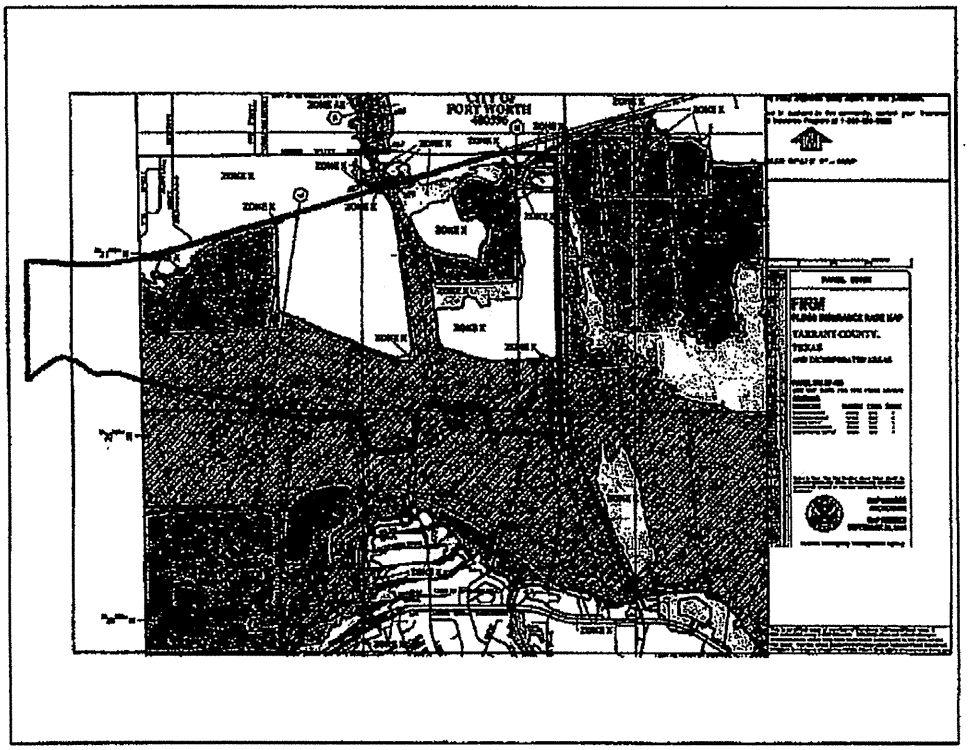



**Sheet 4 of 17:** Existing Project Area and Land Use Areas at the City of Arlington Landfill, Arlington, Texas (2008 NAIP Image, Base Map Source: NRCS 2009)

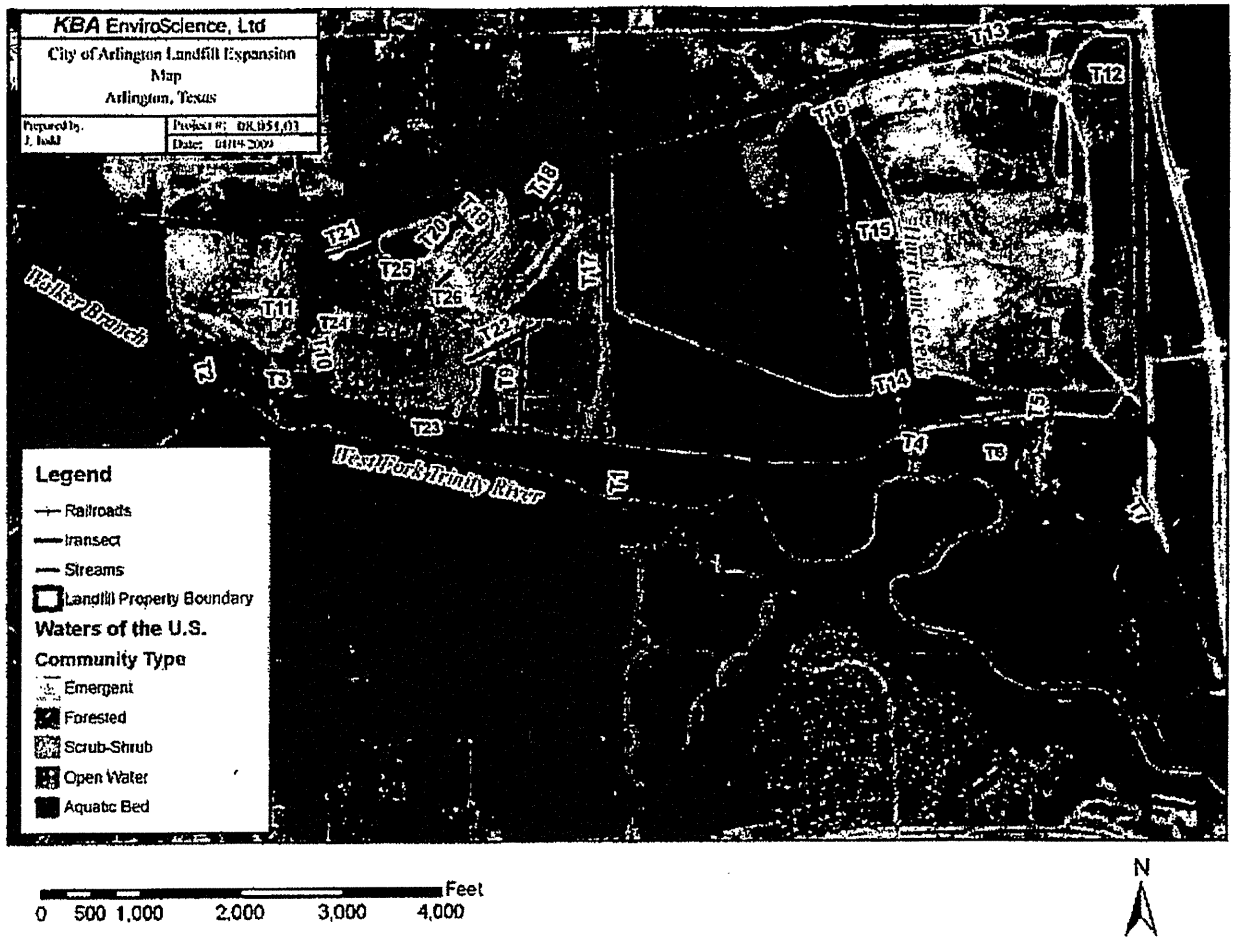
November 4, 2014



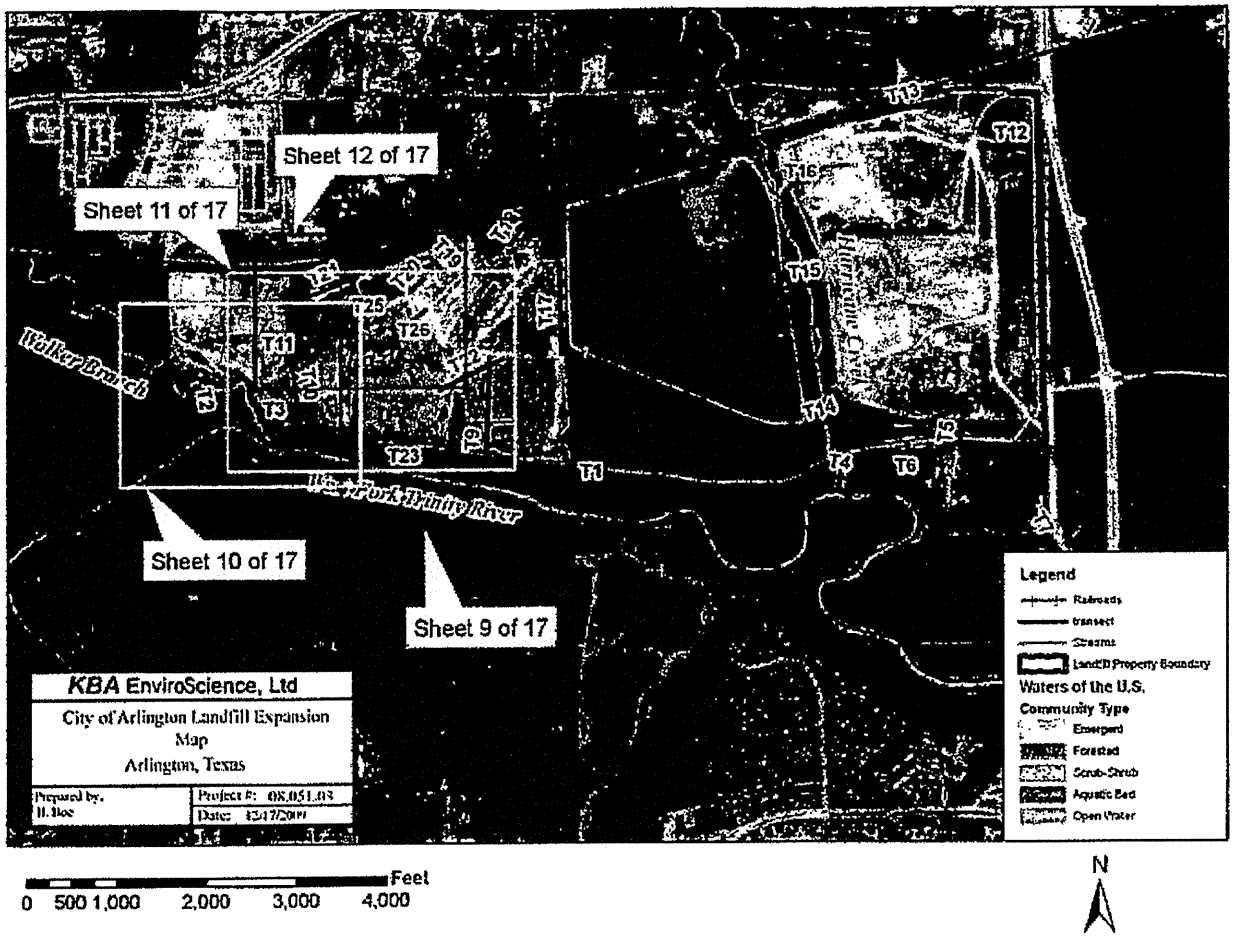

**Sheet 5 of 17.** Federal Emergency Management Agency (FEMA) Floodplain Map No. 48439C0220K for the City of Arlington Landfill (Map Source: FEMA, 2010).



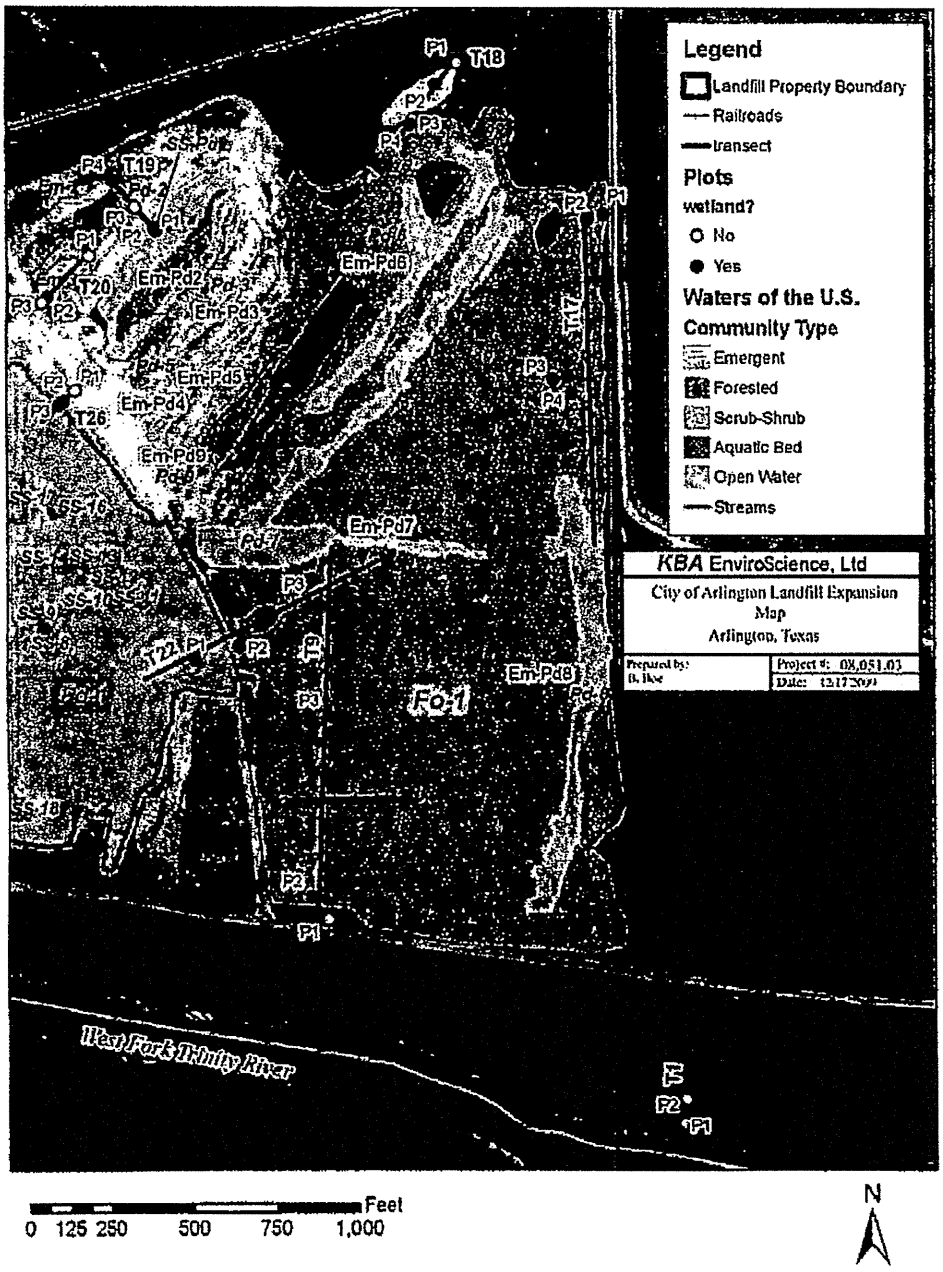

**Sheet 6 of 17.** Federal Emergency Management Agency (FEMA) Floodplain Map No. 48439C0240K for the City of Arlington Landfill (Map Source: FEMA, 2010).



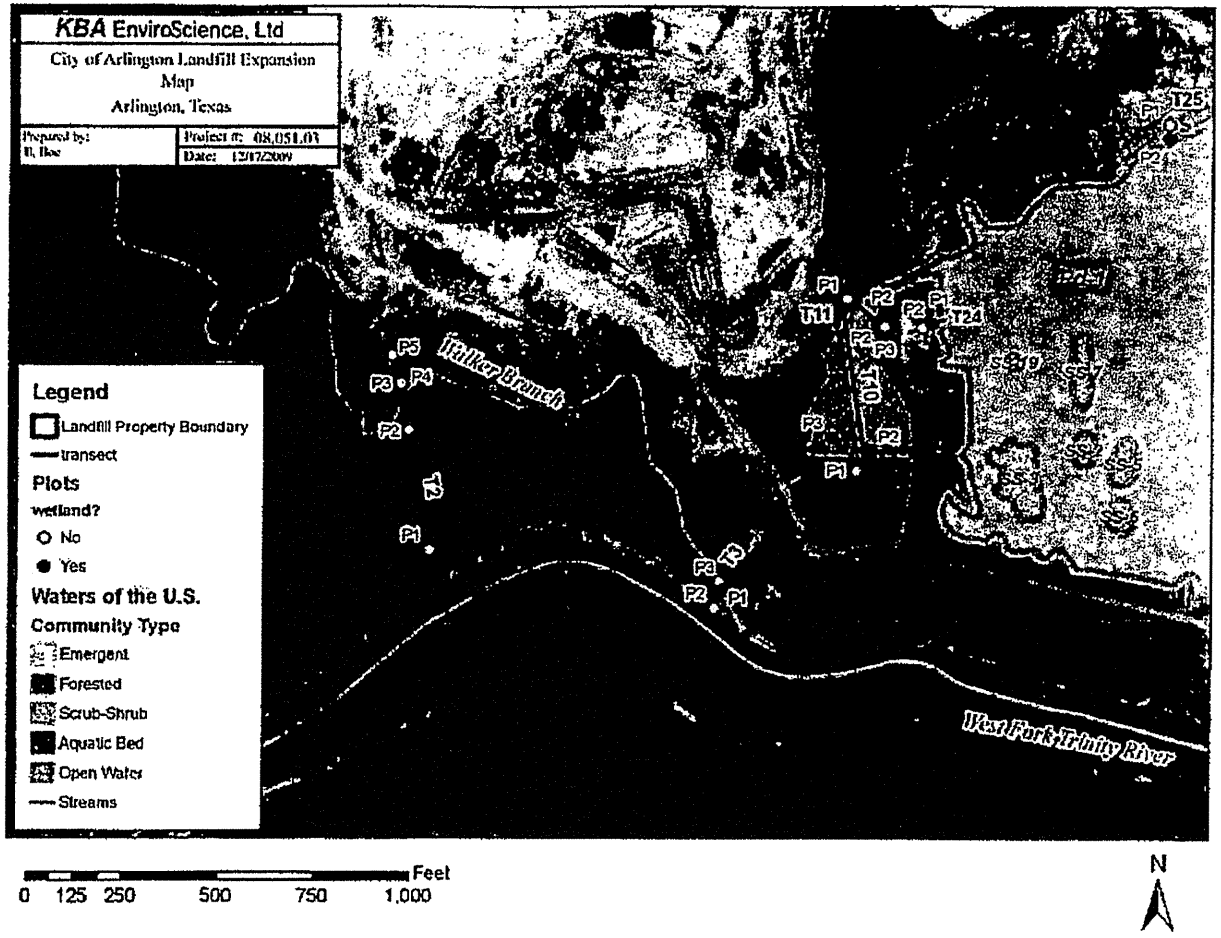

**Sheet 7 of 17**: Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).



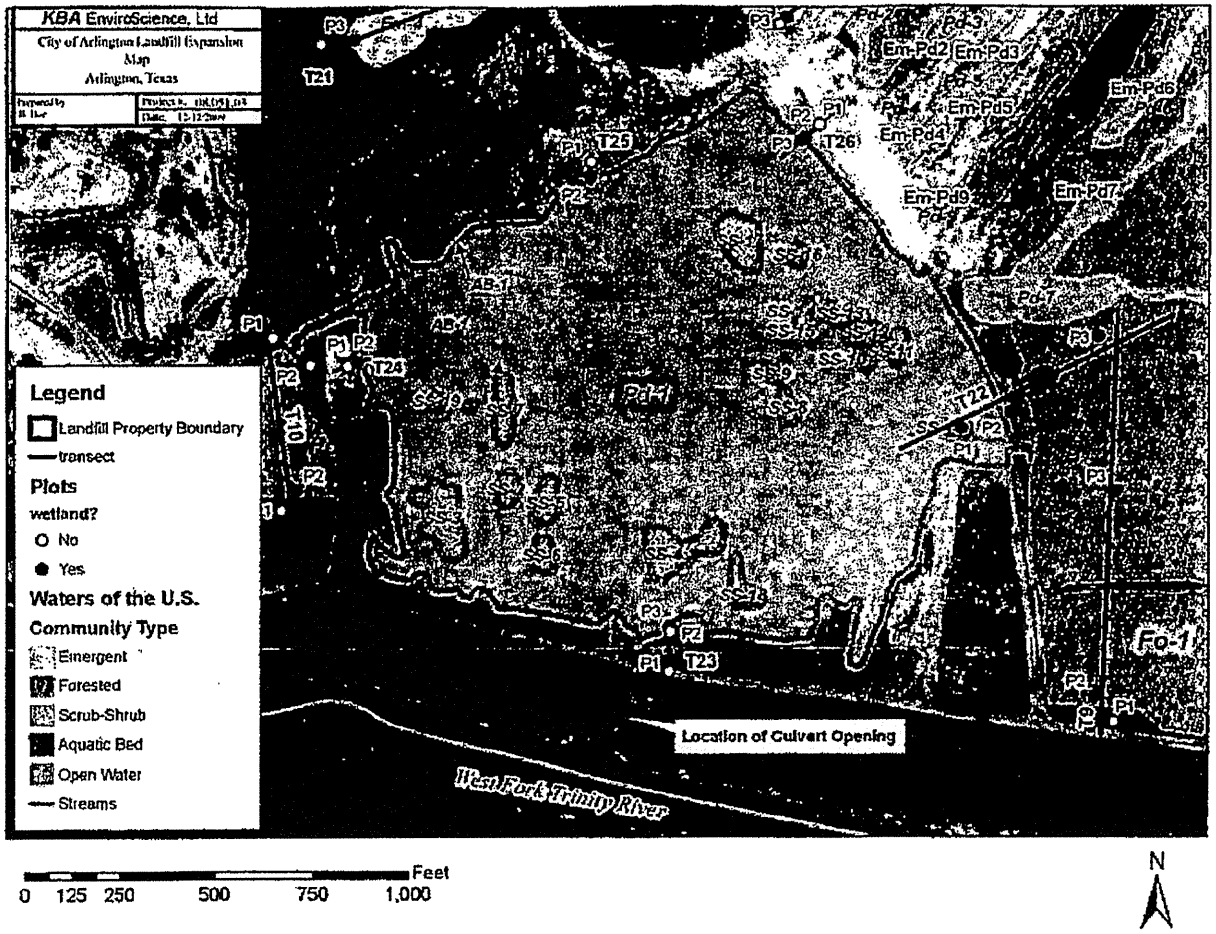

**Sheet 8 of 17:** Index to Detail Maps. Sheets 9 through 12 of 17. City of Arlington Landfill. Arlington. Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).



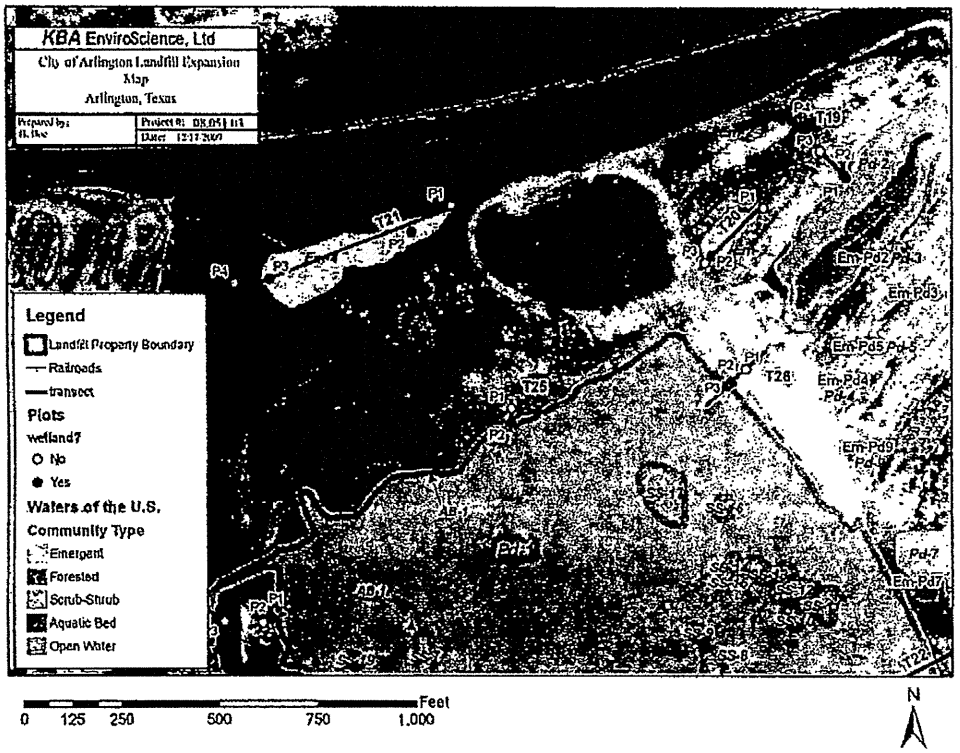

**Sheet 9 of 17:** Detail of the Forested Excavated Channels Area in the Former Sand and Gravel Mining Area, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007.




**Sheet 10 of 17.** Detail of Walker Branch and South Part of Surber Tract, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

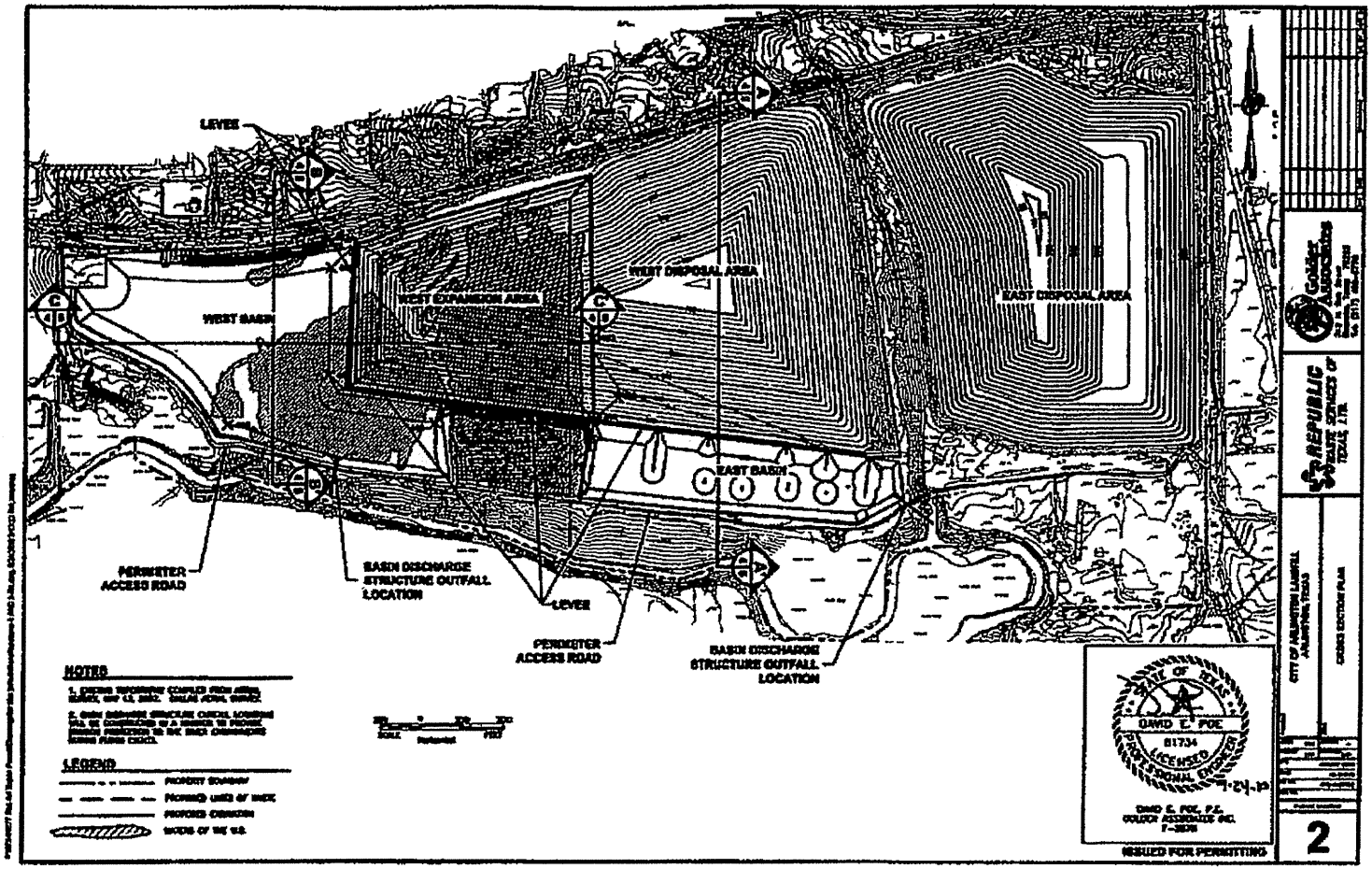



**Sheet 11 of 17.** Detail of Pond Pd-1, a Former Sand and Gravel Pit, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS 2007).

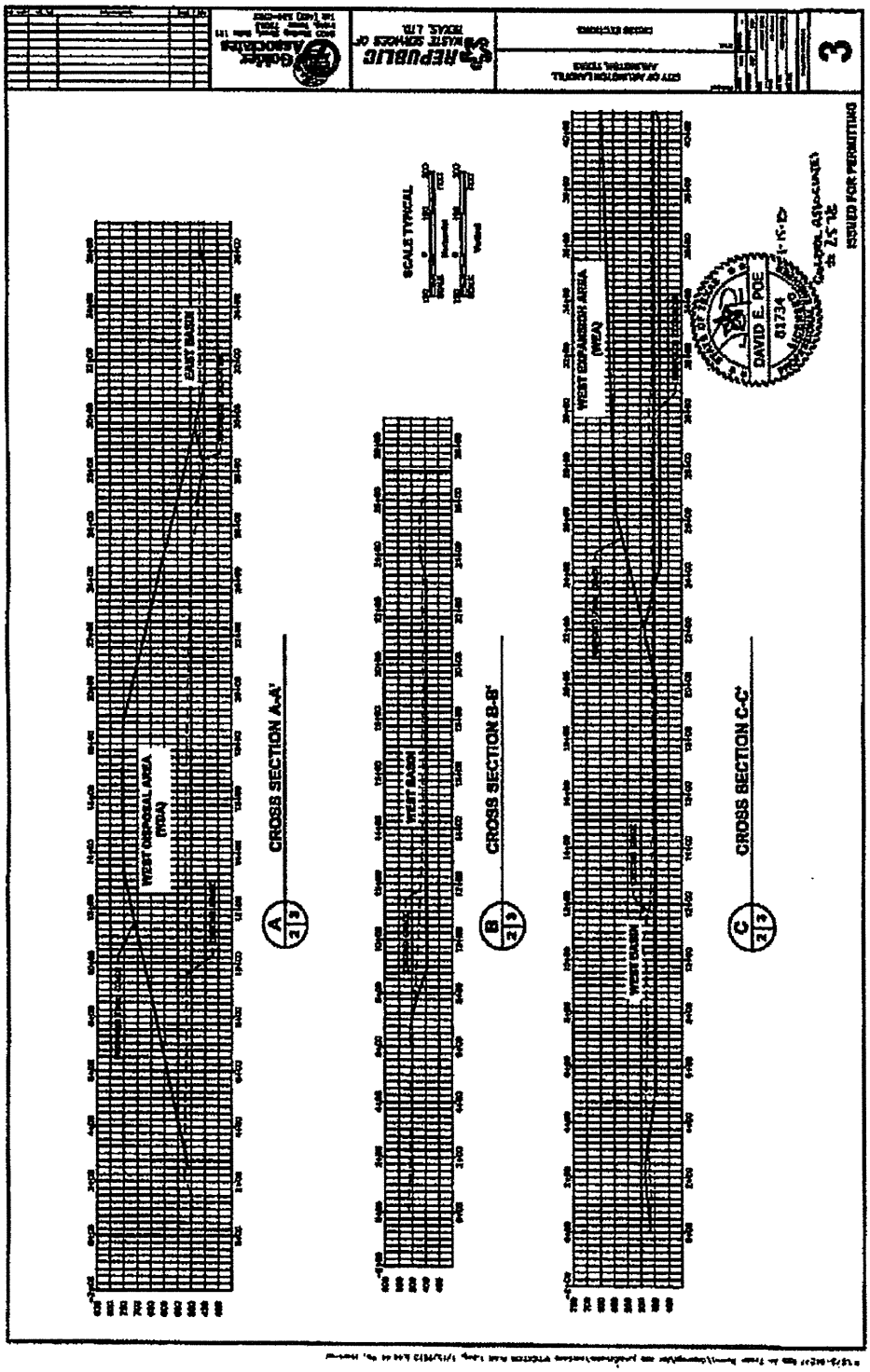



**Sheet 12 of 17.** Detail of the Northern Section of the Former Sand and Gravel Mining Area, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

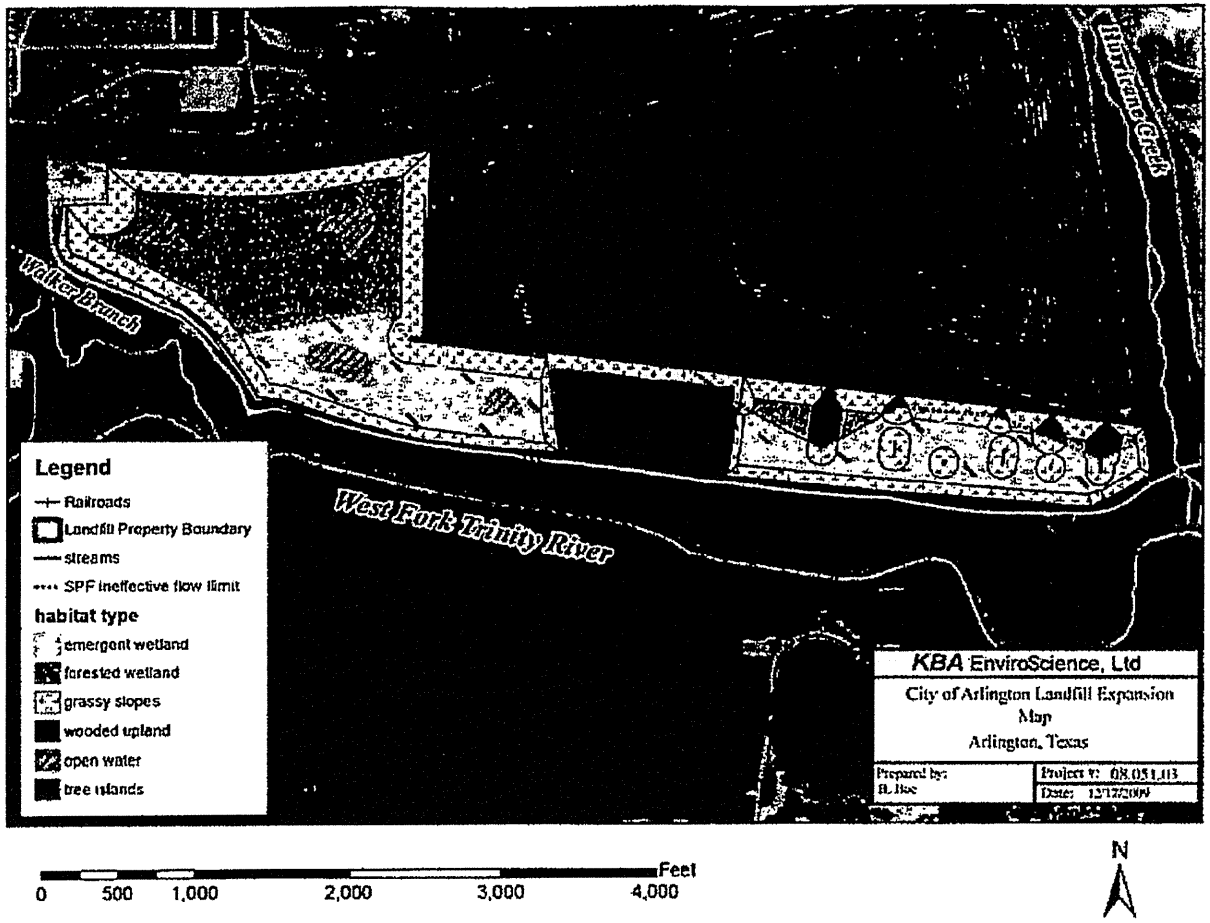
November 4, 2014



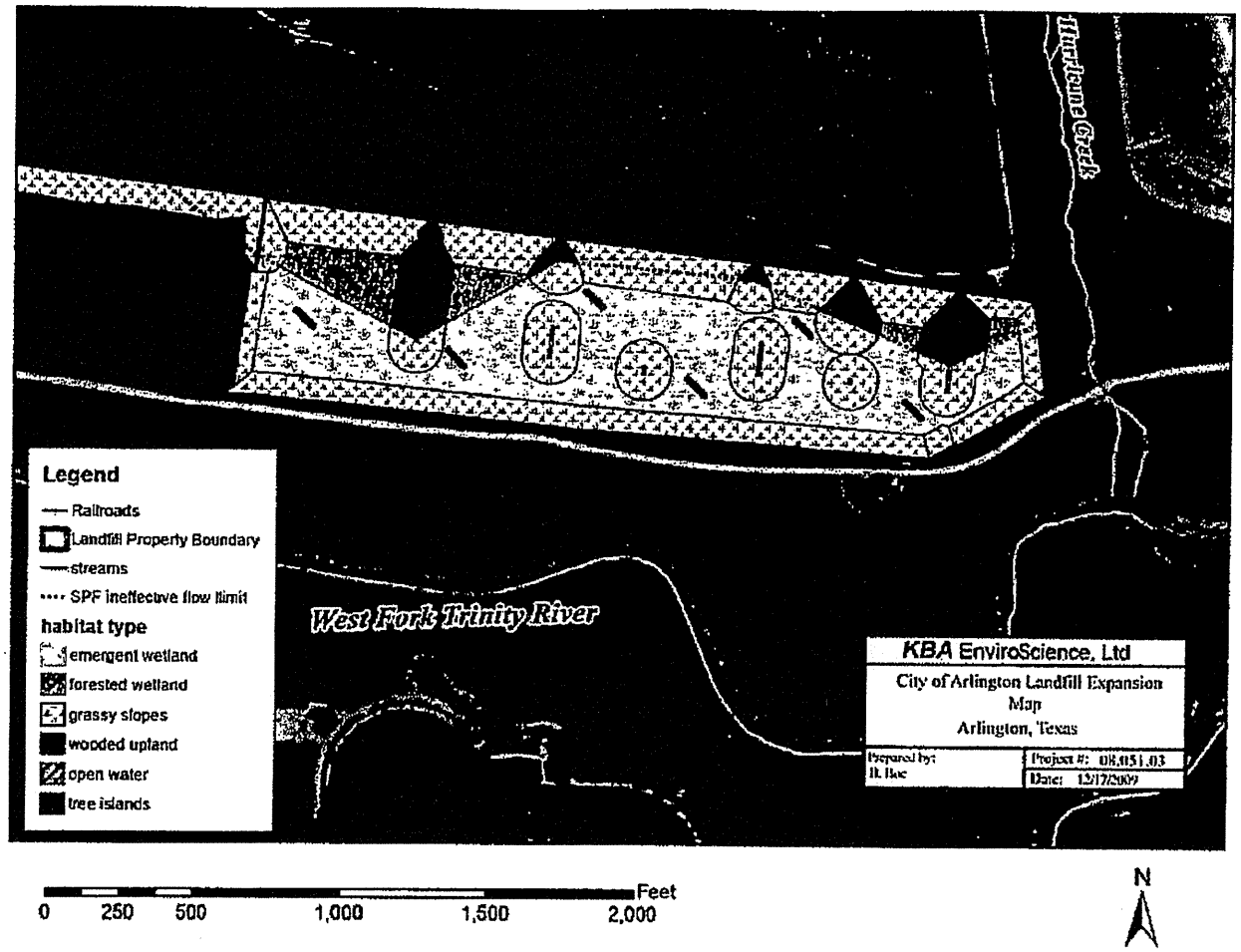

**Sheet 13 of 17:** Plan View of Proposed Project Area at the City of Arlington Landfill, Arlington, Texas



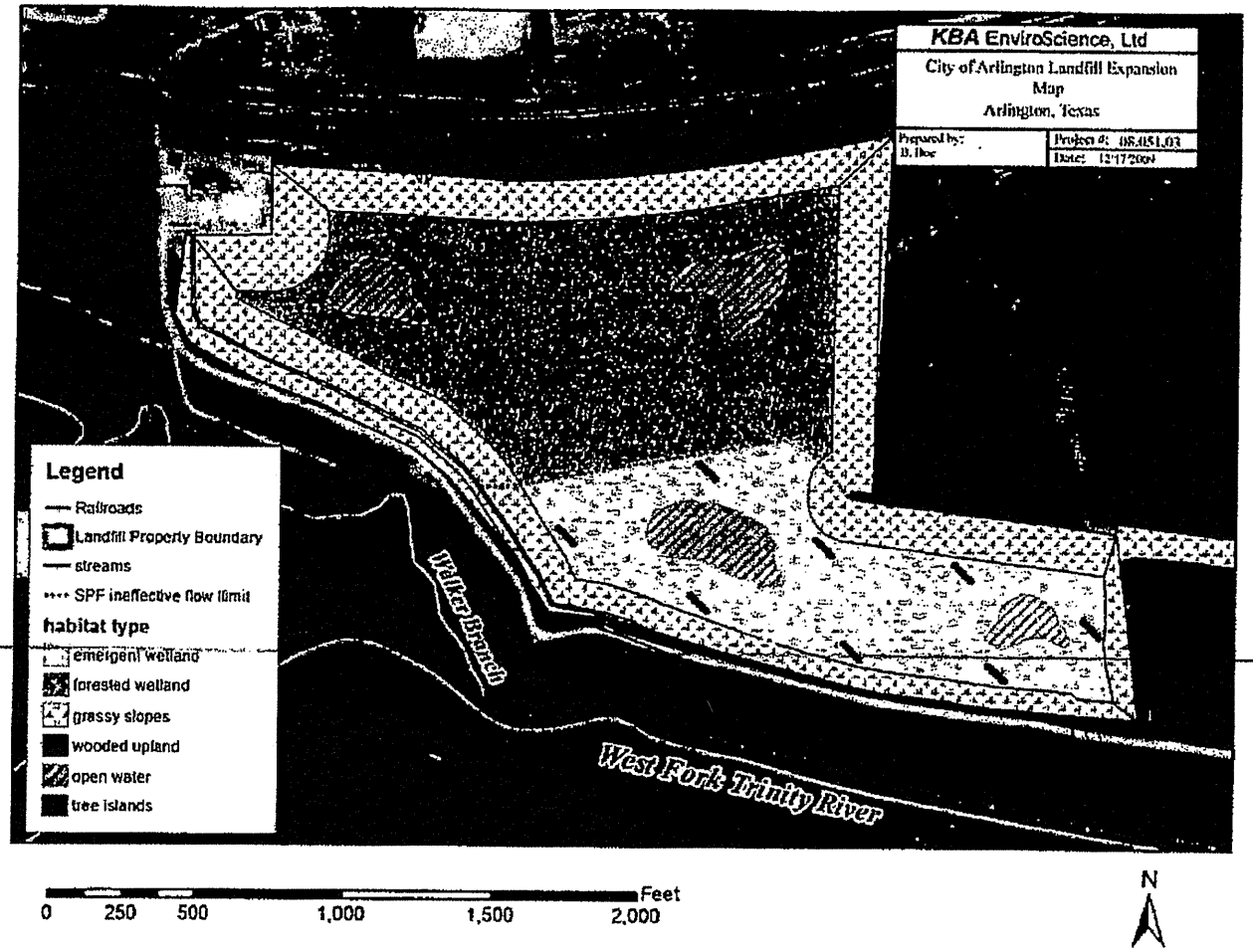

**Sheet 14 of 17:** Cross Sections of Proposed Project Area at the City of Arlington Landfill, Arlington, Texas




**Sheet 15 of 17:** Mitigation Details for the City of Arlington Landfill Expansion Mitigation Area (Source: 2008 National Agriculture Imagery Program (NAIP) Image, NRCS 2009).




**Sheet 16 of 17:** Mitigation Details for the East Basin at the City of Arlington Landfill Expansion Mitigation Area (Source: 2008 NAIP Image, NRCS 2009).




**Sheet 17 of 17:** Mitigation Details for the West Basin at the City of Arlington Landfill Expansion Mitigation Area (Source: 2008 NAIP)

# ATTACHMENT 4

# EXCERPTS FROM PREVIOUS INVESTIGATION

City of Arlington Texas

REPUBLIC SERVICES, INC.

January 28, 2010

Ms. Mary Verwers
Regulatory Branch – Fort Worth District
U.S. Army Corps of Engineers
819 Taylor Street
Fort Worth, Texas 76102-0300

**Re: Application for Authorization of Work under Individual Section 404 Permit, City of Arlington/Republic Waste Services of Texas, Ltd. - City of Arlington Landfill, Arlington, Tarrant County, Texas**

Dear Ms. Verwers:

The enclosed Application for Authorization of Work under Individual Section 404 Permit January 25, 2010, as prepared by KBA EnviroScience, Ltd. is being submitted on behalf of the City of Arlington (Applicant and Owner) and Republic Waste Services of Texas, Ltd. (Authorized Agent and Operator) for an expansion of the City of Arlington Landfill

If you have any questions or concerns regarding this matter, please contact, Bob Weber at 817-459-6220 or Gary Bartels at 817-354-2306, representing the City of Arlington and Republic Waste Services of Texas, Ltd, respectively.

Sincerely,

Robert S. Byrd
Deputy City Manager
City of Arlington, Texas

Nicholas Stefkovich
North Texas Area President
Republic Waste Services of Texas, Ltd.

Enclosure: Application for Authorization of Work under Individual Section 404 Permit

cc: Steve Cooke, City of Arlington – w/o enclosure
Bob Weber, City of Arlington – w/ enclosure
Keith Brooks, City of Arlington – w/o enclosure
Gary Bartels, Republic Waste Services of Texas, Ltd – w/ enclosure
Bill Jones, Republic Waste Services of Texas, Ltd. – w/ enclosure
David Poe, P.E., Golder Associates, Inc. – w/ enclosure
C. Keith Bradley, REP, KBA EnviroScience, Ltd. – w/ enclosure
Site Operating Record, Arlington Landfill

**Arlington Landfill**
800 Mosier Valley Road ♦ Euless, Texas 76040
Telephone (817) 354-2300 ♦ Facsimile (817) 354-2320

KBA EnviroScience, Ltd.

101 E Southwest Pkwy, Ste 114
Lewisville, TX 75067
(972) 436-9669
FAX: (972) 436-9667

January 25, 2010

Ms. Mary Verwers
Regulatory Branch–Fort Worth District
U.S. Army Corps of Engineers
819 Taylor Street
Fort Worth, Texas 76102-0300

**Re: Application for Authorization of Work under Individual Section 404 Permit, Republic Waste Service of Texas, Ltd. – City of Arlington Landfill, Arlington, Tarrant County, Texas**

Dear Ms. Verwers:

We have enclosed a complete Application for Department of the Army Individual Permit for an expansion of the City of Arlington Landfill. The Applicant and Owner of the property is the City of Arlington, and Republic Waste Services of Texas, Ltd. is the (landfill operator) is the Agent for this project. All information required by the application is included in or attached to the application.

The Applicant proposes to construct a landfill expansion adjacent to the existing City of Arlington Landfill. The landfill expansion will involve two areas: the West Disposal Area (WDA) and the West Expansion Area (WEA). The landfill expansion will provide additional vertical disposal capacity to the WDA, which is currently a 128-acre capped landfill. The activity over the existing WDA is not expected to directly impact jurisdictional waters. Jurisdictional waters are present at the WEA and will be impacted by the proposed expansion.

The WEA is a 239-acre former sand and gravel mining area that will be excavated further to construct the additional landfill disposal area and one of two planned stormwater detention/retention basins. The two stormwater basins (East Basin and West Basin) will be constructed to provide adequate valley storage for flood events from the West Fork of the Trinity River. The basins will also serve as locations for on-site mitigation for impacts to jurisdictional waters. After implementation of the Mitigation Plan, the basins will feature several wetland habitat types: forested, emergent, and open water. The newly created basins will be buffered by upland mitigation buffer areas.

We would be pleased to host a visit to the project site for you and other regulatory agency staff as soon as possible to facilitate an early and thorough understanding of the project.

Please let either me or Brian Boe know if any additional information is needed.

Sincerely,

C. Keith Bradley, REP
KBA EnviroScience, Ltd.

Enclosure

cc: Bob Byrd, City of Arlington
Steve Cooke, City of Arlington
Bob Weber, City of Arlington
Keith Brooks, City of Arlington
Gary Bartels, Republic Waste Services of Texas, Ltd.
David Poe, P.E., Golder Associates, Inc.

# U.S. Army Corps of Engineers (USACE)
# Fort Worth District

## Application for Department of the Army Individual Permit

This form integrates the information in ENG Form 4345 with the items required by the Fort Worth District for Section 10 and Section 404 permits. Please consult instructions included at the end prior to completing this form.

**Contents**


- **Description of an Individual Permit**
- **Part I:** Project Information
- **Part II:** Alternative(s) Analysis
- **Part III:** Project Impacts and Mitigation
- **Part IV:** Attachments
- **Instructions**


### DESCRIPTION OF AN INDIVIDUAL PERMIT

Authorities: 33 USC 401, Section 10 of the Rivers and Harbors Act of 1899; Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1976 (not applicable in the Fort Worth District). Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the U.S.; the discharge of dredged or fill material into waters of the U.S.; and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine Uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

Activities that do not qualify for authorization under the General Permit program may qualify for authorization by Individual Permit (IP). Authorization under IP may be obtained only through application with the USACE. These permits are issued for activities that have more than minimal adverse impacts to waters of the U.S., and evaluation of each permit application involves more thorough review of the potential environmental and socioeconomic effects of the proposed activity.

An application for a Department of the Army IP under Section 404 or Section 10 will be determined to be complete when the USACE receives sufficient information to issue a public notice (see 33 CFR 325.1(d) and 325.3(a) for details and supporting information). The applicant should address all activities that the applicant plans to undertake that are reasonably related to the same project and for which a Department of the Army permit would be required. An alternatives analysis and a mitigation plan are not required for a complete application to prepare a public notice but are very helpful.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

## Part I: Project Information

| **Box 1 Project Name:** City of Arlington Landfill Expansion | **Applicant Name** City of Arlington c/o Robert S. Byrd, Deputy City Manager |
|---|---|
| **Applicant Title** Deputy City Manager | **Applicant Company, Agency, etc.** City of Arlington |
| Mailing Address 101 W. Abrams St. PO Box 90231 MS 01-0300 Arlington TX 76004-3231 | Applicant's internal tracking number (if any) |

| Work Phone with area code | Home Phone with area code | Fax # | E-mail Address |
|---|---|---|---|
| 817-459-6105 | N/A | 817-459-6116 | Bob.Byrd@arlingtontx.gov |

Relationship of applicant to property:
☒ Owner ☐ Purchaser ☐ Lessee ☐ Other:

Application is hereby made for a permit or permits to authorize the work as described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. I hereby grant to the agency to which this application is made the right to enter the above-described location to inspect the proposed, in-progress, or completed work. I agree to start work only after all necessary permits have been received.

| **Signature of applicant** | Date (mm/dd/yyyy) |
|---|---|
| Robert S. Byrd | 01/28/2010 |

**Box 2 Authorized Agent/Operator Name and Signature:** ***(If an agent is acting for the applicant during the permit process)***
Nicholas Stefkovich

| **Agent/Operator Title** | **Agent/Operator Company, Agency, etc.** |
|---|---|
| North Texas Area President | Republic Waste Services of Texas, Ltd. |

Mailing Address
1212 Harrison Ave, Arlington, TX 76011

E-mail Address
nstefkovich@republicservices.com

| Work Phone with area code | Home Phone with area code | Fax # | Cell Phone # |
|---|---|---|---|
| 817-317-2074 | N/A | 817-459-4663 | N/A |

I hereby authorize the above-named agent to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application. I understand that I am bound by the actions of my agent, and I understand that if a federal or state permit is issued, I, or my agent, must sign the permit.

| **Signature of applicant** | Date (mm/dd/yyyy) |
|---|---|
| Robert S. Byrd | 01/28/2010 |

I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate.

| **Signature of authorized agent** | Date (mm/dd/yyyy) |
|---|---|
| Nicholas Stefkovich | 01/28/2010 |

**Box 3 Name of property owner, if other than applicant:**

☐ Multiple Current Owners ***(If multiple current property owners, check here and include a list in Attachment A)***

| **Owner Title**<br>Municipality | **Owner Company, Agency, etc.** |
|---|---|
| Full Mailing Address<br>P.O. Box 90231, Arlington, TX 76004-3231 | |
| Work Phone with area code<br>817-459-6777 | Home Phone with area code<br>N/A |

**Box 4 Name of adjoining property owner, lessee, etc. whose property adjoins the project site:**

☒ Multiple Adjoining Property Owners/Lessees and Full Mailing Addresses ***(If multiple adjoining property owners/lessees, check here and include a list in Attachment B)***

Name and Full Mailing Address:
see Attachment B

**Box 5 Project location, including street address, city, county, state, and zip code where proposed activity will occur:**

The West Expansion Area (WEA), a 239-acre area within the City of Arlington Landfill Property, 800 Mosier Valley Rd., Euless, Tarrant County, Texas, 76040

**Nature of Activity** (Description of project; include all features; see instructions)**:**

See Attachment L.

**Project Purpose** (Description of the reason or purpose of the project; see instructions)**:**

The applicant seeks to construct an expansion area to the existing Arlington Landfill. The growing population of the City of Arlington creates a great need for new landfill volume. Between 2000 and 2008, the population of Arlington increased by 36,181 people (NCTCOG 2008). The population is projected to increase by 110,000 between the years 2010-2040 (TWDB 2008). The lack of other open space within the city for construction of a new landfill, the currently permitted status of the active landfill, and previously impacted land adjacent to the current landfill makes the proposed site ideal for landfill expansion. The proposed landfill expansion will provide approximately 42 million cubic yards of gross capacity. Two floodwater detention basins will be excavated to temporarily store stormwater on the site and floodwater from the West Fork of the Trinity River. These basins will provide adequate valley storage for the floodway.

References:

NCTCOG 2008. North Central Texas Council of Governments, Demographic Data for North Central Texas. www.nctcog.org/ris/demographics/index.asp

TWDB 2008. Texas Water Development Board, 2006 Regional Water Plan. www.twdb.state.tx.us/DATA/popwaterdemand/2003Projections/Population%20Projections/STATE_REGION/City_Pop.htm

Has a delineation of waters of the U.S., including wetlands, been completed? (see instructions)

☒ Yes, in Attachment C ☐ No

If a delineation has been completed, has it been verified in writing by the USACE?

☐ Yes, Date of approved or preliminary jurisdictional determination (mm/dd/yyyy)**:**

USACE project:

☒ No

| |
|---|
| Are color photographs of the existing conditions available? ☒ Yes, in Attachment D ☐ No<br>Are aerial photographs available? ☒ Yes, in Attachment D ☐ No |
| **Complete the table in Attachment E for any waters of the U.S. impacted by the proposed project.** |
| **Waterbody(ies)** (if known; otherwise enter "an unnamed tributary to"): Wetlands and ponds within the floodplain of the West Fork of the Trinity River<br><br>Tributary(ies) to what known, downstream waterbody(ies): West Fork of the Trinity River |
| Latitude and longitude (Decimal Degrees at center of project):<br>Lat 32.8002 N, Long -97.1203 W |
| USGS Quad map name(s):<br>Euless, Hurst |
| Watershed(s) and other location descriptions, if known:<br>Upper Trinity River |
| Directions to the project location:<br>From the intersection of Farm to Market Road 157 and Mosier Valley Road, travel west on Mosier Valley Road approximately 420 feet to the entrance gate to the City of Arlington Landfill. From the gate, travel south approximately 4,000 feet to reach the access road that parallels the West Fork of the Trinity River (West Fork). Proceed west on this access road for 2,400 feet until crossing Hurricane Creek. |

## Part II: Alternative(s) Analysis

| |
|---|
| **Box 6 Describe the alternatives that would meet your overall project purpose in accordance with the Clean Water Act Section 404(b)(1) guidelines to demonstrate the proposed activity represents the least environmentally damaging practicable alternative:** (See instructions)<br>☒ Alternative(s) Analysis in Attachment F |

## Part III: Project Impacts and Mitigation

| |
|---|
| **Box 7 Reason(s) for Discharge into waters of the U.S.** (See instructions):<br>To make the landfill expansion logistically and economically feasible, the ponds, intermittent channels, and associated wetlands within the West Expansion Area (WEA) will be required to be excavated and/or filled. Excavation will be necessary to establish the planned depth of the footprint of the landfill expansion, as well as the detention basins. Excavated soil will be stored onsite (in an upland area) for use as daily cover for the landfill operations. When the WEA landfill footprint is established, refuse will be placed in the landfill as part of normal landfill operations. |

Type(s) of material being discharged and the amount of each type in cubic yards:
The total volume of the exavation in jurisdictional waters to be filled is 1,716,347 cubic yards. Fill material will be comprised of a landfill liner, refuse, and soil excavated from the project area. The exact amounts of each fill material is undetermined, but will be primarily refuse. The soil at the site is mapped as Arents. This is a generally loamy soil that also has varied amounts of sand, silt, clay, and gravel. This soil type is the material that remained after sand and gravel mining operations were suspended. A liner system will be installed for the landfill expansion.

Total surface area (in acres) of wetlands or other waters of the U.S. to be filled:
23.29 acres of open water will be excavated; an additional 18.03 acres will be excavated and filled. 1.69 acres of forested wetland will be excavated; an additional 34.31 acres will be excavated and filled. 1.35 acres of emergent wetland will be excavated; an additional 1.91 acres will be excavated and filled. 1.03 acres of scrub-shrub wetland will be excavated; an additional 0.54 acres will be excavated and filled. 3.64 acres of aquatic bed fringe wetland will be excavated; an additional 0.52 acres will be excavated and filled.

For activities involving dredging in navigable waters of the U.S., describe the type, composition, and quantity of the material to be dredged, the method of dredging, and the site and plans for disposal of the dredged material:
No dredging will take place in navigable waters.

Indicate the proposed impacts to **waters of the U.S.** in ACRES (for wetlands and impoundments) and LINEAR FEET (for rivers and streams), and identify the impact(s) as permanent and/or temporary for each waterbody type listed below. The table below is intended as a tool to summarize impacts by resource type for planning compensatory mitigation and does not replace the table of waters of the U.S. in Attachment E.

| | Permanent | | Temporary | |
|---|---|---|---|---|
| **Waterbody Type** | **Acres** | **Linear feet** | **Acres** | **Linear feet** |
| Non-forested wetland | 8.98 | 0 | 0 | 0 |
| Forested wetland | 36.00 | 0 | 0 | 0 |
| Perennial stream | 0 | 0 | 0 | 0 |
| Intermittent stream | 0 | 0 | 0 | 0 |
| Ephemeral stream | 0 | 0 | 0 | 0 |
| Impoundment | 0 | 0 | 0 | 0 |
| Other: ponds | 41.32 | 0 | 0 | 0 |
| Total: | 86.30 | 0 | 0 | 0 |

Potential indirect and/or cumulative impacts of proposed discharge (if any):
No potential indirect and/or cumulative impacts of proposed discharge are identified.

Required drawings (see instructions):
Vicinity map: ☒ In Attachment G
To-scale plan view drawing(s): ☒ In Attachment G
To-scale elevation and/or cross section drawing(s): ☒ In Attachment G

Is any portion of the work already complete? ☐ Yes ☒ No
If yes, describe the work:

**Box 8 Authority:** (see instructions)
Is Section 10 of the Rivers and Harbors Act for projects affecting navigable waters applicable?
☐ Yes ☒ No ***(see Fort Worth District Navigable Waters list)***

Is Section 404 of the Clean Water Act applicable? ☒ Yes ☐ No

**Box 9 Federally Threatened or Endangered Species** (see instructions)
**Please list any federally-listed (or proposed) threatened or endangered species or critical habitat potentially affected by the project (use scientific names (i.e., genus species), if known):**
Interior least tern (Sterna antillarum athalassos); Whooping crane (Grus americana)

Have surveys, using U.S. Fish and Wildlife Service (USFWS) protocols, been conducted?
☒ Yes, Report in Attachment H ☐ No (explain): (habitat evaluation)

If a federally-listed species would potentially be affected, please provide a description and a biological evaluation.
☐ Yes, Report in Attachment H ☒ Not attached

Has Section 7 consultation been initiated by another federal agency?
☐ Yes, Initiation letter in Attachment H ☒ No

Has Section 10 consultation been initiated for the proposed project?
☐ Yes, Initiation letter in Attachment H ☒ No

Has the USFWS issued a Biological Opinion?
☐ Yes, Report in Attachment H ☒ No
If yes, list date Opinion was issued (mm/dd/yyyy):

**Box 10 Historic Properties and Cultural Resources**
**Please list any historic properties listed (or eligible to be listed) on the National Register of Historic Places which the project has the potential to affect:**
no potential for effect

Has an archaeological records search been conducted?
☒ Yes, Report in Attachment I ☐ No (explain):

Are any cultural resources of any type known to exist on-site?
☒ Yes ☐ No

Has an archaeological pedestrian survey been conducted for the site?
☒ Yes, Report in Attachment I ☐ No (explain):

Has Section 106 or SHPO consultation been initiated by another federal or state agency?
☐ Yes, Initiation letter in Attachment I ☒ No

Has a Section 106 MOA been signed by another federal agency and the SHPO?
☐ Yes, in Attachment I ☒ No
If yes, list date MOA was signed (mm/dd/yyyy):

**Box 11 Proposed Conceptual Mitigation Plan Summary** (see instructions)

Applicant proposes combination of one or more of the following mitigation types:
☐ Mitigation Bank ☒ On-site ☐ Off-site (Number of sites: ) ☐ None

Applicant proposes to purchase mitigation bank credits: ☐ Yes ☒ No
Mitigation Bank Name:
Number of Credits:

Indicate in ACRES (for wetlands and impoundments) and LINEAR FEET (for rivers and streams) the total quantity of waters of the U.S. proposed to be created, restored, enhanced, and/or preserved for purposes of providing compensatory mitigation. Indicate mitigation site type (on- or off-site) and number. Indicate waterbody type (non-forested wetland, forested wetland, perennial stream, intermittent stream, ephemeral stream, impoundment, other) or non-jurisdictional (uplands[1]).

| Mitigation Site Type and Number | Waterbody Type | Created | Restored | Enhanced | Preserved |
|---|---|---|---|---|---|
| *e.g., On-site 1* | *Non-forested wetland* | *0.5 acre* | | | |
| *e.g., Off-site 1* | *Intermittent stream* | | *500 LF* | *1000 LF* | |
| On-site 1 | Forested wetland | 31.17 | | | |
| On-site 3 | Emergent wetland | 30.79 | | | |
| On-site 4 | Open water | 5.58 | | | |
| On-site 5<br>On-site 6<br>On-site 7 | Upland--buffer<br>Upland--baffle<br>Upland--tree island | 43.86<br>9.06<br>0.56 | | | |
| | | | | | |
| | Totals: | 121.02 | | | |

[1] **For uplands, please indicate if designed as an upland buffer.**

Summary of Mitigation Work Plan (Describe the mitigation activities listed in the table above): See Attachment M.

Provide a detailed explanation of how appropriate and practicable steps have been taken to avoid, minimize, or mitigate, the adverse impact of the proposed project on the aquatic ecosystem:
The proposed project seeks to avoid and minimize impacts to on-site and off-site ecological receptors. Approximately 72 acres of the riparian forest along the north bank of the West Fork of the Trinity River will remain in its natural state and will not be impacted by the project. The undisturbed forested area along Walker Branch and south to the West Fork will also remain in its natural state and will not be impacted by the project. Impact will occur to 34.40 acres of the 47.85-acre forested wetland east of the large pond that established after gravel mining operations ceased; however, 13.45 acres of this forested wetland will not be impacted.

Impacts will be minimized by completing construction as quickly and efficiently as possible. On-site impacts will be minimized by limiting the disturbance to only the areas necessary to provide for an economically viable project. The wetlands onsite are the result of gravel mining activities in past decades. The mitigation wetland areas will be an opportunity to establish high quality wetlands in these previously disturbed areas.

Off-site impacts will be minimized by adhering to a Storm Water Pollution Prevention Plan (SWPPP) developed for the site. The SWPPP will include best management practices to control erosion and minimize sediment transport off the site.

The stormwater detention basins will also serve as on-site mitigation areas. Unavoidable impacts to jurisdictional waters will be mitigated for by establishing forested wetland, emergent wetland, and open water habitat within the basins. Approximately 67.54 acres of wetland and 53.48 acres of upland areas and buffers will be established in the mitigation area. A functional replacement approach is proposed for the mitigation area. Based on the results of the Functional Assessment, forested wetland appears to be the highest functioning wetland type for the mitigation. Therefore, the acreage of forested wetland will be maximized to the highest extent possible.

Has a conceptual mitigation plan been prepared in accordance with the USACE regulations and guidelines? ☒ Yes, in Attachment J ☐ No (explain):

| Mitigation site(s) latitude and longitude (Decimal Degrees at center of site): 32.799°N, 97.125°W | USGS Quad map name(s): Euless, Hurst |
|---|---|

Other location descriptions, if known:
An area north of the West Fork of the Trinity River, east of Walker Branch, south of the Trinity Railway Express rail line, and west of Hurricane Creek.

Directions to the mitigation location(s):
From the intersection of Farm to Market Road 157 and Mosier Valley Road, travel west on Mosier Valley Road approximately 420 feet to the entrance gate to the City of Arlington Landfill. From the gate, travel south approximately 4,000 feet to reach the access road that parallels the West Fork Trinity. Proceed west on this access road for 2,400 feet until crossing Hurricane Creek. The East Basin will be immediately to the north and northwest. Continue west on the access road for 4,100 feet. The West Basin will be immediately to the north and northwest.

**Box 12 Clean Water Act Section 401 Water Quality Certification** (see instructions)**:**

For Texas:

TCEQ Type of 401 Certification: ☐ Tier I ☒ Tier II

For Tier I, does the project incorporate the Best Management Practices (BMPs) and other requirements of the Tier I Checklist?

☐ Yes (Include Completed Tier I Checklist in Attachment K) ☐ No

For Tier II, has a 401 Certification Questionnaire and Alternatives Analysis Checklist been completed? ☒ Yes, in Attachment K ☐ No

For Louisiana:

Applying for individual water quality certification? ☐ Yes ☐ No

Other information for individual water quality certification:

**Box 13 List of other certifications or approvals/denials received from other federal, state, or local agencies for work described in this application:**

| Agency | Approval Type[2] | Identification No. | Date Applied | Date Approved | Date Denied |
|---|---|---|---|---|---|
| THC | No effect concurrence | | | | |
| FEMA | CLOMR | | | | |
| NCTCOG | Corridor Development Certificate | | | | |
| | | | | | |

[2] Would include but is not restricted to zoning, building, and floodplain permits

## Part IV: Attachments

| | Included |
|---|---|
| A. List of Project Site Property Owners | ☐ |
| B. List of Adjoining Property Owners, Lessees, etc. | ☒ |
| C. Delineation of Waters of the U.S., Including Wetlands | ☒ |
| D. Color Photographs | ☒ |
| E. Table of Waters of the U.S. Impacted by the Proposed Project | ☒ |
| F. Alternative(s) Analysis | ☒ |
| G. Required Drawings/Figures | ☒ |
| H. Federally Threatened or Endangered Species Information | ☒ |
| I. Historic Properties and Cultural Resources Information | ☒ |
| J. Conceptual Mitigation Plan | ☒ |
| K. Section 401 Water Quality Certification Information | ☒ |
| L. Other: Nature of Activity | |
| M. Summary of Mitigation Work Plan | |
| N. Functional Assessment | |

☒

**End of Form**

## Attachment E: Table of Waters of the U.S. Impacted by the Proposed Project

| Waterbody ID[1] | Latitude and Longitude (Decimal Degrees) | Resource Type[2] | Linear Feet in Project Area | Acres in Project Area | Impact Type[3] | Linear Feet of Impact | Acres of Impact | Cubic Yards of Material to be Discharged | Activity Type[4] |
|---|---|---|---|---|---|---|---|---|---|
| *e.g., W-1* | *32.755°N, 97.755°W* | *NFW* | - | *0.25* | *D/P* | - | *0.15* | *1210* | *FP* |
| see Attachment E | | | | | | | | | |
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| | | | | | | | | | |
| NFW subtotal | – | – | | | – | | | | – |
| FW subtotal | – | – | | | – | | | | – |
| PS subtotal | – | – | | | – | | | | – |
| IS subtotal | – | – | | | – | | | | – |
| ES subtotal | – | – | | | – | | | | – |
| I subtotal | – | – | | | – | | | | – |
| TOTAL | – | – | | | – | | | | – |

[1] Waterbody ID may be the name of a feature or an assigned label such as "W-1" for a wetland.

[2] Resource Types: NFW – Non-forested wetland, FW – Forested wetland, PS – Perennial Stream, IS – Intermittent Stream, ES – Ephemeral Stream, I – Impoundment

[3] Impact Types: D/P – Direct* and Permanent, D/T – Direct and Temporary, I/P – Indirect** and Permanent, I/T – Indirect and Temporary
* Direct impacts are here defined as those adverse affects caused by the proposed activity, such as discharge or excavation.
** Indirect impacts are here defined as those adverse affects caused subsequent to the proposed activity, such as flooding or effects of drainage on adjacent waters of the U.S.

[4] Activity Types: BP – Building or Well Pad, RC – Road Crossing, DC – Dam Construction, IN – Inundation, CH – Channelization, BS – Bank Stabilization, UL – Utility Line Installation, DR – Dredging, CL – Clearing, FP – Fill Placement, MA – Mining Activities, or Other (explain in Box 7)

# ATTACHMENT C

# DELINEATION OF WATERS OF THE U.S., INCLUDING WETLANDS

KBA EnviroScience, Ltd.

# ATTACHMENT C

# DELINEATION OF WATERS OF THE UNITED STATES INCLUDING WETLANDS

## City of Arlington Landfill
## Arlington, Texas

**Prepared for**

**City of Arlington, Texas**
**P.O. Box 90231**
**Arlington, Texas 76004**

**&**

**Republic Waste Service of Texas, Ltd.**
**800 Mosier Valley Road**
**Euless, Texas 76040**

**Prepared by**

**KBA EnviroScience, Ltd.**
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**972-436-9669**

**Prepared January 2010**

KBA EnviroScience, Ltd.

# DELINEATION OF WATERS OF THE UNITED STATES INCLUDING WETLANDS

## City of Arlington Landfill
## Arlington, Texas

Brian Boe, Project Manager — January 22, 2010 Date

C. Keith Bradley, REP 5734
Environmental Professional of Record — January 22, 2010 Date

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# APPENDICES

Appendix A: Stream Data Sheets
Appendix B: Routine Wetland Determination Data Forms
Appendix C: Site Photographs

# INTRODUCTION

KBA EnviroScience, Ltd. (KBA) performed a delineation of wetlands and other "waters of the United States" (as defined by the Clean Water Act) for the City of Arlington Landfill in Arlington, Texas. "Waters of the U.S." are potentially subject to Federal regulation pursuant to Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899 under the jurisdiction of the U.S. Army Corps of Engineers (USACE). "Wetlands" are potentially a subset of "waters of the U.S." and would therefore be subject to Federal regulation as well.

The delineation was performed by Keith Bradley, REP; Brian Boe; Brandon Law; Dave Babicki; and Kirsten Ward of KBA on November 12-16, 2007. Both "wetlands" and "waters of the U.S." were delineated.

### *Project Area*

The project site consists of an approximately 790-acre tract bordered by the old route of FM 157 to the east, the West Fork of the Trinity River to the south, the boundary with the City of Fort Worth to the west, and the Trinity Railway Express (TRE) commuter rail line and Mosier Valley Road to the north (**Figure 1**). A small section at the southeast corner of the property is bordered by a fence that marks the property line with a small part of River Legacy Park that is north of the Trinity River.

The property includes several different areas designated by their previous or current land use (**Figure 2**). The active landfill is referred to as the East Disposal Area (EDA) and occupies 175 acres in the east part of the property between FM 157 and Hurricane Creek. The 128-acre West Disposal Area (WDA) is a closed and capped portion of the landfill site, and sits in the middle of the property to the west of Hurricane Creek. The USGS topographical map shows gravel mining in the areas that are the WDA and EDA today (**Figure 3**). The 239-acre West Expansion Area (WEA) is part of a former sand and gravel mining operation that was in operation from the 1940s until operations ceased in 2004. It is characterized by excavated channels and pits plus ridges of mounded material. Water has collected in the excavated areas over the years. One especially large pond has formed in the WEA to the west of the channel/ridge area. A 54-acre parcel referred to as the Surber tract is located to the west of the WEA and was a motocross riding area for several decades. Two areas are known as historical fill areas (HFAs); they were utilized before the landfill was originally permitted in 1978. One is to the south of the EDA, and the other is south of the WDA. The topographic map shows a wavy pattern for the HFA south of the EDA; this indicates a disturbed surface. The color for this pattern on the map is purple, indicating that this feature was added in the photorevisions in 1981 (**Figure 3**). Together, the HFAs total an estimated 189 acres. A forested area lies along the West Fork Trinity River along the southern boundary of the property.

Walker Branch enters the property from the west side and flows into the West Fork Trinity near the southwest corner of the property. Just northeast of Walker Branch, there is a depressional area with forest vegetation. According to USGS topographic maps, which are based on aerial imagery from 1956, Hurricane Creek originally flowed eastward from a point just south of the TRE railroad tracks (**Figure 3**). The USFWS National Wetland Inventory (NWI) map

(**Figure 4**) (based on 1981 aerial photography) shows that the channel of Hurricane Creek flows south through the central part of the property and into the Trinity River. Current observations show the channel of Hurricane Creek follows the north-to-south course indicated on the NWI map, which marks the boundary between the EDA and the WDA. Based on these observations, it is likely that the course of Hurricane Creek was re-routed sometime between 1956 and 1981. Forest vegetation is found along the current channel of Hurricane Creek. The West Fork of the Trinity River flows roughly eastward, forming the southern boundary of the City of Arlington Landfill property. Forested vegetation is found between the river and the southern access road. The southern access road runs along a levee between the forested buffer along the Trinity and the large pond (Pd-1) in the WEA (**Figure 5**).

Most of the WEA property, with the exception of parts of the northern edge, is located within 'Zone A', indicating the 100-year flood plain, as mapped by the Federal Emergency Management Agency (FEMA). This is indicated in **Figure 6,** Flood Insurance Rate Map Panel No. 48439C0220K and **Figure 7**, Flood Insurance Rate Map Panel No. 48439C0240K (FEMA 2010). The elevation of the property ranges from approximately 450 (near the river) to 520 feet (along the north property boundary) above mean sea level (msl) (TNRIS 2007, Golder 2005) (**Figure 3, Figure 8**).

A 36-inch Reinforced Concrete Pipe (RCP) culvert runs under the south access road (which runs along a levee) between the large pond (Pd-1)in the WEA and an eroded channel that flows into the West Fork Trinity River (**Figure 5, Figure 9, Photo 4**).

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map depicts surface waters, regardless of whether or not they are subject to federal or state jurisdiction (e.g., stock ponds). The map that includes this site (Euless and Hurst Quadrangles, 1992) (**Figure 4**) includes many surface water features. However, due to the land use changes associated with the previous sand and gravel operation and the establishment of the landfill, many of the designations are no longer reliable. The following map features are likely to represent actual conditions today:

**R4SBCx – Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated.** This designation is mapped for Hurricane Creek.

**R2UBH – Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded.** This designation is mapped for the West Fork Trinity River.

**PFO1A – Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded.** This designation is mapped for several areas: a braided area of Hurricane Creek in the central part of the property, along much of the southern boundary of the property along the West Fork Trinity River, along Walker Branch, a depressional area just east of Walker Branch, and the large forested area in the WEA that consists of the excavated channels from the sand and gravel mining operation.

**L1UBx – Lacustrine, Limnetic, Unconsolidated Bottom, Excavated.** This designation is for the long pond between the WDA and the WEA.

## DESCRIPTION OF SOILS

Soils within the project area are described in the USDA Natural Resources Conservation Service (NRCS) Soil Survey of Tarrant County, Texas (NRCS 2007). The soil survey map is provided as **Figure 10**; the numbers in brackets correspond to the numbers within the project area on the soil survey map. Seven soil types are described for the delineated area:

**[6] – Aquilla loamy fine sand, 1 to 5 percent slopes.** This is a deep, gently sloping, sandy soil on old terraces of major streams. Typically, the surface layer is mildly alkaline, brownish loamy fine sand about 6 inches thick. From a depth of 6 to 28 inches is neutral, reddish yellow loamy fine sand. This soil is somewhat excessively drained, runoff is slow, permeability is moderately rapid, and available water capacity is low. The soil is not flooded or ponded.

**[7] – Arents, frequently flooded.** These are deep, loamy soil materials that are the overburden from excavated areas of sand and gravel mining operations on nearly level flood plains of large streams. Most of the unit consists of mounds and piled-up areas 15 to 40 feet high and pits 5 to 25 feet deep. The rest of the unit has been smoothed and reclaimed. Areas that are not protected by levees are flooded once or twice annually from fall to spring. Water is present in the deeper pits. The soil materials are extremely varied. They are in shades of red, brown, and yellow and contain varied amounts of clay, sand, silt, and gravel. The materials are mainly loamy, moderately alkaline, and calcareous. According to the NRCS 2007 National Hydric Soils List, 2% of the map unit contains unnamed, hydric minor components in depressions and flood plains. The hydric rating is based on criteria 3: soils that are frequently ponded for long or very long duration during the growing season. The NRCS Service Center for Tarrant County also lists these soil components as hydric based on the above criteria.

**[8] – Arents, loamy.** These are gently undulating, loamy soils that have been smoothed and reclaimed after sand and gravel mining operations were suspended. These soils are mainly on terraces along major streams. Arents are extremely varied within a mapped area. They are stratified in shades of red, brown, and yellow. They mainly consist of loamy material that has varied amounts of sand, silt, clay, and gravel. Sandy clay loam is the dominant texture, but fine sand, loamy fine sand, and fine sandy loam are common. They can all be present in a mapped area. Available water capacity is moderate.

**[54] – Ovan clay, frequently flooded.** This is a deep, nearly level, clayey soil on flood plains of major streams. The surface layer is typically a moderately alkaline, very dark grayish brown clay about 6 inches thick. From 6 to 25 inches the soil is moderately alkaline, very dark grayish brown clay. Permeability is very slow, available water capacity is high, and surface runoff is slow.

**[59] – Pulexas fine sandy loam, frequently flooded.** This is a deep, nearly level soil on narrow flood plains of streams that are within and that drain sandy and loamy areas. It is also on slight benches or overwashes above the more clayey soils on larger flood plains.

The soil is flooded once or more every two years for brief periods. Typically, to a depth of 64 inches, this soil is neutral, light yellowish brown fine sandy loam containing thin, loamy strata. Permeability is moderately rapid, available water capacity is medium, and surface runoff is slow.

**[70] – Silawa fine sandy loam, 3 to 8 percent slopes.** This is a deep, gently sloping and sloping loamy soil that is on high terraces above flood plains of major streams. Typically the surface layer is slightly acid, dark yellowish brown fine sandy loam to 6 inches. From a depth of 6 to 46 inches, it is a red to yellowish red medium acid sandy clay. Permeability is moderate, available water capacity is medium, and runoff is medium. The hazard of erosion is moderate.

**[80] – Trinity clay, frequently flooded.** This is a deep, nearly level, clayey soil that is on flood plains of major streams. It is flooded once every year to once every two years. Typically, this soil is moderately alkaline, dark gray clay to a depth of 32 inches. Permeability is very slow, available water capacity is high, and surface runoff is very slow. According to the NRCS 2007 National Hydric Soils List, 5% of the map unit contains unnamed hydric minor components in depressions. The hydric rating is based on hydric criteria 3: soils that are frequently ponded for long or very long duration during the growing season, and hydric criteria 4: soils that are frequently flooded for long of very long duration during the growing season. The NRCS Service Center for Tarrant County also lists these soil components as hydric based on the above criteria.

As discussed, certain components of Arents, frequently flooded (Soil 7) and Trinity clay, frequently flooded (Soil 80) are listed by the NRCS as hydric. The remainder of the site soils are not listed by the NRCS as hydric.

# FIELD METHODOLOGY

### *General*

After review of available information, including topographic maps, the NWI map, and the soil survey, the field delineation was performed in accordance with the United States Army Corps of Engineers Wetland Delineation Manual (USACE, 1987), as later amended by USACE memoranda. Stream Data Sheets were recorded for the streams located within the project area (**Appendix A**). The Stream Data Sheets include stream characteristics, substrate, instream cover, and riparian zone characteristics for the purposes of identifying and describing streams observed onsite.

A total of twenty-five delineation transects were traversed along portions of the onsite streams Walker Branch and Hurricane Creek, associated wetland areas, and open water areas. Transects were selected to follow topographic gradients and intercept suspected wetland areas, based on the aforementioned review of available documents. On each transect, at least one plot was evaluated for each community type that was evidenced by a change in dominant vegetation type or hydrology. Additional plots were developed to characterize uplands away from the wetland areas. Field observations were recorded on a Corps of Engineers Routine Wetland Determination Data Form (forms taken from USACE, 1987) (**Appendix B**).

The boundaries of the jurisdictional waters of Hurricane Creek and the wetlands at Transects T5 and T13 were pin-flagged. Photographs were taken from various positions along the aforementioned surface water features (**Appendix C**). Transects, and plot locations are provided on **Figures 5, 11-16**.

### *Streams*

Streams are identified as channels that have regular flow at a frequency and duration resulting in the formation of ordinary high water marks (OHWM). The OHWM is defined as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." KBA walked along the streams and recorded the distance between the OHWMs (stream width) at regular intervals and where the width changed substantially.

### *Wetlands*

Wetlands are defined as those areas that are inundated or saturated by surface or ground water 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. Wetlands generally include but are not limited to swamps, marshes, bogs, and similar areas. Wetlands have the following three diagnostic environmental characteristics: hydrophytic (or wetland) vegetation, wetland hydrology, and hydric soils. Evidence of all three parameters must be found in order to make a positive wetland determination.

### *Vegetation*

Dominant plant species in each vegetation layer in the immediate vicinity of the plot were identified and recorded. Generally, a 5-ft radius was used for herbs and saplings/shrubs, and a 30-ft radius was used for trees and woody vines (if present). Dominant species were determined by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or the greatest number of stems (woody vines).

Morphological adaptations, such as buttressed trunks, adventitious roots, or multi-trunked trees, were recorded. The indicator status for vegetation in US Environmental Protection Agency (EPA) Region 6 was recorded for each of the dominant species. The following abbreviations were used on the data forms:

| | |
|---|---|
| OBL: | Obligate wetland plants |
| FACW: | Facultative wetland plants |
| FAC: | Facultative plants |
| FACU: | Facultative upland plants |
| UPL: | Upland plants |

In some instances, the indicator status included a"+" or a"-"(e.g., FACW-), to indicate a relative tendency to be more or less a wetland (or upland) plant. Hydrophytic vegetation is present at the observation point when more than 50 percent of the dominant species have an indicator status of OBL, FACW, and/or FAC; when two or more dominant species have observed morphological or known physiological adaptations for occurrence in wetlands; or when other indicators of hydrophytic vegetation are present.

### *Soils*

Information regarding soils was recorded for each community at the site. A soil sample of the upper 14 to 16 inches was collected. The color of the matrix and any mottling in the sample were determined for each apparent layer in the sample using a soil color chart (Munsell, 1994). Gleyed soils, or soils with matrix chroma of 2 or less in mottled soils or chroma of 1 in unmottled soils were considered to potentially exhibit hydric characteristics. The presence of high organic matter content in the surface horizon and a depleted matrix in sandy soils are also indicators of hydric soils. Soil characteristics were reported on the data form and checked against the mapped soil type to determine if the mapped soil type appeared to be accurate for the plot.

Other soil characteristics such as iron and manganese concretions were recorded when observed. Evidence of organics in sand, either as a layer above the mineral surface, vertical streaking, or as a hardened subsurface pan, was also recorded when observed. The depth of root zones from nearby trees and shrubs was noted, as shallow roots are indicative of saturated conditions.

### *Hydrology*

At each plot, visual indications of wetland hydrology were recorded. Visual signs could generally include:

Degree of inundation
Drainage patterns
Depth to saturated soil or free water in soil pit
Water marks on tree trunks
Drift lines (deposition of debris from flooding)
Deposits of sediments, organic material, or minerals on vertical materials such as tree trunks
Oxidized root channels
Water stained leaves

Additionally, the result of the FAC-Neutral test was recorded. The FAC-Neutral test is determined by first eliminating all FAC species from consideration. The FAC-Neutral test is positive if the number of remaining species wetter than FAC (OBL, FACW, FAC+) are greater than the number of species drier than FAC (UPL, FACU, FAC-).

***Other Observations***

Other observations pertinent to the outcome of the wetland delineation were recorded. Primarily, these observations were directed to land alterations that would impact hydrology, such as dams or other blockages, man-made drainage channels, or changes to onsite or offsite topography that would modify drainage patterns.

## RESULTS

The project area consists of several types of land use areas.

A large, active landfill (EDA) is found at the eastern section of the property. An inactive, capped landfill area (WDA) occupies the center of the property. This is a large mounded area covered in grasses such as Bermudagrass (*Cynodon dactylon*) and Johnsongrass (*Sorghum halepense*). Two areas of historic fill (HFA) exist on the property, which predate the original solid waste permit for the landfill, and likely predate the Clean Water Act. One HFA is situated just south of the WDA. The other HFA is in a low area south of the EDA, and 24 separate emergent wetlands were found in this HFA (**Figure 11**).

The City of Arlington acquired property (WEA) to the west of the WDA that was a sand and gravel mining operation for at least 60 years. This area is characterized by large excavated pits and networks of ridges and channels that have filled with water over the years. At the time of the field investigation, there are 1 large ponded area, 8 smaller ponded areas, emergent wetland fringes around the ponds, 19 small islands in the large pond with scrub-shrub and aquatic bed wetland vegetation, 4 emergent wetlands, and 2 areas of forested wetland. (**Figure 5, Figure 12, Figure 13**). The area of channels and ridges has been abandoned from mining operations for some time and forest vegetation now dominates the site. (**Figure 12**). The Surber Tract, located west of the WEA, was found to consist of a disturbed and eroded landscape in an upland setting.

At the northeast corner of the property, water drains onto the landfill property at two locations along the north property boundary, collects in an emergent wetland, and then drains offsite into a roadside ditch. From the north, water enters the property from a small pond just to the north of the railroad tracks and flows through culverts under the railroad tracks and Mosier Valley Road. The source from the west appears to originate with a seep in a sandstone shelf along the northern boundary of the landfill property. After intersecting the channel from the north, it flows east off the property, draining the northeast corner of the property. The ditch then flows south along FM 157 for approximately 600 feet, then flows east through a culvert under the road into the original Hurricane Creek channel. At the time of the field investigation, the old Hurricane Creek channel flowed southeast through ponds and channels associated with another historic sand and gravel mining operation east of the landfill property.

A 36-inch diameter reinforced concrete culvert is located between the large pond Pd-1 and an eroded channel that drains to the river. Water was observed in the channel, but was not flowing out of the culvert itself at the time of observation. At the time of the field visit in November, the water level of the large pond Pd-1 was less than a foot below the opening of the culvert, as seen in **Photo 4**.

***Community Types***

Twelve community types were identified on the delineated portion of the property:

Community Type A: Uplands, rarely inundated or saturated. Hydrophytic vegetation was not dominant, wetland hydrology was not observed, and hydric soils were not present.

Community Type B: Uplands, rarely inundated or saturated. Hydric soils were present; however, hydrophytic vegetation was not dominant and wetland hydrology was not observed.

Community Type C: Uplands, periodically inundated or saturated. Hydrology was observed and hydric soils were present; however, hydrophytic vegetation was not dominant.

Community Type D: Uplands, rarely inundated or saturated. Hydrophytic vegetation was dominant and hydric soils were present; however, hydrology was not observed.

Community Type E: Uplands, rarely inundated or saturated. Hydrophytic vegetation was dominant; but hydric soils and wetland hydrology were not observed.

Community Type F: Uplands, periodically inundated or saturated. Hydrophytic vegetation was dominant and hydrology were present; however, hydric soils were not observed.

Community Type G: Forested Wetlands, periodically inundated or saturated. Hydrophytic vegetation was dominant, wetland hydrology was observed, and hydric soils were present.

Community Type H: Emergent Wetlands, periodically inundated or saturated. Hydrophytic vegetation was dominant, wetland hydrology was observed, and hydric soils were present.

Community Type I: Perennial streams below the OHWMs.

Community Type J: Open water– pond.

Community Type K: Scrub-Shrub Wetlands, periodically inundated or saturated. Hydrophytic vegetation was dominant, wetland hydrology was observed, and hydric soils were present.

Community Type L: Intermittent streams (or erosional channel) below the OHWMs.

Community Type M: Aquatic Bed Fringe Wetlands, permanently inundated. Hydrophytic vegetation was dominant, wetland hydrology was observed, and hydric soils were present.

A summary of waters of the U.S. is provided as **Table 1**. Summary of field data for Hurricane Creek (Community I) is provided as **Table 2**. Maps of waters of the U.S. including wetlands and transects for the project areas are provided in **Figures 5, 11-16**. Stream data sheets are included in **Appendix A**; Routine Wetland Delineation forms for each observation location ('Plot ID') are included in **Appendix B**. Photographs of representative plots are provided in **Appendix C**. Transect 8 was abandoned and it is not included in either the tables or figures.

Community Type A (**Table 3**) represents areas upgradient to and along streams and ponds within an upland setting. Hydrophytic vegetation was not dominant, and wetland hydrology and hydric soils were not observed. Dominant vegetation within this community includes Bermuda grass (*Cynodon dactlyon*), Johnsongrass (*Sorghum halepense*), and annual ragweed (*Ambrosia artemisiifolia*). This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type B (**Table 4**) represents areas with hydric soil in uplands. Wetland hydrology and hydrophytic vegetation were not present. This community was found outside the fringe of the drainage ditch at the northeast corner of the property, to the west of the isolated wetland at T21, and at the south edge of the large pond at T23. The dominant vegetative species include Johnsongrass and Bermuda grass. This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type C (**Table 5**) represents the area along the north edge of the drainage in the northeast corner of the site. The vegetation was dominated by Bermuda grass. Hydrophytic vegetation was not present; however hydric soils and wetland hydrology were observed. The community was identified at T12 P1. This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type D (**Table 6**) represents areas that are dominated by hydrophytic vegetation and have hydric soils, but do not have wetland hydrology. This type was found outside the boundary of isolated emergent wetlands at T13, T18, and T21. Dominant vegetation here includes Johnsongrass, southern dewberry (*Rubus trivialis*), and eastern cottonwood (*Populus deltoides*). This community type was also found south of the forested wetland at T10. The vegetation at P1 was primarily dominated by FAC indicator status, such as eastern cottonwood, sugarberry (*Celtis laevigata*), cedar elm (*Ulmus crassifolia*), and eastern poison ivy (*Toxicodendron radicans*). This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type E (**Table 7**) represents areas dominated by hydrophytic vegetation, but wetland hydrology and hydric soils were not observed. This type was found at 11 transects. T1 represents riparian forest along the north bank of the West Fork Trinity River. Transects T2 and T3 are both in riparian forest along Walker Branch. Similar riparian forest was found along Hurricane Creek, and is documented at T4, T14, T15, and T16. T11 is in a forested area along a finger of water that extends west from the large pond Pd-1. Typical vegetation at these sites includes black willow (*Salix nigra*), eastern cottonwood, cedar elm, saw greenbrier (*Smilax*

*bona-nox*), eastern poison ivy, and great ragweed (*Ambrosia trifida*). This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type F (**Table 8**) represents uplands where hydrophytic vegetation was dominant and wetland hydrology was found, but hydric soils were not observed. This type was found in the riparian areas of the West Fork Trinity River at T1 P1 and T2 P1, along the north bank of Walker Branch at T2 P4, and along Hurricane Creek at T14 P2. Typical vegetation includes pecan (*Carya illinoinensis*), Virginia wildrye (*Elymus virginicus*), black willow, and great ragweed. This community is not subject to regulation as "waters of the U.S." and is not a wetland.

Community Type G (**Table 9**) represents forested wetlands having hydrophytic vegetation, wetland hydrology, and hydric soils. This type was documented at 7 transects on the property. The network of channels and ridges with wooded vegetation in the WEA is represented by T9, T17, and T22. This community type is also found at the depressional area west of the large pond Pd-1. Just to the north, the finger of the pond Pd-1 featured a swampy area dominated by black willow, documented at T11 P2. Another swampy area dominated by black willow is found at T18 P4, at the very northern end of the excavated pits and channels area. At the northeast corner of the property, one plot on the drainage documented at T13 P3 featured this type. Typical vegetation at these areas includes: American elm, black willow, eastern cottonwood, green ash (*Fraxinus pennsylvanica*), boxelder (*Acer negundo*), cedar elm, and eastern poison ivy. The total acreage of Community G is approximately 49.45 acres. These wetlands are considered "waters of the United States" as defined by the Clean Water Act.

Community Type H (**Table 10**) represents emergent wetlands and wetland fringes around water bodies and is dominated by hydrophytic vegetation, feature wetland hydrology, and have hydric soils. Typical vegetation for Community H includes rush (*Juncus* sp.), spikerush (*Eleocharis* sp.), bushy bluestem (*Andropogon glomeratus*), redroot flatsedge (*Cyperus erythrorhizos*), valley redstem (*Ammania coccinea*), cattail (*Typha* sp.), and occasional black willow. A total of 12 transects document this community type.

Community Type H is found at the 24 wetland areas on the HFA at the southeast corner of the property, which are documented at transects T5, T6, and T7. It is also found in the drainage at the northeast corner of the property, documented at transects T12 and T13. The five wetland areas north of the excavated channels and ridges area are also in this community. They are documented by transects T18, T19, T20, and T21. The shoreline of the large pond Pd-1 had an emergent wetland fringe around the perimeter as well as aquatic vegetation extending into the water. The emergent wetland fringe is documented at transect T22 on the east shore, T25 on the north shore, and T26 on the northeast shore. The width of this fringe was estimated at 2.5 feet for the terrestrial emergent wetland, based on field observations. This fringe is indicated on the map as Em-31. The shoreline of the smaller ponds Pd-2 through Pd-9 also feature this fringe. For these ponds, the width was estimated at 3 feet. This fringe is indicated on the map as Em-Pd2, Em-Pd3, Em-Pd4, Em-Pd5, Em-Pd6, Em-Pd7, Em-Pd8, and Em-Pd9. The total acreage of Community H is approximately 5.96 acres. These wetlands are considered "waters of the United States" as defined by the Clean Water Act.

Community Type I (**Table 2**) represents the area below the OHWM of Hurricane Creek and Walker Branch. Hydrophytic vegetation was dominant and wetland hydrology and hydric soils were present. Hurricane Creek flows south through the central portion of the site for a length of 4,793 linear feet with an average width between OHWMs of 34.21 feet. Walker Branch flows southeast through the southwest corner of the site for a length of 3,240 linear feet with an average width between OHWMs of 3.4 feet. The total acreage of Community I is approximately 5.56 acres. These stream segments are considered "waters of the United States" as defined by the Clean Water Act.

Community Type J (**Table 1**) represents open waters, including the large open pond Pd-1 in the former sand and gravel mining area in the WDA, as well as the smaller ponds Pd-2–Pd-9. The WEA area connects to the West Fork Trinity River by the culvert at the south shore of the pond. The estimated total area of these ponds is 42.91 acres. These ponds are considered "waters of the United States" as defined by the Clean Water Act. Community Type J does not contain in-stream wetlands.

Community Type K (**Table 11**) represents scrub-shrub wetlands, which feature hydrophytic vegetation, wetland hydrology, and hydric soils. This type is found on the 19 islands in the large pond Pd-1, and is documented at T22 P1. It is also found adjacent to several areas of fringe around the ponds Pd-1 and Pd-2, and is documented at T19 P1 and T24 P2. The vegetation is dominated by saplings of black willow and eastern cottonwood, and other vegetation such as redroot flatsedge and Johnsongrass is present. The total acreage of Community K is approximately 1.57 acres. These wetlands are considered "waters of the United States" as defined by the Clean Water Act.

Community Type L (**Table 1**) represents erosional features that drain from the emergent wetlands into water bodies at a lower elevation. Erosional Channel A originates at the emergent wetland Em-3 and flows into the pond Pd-2. The channel has a total length of 219.48 linear feet and an average width of 4 inches. Erosional Channel B originates at the emergent wetland Em-4, splits into branches as it flows south, and drains into the pond Pd-1. The total length of the erosional channel is 1,246.70 linear feet, with an average width of 7 inches. These channels are not streams and are not regulated as "waters of the U.S."

Community Type M (**Table 12**) represents permanently inundated aquatic bed fringe wetlands, The shoreline of the large pond Pd-1 has an emergent wetland fringe around the perimeter as well as aquatic vegetation extending into the water. The aquatic bed is documented at T23 P3 on the south shore and T26 P3 on the northeast shore. Typical vegetation for Community M includes longleaf pondweed (*Potamogeton nodosus*), creeping primrose-willow (*Ludwigia repens*), and dotted smartweed (*Polygonum nodosus*). The 19 islands in the large pond Pd-1 also feature this fringe. The width of the aquatic bed fringe around the pond and the islands was estimated at 15 feet for the extent of aquatic vegetation into the water, based on field observations. This fringe is indicated on the map as AB-1. The total acreage of Community K is approximately 4.16 acres.

# SUMMARY AND CONCLUSIONS

## SITE SETTING

The City of Arlington Landfill tract is an approximately 790-acre tract of land located in Arlington, Texas just north of the West Fork of the Trinity River. The property has several distinct areas of historic and current land use. An area referred to as the Surber Tract is a recently acquired parcel at the western edge of the property that was a motocross racing track for several decades. Walker Branch enters the property from the west and flows into the West Fork Trinity River near the southwest corner of the property. A large section of the property was the location of a sand and gravel mining operation that was active for over 60 years. The West Disposal Area (WDA) is an excavated area that was later used as a municipal landfill. The West Expansion Area (WEA) was also an area of sand and gravel mining. The eastern section of the WEA was abandoned decades ago, and forest vegetation now dominates the channels and mounded ridges left by the mining operation. Mining activity ceased in the western section of the WEA in 2004, and the excavated pits filled with water to form ponds. The current channel of Hurricane Creek flows from the north across the central part of the property and drains into the West Fork Trinity River at the southern boundary of the property. The East Disposal Area (EDA) is an area of current landfill activities, and is located to the east of Hurricane Creek. Two areas on the property are known Historic Fill Areas (HFAs), which were the site of solid waste dumping before the original permitting of the landfill.

## WATERS OF THE UNITED STATES AND WETLANDS

A total of 2 perennial streams, 9 ponds, 2 forested wetland areas, 36 emergent wetland areas, 1 aquatic bed fringe wetland, and 21 scrub-shrub wetland areas were identified as "waters of the United States" within the delineated project area. Total waters of the U.S. identified within the project area include approximately 3.95 acres of stream and 61.16 acres of wetland. Hurricane Creek extends approximately 4,793 linear feet (3.70 acres) onsite. Walker Branch extends approximately 2,174 linear feet (0.25 acres) onsite. The ponds total 41.97 acres, the forested wetland totals 49.45 acres, the emergent wetland totals 5.98 acres, the aquatic bed fringe wetland totals 4.16 acres, and the scrub-shrub totals 1.57 acres.

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# TABLES

**Table 1. Summary of Waters of the United States Including Wetlands at the City of Arlington Landfill, Arlington, Texas.**

| Stream/Pond Name | Total Length (feet) | Average Width at OHWM | Total Area (acres) |
|---|---|---|---|
| **PERENNIAL STREAM** | | | |
| Hurricane Creek | 4793 | 34.21 | 3.70 |
| Walker Branch | 2174 | 5.00 | 0.25 |
| **STREAM TOTAL** | **6967** | **---** | **3.95** |
| **PONDS** | | | |
| Pd-1 | --- | --- | 33.85 |
| Pd-2 | --- | --- | 1.46 |
| Pd-3 | --- | --- | 0.18 |
| Pd-4 | --- | --- | 0.04 |
| Pd-5 | --- | --- | 0.23 |
| Pd-6 | --- | --- | 1.28 |
| Pd-7 | --- | --- | 2.67 |
| Pd-8 | --- | --- | 2.17 |
| Pd-9 | --- | --- | 0.09 |
| **POND TOTAL** | --- | --- | **41.97** |
| **WETLANDS** | | | |
| **FORESTED WETLANDS** | | | |
| Fo-1 | --- | --- | 47.85 |
| Fo-2 | --- | --- | 1.60 |
| **FORESTED WETLANDS TOTAL** | | | **49.45** |
| **EMERGENT WETLANDS** | | | |
| Em-1 | --- | --- | 0.43 |
| Em-2 | --- | --- | 0.19 |
| Em-3 | --- | --- | 0.23 |
| Em-4 | --- | --- | 0.97 |
| Em-5 | --- | --- | 0.14 |
| Em-6 | --- | --- | 0.49 |
| Em-7 | --- | --- | 0.15 |
| Em-8 | --- | --- | 0.05 |
| Em-9 | --- | --- | 0.01 |
| Em-10 | --- | --- | 0.43 |
| Em-11 | --- | --- | 0.02 |
| Em-12 | --- | --- | 0.09 |
| Em-13 | --- | --- | 0.02 |
| Em-14 | --- | --- | 0.13 |
| Em-15 | --- | --- | 0.02 |
| Em-16 | --- | --- | 0.02 |
| Em-17 | --- | --- | 0.01 |
| Em-18 | --- | --- | 0.00* |
| Em-19 | --- | --- | 0.04 |
| Em-20 | --- | --- | 0.08 |
| Em-21 | --- | --- | 0.13 |
| Em-22 | --- | --- | 0.02 |
| Em-23 | --- | --- | 0.06 |
| Em-24 | --- | --- | 0.08 |
| Em-25 | --- | --- | 0.01 |
| Em-26 | --- | --- | 0.05 |
| Em-27 | --- | --- | 0.01 |

| | | | |
|---|---|---|---|
| Em-28 | --- | --- | 0.59 |
| Em-31 | --- | --- | 0.39 |
| Em-Pd2 | --- | --- | 0.21 |
| Em-Pd3 | --- | --- | 0.06 |
| Em-Pd4 | --- | --- | 0.02 |
| Em-Pd5 | --- | --- | 0.08 |
| Em-Pd6 | --- | --- | 0.17 |
| Em-Pd7 | --- | --- | 0.34 |
| Em-Pd8 | --- | --- | 0.22 |
| Em-Pd9 | --- | --- | 0.02 |
| **EMERGENT WETLAND TOTAL** | | | **5.98** |
| **SCRUB-SHRUB WETLANDS** | | | |
| SS-1 | --- | --- | 0.01 |
| SS-2 | --- | --- | 0.06 |
| SS-3 | --- | --- | 0.32 |
| SS-4 | --- | --- | 0.28 |
| SS-5 | --- | --- | 0.09 |
| SS-6 | --- | --- | 0.06 |
| SS-7 | --- | --- | 0.11 |
| SS-8 | --- | --- | 0.04 |
| SS-9 | --- | --- | 0.01 |
| SS-10 | --- | --- | 0.02 |
| SS-11 | --- | --- | 0.06 |
| SS-12 | --- | --- | 0.08 |
| SS-13 | --- | --- | 0.06 |
| SS-14 | --- | --- | 0.01 |
| SS-15 | --- | --- | 0.01 |
| SS-16 | --- | --- | 0.02 |
| SS-17 | --- | --- | 0.22 |
| SS-18 | --- | --- | 0.08 |
| SS-19 | --- | --- | 0.01 |
| SS-Pd1 | --- | --- | 0.00* |
| SS-Pd2 | --- | --- | 0.02 |
| **SCRUB-SHRUB WETLANDS TOTAL** | | | **1.57** |
| **AQUATIC BED WETLANDS** | | | |
| AB-1 | --- | --- | 4.16 |
| **AQUATIC BED WETLANDS TOTAL** | | | **4.16** |
| **WETLAND TOTAL** | --- | --- | **61.16** |
| **TOTAL WATERS** | **6967** | --- | **107.08** |

*Indicates area is less than 0.01 acre.

**Table 2. Summary of Field Data for Community Type I – Hurricane Creek. City of Arlington Landfill, Arlington, Texas.**

| Station | Length (ft) | Width (ft) | Area (sq ft) | Area (ac) |
|---|---|---|---|---|
| HC-1 | 370 | 18 | 6660 | 0.15 |
| HC-2 | 75 | 55 | 4125 | 0.09 |
| HC-3 | 230 | 60 | 13800 | 0.32 |
| HC-4 | 18 | 50 | 900 | 0.02 |
| HC-5 | 187 | 20 | 3740 | 0.09 |
| HC-6 | 195 | 30 | 5850 | 0.13 |
| HC-7 | 37 | 25 | 925 | 0.02 |
| HC-8 | 98 | 25 | 2450 | 0.06 |
| HC-9 | 108 | 25 | 2700 | 0.06 |
| HC-10 | 162 | 30 | 4860 | 0.11 |
| HC-11 | 47 | 25 | 1175 | 0.03 |
| HC-12 | 106 | 35 | 3710 | 0.09 |
| HC-13 | 106 | 25 | 2650 | 0.06 |
| HC-13 | 148 | 25 | 3700 | 0.08 |
| HC-14 | 109 | 25 | 2725 | 0.06 |
| HC-15 | 111 | 16 | 1776 | 0.04 |
| HC-16 | 113 | 16 | 1808 | 0.04 |
| HC-17 | 92 | 30 | 2760 | 0.06 |
| HC-18 | 174 | 35 | 6090 | 0.14 |
| HC-19 | 150 | 40 | 6000 | 0.14 |
| HC-20 | 144 | 40 | 5760 | 0.13 |
| HC-21 | 66 | 40 | 2640 | 0.06 |
| HC-22 | 147 | 30 | 4410 | 0.10 |
| HC-23 | 58 | 30 | 1740 | 0.04 |
| HC-24 | 133 | 35 | 4655 | 0.11 |
| HC-25 | 66 | 40 | 2640 | 0.06 |
| HC-26 | 186 | 40 | 7440 | 0.17 |
| HC-27 | 108 | 45 | 4860 | 0.11 |
| HC-28 | 68 | 50 | 3400 | 0.08 |
| HC-29 | 189 | 50 | 9450 | 0.22 |
| HC-30 | 108 | 40 | 4320 | 0.10 |
| HC-31 | 71 | 40 | 2840 | 0.07 |
| HC-32 | 208 | 35 | 7280 | 0.17 |
| HC-33 | 158 | 35 | 5530 | 0.13 |
| HC-34 | 122 | 35 | 4270 | 0.10 |
| HC-35 | 87 | 35 | 3045 | 0.07 |
| HC-36 | 108 | 30 | 3240 | 0.07 |
| HC-37 | 130 | 40 | 5200 | 0.12 |
| **Total** | **4793** | --- | **161124** | **3.70** |

**Table 3. Summary of Field Data for Community A – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T4 P1 | T5 P1 | T5 P3 | T6 P1 | T6 P3 | T7 P3 | T13 P1 | T13 P5 | T13 P7 | T14 P1 | T19 P3 | T20 P1 | T20 P3 | T24 P1 | T25 P1 | T26 P1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | | | | | | | | | | | | | |
| *Ambrosia artemisiifolia* (Annual ragweed) | FACU- | | | | | | | | • | | | • | • | • | | • | • |
| *Ambrosia trifida* (Great ragweed) | FAC | • | | | | | • | | | | | • | • | • | | • | • |
| *Amphiachyris dracunculoides* (Common broomweed) | NL* | | | | | | • | | | | | | | | | | |
| *Baccharis neglecta* (Rooseveltweed) | FAC | | | | | | | | | | | | | | | • | • |
| *Bothriochloa ischaemum* (Yellow bluestem) | NI* | | | | | | | | | | | | | | • | | |
| *Cynodon dactlyon* (Bermuda grass) | FACU+ | • | • | • | • | • | | • | • | • | • | • | • | • | | • | • |
| *Desmanthus illinoensis* (Illinois bundleflower) | FACU | | | | | | | | • | | | | | | | | |
| *Iva annua (*Annual marsh elder*)* | FAC | | | | | | | | • | | | | | | | | |
| *Rumex crispus* (Curly dock) | FACW | | • | • | • | • | | | | | | | | | | | |
| *Salix nigra* (Black willow) | FACW+ | | | | | | | | • | | | | | | | | |
| *Sorghum halepense* (Johnsongrass) | FACU | • | • | • | • | • | • | | • | | • | • | • | • | • | • | • |
| *Ulmus americana* (American elm) | FAC | | | | | | | | • | | | | | | | | |
| *Ulmus crassifolia* (Cedar elm) | FAC | • | | | | | | | • | | | | | | | | |
| Unknown A | --- | | | | | | | | | | | | | | • | | |
| **Summary** | | | | | | | | | | | | | | | | | |
| Hydrophytic vegetation? | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Wetland hydrology? | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Hydric soils? | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

*NL: Not Listed on National Wetland Plant Species List ; assumed to be UPL.

**Table 4. Summary of Field Data for Community B – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T12 P1 | T12 P3 | T21 P4 | T23 P1 |
|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | |
| *Ambrosia artemisiifolia* (Annual ragweed) | FAC | | | • | |
| *Aristida sp.* | -- | | | • | |
| *Bothriochloa laguroides* (Silver beardgrass) | NL* | | | • | |
| *Cynodon dactlyon* (Bermuda grass) | FACU+ | • | • | • | • |
| *Desmanthus illinoensis* (Illinois bundleflower) | FACU | | | • | |
| *Euphorbia marginata* (Snow on the mountain) | FACU- | | | • | |
| *Iva annua (*Annual marsh elder*)* | FAC | | | • | |
| *Populus deltoides* (Eastern cottonwood) | FAC | | | • | |
| *Sorghum halepense* (Johnsongrass) | FACU | • | • | • | • |
| *Ulmus alata* (Winged elm) | FACU | | | • | |
| **Summary** | | | | | |
| Hydrophytic vegetation? | | N | N | N | N |
| Wetland hydrology? | | N | N | N | N |
| Hydric soils? | | Y | Y | Y | Y |

*NL: Not Listed on National Wetland Plant Species List for this region; assumed to be UPL

**Table 5. Summary of Field Data for Community C – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T12 P1 |
|---|---|---|
| **Dominant Vegetation** | **Status** | |
| *Cynodon dactylon* (Bermuda grass) | FACU+ | • |
| **Summary** | | |
| Hydrophytic vegetation? | | N |
| Wetland hydrology? | | Y |
| Hydric soils? | | Y |

**Table 6. Summary of Field Data for Community D – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T10 P1 | T13 P4 | T18 P1 | T18 P3 | T21 P1 |
|---|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | | |
| *Ambrosia artemisiifolia* (Annual ragweed) | FACU- | | | | | • |
| *Ambrosia trifida* (Great ragweed) | FAC | | | | • | |
| *Andropogon glomeratus* (Bushy bluestem) | FACW+ | | • | | | |
| *Baccharis neglecta* (Rooseveltweed) | FAC | | | | | • |
| *Celtis laevigata* (Sugarberry) | FAC | • | | | | |
| *Crataegus viridis* (Green hawthorn) | FAC | • | | | | |
| *Elymus virginicus* (Virginia wildrye) | FAC | • | | | | |
| *Fraxinus pennsylvanica* (Green ash) | FACW- | • | | | | |
| *Iva annua* (Annual marshelder) | FAC | | | • | • | |
| *Monarda punctata* (Spotted beebalm) | UPL | | | | | • |
| *Populus deltoides* (Eastern cottonwood) | FAC | • | | • | | • |
| *Rubus trivialis* (Southern dewberry) | FAC | | • | • | | |
| *Sideroxylon lanuginosum* (Gum bully) | FACU- | | | | | • |
| *Sorghum halepense* (Johnsongrass) | FACU | | • | • | • | • |
| *Toxicodendron radicans* (Eastern poison ivy) | FAC | • | | | | • |
| *Ulmus crassifolia* (Cedar elm) | FAC | • | | | | |
| **Summary** | | | | | | |
| Hydrophytic vegetation? | | Y | Y | Y | Y | Y |
| Wetland hydrology? | | N | N | N | N | N |
| Hydric soils? | | Y | Y | Y | Y | Y |

**Table 7. Summary of Field Data for Community E – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T1 P2 | T2 P2 | T2 P5 | T3 P2 | T3 P3 | T4 P3 | T9 P1 | T10 P4 | T11 P1 | T11 P3 | T14 P4 | T15 P1 | T15 P3 | T16 P1 | T16 P3 | HFA-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | | | | | | | | | | | | | |
| *Acer negundo* (Boxelder) | FACW- | | | | | | | | | | | • | | | • | • | |
| *Ambrosia artemisiifolia* (Annual ragweed) | FACU- | | • | | | | | | • | • | | | | | | | |
| *Ambrosia trifida* (Great ragweed) | FAC | • | | • | • | • | | | | | | • | • | • | | | • |
| *Arundo donax* (Giant reed) | FAC+ | | | | | | | | | | | | | | | | • |
| *Baccharis neglecta* (Rooseveltweed) | FAC | | | | | | | | • | • | • | | | | | | |
| *Bothriochloa laguroides* (Silver beardgrass) | NL* | | | • | | | | | | | | | | | | | |
| *Celtis laevigata* (Sugarberry) | FAC | | | | • | • | • | | | | | | | | | | • |
| *Chasmanthium latifolium* (Indian woodoats) | FAC | | | • | • | • | | | | | | • | • | • | | | |
| *Cynodon dactylon* (Bermuda grass) | FACU+ | | | | | | | • | | | | | | | • | • | • |
| *Elymus canadensis* (Canada wildrye) | FAC+ | | | | | | | | | | | | • | • | | | |
| *Elymus virginicus* (Virginia wildrye) | FAC | • | • | • | | | • | | | | | | | | | | |
| *Fraxinus pennsylvanica* (Green ash) | FACW- | | | | | | • | • | | | | | • | • | | | |
| *Juniperus virginiana* (Eastern red cedar) | FACU- | | | | | | • | | | | | | | | | | |
| *Ligustrum sinense* (Chinese privet) | UPL | • | | | | | | | | | | | | | | | |
| *Melia azedarach* (Chinaberry) | NL | | | | • | • | | | | | | | | | | | |
| *Populus deltoides* (Eastern cottonwood) | FAC | | | | • | • | • | • | • | • | • | | • | • | • | • | • |
| *Rubus trivialis* (Southern dewberry) | FAC | | | | | | | | | | • | | | | | | |
| *Salix nigra* (Black willow) | FACW+ | | | • | | | • | • | • | • | • | • | • | • | • | • | • |
| *Smilax bona-nox* (Saw greenbrier) | FAC | • | | | • | • | • | • | | | | | | | | | |
| *Sorghum halepense* (Johnsongrass) | FACU | | | | • | • | • | • | • | • | • | | | | • | • | • |
| *Toxicodendron pubescens* (Poison oak) | FACU | • | | | | | | | | | | | | | | | |
| *Toxicodendron radicans* (Eastern poison ivy) | FAC | | • | | | | | • | • | • | • | | • | • | | | |
| *Tridens albescens* (White tridens) | FAC- | | | • | | | | | | | | | | | | | |
| *Ulmus americana* (American elm) | FAC | | | | • | • | | | • | • | | • | | | | | |
| *Ulmus crassifolia* (Cedar elm) | FAC | • | • | • | • | • | • | | | | • | | | | | | |
| *Vitis riparia* (Grapevine) | FAC | | | | • | • | | | | | | | | | | | |
| **Summary** | | | | | | | | | | | | | | | | | |
| Hydrophytic vegetation? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Wetland hydrology? | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Hydric soils? | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

*NL: Not Listed on National Wetland Plant Species List; assumed to be UPL.

**Table 8. Summary of Field Data for Community F – Upland. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T1 P1 | T2 P1 | T2 P4 | T14 P2 |
|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | |
| *Acer negundo* (Boxelder) | FACW- | • | | | • |
| *Ambrosia trifida* (Great ragweed) | FAC | • | • | | • |
| *Callicarpa americana* (American beautyberry) | FAC | | • | | |
| *Carya illinoinensis* (Pecan) | FAC | | • | • | |
| *Celtis laevigata* (Sugarberry) | FAC | • | | • | |
| *Chasmanthium latifolium* (Indian woodoats) | FAC | | | • | • |
| *Elymus virginicus* (Virginia wildrye) | FAC | • | • | • | |
| *Populus deltoides* (Eastern cottonwood) | FAC | • | | | |
| *Rubus trivialis* (Southern dewberry) | FAC | • | | | |
| *Salix nigra* (Black willow) | FACW+ | | | • | • |
| *Smilax bona-nox* (Saw greenbrier) | FAC | | • | | |
| *Smilax rotundifolia* (Roundleaf greenbrier) | FAC | • | | | |
| *Toxicodendron radicans* (Eastern poison ivy) | FAC | • | | | |
| *Ulmus americana* (American elm) | FAC | • | | | • |
| *Ulmus crassifolia* (Cedar elm) | FAC | | • | | |
| **Summary** | | | | | |
| Hydrophytic vegetation? | | Y | Y | Y | Y |
| Wetland hydrology? | | Y | Y | Y | Y |
| Hydric soils? | | N | N | N | N |

**Table 9. Summary of Field Data for Community G – Forested Wetlands. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T9 P2 | T9 P3 | T10 P2 | T10 P3 | T11 P2 | T13 P2 | T13 P3 | T17 P1 | T17 P2 | T17 P3 | T17 P4 | T17 P5 | T18 P4 | T22 P3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | | | | | | | | | | | |
| *Acer negundo* (Boxelder) | FACW- | | • | | | | | | | | | | | | • |
| *Ambrosia trifida* (Great ragweed) | FAC | | | | | | | • | | | | • | | | |
| *Andropogon glomeratus* (Bushy bluestem) | FACW+ | | | | | | • | • | | | | | | | |
| *Azolla caroliniana* (Carolina mosquitofern) | OBL | | | | | | | | | • | | | | | |
| *Cephalanthus occidentalis* (Buttonbush) | OBL | | | | | | | | | | | | • | | |
| *Cynodon dactylon* (Bermuda grass) | FACU+ | | | | | | | | | | | | • | | |
| *Eleocharis* sp. (Spikerush species) | OBL/FACW | | | | | | • | • | | | | | | | |
| *Elymus virginicus* (Virginia wildrye) | FAC | | | | | | | | | | | • | | | |
| *Eupatorium serotinum* (Lateflowering thoroughwort) | FAC- | | | | | | | | | | | • | | | |
| *Fraxinus pennsylvanica* (Green ash) | FACW- | • | | | | | | | | | • | | | | • |
| *Juncus effuses* (Soft rush) | OBL | | | | | | | • | | | | | | | |
| *Lemna minor* (Common duckweed) | OBL | | | | | | | | | | | | | • | |
| *Ludwigia repens* (Creeping primrose-willow) | OBL | | | | | | | | | | | | | • | |
| *Maclura pomifera* (Osage orange) | UPL | | • | | | | | | | | | | | | |
| *Morus rubra* (Red mulberry) | FACU | | | | | | | | | | • | • | | | |
| *Plantago major* (Common plantain) | FAC+ | | | | | • | | | | | | | | | |
| *Platanus occidentalis* (American sycamore) | FAC+ | | | | | | | | | | | | | | • |
| *Populus deltoides* (Eastern cottonwood) | FAC | • | • | • | • | | • | • | | | • | • | | • | • |
| *Rhus copallinum* (Winged sumac) | NI | | | | | | | | | | • | | | | |
| *Rubus trivialis* (Southern dewberry) | FAC | | | | | | | | | | | | • | | |
| *Salix nigra* (Black willow) | FACW+ | • | • | | • | • | | • | • | • | | • | • | • | • |
| *Schoenoplectus* sp. (Bulrush species) | OBL/FACW | | | | | | • | | | | | | | | |
| *Smilax bona-nox* (Saw greenbrier) | FAC | • | | • | | | | | | | • | | | | |
| *Smilax rotundifolia* (Roundleaf greenbrier) | FAC | • | | | | | | | | | | | | | |
| *Sorghum halepense* (Johnsongrass) | FACU | | | | | | | | | | | | • | | |
| *Toxicdendron radicans* (Eastern poison ivy) | FAC | • | • | • | | | | | • | | | | | | • |
| *Ulmus americana* (American elm) | FAC | • | • | • | • | | • | • | • | | • | | | | • |
| *Ulmus crassifolia* (Cedar elm) | FAC | • | | • | | | | | | | | | | | |
| Unknown shrub | --- | | | | | | | | • | | | | | | • |
| **Summary** | | | | | | | | | | | | | | | |
| Hydrophytic vegetation? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Wetland hydrology? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Hydric soils? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

**Table 10. Summary of Field Data for Community H – Emergent Wetlands. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T5 P2 | T6 P2 | T7 P2 | T12 P2 | T13 P6 | T13 P8 | T18 P2 | T19 P2 | T19 P4 | T20 P2 | T21 P2 | T21 P3 | T22 P1 | T22 P2 | T25 P2 | T26 P2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | | | | | | | | | | | | | | |
| *Ambrosia trifida* (Great ragweed) | FAC | | | | | | | | | • | | | | | | | |
| *Ammannia coccinea* (Valley redstem) | OBL | | | | | | | | • | | | | | | | • | • |
| *Andropogon glomeratus* (Bushy bluestem) | FACW+ | | | | • | • | • | • | | • | • | • | • | | | | |
| *Baccharis neglecta* (Rooseveltweed) | FAC | | | | | | | | | | | • | • | | • | | |
| *Bothriochloa ischaemum* (Yellow bluestem) | NI/UPL | | | | • | | | | | | | | | | | | |
| *Carex* sp. (Sedge species) | OBL/FACW | | | | • | | | | | | | | | | | | |
| *Cephalanthus occidentalis* (Buttonbush) | OBL | | | | | | | • | | | | • | | | | | |
| *Conoclinium coelestinum* (Blue mistflower) | FACW- | | | | | • | | | | | | | | | | | |
| *Cyperus* sp. (Flatsedge species) | OBL/FACW | | | | | | | | | | | • | | | | | |
| *Cyperus difformis* (Variable flatsedge) | NI/OBL* | | | | | | | | | | | | | | | • | |
| *Cyperus erythorhizos* (Redroot flatsedge) | OBL | | | | | | | | • | | | | | • | • | | • |
| *Eleocharis sp.* (Spikerush species) | OBL/FACW | | | | | • | • | • | • | | • | • | • | | | | |
| *Iva annua* (Annual marshelder) | FAC | | | | | • | • | • | | | | | | | | | |
| *Juncus* sp. (Rush species) | OBL/FACW | • | • | • | • | • | | | | | | | | | | | |
| *Marsilea* sp. (Waterclover) | OBL | | | | | | | | | | | | | | | • | • |
| *Paspalum* sp. (Paspalum grass species) | OBL/FACW/ FAC | | | • | | | | | | | | | | | | | |
| *Phyla nodiflora* (Turkey tangle fogfruit) | FACW | | | | | | | | | | | | | | • | • | |
| *Populus deltoides* (Eastern cottonwood) | FAC | | | | • | | • | • | | | | • | | | | | |
| *Rumex crispus* (Curly dock) | FACW | • | • | | | • | • | | | | | | | • | | | |
| *Salix nigra* (Black willow) | FACW+ | | | | • | • | | • | • | • | • | • | • | • | • | | |
| *Sorghum halepense* (Johnsongrass) | FACU | | | | • | | | | | | | | | • | | | |
| *Thelypteris kunthii* (Kunth's maiden fern) | FAC | | | | | | • | | | | | | | | | | |
| *Typha* sp. (Cattail) | OBL | | | | • | • | | | | • | • | | | | | | |
| *Xanthium strumarium* (Rough cocklebur) | FAC- | | | | | | | | | | | | | | • | | |
| **Summary** | | | | | | | | | | | | | | | | | |
| Hydrophytic vegetation? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Wetland hydrology? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Hydric soils? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

*NI: No indicator status in National Wetland Plant Species List for Region 6; the national indicator status is OBL.

**Table 11. Summary of Field Data for Community K – Scrub-Shrub Wetlands. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T19 P1 | T22 P1 | T24 P2 |
|---|---|---|---|---|
| **Dominant Vegetation** | **Status** | | | |
| *Cynodon dactylon* (Bermuda grass) | FACU+ | | | • |
| *Cyperus erythrorhizos* (redroot flatsedge) | OBL | | • | |
| *Plantago major* (Common plantain) | FAC+ | | | • |
| *Populus deltoides* (Eastern cottonwood) | FAC | | | • |
| *Rumex crispus* (curly dock) | FACW | | • | |
| *Salix nigra* (black willow) | FACW+ | • | • | • |
| *Sorghum halepense* (Johnsongrass) | FACU | | • | • |
| *Xanthium strumarium* (Rough cocklebur) | FAC- | | | • |
| Unknown A | --- | | | • |
| **Summary** | | | | |
| Hydrophytic vegetation? | | Y | Y | Y |
| Wetland hydrology? | | Y | Y | Y |
| Hydric soils? | | Y | Y | Y |

**Table 12. Summary of Field Data for Community M – Aquatic Bed Fringe Wetlands. City of Arlington Landfill, Arlington, Texas.**

| Observation | | T23 P3 | T26 P3 |
|---|---|---|---|
| **Dominant Vegetation** | **Status** | | |
| *Carex* sp. (Sedge species) | OBL/FACW | • | |
| *Ludwigia repens* (Creeping primrose-willow) | OBL | • | • |
| *Plantago major* (Common plantain) | FAC+ | • | |
| *Polygonum punctatum* (Dotted smartweed) | FACW | | • |
| *Potamogeton nodosus* (Longleaf pondweed) | OBL | | • |
| *Salix nigra* (Black willow) | FACW+ | | • |
| *Sorghum halepense* (Johnsongrass) | FACU | • | |
| *Typha* sp. (Cattail) | OBL | | • |
| **Summary** | | | |
| Hydrophytic vegetation? | | Y | Y |
| Wetland hydrology? | | Y | Y |
| Hydric soils? | | Y | Y |

# FIGURES

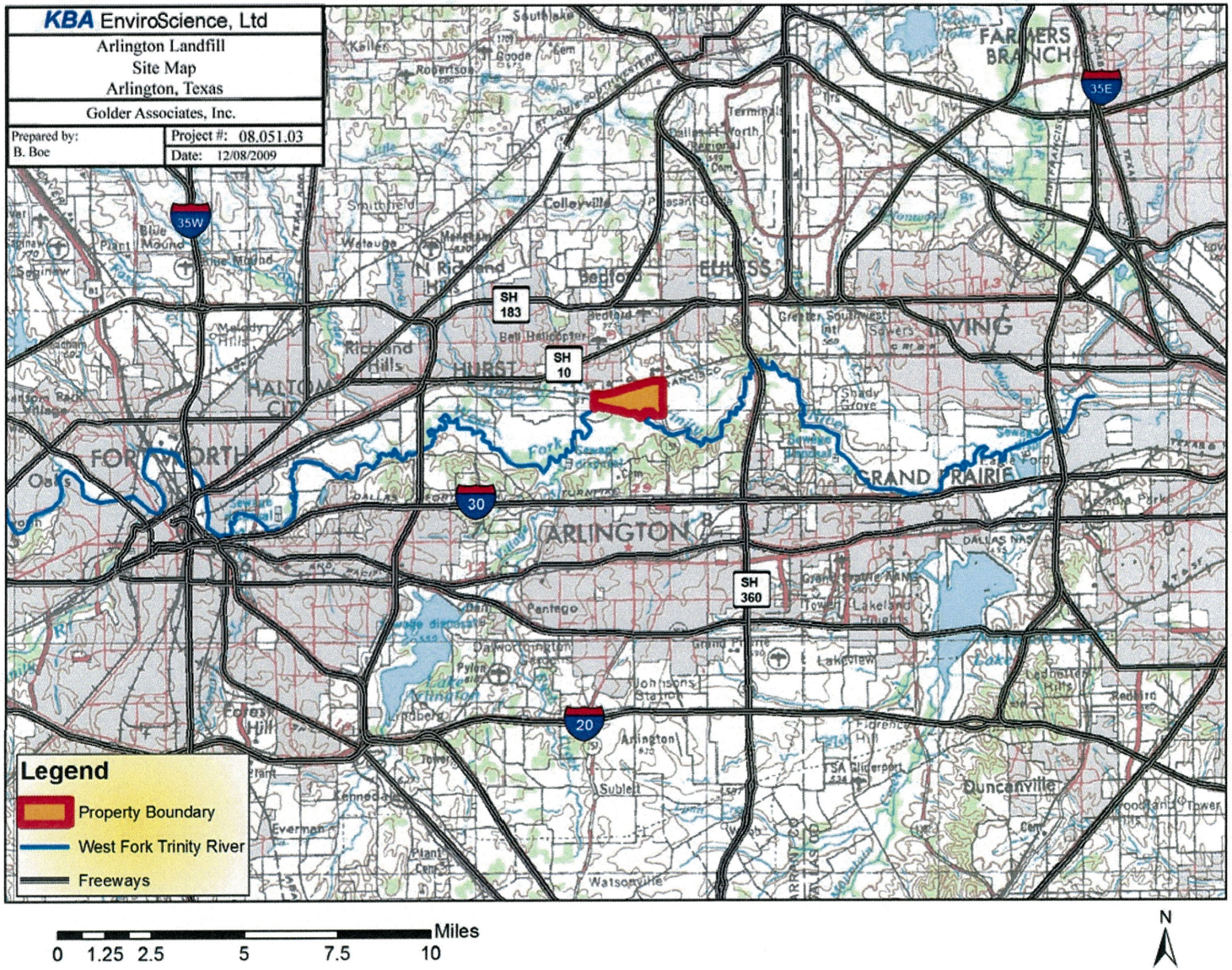



**Figure 1.** Site Location for City of Arlington Landfill, Arlington, Texas (Base Map Source: USGS 1:250,000 Topographic Map, TNRIS 2007).

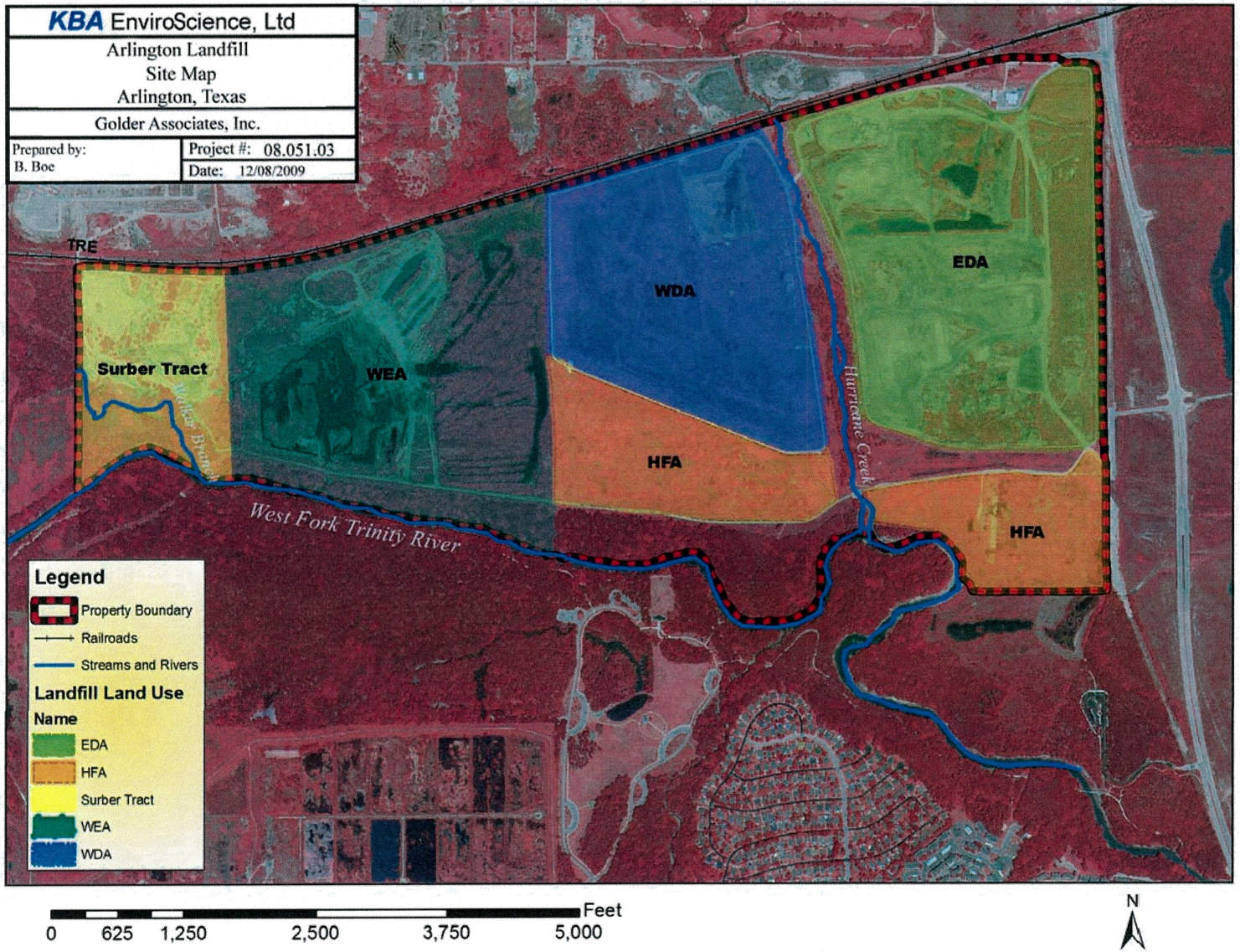



**Figure 2**. Land use Areas at the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 National Agricultural Imagery Program (NAIP), TNRIS, 2007).

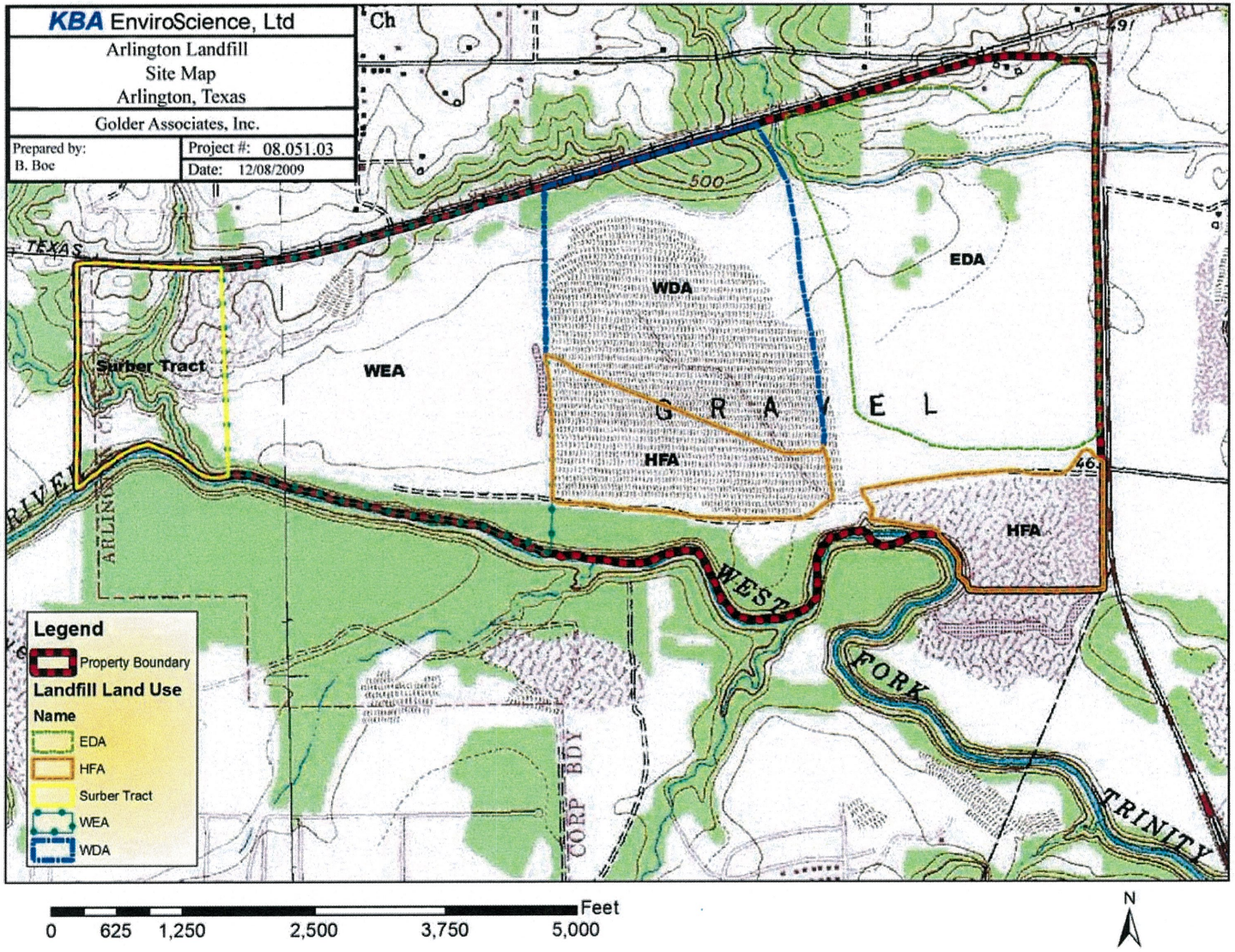



**Figure 3.** USGS Topographic Map (Euless and Hurst Quadrangles, 1959, Photorevised 1981) Overlaid with Land Use Areas for the City of Arlington Landfill, Arlington, Texas (Base Map Source: TNRIS 2007).

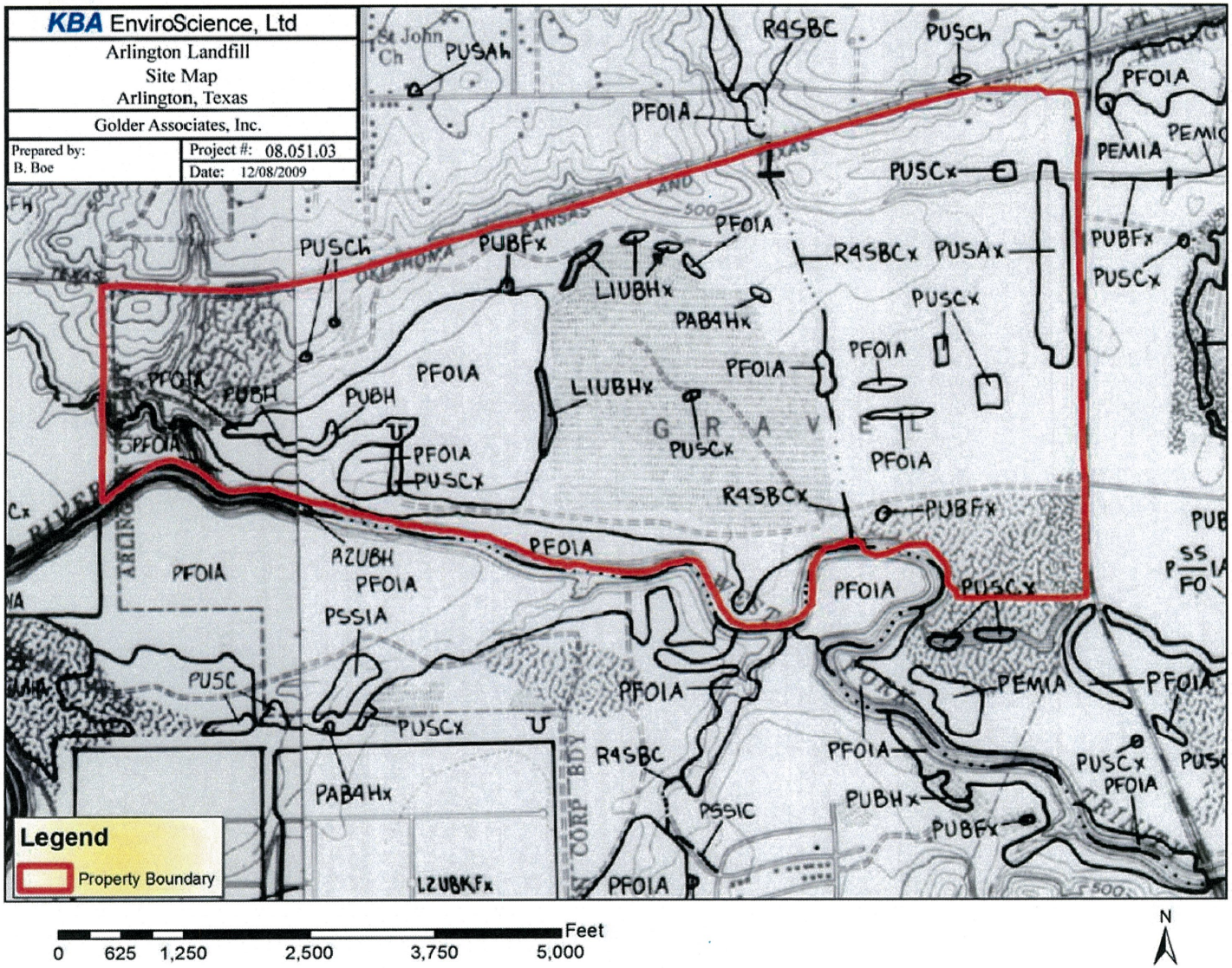



**Figure 4.** USFWS National Wetland Inventory Map (Euless and Hurst Quadrangles, 1992) for the City of Arlington Landfill, Arlington, Texas (Base Map Source: TNRIS 2007).

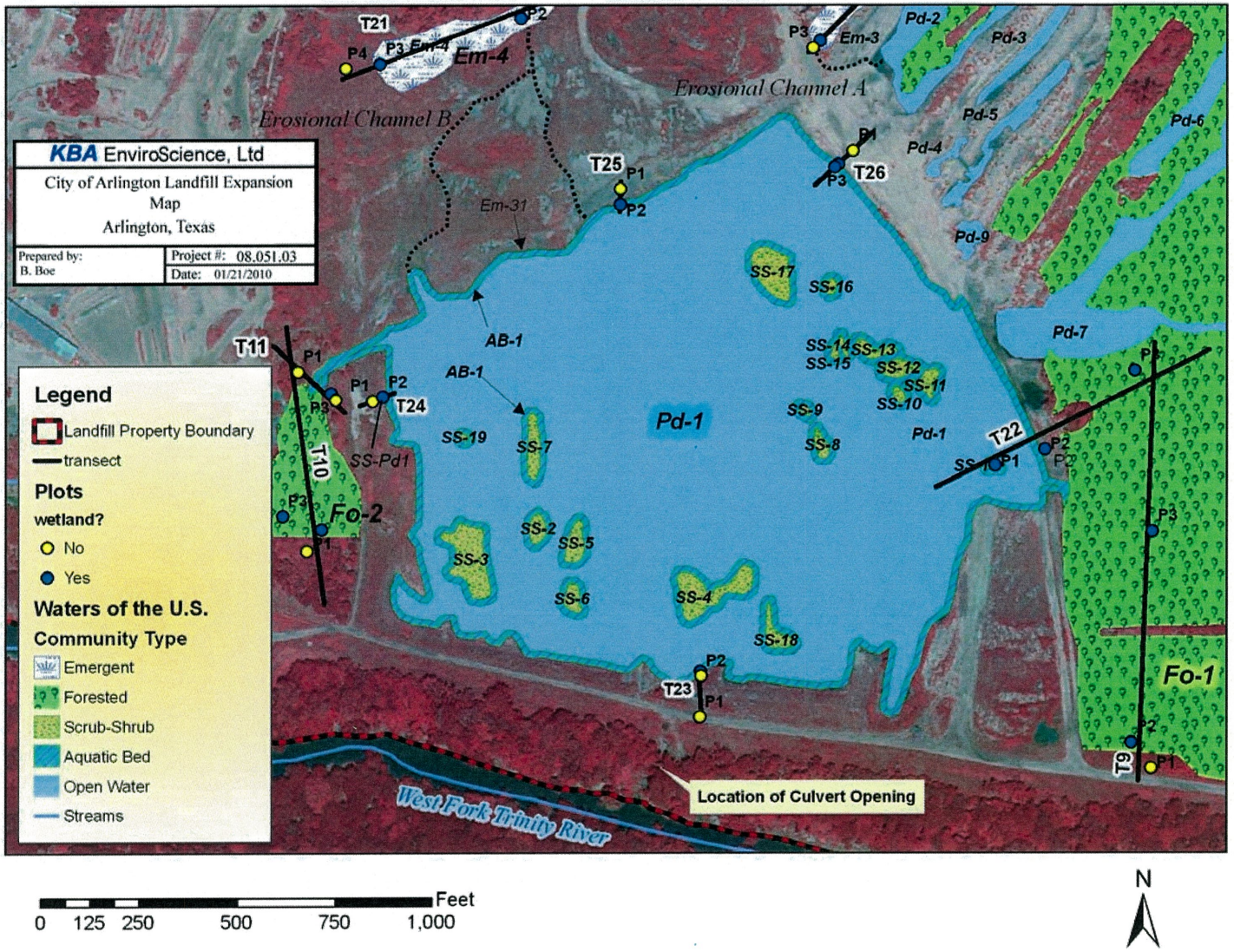



**Figure 5.** Detail of the WEA, Large Pond Pd-1, and Culvert Opening Leading to Trinity River, Depicting Waters of the U.S. including Wetlands and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

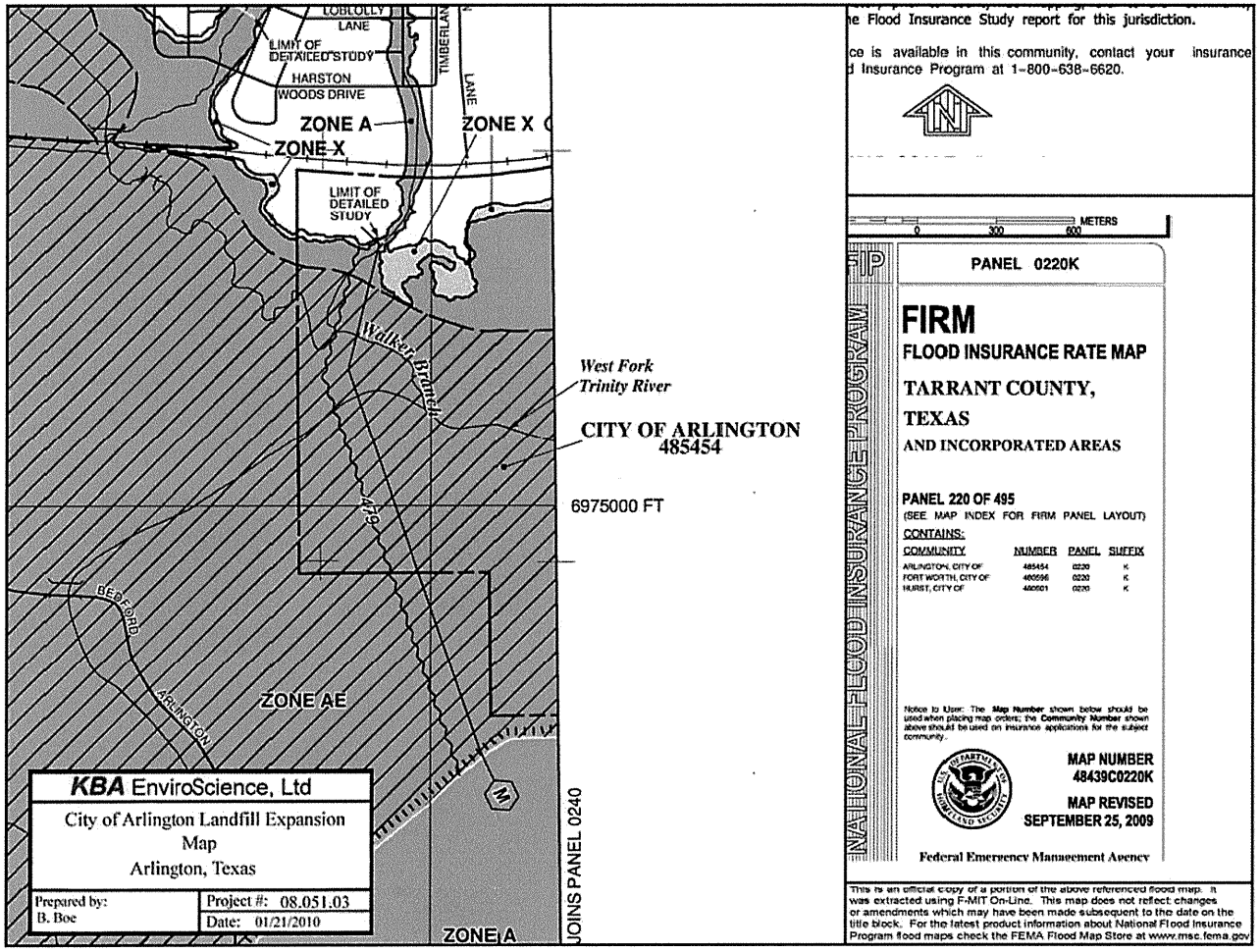



**Figure 6.** Federal Emergency Management Agency (FEMA) Floodplain Map No. 48439C0220K for the City of Arlington Landfill (Map Source: FEMA, 2010)

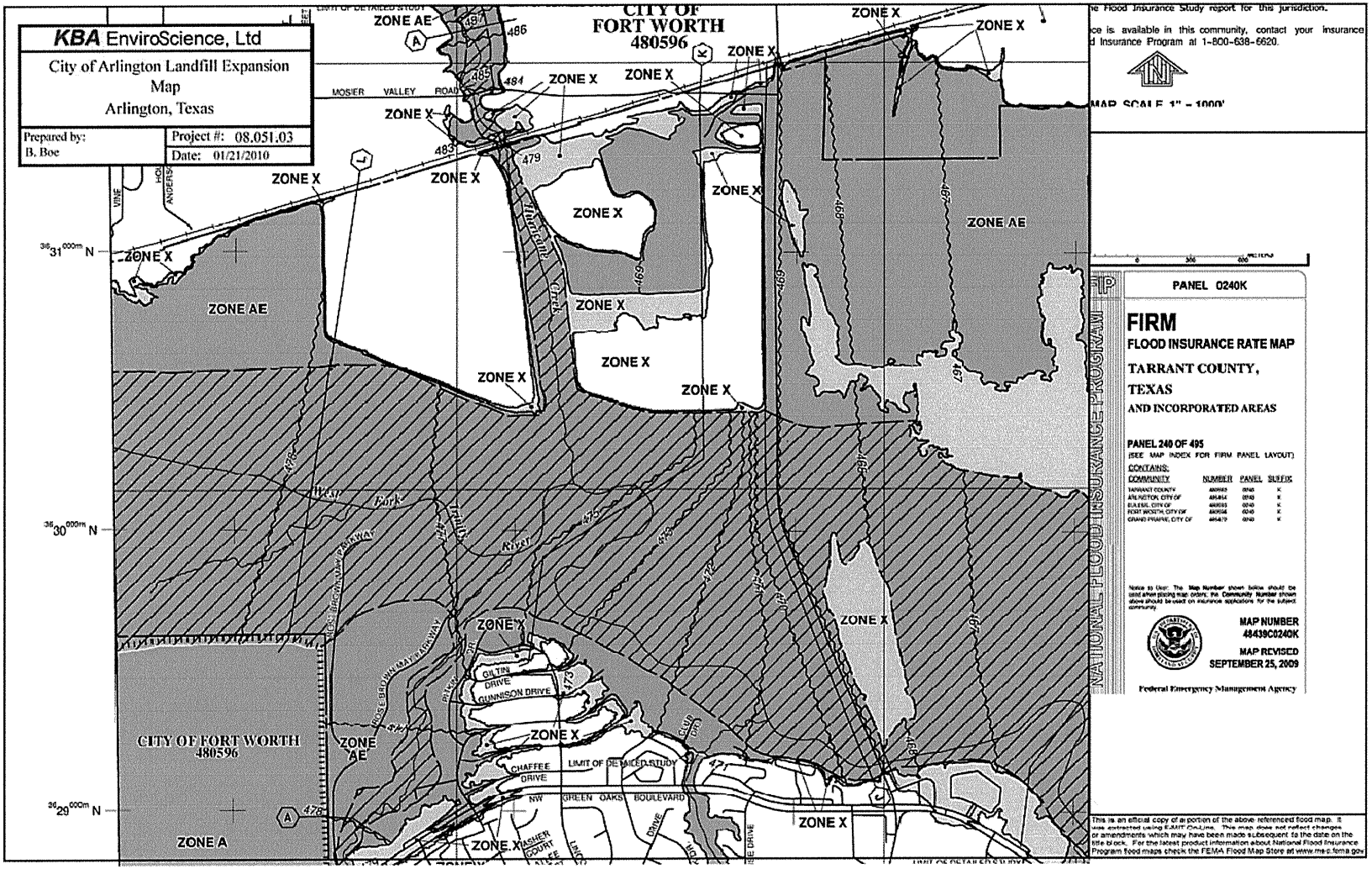



**Figure 7.** Federal Emergency Management Agency (FEMA) Floodplain Map No. 48439C0240K for the City of Arlington Landfill (Map Source: FEMA, 2010).

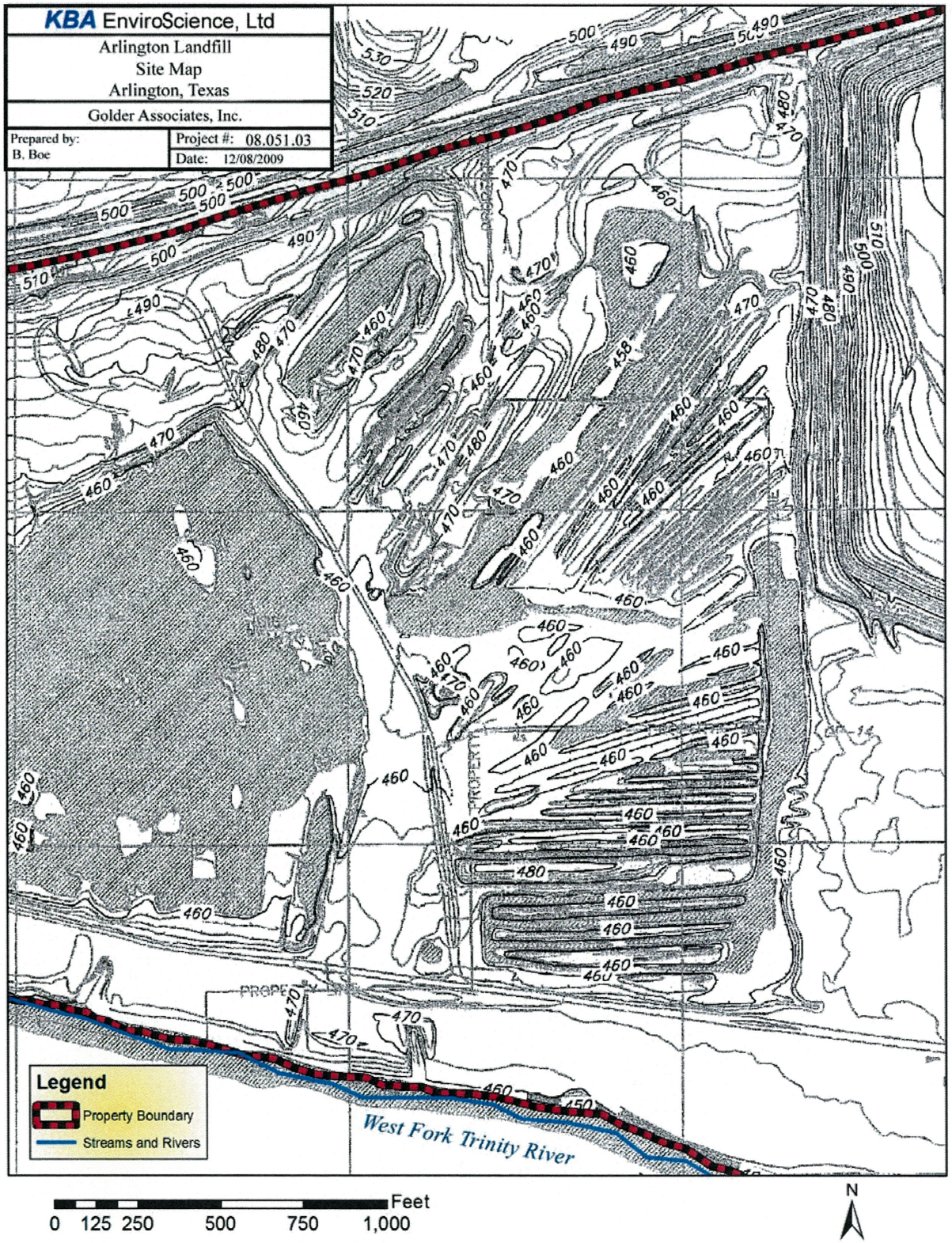



**Figure 8.** Detail of 2005 Topographic Map Created by Aerial Survey of WEA, City of Arlington Landfill, Arlington, Texas (Base Map Source: Golder 2005).

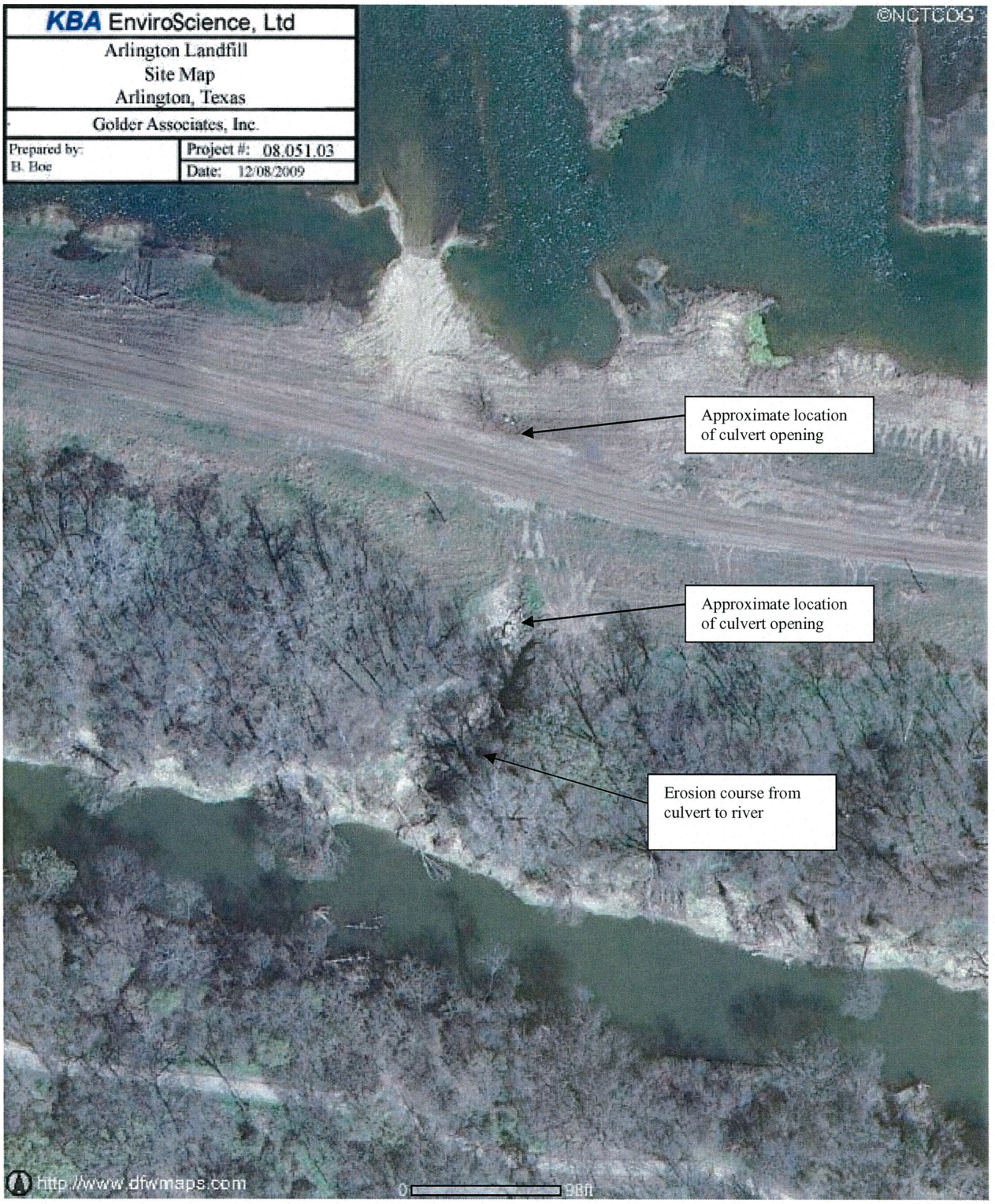



**Figure 9.** 2005 Aerial Photograph Depicting the Southern Shore of the Pond Pd-1, the Culvert Under the Levee/South Access Road, and Eroded Drainage Channel to Trinity River at the City of Arlington Landfill, Arlington, Texas (Base Map Source: NCTCOG 2008).

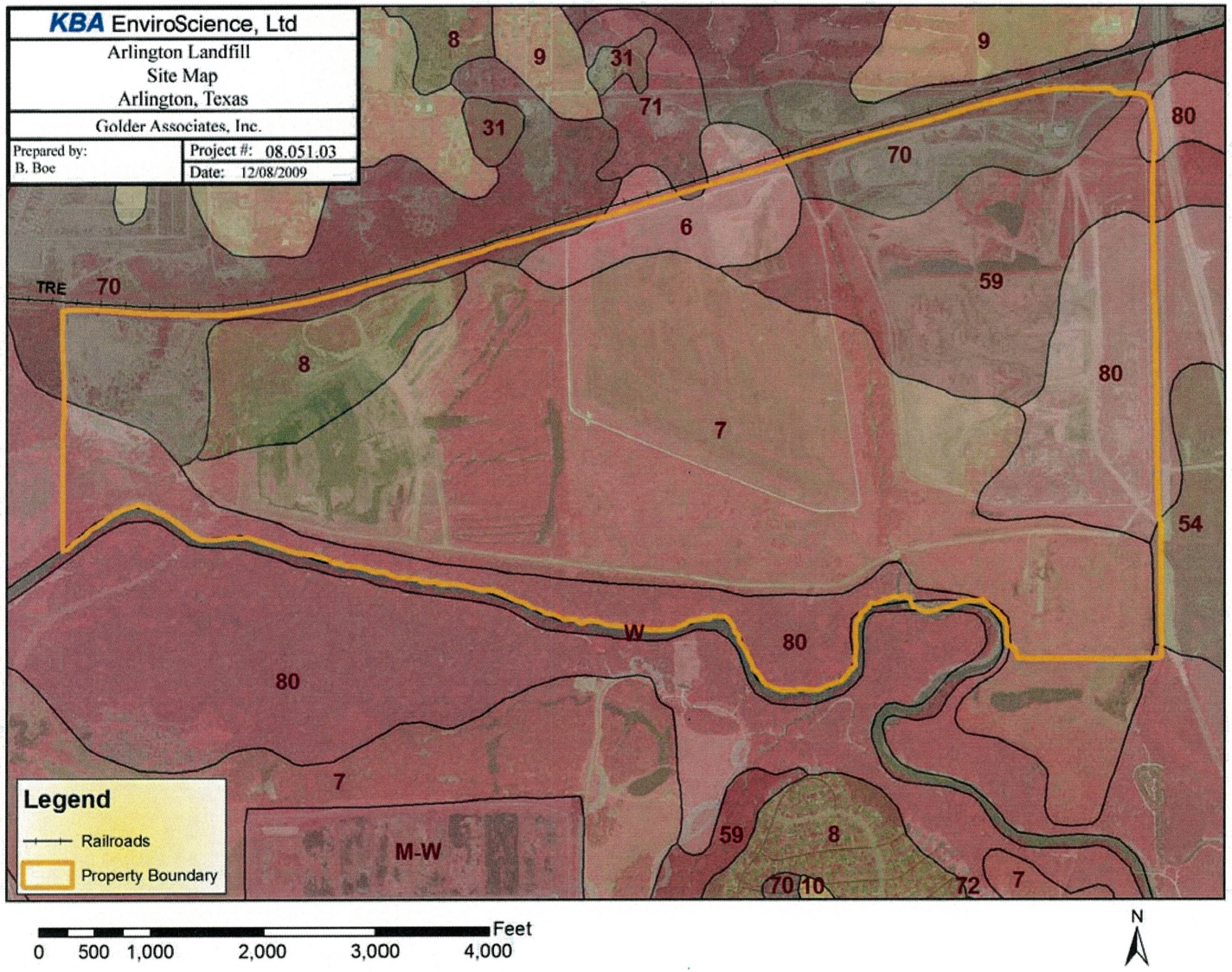



**Figure 10.** USDA Soils Map for the City of Arlington Landfill, Arlington, Texas (NRCS 2007). Numbers correspond to soil map units as described in the Description of Soils (Base Map Source: 2004 NAIP, TNRIS, 2007).

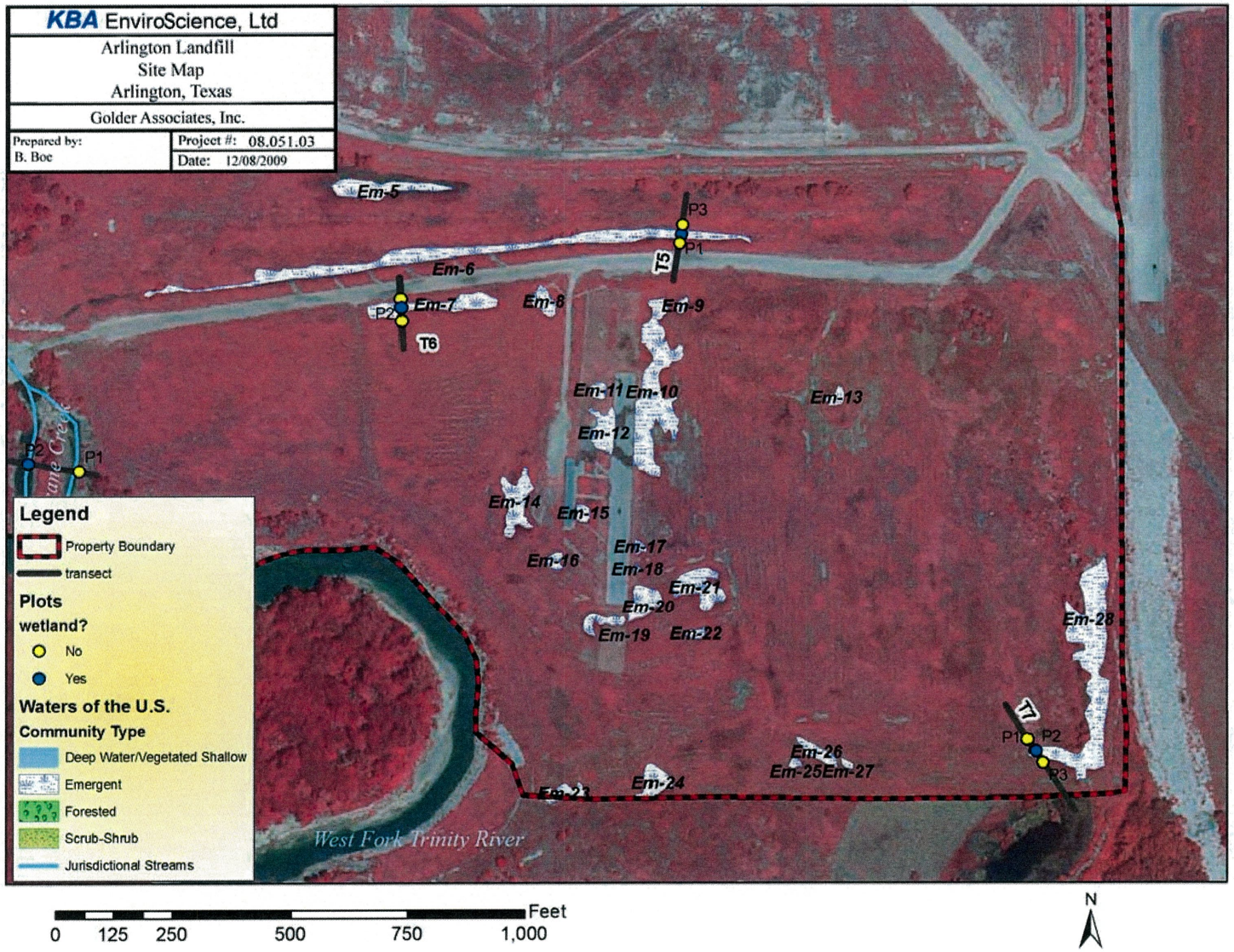



**Figure 11.** Detail of the Southeast Section of the Landfill Property at a Historic Fill Area, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

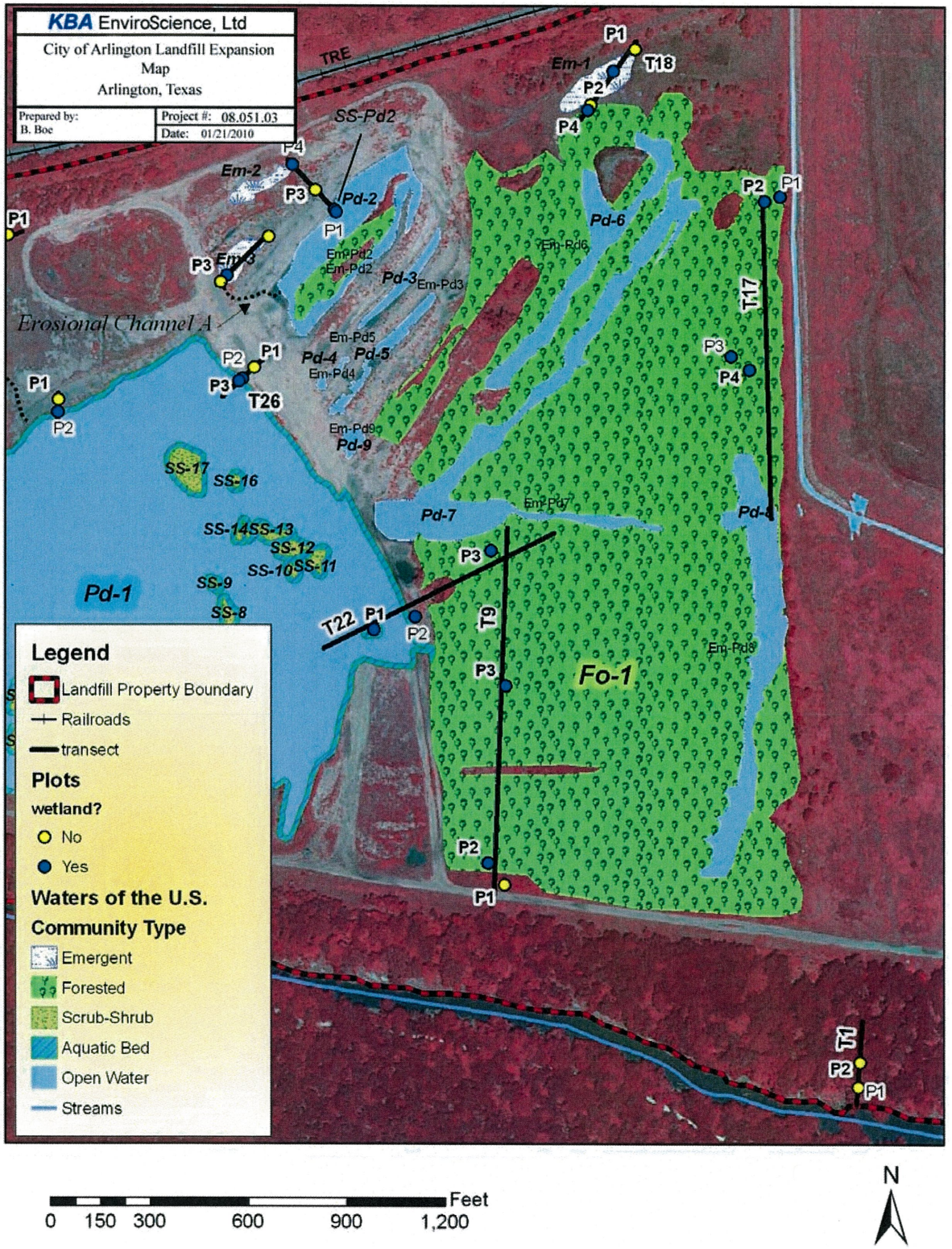



**Figure 12.** Detail of the Forested Excavated Channels Area in the Former Sand and Gravel Mining Area, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

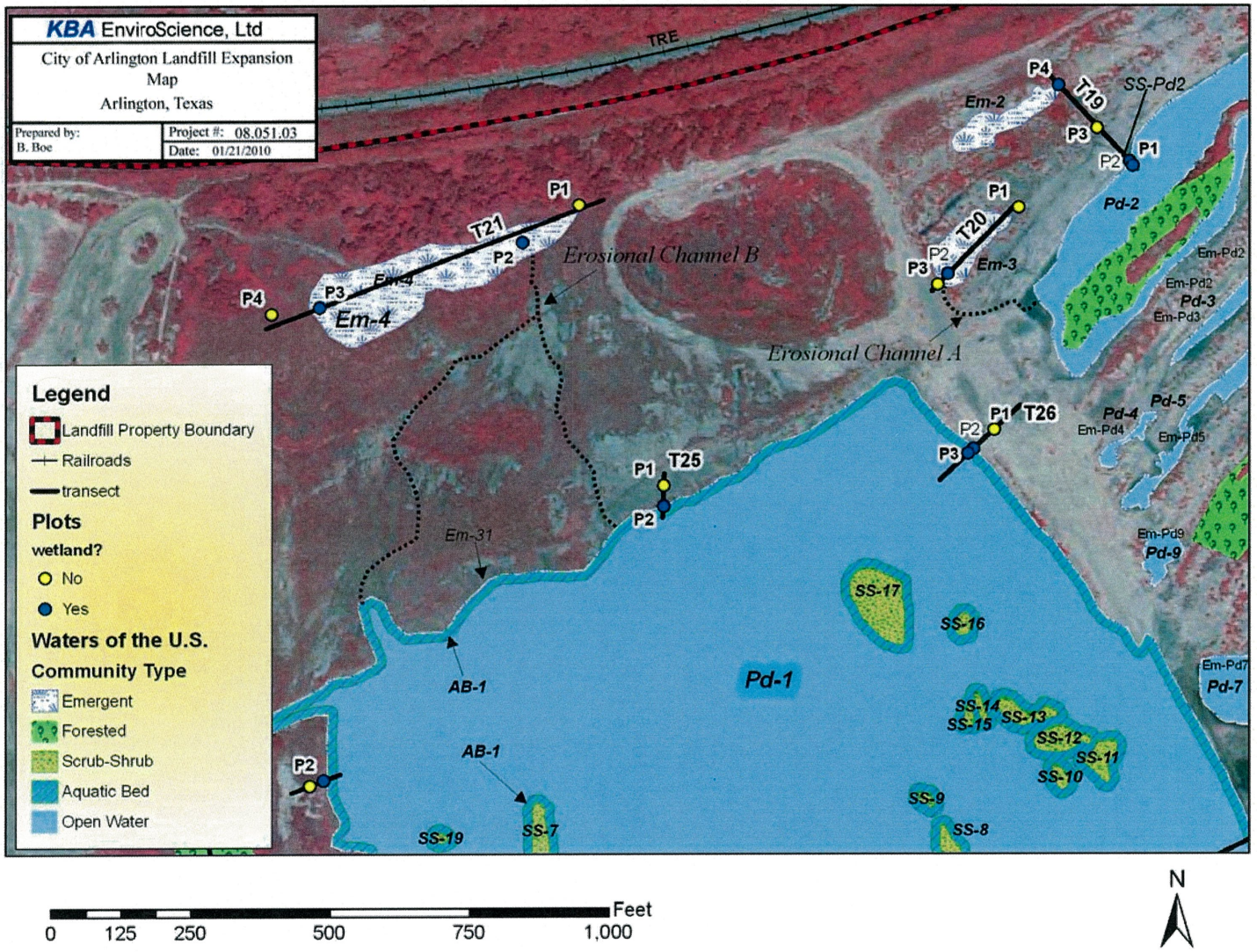



**Figure 13.** Detail of the Northern Section of the Former Sand and Gravel Mining Area, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

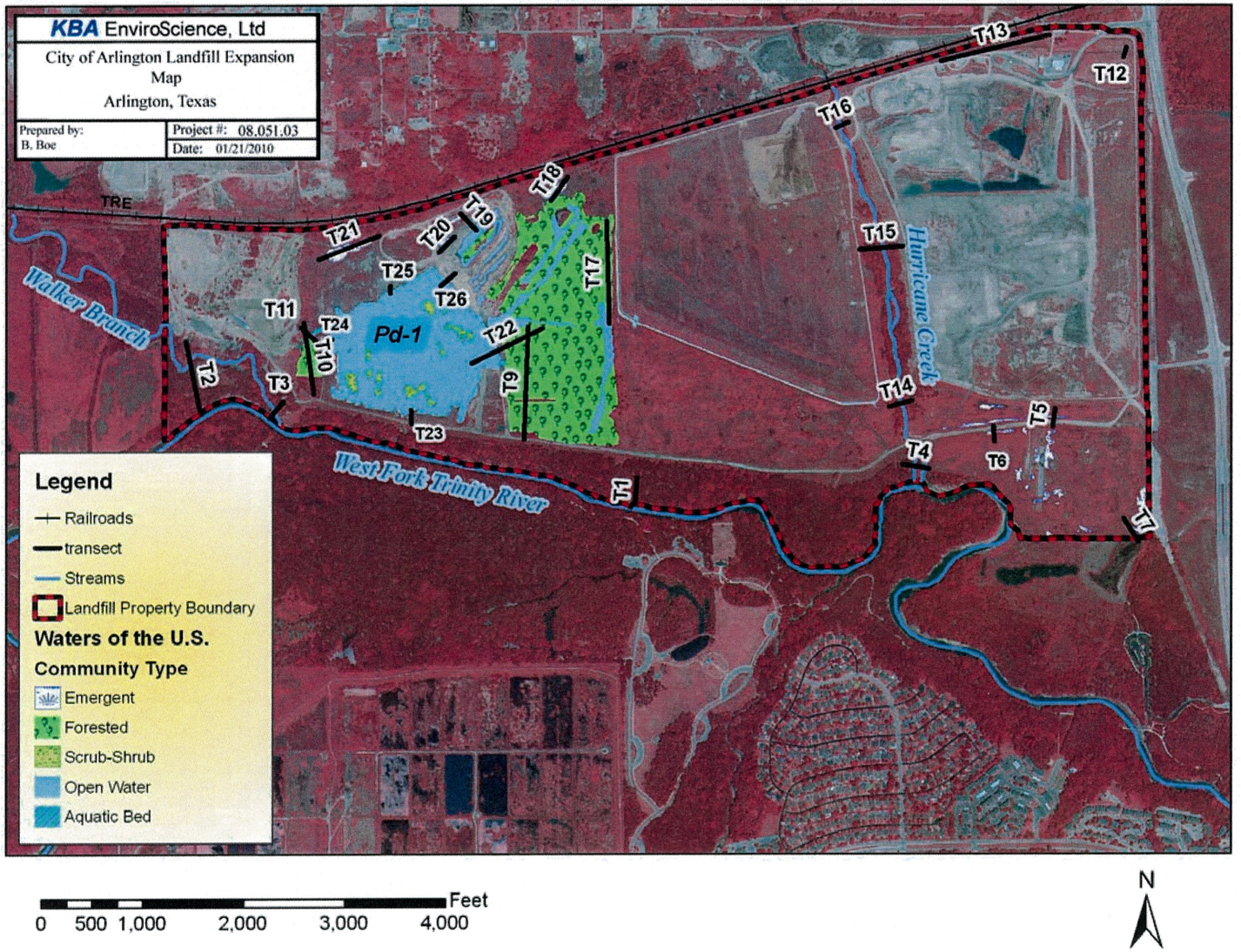



**Figure 14.** Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

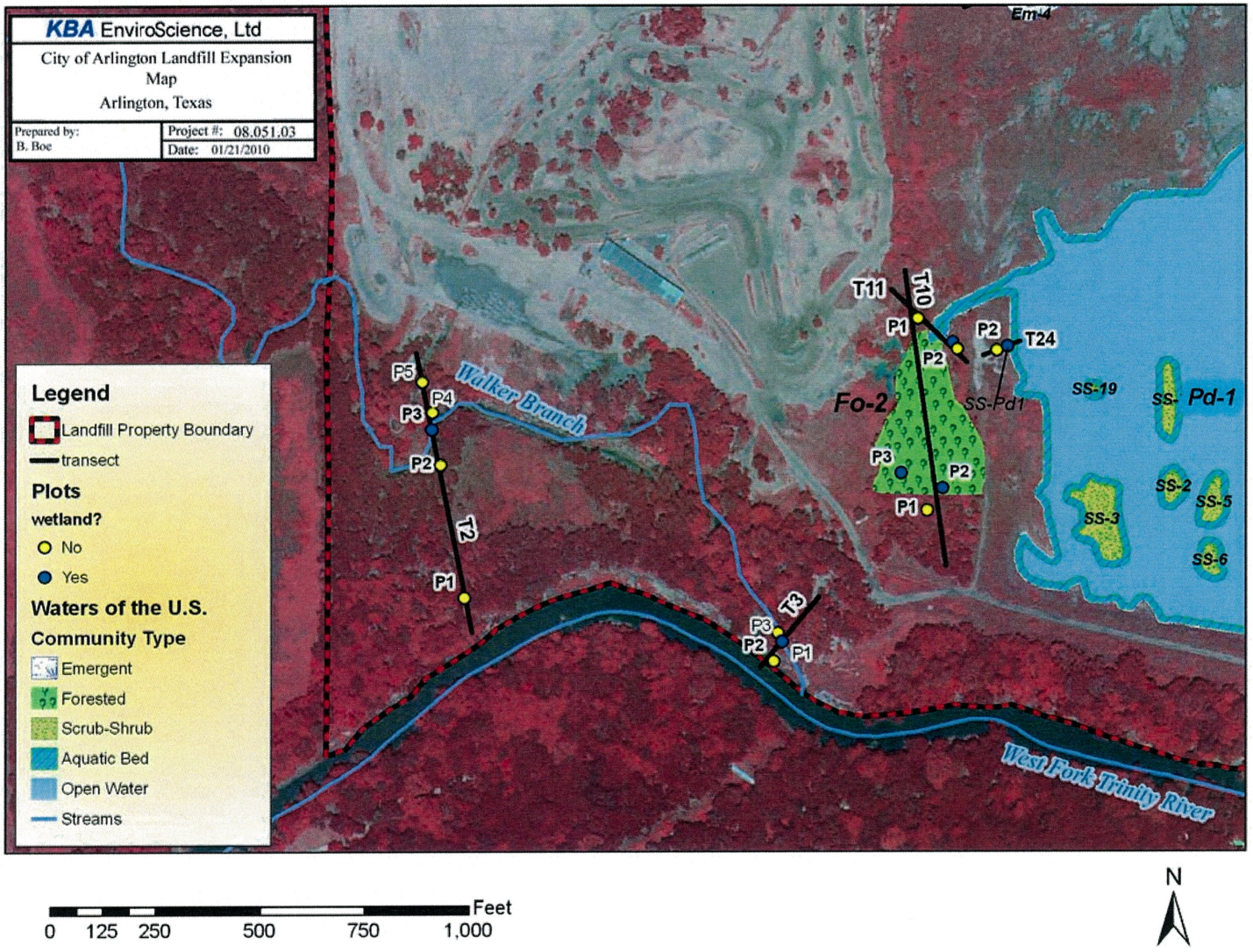



**Figure 15.** Detail of Walker Branch and South Part of Surber Tract, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

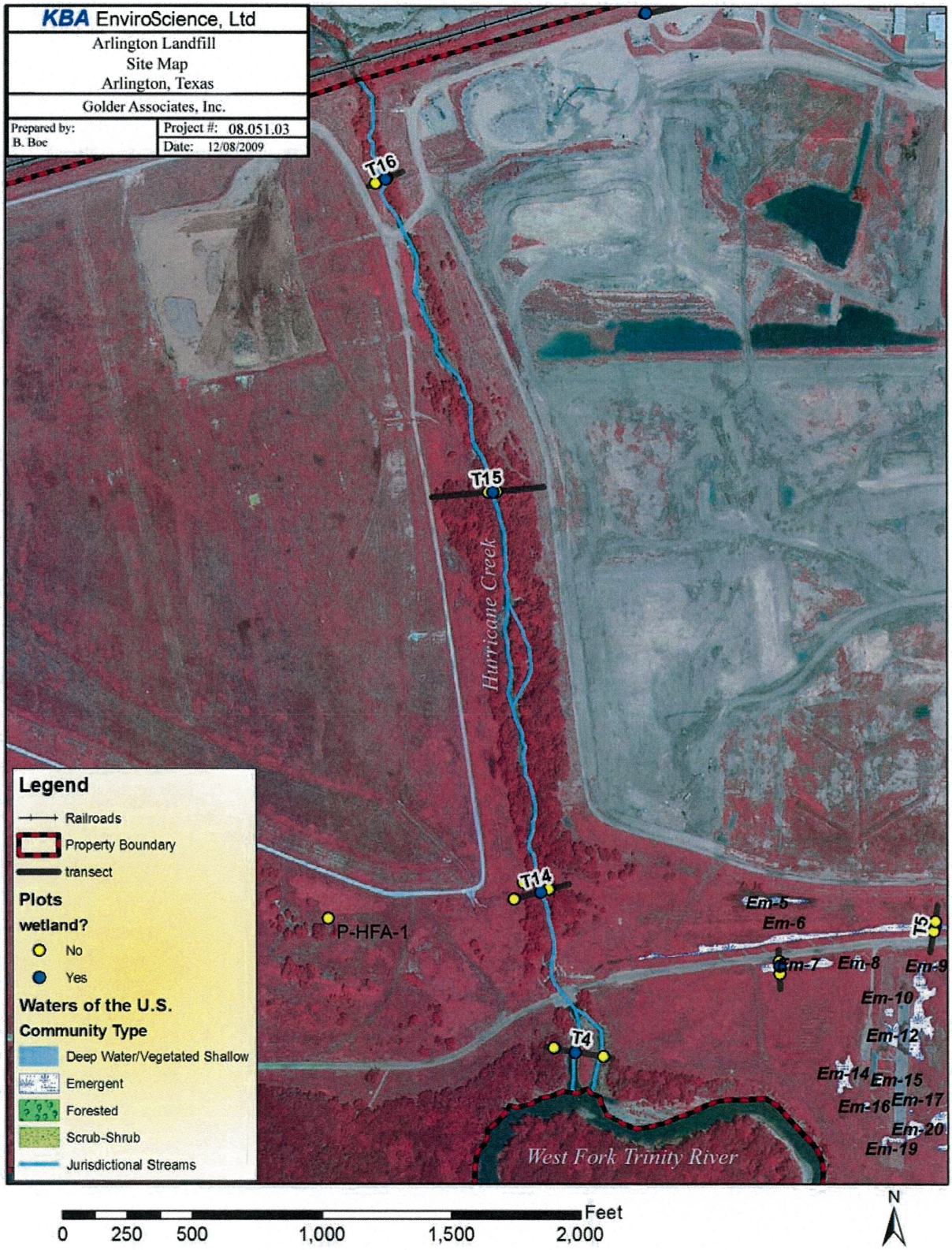



**Figure 16.** Detail of Hurricane Creek, Depicting Waters of the U.S. and Delineation Transects for the City of Arlington Landfill, Arlington, Texas (Base Map Source: 2004 NAIP, TNRIS, 2007).

# COORDINATION WITH
# U.S. DEPARTMENT OF THE INTERIOR,
# FISH AND WILDLIFE SERVICE

- January 4, 2022, FWS email correspondence.
- December 1, 2021, WCG Request for Review Letter.

# JANUARY 4, 2022, FWS EMAIL CORRESPONDENCE

## Spicer, Ryne

**Subject:** [EXTERNAL] City of Arlington Landfill - Biological Assessment Report

**From:** Bocanegra, Omar <omar_bocanegra@fws.gov>
**Sent:** Tuesday, January 04, 2022 3:15 PM
**To:** Spicer, Ryne <rspicer@wcgrp.com>
**Cc:** Dragon, Sydney R <sydney_dragon@fws.gov>
**Subject:** Fw: [EXTERNAL] City of Arlington Landfill - Biological Assessment Report

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Mr. Spicer:

Thank you for providing the biological assessment along with the other materials regarding the City of Arlington Landfill project. The assessment indicates you have determined the proposed action would no have effect on federally listed species. If you would like a letter documenting your assessment, please visit our website for Information, Planning, and Consultation (IPaC) and utilize the Arlington Field Office determination key. The determination key is an up-front analysis for certain project types and species. Determination Keys allow 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 site can be accessed here: https://ecos.fws.gov/ipac/

Additionally, we noted that the proposed project would involve relocating Hurricane Creek where it flows through the project area. Please contact the Fort Worth District Army Corps of Engineers to inquire about permits under section 404 of the Clean Water Act for impacts to the creek. Our office may have addtional comments through the Corps permitting process if necessary.

Please let me know if you have additional questions.

Omar R. Bocanegra
Supervisory Fish & Wildlife Biologist
Branch of Environmental Review, Classification & Recovery
U.S. Fish & Wildlife Service
2005 NE Green Oaks Blvd, Suite 140
Arlington, Texas 76006
(817) 277-1100 ext. 22110
(817) 277-1129 fax
Website: https://www.fws.gov/southwest/es/arlingtontexas/

# DECEMBER 1, 2021, WCG REQUEST FOR REVIEW LETTER

REPUBLIC SERVICES

City of Arlington Landfill - 800 Mosier Valley Road, Euless, TX 76040
o 817-317-2047 c 903-539-4065 RepublicServices.com

December 1, 2021

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 City of Arlington Landfill Major Permit Amendment
Tarrant 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 is preparing a permit amendment application on behalf of Republic Waste Services of Texas, Ltd. and the City of Arlington to expand the existing municipal solid waste landfill located in Tarrant County, Texas. 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 Weaver Consultants Group, LLC in November 2021.

The site has operated as a landfill for over 40 years. As discussed in the attached assessment report, the site does not provide habitat for and would not likely be occupied by any federally listed and state listed threatened and endangered species.

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 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,
**Republic Waste Services of Texas, Ltd.**

Adam Hart
Environmental Manager – South Area

Attachments: Attachment 1 – Project Summary and Site Location Maps
Attachment 2 – Biological Assessment Report

cc: Ryne J. Spicer, P.E., Weaver Consultants Group, LLC

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

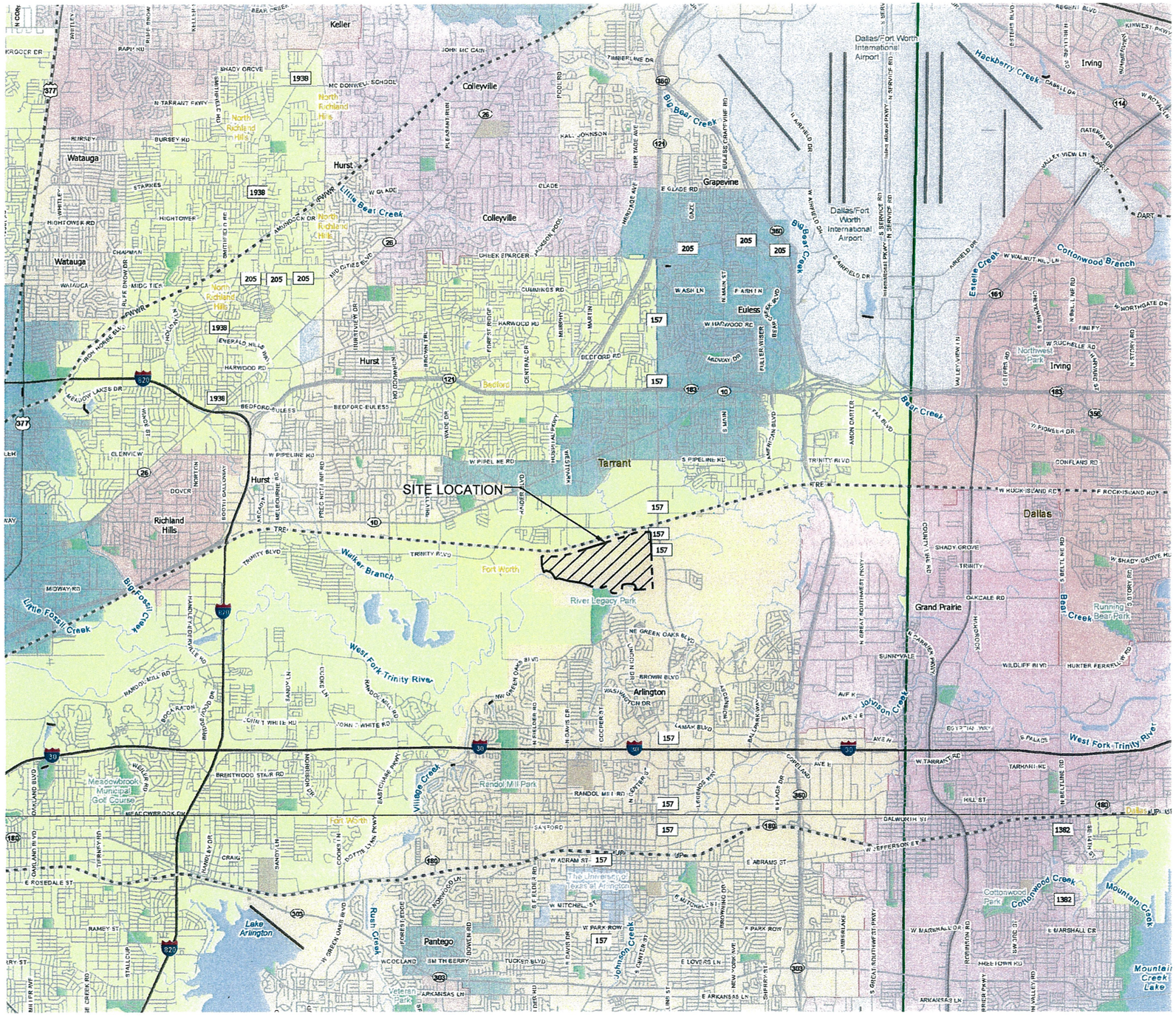
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.




LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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- [ ] DRAFT
- [X] FOR INFORMATION PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 1-SITE LOC.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
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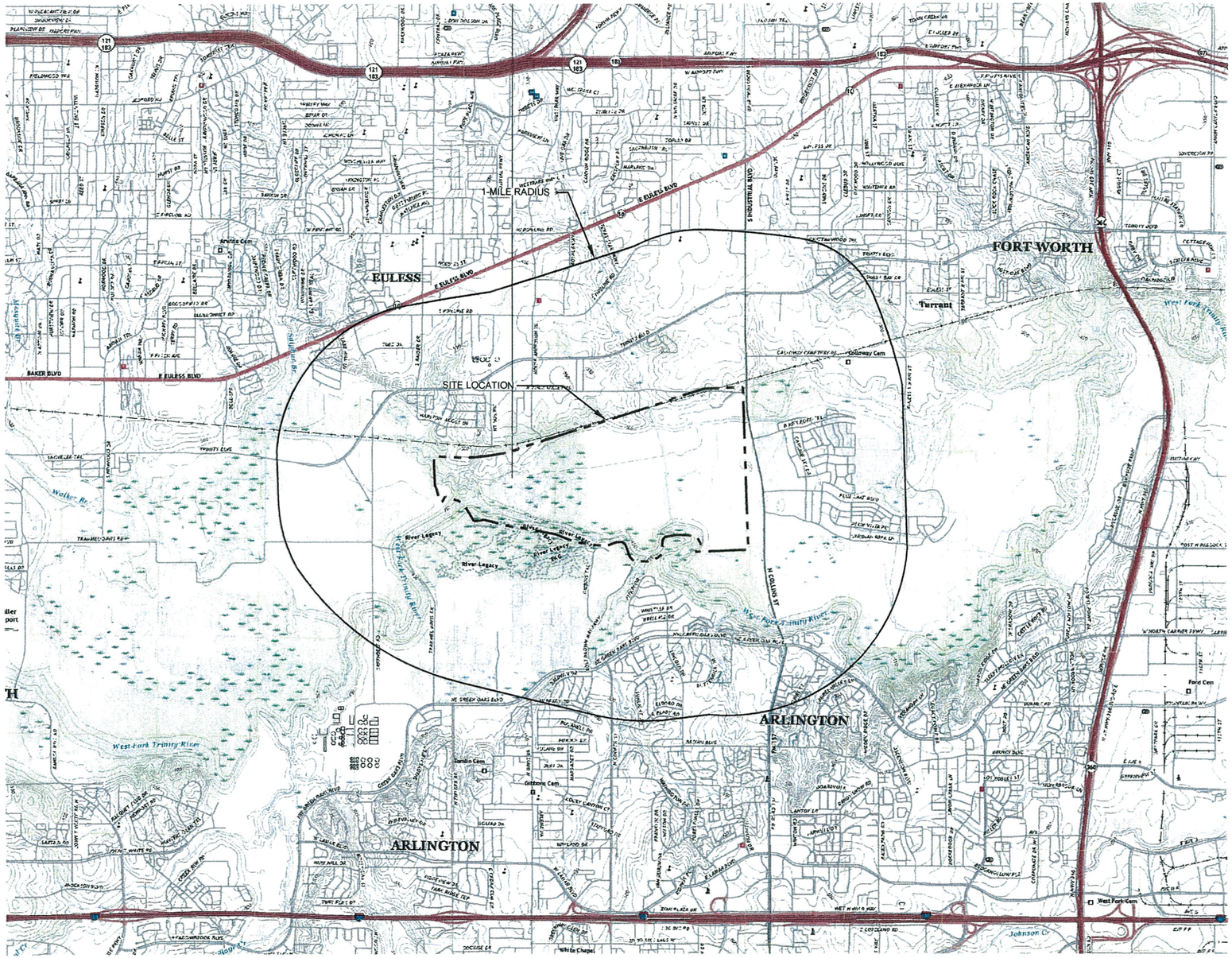
# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

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SCALE IN FEET

LEGEND

ROAD CLASSIFICATION

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

PERMITTED PERMIT BOUNDARY

EULESS, TX
2019

HURST, TX
2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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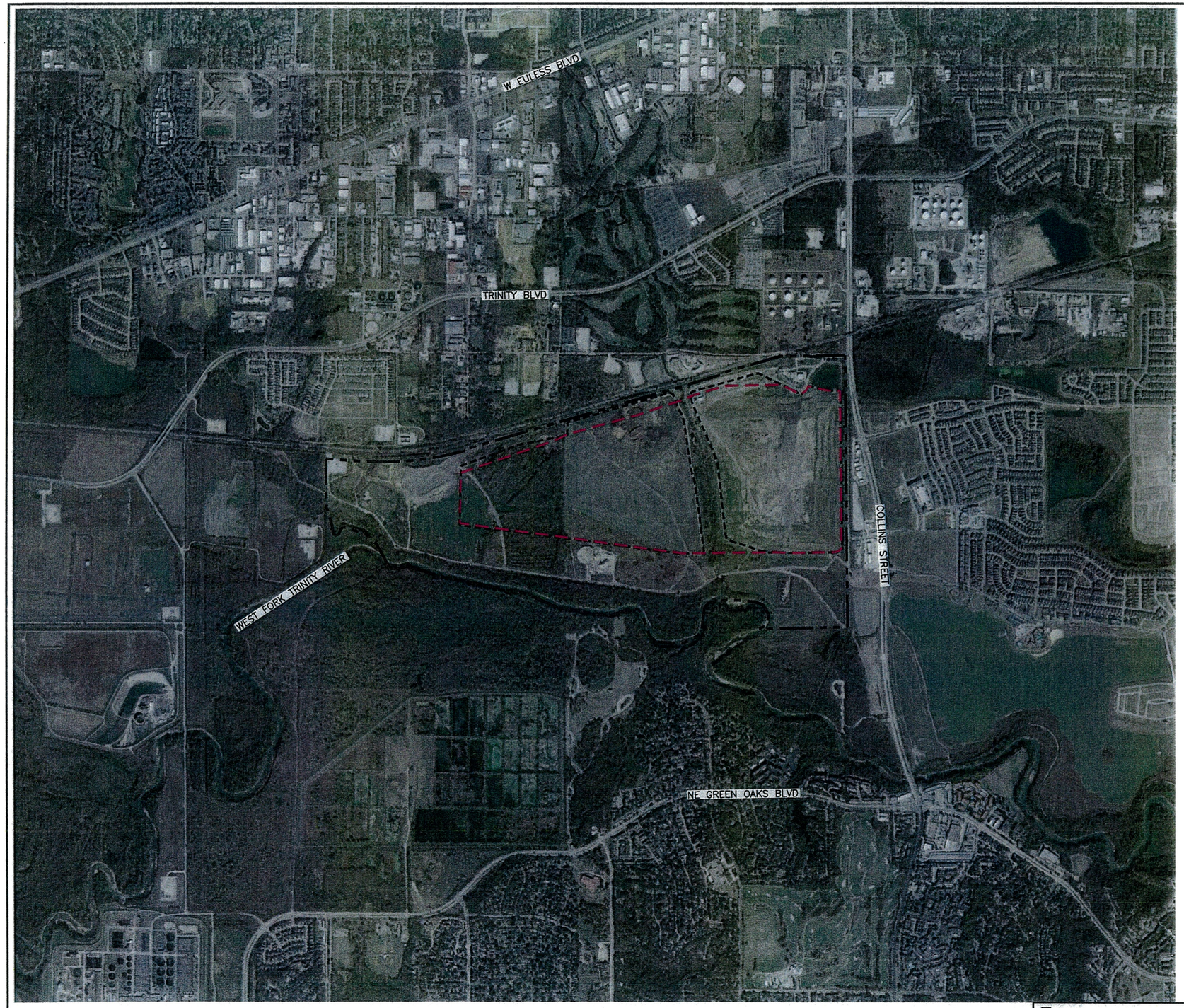
FIGURE 2

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SCALE IN FEET

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PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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TBPE REGISTRATION NO. F-3727

# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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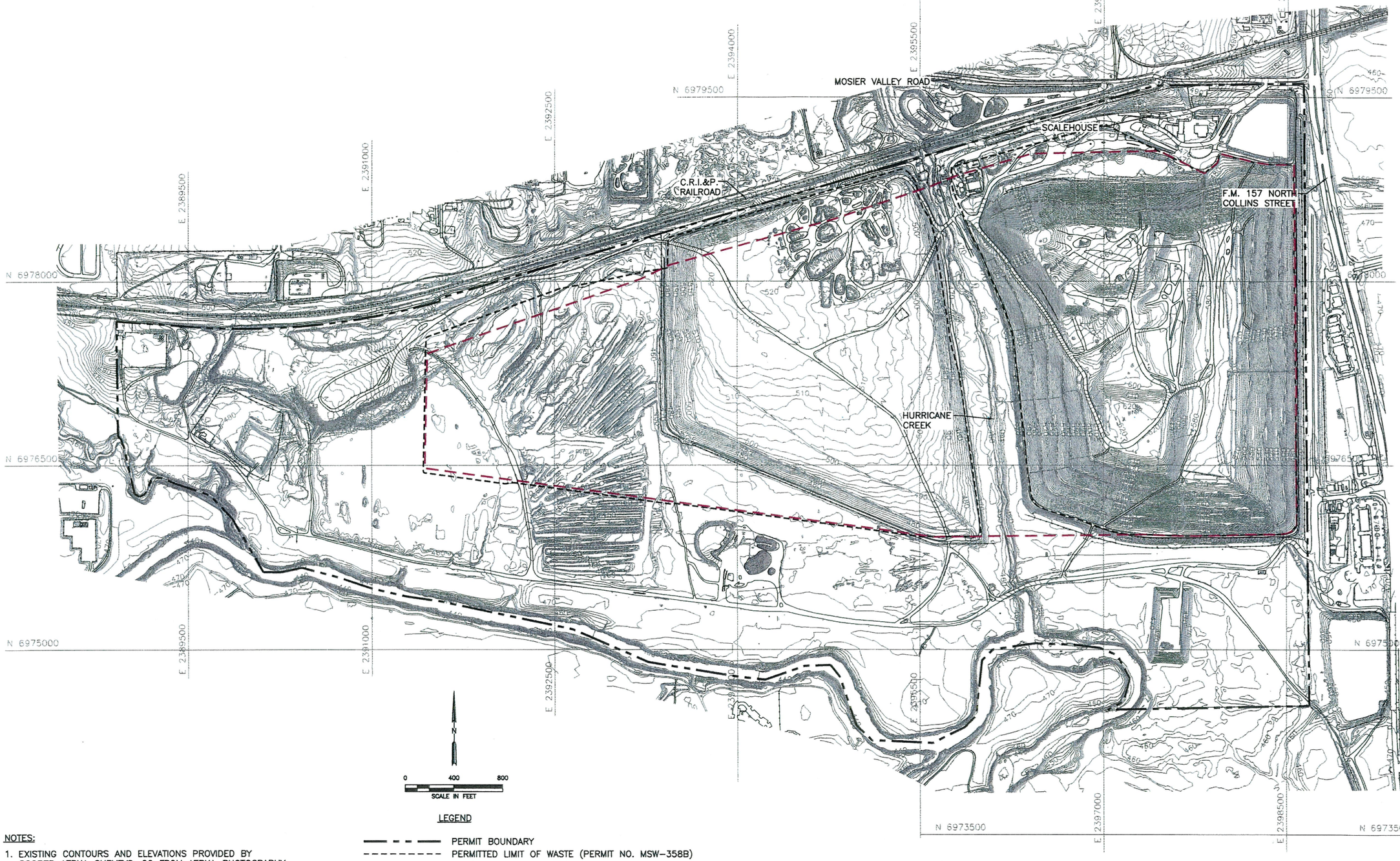
FIGURE 3




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020.

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW–358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW–358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM



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☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

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Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

# SITE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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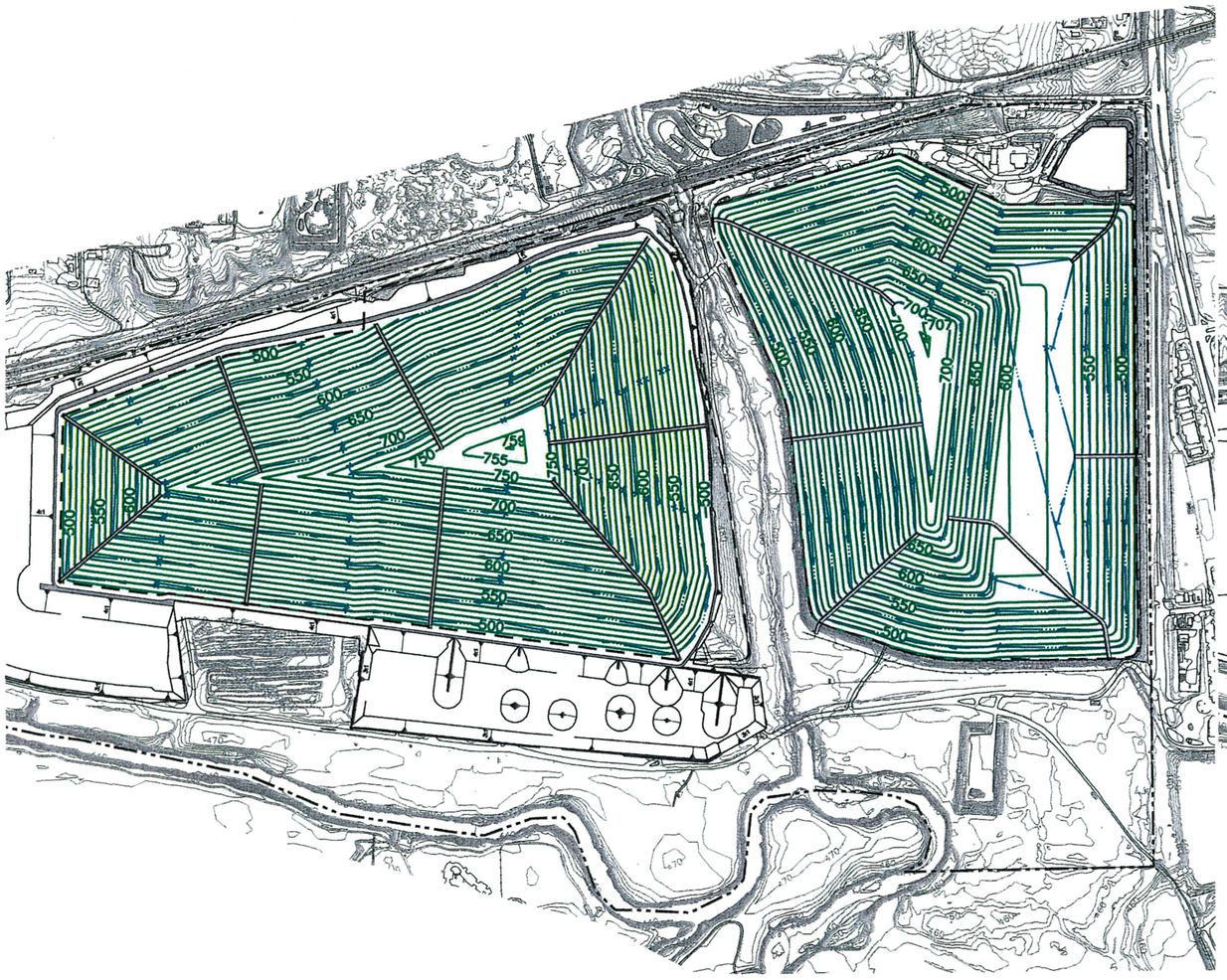
FIGURE 4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# ATTACHMENT 2

# BIOLOGICAL ASSESSMENT REPORT

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

# BIOLOGICAL ASSESSMENT REPORT FOR PROPOSED CITY OF ARLINGTON LANDFILL RECONFIGURATION

Prepared for

City of Arlington
And
Republic Waste Services of Texas, Ltd.

December 2021

Prepared by

**Weaver Consultants Group, LLC**
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0023-404-11-95

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| 6 | REFERENCES | 6 |

# 1 INTRODUCTION

The purpose of this document is to assess the effects of the proposed City of Arlington Landfill reconfiguration on federal- and state-listed threatened and endangered species that may occur in the project area. The City of Arlington Landfill is located in Tarrant County, Texas, on the west side State Highway 157 in the City of Arlington.

# 2 HABITAT DESCRIPTION

The project is located at the boundary between the Cross Timbers and Prairies and Blackland Prairies ecoregions of Texas (Diggs, G.M., Jr., et al., 2006; Correll and Johnston, 1979). Land use in the Cross Timbers and Prairies is variable but is dominated by urban development with a mixture of ranching and farming. The dominant grasses are little bluestem (*Schizachyrium scoparium* var. *frequens*), big bluestem (*Andropogon gerardi*), Indian grass (*Sorghastrum avenaceum*), switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), tall dropseed (*Sporobolus asper*), Texas wintergrass (*Stipa leucotricha*). Brush species and weedy annuals/perennials have invaded the area.

Land use in the Blackland Prairies ecoregion is variable, with a mixture of ranching and farming. The climax vegetation communities consist of herbaceous species dominated by little bluestem but with other species such as big bluestem, Indian grass, switchgrass, hairy grama, tall dropseed, and side-oats grama present as well. Tree species consist of post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), other oak species, cedar elm (*Ulmus crassifolia*), pecan (*Carya illinoinensis*), bois d'arc (*Maclura pomifera*), and mesquite (*Prosopis glandulosa*).

Vegetation observed during field visits consisted of cottonwood (*Populus deltoids*), cedar elm, green ash (*Fraxinus pennsylvanica*), sugar hackberry (*Celtis laevigata*), giant ragweed (*Ambrosia trifida*), southern dewberry (*Rubus trivialis*), Johnsongrass (*Sorghum halepense*), Bermudagrass (*Cynodon dactylon*), partridge pea (*Chamaecrista* fasciculata), common broomweed (*Gutierrezia dracunculoides*), sumpweed (*Iva annua*), and other species indicative of the region as well as disturbed areas.

# 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 Tarrant County.

The USFWS lists one endangered species and two threatened species as occurring in Tarrant County (**Table 1**). No critical habitat for any federally threatened or endangered species occurs in the project area.

In addition to federally listed species, the TPWD lists one endangered species and 10 threatened species as occurring in Tarrant County (**Table 1**).

# 4 SPECIES DESCRIPTIONS

The piping plover and red knot should be considered only for wind energy projects within the migratory route of these species. The whooping crane and is considered migratory through this area. Although migratory species occasionally stop over at points along their migratory routes, use of the project area would be highly unlikely due to the current land uses of the site.

Habitat for the black rail and white-faced ibis is not present on the site. Therefore, the proposed project would have no impact on these two species.

The black bear is not expected to occur in the region. The proposed project would not impact this species.

Three mollusks are state-listed as threatened and include the Louisiana pigtoe, sandback pocketbook, and Texas heelsplitter. Appropriate habitat was not found within the project area.

The alligator snapping turtle is a state-listed species that is considered as potentially occurring in Tarrant County. Appropriate 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 Tarrant County, nor has critical habitat been designated in the project area for any threatened and endangered species. The landfill reconfiguration 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.

# ATTACHMENT A

# TABLE 1 – LIST OF THREATENED AND ENDANGERED SPECIES POTENTIALLY OCCURRING IN TARRANT COUNTY

# THREATENED & ENDANGERED SPECIES TABLE

## Table 1

### Possible Effects To Listed Species Potentially Occurring Within The Project Area (Tarrant County, Texas)

| Common Name *(Scientific Name)* | State Status | Federal Status | Description of Suitable Habitat | Unique, Critical, or Designated Habitat | Effects Discussion |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| Black Rail (*Laterallus jamaicensis*) | T | T | 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*. | No | No impact; habitat not present |
| Piping Plover (*Charadrius melodus*) | T | T | Found on sandy lakeshores, dunes and beaches | 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 |
| 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 |
| **Mammals** | | | | | |
| Black Bear (*Ursus americanus*) | T | Not listed | Found within bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas. | No | No impact; habitat not present |
| **Mollusks** | | | | | |
| Louisiana Pigtoe (*Pleurobema riddellii*) | T | | Found in streams and moderate-size rivers, usually in flowing water on substrates of mud, sand, and gravel; not generally found in impoundments; Neches, Sabine, and Trinity river basins | No | No impact; habitat not present |
| Sandbank Pocketbook (*Lampsilis satura*) | T | Not listed | Found in small streams and large rivers in slow to moderate current in sandy mud to sand and gravel substrate. | No | No impact; habitat not present |
| Texas Heelsplitter (*Potamilus amphichaenus*) | T | | Found in stream with quiet waters in mud or sand and also in reservoirs; Neches, Sabine and Trinity river basins | No | No impact; habitat not present |

## Table 1 (Continued)

## Possible Effects to Listed Species Potentially Occurring Within the Project Area (Tarrant County, Texas)

| Common Name *(Scientific Name)* | State Status | Federal Status | Description of Suitable Habitat | Unique, Critical, or Designated Habitat | Effects Discussion |
|---|---|---|---|---|---|
| **Reptiles** | | | | | |
| Alligator Snapping Turtle (*Macrochelys temminckii*) | T | | Found in perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; usually in water with mud bottom and abundant aquatic vegetation | No | No impact to the species as a whole |
| 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 |
| Timber Rattlesnake (*Crotalus horridus*) | T | | Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground cover | No | No impact |

Note:

E – Endangered T – Threatened DL – Delisted Taxon, recovered, being monitored first five years

# COORDINATION WITH
# NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

- June 3, 2022, NCTCOG Review Letter

REPUBLIC SERVICES

Sustainability in Action

June 3, 2022

Ms. Edith Marvin
Director of Environment and Development
North Central Texas Council of Governments
616 Six Flags Drive
Arlington, TX 76011

Re: NCTCOG Conformance Review Request
Major Permit Amendment Application – MSW 358C
City of Arlington Landfill, Tarrant County, Texas

Dear Ms. Marvin:

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 the City of Arlington and Republic Waste Services of Texas, Ltd. The purpose of the major permit amendment is to reconfigure the waste disposal area of the existing City of Arlington Landfill. The currently permitted peak elevation of 759.0 feet mean sea level (ft-msl) will remain unchanged, and the waste disposal footprint will be increased from 382.7 acres to 390.5 acres, which will increase the permitted disposal capacity by approximately 15.9 million cubic yards. The continued operation of the City of Arlington Landfill will provide for the long-term disposal needs of Tarrant County and surrounding communities.

The major permit amendment application was submitted to TCEQ on June 3, 2022. 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 City of Arlington 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 City of Arlington Landfill is identified as a key part of the NCTCOG Regional Solid Waste Plan. The continued development of the facility will provide an economical option for continued disposal.
- The City of Arlington 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,
**Republic Waste Services of Texas, Ltd.**

Adam Hart
Environmental Manager – South Area

Enclosures: Parts I/II, City of Arlington Landfill Major Permit Amendment Application
Regional Review of MSW Facility Application Evaluation Form

cc: Sunanda Katragadda, City of Arlington
Jason A. Edwards, P.E., Weaver Consultants Group, LLC

# North Central Texas Council of Governments

# Regional Review of MSW Facility Application Evaluation Form

## Section 1: General Applicant Information

1.1 Applicant's Name: City of Arlington (Owner)
Mailing Address: 801 Main St. Mail Stop 01-0370
City, State, Zip Code: Arlington, TX 76010
Facility Contact Person: Sunanda Katragadda, Environmental Services Administrator

Applicant's Name: Republic Waste Services of Texas, Ltd. (Operator)
Mailing Address: 1212 Harrison Ave.
City, State, Zip Code: Arlington, TX 76011-7332
Facility Contact Person: Adam Hart, Environmental Manager

1.2 Site Location
Address: 800 Mosier Valley Road
Zip Code: 76040
Nearest City: Arlington, Texas
County: Tarrant

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. 358B (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:

_____
_____
_____
_____

# North Central Texas Council of Governments

# Regional Review of MSW Facility Application Evaluation Form

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(154) is currently accepted at the City of Arlington Landfill in accordance with the Waste Acceptance Plan previously prepared for the facility. The facility currently accepts Class 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(154) will be accepted at the City of Arlington Landfill in accordance with the Waste Acceptance Plan. The facility currently accepts Class 2 and 3 non-hazardous industrial waste. No change in types of waste acceptance is proposed with this amendment.

*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?

Special Use Permit SUP11-5 (attached)

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.

_____
_____
_____
_____

*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.

_____
_____
_____
_____

*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.

_____
_____
_____

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.

_____
_____
_____
_____

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.

_____
_____
_____
_____

*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.

_____
_____
_____
_____

*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)

_____
_____
_____

3.10 Describe measures to minimize the impact from trash, odor and any other potential nuisances related to your operation on surrounding land use.

_____
_____
_____

*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.)

_____
_____

How will the facility compare to the general terrain of the area, within two miles of the facility boundary?

_____
_____

*Source:.*

3.12 Describe any measures that you will implement to screen and/or blend the facility with surrounding features.

_____
_____
_____

*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.)

_____
_____
_____

*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 City of Arlington Landfill has multiple recycling operations at the facility. Living Earth Technology is a landfill mulch recycling operation that processes wood, brush, and yard waste for beneficial reuse. Big City Crushed Concrete is a concrete recycling operation that processes concrete for beneficial reuse. The facility also accepts appliances and other household electric items for recycling at the landfill.

**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 City of Arlington Landfill maintains an existing citizens convenience center area on site for public drop-off, and residents can also use three free annual landfill coupons per year. 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.

**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.

[1] Capacity issues can be considered to demonstrate the need for a facility, but cannot be used as a basis against a facility.

- 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 disposal 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.

# 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.

Adam Hart
**Type or Printed Name of Applicant's Chief Administrative Officer**

Environmental Manager
**Title of Chief Administrative Officer**



**Signature of Chief Administrative Officer**

6/3/2022
**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.**

09/16/11
09/19/11

**Ordinance No. 11-051**

**An ordinance changing the zoning classification on certain properties known as 800 Mosier Valley Road; 3414, 3698, and 3900-3912 North Collins Street by the approval of Specific Use Permit SUP11-5 for high impact use (landfill); amending the Zoning District Map accordingly; authorizing the building official to issue permits upon the effective date; providing for a fine of up to $2,000.00 for each violation; providing this ordinance be cumulative; and providing for severability, governmental immunity, injunctions, publication, and an effective date.**

WHEREAS, after notice and public hearing the Planning and Zoning Commission heard and recommended approval of Specific Use Permit SUP11-5 on July 13, 2011; and

WHEREAS, after notice and public hearing, and upon consideration of the recommendation of the Commission and of all testimony and information submitted during the public hearing, the City Council has determined that the use will: complement or be compatible with the surrounding uses and community facilities; contribute to, enhance or promote the welfare of the area of the SUP and adjacent properties; not be detrimental to the public health, safety or general welfare; and conform in all other respects to all applicable zoning regulations and standards; and

WHEREAS, the City Council has determined that it is in the best interest of the public and in support of the health, safety, morals, and general welfare of the citizens that the specific use permit be approved. Now therefore

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARLINGTON, TEXAS:

1.

A specific use permit for high impact use (landfill) is hereby granted for the properties known as 800 Mosier Valley Road; 3414, 3698, and 3900-3912 North Collins Street, described in Exhibit A, and the Zoning District Map shall be amended to reflect the change made by this ordinance. Development and use of the property shall be in compliance with this ordinance, the conditions stated in Exhibit B, and the attached site plan. In the event of a conflict between the provisions in Exhibit B and the provisions in any other exhibit, the provisions in Exhibit B control.

2.

The Building Official is hereby authorized and directed to issue permits in compliance with this ordinance, including all exhibits to this ordinance, immediately after the effective date of this ordinance.

3.

Any person, firm, corporation, agent or employee thereof who violates any of the provisions of this ordinance shall be guilty of a misdemeanor and upon conviction thereof shall be fined an amount not to exceed Two Thousand Dollars and No Cents ($2,000.00) for each offense. Each day that a violation is permitted to exist shall constitute a separate offense.

4.

This ordinance shall be and is hereby declared to be cumulative of all other ordinances of the City of Arlington; and this ordinance shall not operate to repeal or affect any of such other ordinances except insofar as the provisions thereof might be inconsistent or in conflict with the provisions of this ordinance, in which event such conflicting provisions, if any, in such other ordinance or ordinances are hereby repealed.

5.

If any section, subsection, sentence, clause or phrase of this ordinance is for any reason held to be unconstitutional, such holding shall not affect the validity of the remaining portions of this ordinance.

6.

All of the regulations provided in this ordinance are hereby declared to be governmental and for the health, safety and welfare of the general public. Any member of the City Council or any City official or employee charged with the enforcement of this ordinance, acting for the City of Arlington in the discharge of his/her duties, shall not thereby render himself/herself personally liable; and he/she is hereby relieved from all personal liability for any damage that might accrue to persons or property as a result of any act required or permitted in the discharge of his/her said duties.

7.

Any violation of this ordinance can be enjoined by a suit filed in the name of the City of Arlington in a court of competent jurisdiction, and this remedy shall be in addition to any penal provision in this ordinance or in the Code of the City of Arlington.

8.

The caption and penalty of this ordinance shall be published in a newspaper of general circulation in the City of Arlington, Texas, in compliance with the provisions of Article VII, Section 15, of the City Charter. Further, this ordinance may be published in pamphlet form and shall be admissible in such form in any court, as provided by law

9.

This ordinance shall become effective upon second publication.

PRESENTED AND GIVEN FIRST READING on the 16th day of August, 2011, at a regular meeting of the City Council of the City of Arlington, Texas; and GIVEN SECOND READING, passed and approved on the 13th day of September, 2011, by a vote of 8 ayes and 0 nays at a regular meeting of the City Council of the City of Arlington, Texas.

ROBERT N. CLUCK, Mayor

ATTEST:

MARY W. SUPINO, City Secretary

APPROVED AS TO FORM:
JAY DOEGEY, City Attorney

BY

SUP11-5

Exhibit "A"

BEING 752.436 acres of land situated in the J.J. Wingfield Survey, Abstract No. 1634, the M. Lee Survey, Abstract No. 967, the McKinney and Williams Survey, Abstract No. 1936, The William Lee Survey, Abstract No. 968 and the W. R. Loving Survey, Abstract No. 944, City of Arlington, Tarrant County, Texas, being all of Lot 1, J. J. Wingfield Addition, an addition to the City of Arlington, Tarrant County, Texas, as recorded in Cabinet A, Slides 553 and 554 Plat Records of Tarrant County, Texas, and all of the tracts of land conveyed to the City of Arlington, Texas, as recorded in County Clerk's Document No. D209239249, Deed Records of Tarrant County, Texas, County Clerk's Document No. D204267342, Deed Records of Tarrant County, Texas, County Clerk's Document No. D205030835, Deed Records of Tarrant County, Texas, and also being a portion of a tract of land conveyed to the City of Arlington as recorded in County Clerk's Document No. D206251199, Deed Records of Tarrant County, Texas, said 752.436 acres of land being more particularly described by metes and bounds as follows:

BEGINNING at a ½-inch iron rod with plastic cap stamped "Landes & Assoc." found at the northeast corner of the aforementioned Lot 1, J.J. Wingfield Addition being the intersection of the westerly right-of-way line of North Collins Street (F.M. No. 157) and the southerly right-of-way line of Mosier Valley Road;

THENCE South 00°36'27" East, along the easterly line of said Lot 1 and said westerly right-of-way line, a distance of 5067.24 feet to a ½-inch iron rod with plastic cap stamped "Brittain & Crawford" found at the southeast corner of said Lot 1 in the north line of a tract of land conveyed to the City of Arlington as recorded in Volume 11733, Page 1727, Deed Records of Tarrant County, Texas;

THENCE South 89°02'44" West, along the southerly line of said Lot 1, at 1290.18 feet past a ½-inch iron rod with plastic cap stamped "Landes & Assoc." set, a total distance of 1644.30 feet to the center of the West Fork of the Trinity River per Lot 1 Plat call;

THENCE along the southerly line of said Lot 1 and the approximate centerline of said river (per Plat call) the following courses and distances:

North 63°26'33" East, a distance of 147.80 feet;

North 14°56'33" East, a distance of 195.00 feet;

North 28°48'27" West, a distance of 215.00 feet;

North 67°48'27" West, a distance of 155.00 feet;

North 84°03'27" West, a distance of 220.00 feet;

North 88°48'27" West, a distance of 310.00 feet;

South 80°45'33" West, a distance of 347.00 feet;

South 44°56'33" West, a distance of 125.00 feet;

South 05°26'33" West, a distance of 455.00 feet;

South 44°33'33" West, a distance of 126.00 feet;

South 62°51'33" West, a distance of 295.00 feet;

North 88°03'27" West, a distance of 350.00 feet;

North 70°03'27" West, a distance of 150.00 feet;

North 47°23'27" West, a distance of 178.50 feet;

North 20°13'27" West, a distance of 420.00 feet;

North 40°28'27" West, a distance of 120.00 feet;

South 87°26'33" West, a distance of 210.00 feet;

South 69°53'57" West, a distance of 341.25 feet;

North 84°31'59" West, a distance of 234.10 feet;

North 81°50'27" West, a distance of 751.47 feet to the southwest corner of said Lot 1, J. J. Wingfield Addition;

THENCE North 00°27'08" West, along the westerly line of said Lot 1, leaving said river, at 98.08 feet, pass a ½-inch iron rod with plastic cap stamped "Landes & Assoc." set in the north bank of the river, a total distance of 675.09 feet to a 7/8-inch iron rod found at the northeast corner of Lot 1, R. Brown Addition an addition to the City of Arlington as recorded in Volume 388-213, Page 20, Plat Records of Tarrant County, Texas and the southeast corner of a 7.00-acre tract of land conveyed to the City of Arlington, Texas, as recorded in Volume 9872, Page 1087, Deed Records of Tarrant County, Texas;

THENCE North 00°16'49" West, continuing along the westerly line of said Lot 1 and the easterly line of said 7.00 acres, a distance of 338.66 feet to the northeast corner of said 7.00 acres and the southeast corner of a 9.01-acre tract of land conveyed to the City of Arlington, as recorded in County Clerk's Document No. D209239249, Deed Records of Tarrant County, Texas;

THENCE North 89°33'05" West, along the common line of said 7.00 acres and said 9.01 acres, a distance of 900.17 feet to a 5/8-inch iron with cap stamped "Fort Worth Survey" found at the northwest corner of said 7.00 acres and the southwest corner of said 9.01 acres;

THENCE South 00°16'41" East, along the westerly line of said 7.00 acres, a distance of

338.66 feet to a ½-inch iron rod found at the southwest corner of said 7.00 acres in the north line of the aforementioned Lot 1, R. Brown Addition;

THENCE North 89°33'05" West, along the north line of said Lot 1, a distance of 800.98 feet to a 7/8-Inch iron rod found at the northwest corner of said Lot 1;

THENCE South 00°22'42" East, along the west line of said Lot 1, at 75.24 feet past a 7/8-inch iron rod found, a total distance of 194.94 feet to the centerline of the aforesaid West Fork of the Trinity River;

THENCE continuing along the centerline of said river;

North 77°10'31" West, a distance of 549.75 feet;

North 73°23'03" West, a distance of 504.35 feet;

North 86°26'44" West, a distance of 100.18 feet;

South 81°31'59" West, a distance of 195.02 feet;

North 81°04'26" West, a distance of 156.76 feet;

North 52°55'04" West, a distance of 156.63 feet;

THENCE leaving said river and continuing along the centerline of the Walker Branch of the West Fork of the Trinity River with its meanders, the following courses and distances:

North 10°58'12" West, a distance of 159.62 feet, a ½-inch iron rod with plastic cap stamped "Landes & Assoc." set on the easterly bank of said Branch bears North 51°47'35" East, 60.17 feet;

North 41°02'21" West, a distance of 149.37 feet;

North 16°58'19" West, a distance of 47.69 feet;

North 27°50'40" East, a distance of 56.89 feet;

North 13°57'06" West, a distance of 29.54 feet;

North 32°56'18" West, a distance of 43.76 feet;

North 59°45'17" West, a distance of 166.19 feet;

North 59°40'29" West, a distance of 102.51 feet;

North 73°34'45" West, a distance of 199.15 feet;

North 68°53'17" West, a distance of 132.25 feet;

North 87°19'16" West, a distance of 52.21 feet;

South 54°41'17" West, a distance of 48.12 feet;

South 14°51'35" West, a distance of 79.32 feet;

South 34°13'44" West, a distance of 24.48 feet;

South 60°19'29" West, a distance of 62.32 feet;

North 75°05'26" West, a distance of 33.59 feet;

North 28°15'01" West, a distance of 75.43 feet;

North 21°00'14" East, a distance of 17.08 feet;

North 12°20'41" West, a distance of 246.02 feet;

North 02°53'10" West, a distance of 69.72 feet;

North 25°21'25" West, a distance of 40.31 feet;

North 46°28'10" West, a distance of 68.86 feet to a point in the west line of a 58.909-acre tract of land conveyed to the City of Arlington, as recorded in County Clerk's Document No. D206251199, Deed Records of Tarrant County, Texas;

THENCE North 00°48'07" West, along the west line of said 58.909 acres, leaving said Branch, at 50.30 feet past a ½-inch iron rod with plastic cap stamped "Landes & Assoc." set, a total distance of 757.65 feet to a ½-inch iron rod found;

THENCE North 00°02'53" East, continuing along said west line, a distance of 190.50 feet to a ½-inch iron rod found in the southerly right-of-way line of the Trinity Railway Express (formerly the Chicago, Rock Island and Pacific Railroad Company) as recorded in Volume 7726, Page 1848, Deed Records of Tarrant County, Texas, said iron rod also being the northwest corner of the aforesaid 58.909 acres;

THENCE South 85°56'57" East, along said southerly right-of-way line, a distance of 654.79 feet to a 5/8-inch iron rod found at the beginning of a curve to the left with a radius of 5782.61 feet and whose long chord bears North 84°07'03" East, 2008.41 feet;

THENCE easterly, along said curve, with said right-of-way, passing the northeast corner of said 58.909 acres, the northwest and northeast corners of a 0.645 of an acre tract of land conveyed to the City of Arlington as recorded in County Clerk's Document No. D205030835, the northwest corner of Tract One conveyed to the City of Arlington as recorded in County Clerk's Document No. D204267342, Deed Records of Tarrant County, Texas and continuing with the northerly line of said Tract One, through a central angle of 20°00'05", an arc distance of 2018.64 feet, to ½-inch iron rod with cap stamped "Brittain & Crawford" found at the end of said curve;

THENCE North 00°13'02" West, along said right-of-way line and the northerly line of said Tract One, a distance of 25.96 feet to a ½-inch iron rod with cap stamped "Brittain & Crawford" found at the beginning of a curve to the left with a radius of 5757.61 feet and whose long chord bears North 73°36'45" East, 91.15 feet;

THENCE northeasterly along said curve, with said right-of-way and the north line of Tract One, through a central angle of 00°54'26", an arc distance of 91.15 feet to a to ½-inch iron rod with cap stamped "Brittain & Crawford" found at the beginning of a compound curve to the left with a radius of 20978.04 feet and whose long chord bears North 74°09'08" East, 279.43 feet;

THENCE easterly along said curve with said right-of-way line, through a central angle of 00°45'47", an arc distance of 279.43 feet to a to ½-inch iron rod with cap stamped "Brittain & Crawford" found the end of said curve;

THENCE North 73°45'45" East, with said southerly right-of-way line, at 523.27 feet pass a one-inch iron rod found at the most northerly northeast corner of said Tract One and the northwest corner of the aforesaid Lot 1, J.J. Wingfield Addition and continuing with the north line of said Lot 1, a total distance of 4656.13 feet to a one-inch iron rod found;

THENCE North 00°34'48" West, along said right-of-way line and the northerly line of said Lot 1, a distance of 26.11 feet to a ½-inch iron rod with plastic cap stamped "Landes & Assoc." found;

THENCE North 73°51'13" East, continuing along said right-of-way line and said Lot 1, a distance of 1081.18 feet to a ½-inch iron rod with plastic cap stamped "Landes & Assoc." found in the south right-of-way line of Mosier Valley Road;

THENCE North 89°08'29" East, along said south right-of-way line and the north line of said Lot 1, a distance of 1211.15 feet to the PLACE OF BEGINNING and containing 752.436 acres of land;

AND being generally south of Mosier Valley Road and west of North Collins Street with the approximate addresses being 800 Mosier Valley Road; 3414, 3698, and 3900-3912 North Collins Street.

SUP11-5

EXHIBIT "B"

1. Following the approval of ZA11-2, the zoning of this site is Industrial Manufacturing (IM).

2. The purpose of this Specific Use Permit is to bring the entire landfill area into zoning conformance.

3. Access to the site will continue to be from Mosier Valley Road and North Collins Street.

4. There is no expiration for this Specific Use Permit.

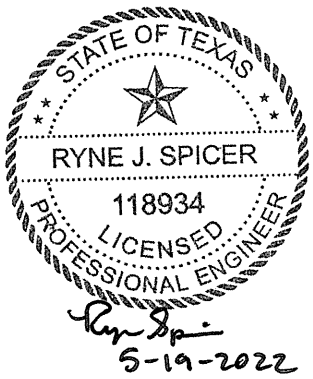
5. Use and development of the property must be in compliance with the attached site plan (pages 1-2).

6. In the event of a conflict between the provisions in this Exhibit B and any other exhibits to this ordinance, the provisions of Exhibit B control.

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## PARTS I/IIC
## LOCATION RESTRICTION DEMONSTRATIONS




Prepared for:

City of Arlington
and
Republic Waste Services of Texas, Ltd.

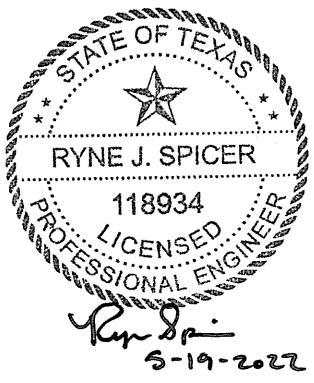
May 2022

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. 0023-404-11-104

This document intended for permitting purposes only.

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| **3** | **AIRPORT SAFETY** | **I/IIC-5** |
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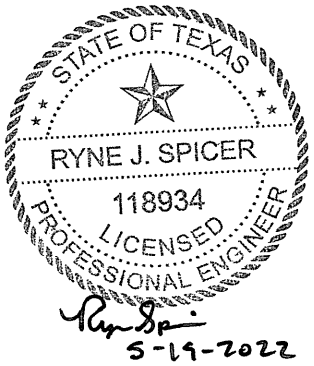


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# 1 INTRODUCTION

The purpose of this appendix is to provide demonstrations of the location restrictions for the City of Arlington 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. 358B.
- **Newly Permitted Limits of Waste.** As shown on Drawing I/IIC-1, a buffer zone of at least 125 feet 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).
- **Leachate Storage Tank Area.** A buffer zone of over 50 feet is maintained between the permit boundary and the leachate storage tank area.
- **Citizens Convenience Center.** A buffer zone of over 50 feet is maintained between the permit boundary and the existing Citizens Convenience Center.

The existing easements at the facility, as identified by Landes and Associates, Inc., are shown on the drawing included on Page I/II-13-7 of Parts I/II and listed below.

- 50' Utility Easement; City of Arlington & Trinity River Authority; Vol. 12975, Page 501, D.R.T.C.T.
- 20' Pipeline Easement; Renovar Energy Corp.; Vol. 15989, Page 314, D.R.T.C.T.
- 20' Pipeline Easement; Renovar Energy Corp.; Vol. 15989, Page 315, D.R.T.C.T.
- 25' Utility Easement; City of Arlington; Vol. 12952, Page 250, D.R.T.C.T.
- 10' Pipeline Easement; ETC Texas Pipeline, LTD.; Doc. No. D209304763, D.R.T.C.T.

- 50' Easement and Right-of-Way (ROW); Trinity River Authority; Vol. 6472, Page 791, D.R.T.C.T.
- 10' Utility Easement; Texas Utilities Electric Co.; Vol. 9696, Page 1772, D.R.T.C.T.
- 25' Utility Easement; City of Arlington; Vol. 13214, Page 338, D.R.T.C.T.
- 50' Easement and ROW; Trinity River Authority; Vol. 13629, Page 5, D.R.T.C.T.
- 50' Easement and ROW; Trinity River Authority; Vol. 5207, Page 293, D.R.T.C.T.
- 20' Sanitary Sewer Easement; Trinity River Authority; Vol. 5207, Page 282, D.R.T.C.T.
- 15' Permanent Access Easement; Trinity River Authority; Vol. 5207, Page 282, D.R.T.C.T.
- 10' Distribution Easement and ROW; Texas Electric Serv. Co.; Vol. 4952, Page 25, D.R.T.C.T.
- 20' ROW and Easement; Sinclair Refining Co.; Vol. 1946, Page 344, D.R.T.C.T.
- 25' Utility Easement; Trinity River Authority; Vol. 13214, Page 337, D.R.T.C.T.
- 10' Utility Easement; CAB A, Slides 553 & 554, P.R.T.C.T.
- 30' ROW Dedication (Mosier Valley Road); City of Arlington
- 35' ROW and Easement; Texas Pipeline Co.; Vol. 1950, Page 215, D.R.T.C.T.
- 20' ROW and Easement; Texas Pipeline Co.; Vol. 1925, Page 75, D.R.T.C.T.
- 20' ROW and Easement; Texas Pipeline Co.; Vol. 1925, Page 71, D.R.T.C.T.
- 50' ROW and Easement; Trinity River Authority; Vol. 5207, Page 333, D.R.T.C.T.
- Valve Site Easement; ETC Texas Pipeline, LTD.; Doc. No. D209304763, D.R.T.C.T.
- 60' Channel Easement; State of Texas; Vol. 1950, Page 554, D.R.T.C.T.

No solid waste disposal will occur within 25 feet of the centerline of any easement. 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.

LEGEND

- PERMIT BOUNDARY
- AUTHORIZED PRE–SUBTITLE D LIMIT OF WASTE
- PROPOSED LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- PREVIOUSLY AUTHORIZED DISPOSAL AREA
- NEWLY PERMITTED DISPOSAL AREA

N

0 400 800

SCALE IN FEET

EXISTING CITIZENS CONVENIENCE CENTER

EXISTING LANDFILL GAS TO ENERGY FACILITY AND FLARE

EXISTING LEACHATE STORAGE AREA

EXISTING PRE–SUBTITLE D WASTE TO BE RELOCATED

SECTOR 5B2

SECTOR 5A2A

SECTOR 5B1

SECTOR 5A1

SECTOR 4

PRE–SUBTITLE D AREA

SECTOR 1 (PRE–SUBTITLE D AREA)

OVERLINER SECTOR 1A/2A

SECTOR 3

SECTOR 2

FUTURE LEACHATE STORAGE AREA, LANDFILL GAS TO ENERGY FACILITY, AND FLARE

| LANDFILL BUFFER ZONE INFORMATION | | |
|---|---|---|
| LOCATION | BUFFER ZONE BETWEEN PERMIT BOUNDARY AND PREVIOUSLY AUTHORIZED DISPOSAL AREA | BUFFER ZONE BETWEEN PERMIT BOUNDARY AND NEWLY PERMITTED DISPOSAL AREA |
| 1 | NA | 256 FEET |
| 2 | 58 FEET | 284 FEET |
| 3 | 276 FEET | NA |
| 4 | 385 FEET | NA |
| 5 | 2532 FEET | NA |
| 6 | 1052 FEET | NA |
| 7 | 1320 FEET | NA |
| 8 | NA | 874 FEET |
| 9 | 1394 FEET | NA |
| 10 | 94 FEET | NA |
| 11 | 90 FEET | NA |
| 12 | 92 FEET | NA |
| 13 | 565 FEET | NA |
| 14 | 227 FEET | NA |
| PROCESSING/DISPOSAL UNIT BUFFER ZONE INFORMATION | | |
| A | EXISTING CITIZENS CONVENIENCE CENTER | 147 FEET |
| B | EXISTING LFGTE FACILITY AND FLARE | 149 FEET |
| C | EXISTING LEACHATE STORAGE TANK AREA | 192 FEET |
| D | FUTURE LEACHATE STORAGE AREA, LFGTE FACILITY, AND FLARE | 882 FEET |

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. PERMIT BOUNDARY WAS REPRODUCED FROM A LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.

SHEET I/IIC–4

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- [ ] ISSUED FOR CONSTRUCTION

DATE: 05/2022
FILE: 0023–404–11
CAD: 3.1–EXISTING SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION |
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# MAJOR PERMIT AMENDMENT BUFFER ZONE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE I/IIC–1

O:\0023\404\EXPANSION 2021\PARTS I–II\C\C.1 BUFFER ZONE.dwg, jwilson, 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 land disposal 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 unit is designed and operated so that the landfill does not pose a bird hazard to aircrafts.

The FAA reviewed the proposed changes to determine the potential for the site to be a hazard to air navigation. As documented in a letter dated April 13, 2022, 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. No small general service airports or large general public commercial airports are located within a six-mile or five-mile radius, respectively, of the site (as shown on Figure I/II-8.1 in Parts I/II).

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.

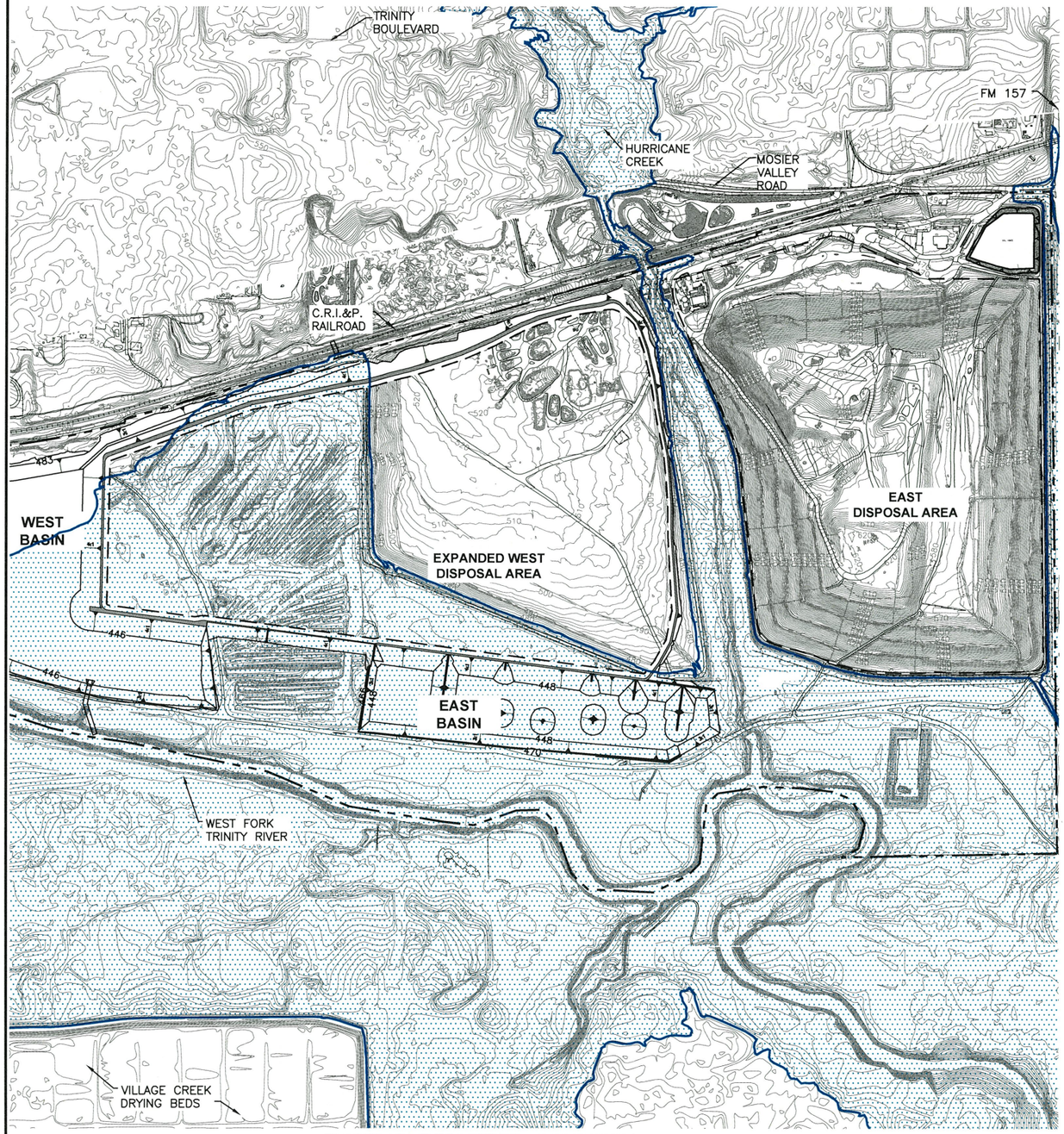
Drawing I/IIC-2 compares the existing permitted site condition (TCEQ Permit No. 358B) and the effect the proposed revision to the site development plan will have on the 100-year floodplain under TCEQ Permit No. 358C. As discussed in Part III, Appendix IIIN – Floodplain Information, flood storage will be created to offset the flood storage consumed by the proposed landfill reconfiguration. The site is located within the Trinity River corridor and a Trinity River Corridor Development Certificate (CDC) will be approved by the City of Arlington and the USACE for the continued development of the landfill. In addition, a CLOMR will be approved by the City of Arlington and FEMA to allow for the proposed development within the 100-year floodplain. The CDC and CLOMR permit applications and permits are included in Part III, Appendix IIIN, and represent the approvals required to develop the site so that the waste disposal area will be protected from the 100-year floodplain. Drawing I/IIC-3 shows the revised limits of the 100-year floodplain shown on the revised Flood Insurance Rate Map (FIRM) included in the FEMA CLOMR request.

Supporting floodplain information is included in Parts I/II, Section 11.1 and Appendix IIIN. Compliance with each floodplain location/coordination regulation is listed in Table 4-1.

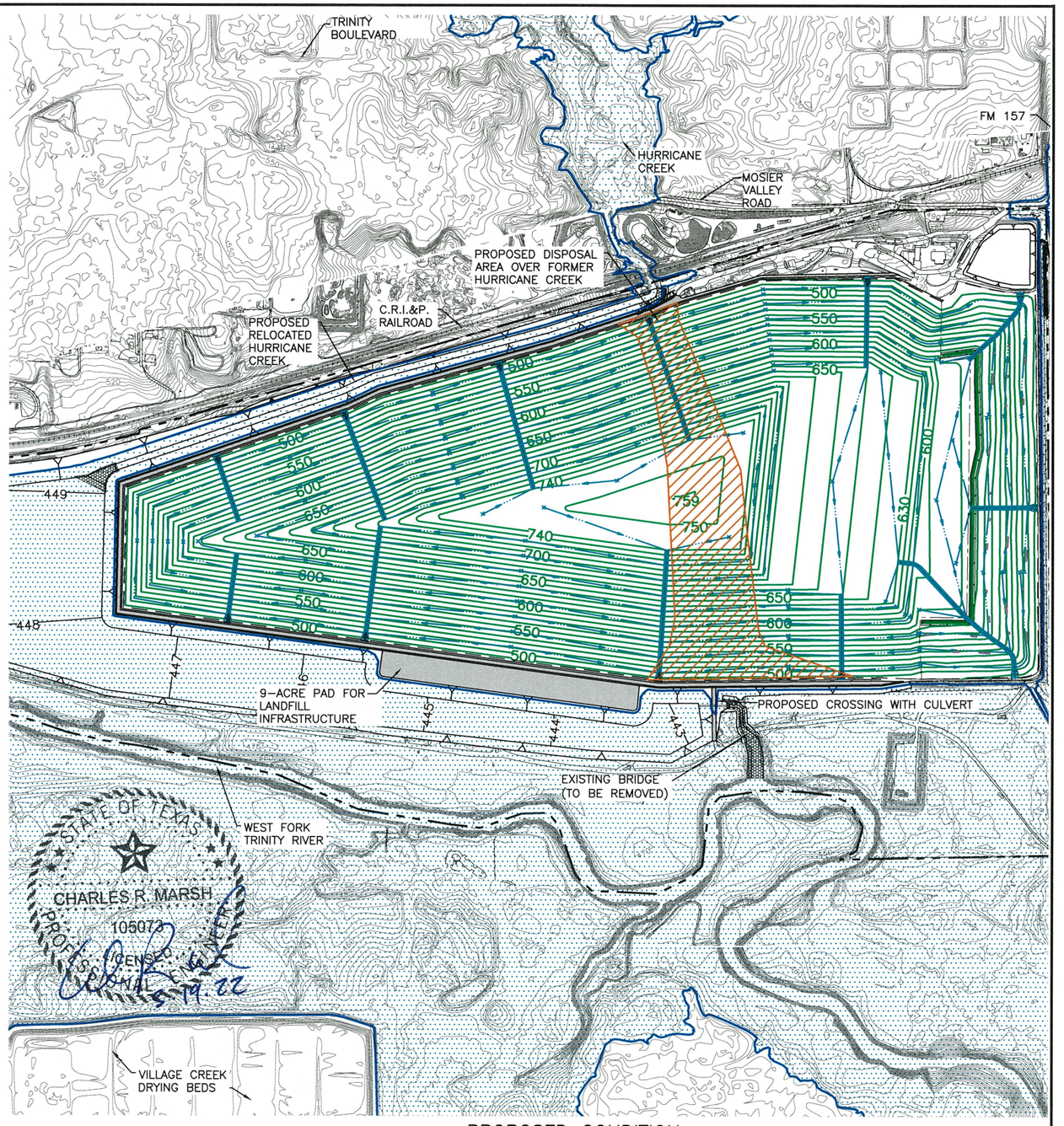


# Table 4-1
# Floodplain Location Restriction Requirements

| Regulatory Citation | Regulation Summary | How Regulation is Addressed |
|---|---|---|
| **330.547(a)** | No disposal operations located in a 100-year floodway. | As shown on Drawing I/IIC-3, no disposal operations are located in a 100-year floodway. |
| **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. | As noted in Appendix IIIN, the existing and proposed waste fill areas and related site development will not restrict the flow or the 100-year flood. As noted in Appendix IIIN-C, the proposed condition creates additional floodplain storage for the 100-year flood. Additionally, there is over three feet of freeboard available between the landfill perimeter berm and the 100-year water surface elevation. |
| **330.547(c)** | Storage and processing facilities located outside of 100-year floodplain unless facilities prevent washing during 100-year event. | There are no proposed facilities within the limits of the 100-year floodplain. Also, over 3 feet of freeboard is provided between the landfill perimeter berm and the calculated 100-year water surface elevation delineated in Appendix IIIN. |




## EXISTING PERMITTED CONDITION




## PROPOSED CONDITION

LEGEND:

- LANDFILL PERMIT BOUNDARY
- LIMIT OF WASTE
- 470 EXISTING CONTOUR
- 700 FINAL COVER CONTOUR
- DRAINAGE CHUTE
- DRAINAGE SWALE
- FORMER HURRICANE CREEK LOCATION
- 100-YEAR FLOODPLAIN

N

0 500 1000
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. OFFSITE CONTOURS AND ELEVATIONS PROVIDED BY DFWMAPS.COM FROM AERIAL SURVEYS FLOWN JANUARY TO MARCH 2007.

SHEET I/IIC-8

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DATE: 05/2022
FILE: 0023-404-11
CAD: I/IIC-2 FLOODPLAIN CONDITION COMP.DWG

DRAWN BY: RAA
DESIGN BY: BPY
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
REPUBLIC WASTE SERVICES OF TEXAS, LTD.

REVISIONS

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|---|---|---|
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# MAJOR PERMIT AMENDMENT
# FLOODPLAIN CONDITION COMPARISON

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIC-2

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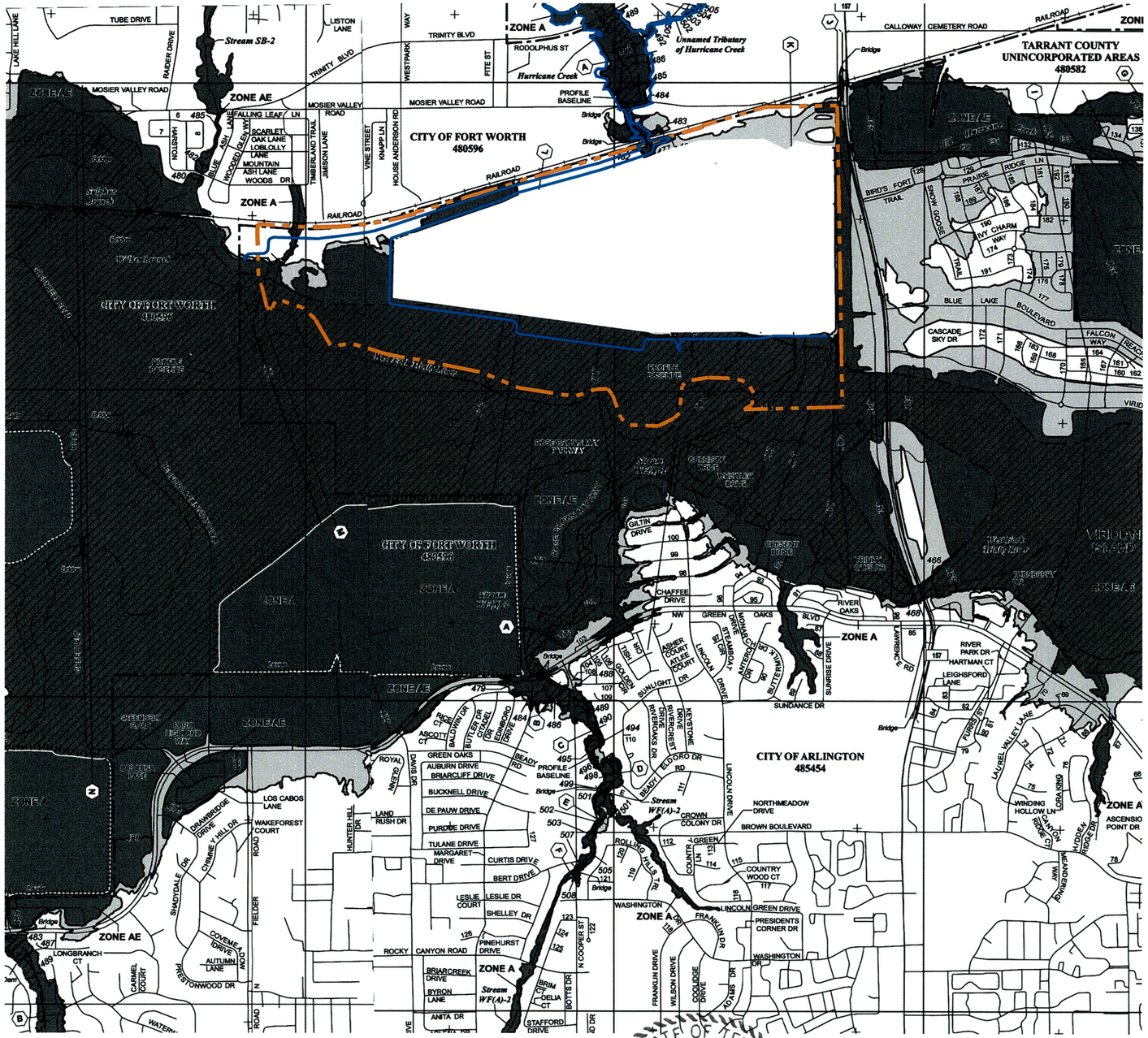









LEGEND:

PERMIT BOUNDARY

POST–PROJECT 100–YEAR FLOODPLAIN

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

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

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

| | |
|---|---|
| ZONE X | Areas determined to be outside the 0.2% annual chance floodplain. |
| ZONE D | Areas in which flood hazards are undetermined, but possible. |

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A: Cross section line
- 23 — 23: Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 5100000 FT — 5000-foot ticks: Texas State Plane North Central Zone (FIPS Zone 4202), Lambert Conformal Conic projection
- 3960000 FT — 1000-meter Universal Transverse Mercator grid values, zone 14
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

NOTES:

1. REPRODUCED FROM FEMA FIRM NUMBERS 48439C0240L, AND 48439C0220L FOR TARRANT COUNTY, TEXAS AND INCORPORATED AREAS, EFFECTIVE MARCH 21, 2019.

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
5.19.22

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DATE: 05/2022
FILE: 0023–404–11
CAD: I/IIC–2–REVISED FIRM MAP.DWG

DRAWN BY: RAA
DESIGN BY: BPY
REVIEWED BY: CRM

Weaver Consultants Group

PREPARED FOR
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
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MAJOR PERMIT AMENDMENT
REVISED FLOOD INSURANCE RATE MAP (FIRM)

CITY OF ARLINGTON
TARRANT COUNTY, TEXAS

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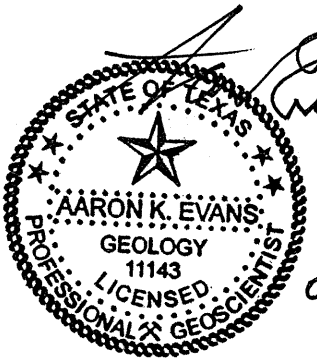
DRAWING I/IIC–3

O:\0023\404\EXPANSION 2021\PARTS I-II\I-IIC3 REVISED FIRM.dwg, rarrington, 1:2

# 5 GROUNDWATER

The groundwater location restriction within Title 30 TAC §330.549 prohibits a Type I or Type IAE landfill on the recharge zone of the Edwards Aquifer. Given that the City of Arlington Landfill is not located on the recharge zone of the Edwards Aquifer, the site is in compliance with the groundwater location restriction.




05-19-22

# 6 ENDANGERED OR THREATENED SPECIES

The endangered or threatened species location restrictions within Title 30 TAC §330.551 require that the facility and the operation of the facility 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. In addition, a site specific threatened and endangered species habitat assessment was completed by Weaver Consultants Group, LLC (refer to the TPWD and FWS tabs in Appendix I/IIB). This study concluded that the area within the landfill permit boundary does not provide habitat for nor has critical habitat been designated in the project area for any threatened or endangered species.

Therefore, it is concluded that the reconfiguration of the City of Arlington 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.

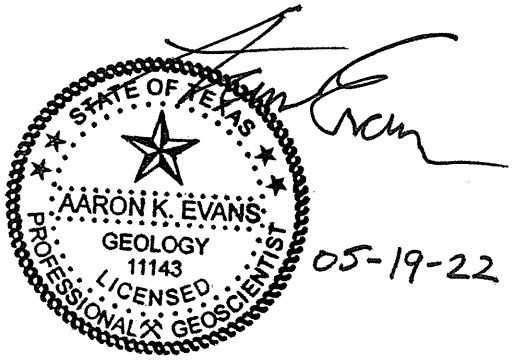
Given the above, the site is in compliance with the endangered or threatened species location restriction.

# 7 WETLANDS

The area within the existing permit boundary of the City of Arlington 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 §330.553(b).

A waters of the U.S. and wetlands determination/delineation was performed by KBA EnviroScience, Ltd. Excerpts from their January 2010 report is included in Appendix I/IIB which describes and identifies wetlands located within the facility boundary. The U.S. Army Corps of Engineers (USACE) Permit (Project Number SWF-2010-00056) was issued on November 21, 2014, authorizing the permanent filling and excavation of approximately 86 acres of waters of the U.S. associated with the City of Arlington Expansion Project (TCEQ Permit No. 358B). The permit associated with Project Number SWF-2010-00056 is also included in Appendix I/IIB.

The proposed post-development condition of the landfill will require (1) excavation of additional waters of the U.S. previously delineated as forested wetland and open water and (2) relocation of Hurricane Creek. Coordination with the USACE for the proposed changes to Project Number SWF-2010-00056 in included in Appendix I/IIB, which represents the authorizations required to develop the site.



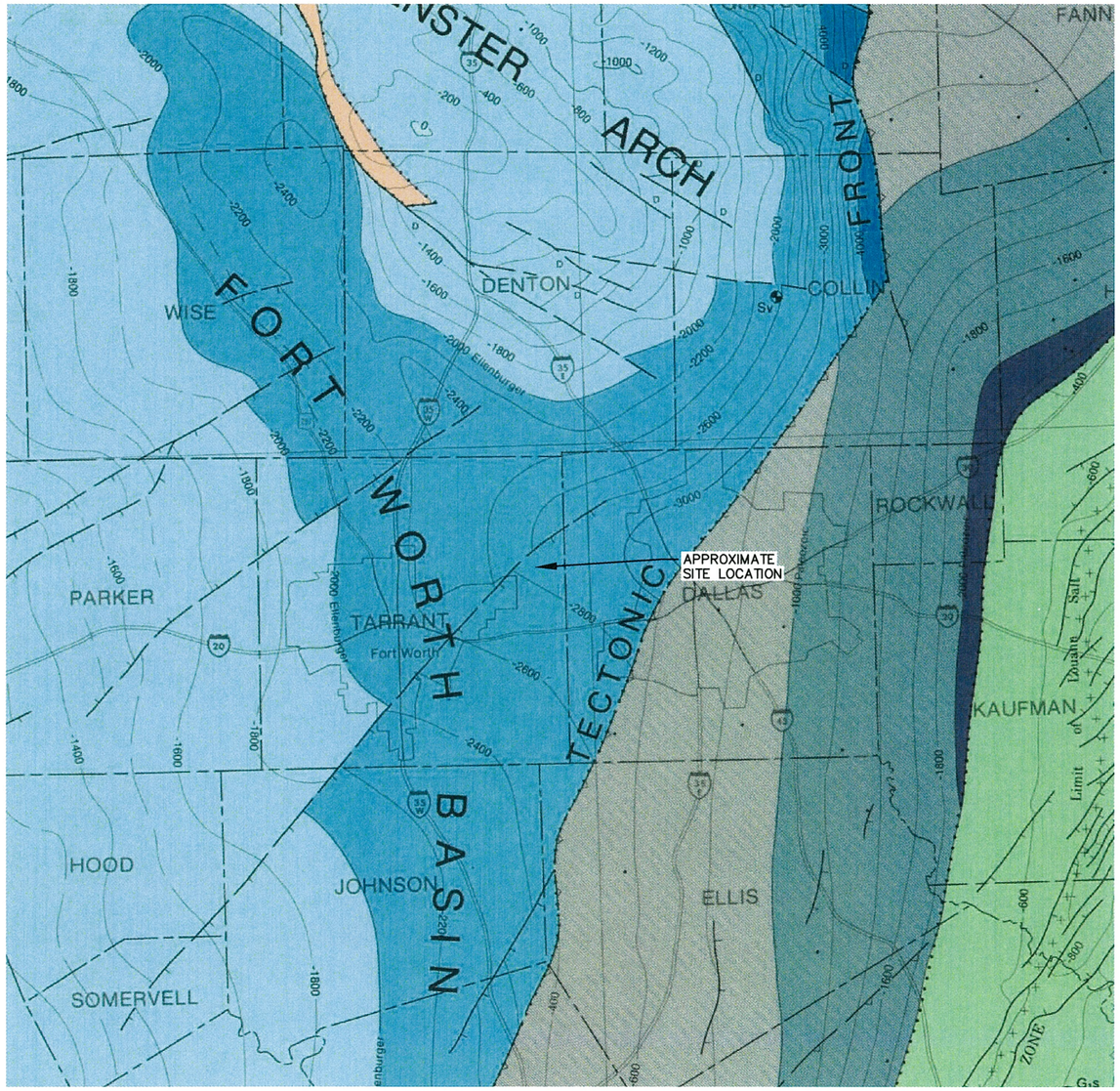

# 8 FAULT AREAS

The City of Arlington 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 photography. 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 January 2022), area USGS 7.5 Minute Topographic Quadrangle Maps (Euless, TX and Hurst, TX; 2019), Google Earth aerial imagery of Tarrant County (accessed January 2022), and field reconnaissance of the City of Arlington Landfill and the surrounding areas (conducted February 2022). 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-4 – Regional Tectonic Map and Drawing I/IIC-5 – Regional Lineament Map. As indicated on these figures, the City of Arlington Landfill is about one mile southeast of the nearest mapped potential 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.

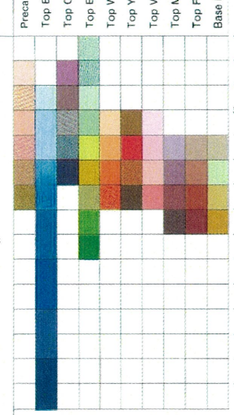
Based on review of the aforementioned references and field reconnaissance from area roadways, no areas of concern were noted in the landfill vicinity. No unusual scarps, topographic breaks, vegetation changes, or lineations were interpreted within 200 feet of the site. No structural damage to facilities, 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) | |
| | | | | TRANS-PECOS PROVINCE: 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 | $Gb_2$ | Base of Austin Chalk (BAC) | Woodbine Fm. pinch-out |
| | | | | BALCONES PROVINCE: Ultramafic to felsic intrusives | $Gb_1$ | 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 | | |
| | | | | WICHITA PROVINCE: 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.) | $Ll_2$ | Later granites (Town Mountain) | $Ll_3$ | | |
| | | Gneisses (Valley Spring) | $Ll_1$ | Earlier granites | $Ll_2$ | | |
| | | | | Ultramafic rocks (Coal Creek) | $Ll_1$ | | |
| 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:**

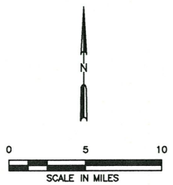
- Contact of exposed units
- -200 — Contour, 200-m interval, tick on downdip side
- -100 — Supplemental contour, 100-m interval
- Change of contour horizon
- vvvvvvvv — Limit of volcanic cover, in Marfa Basin area

**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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AARON K. EVANS
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PROFESSIONAL GEOSCIENTIST
05-19-22

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DATE: 02/2022
FILE: 0023-404-11
CAD: I/IIC-4_REGIONAL TECTONIC MAP.DWG
DRAWN BY: CRA
DESIGN BY: AKE
REVIEWED BY: AKE

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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# MAJOR PERMIT AMENDMENT
# REGIONAL TECTONIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIC-4

SHEET I/IIC-14

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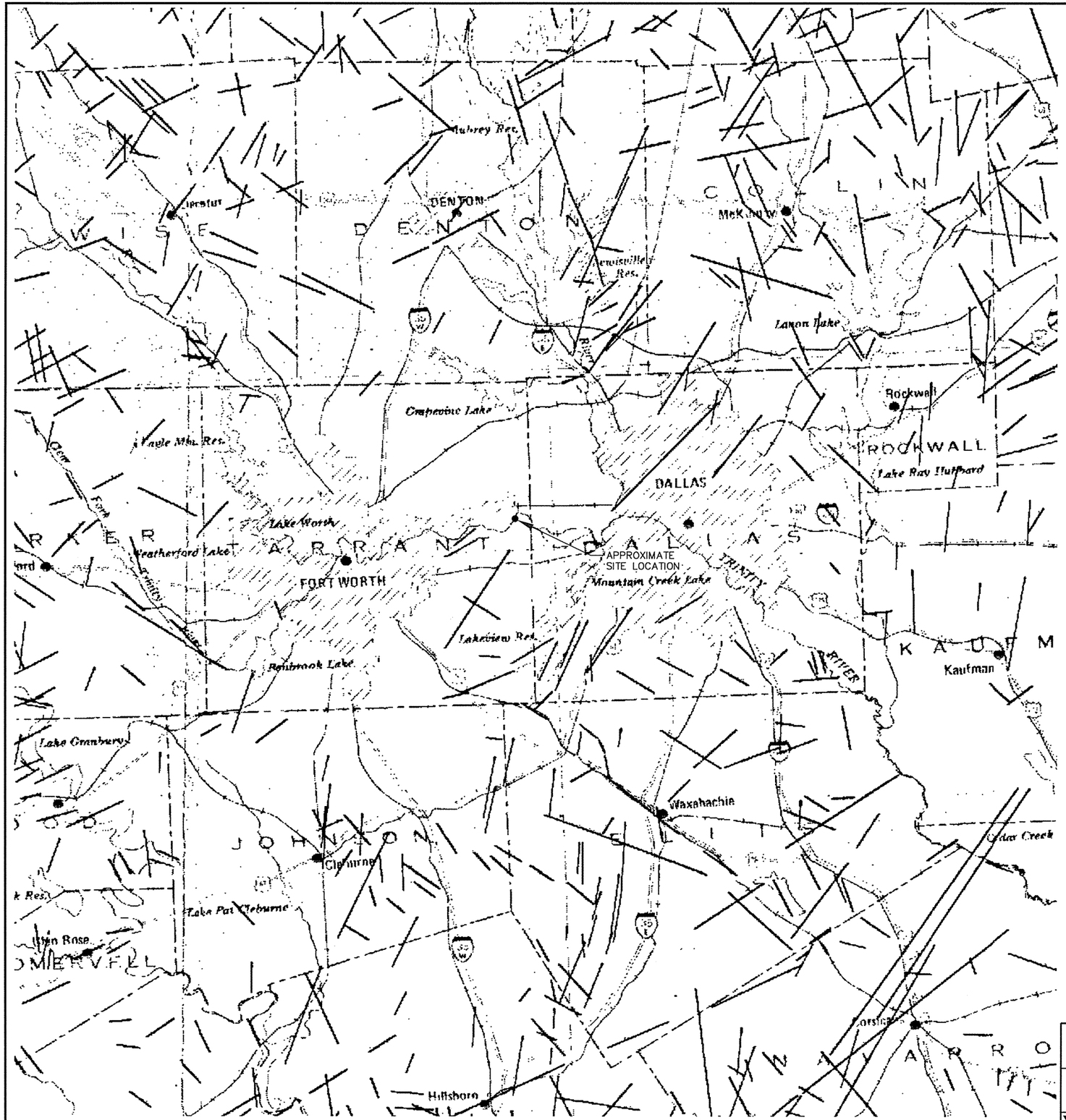


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SHEET I/IIC-15

STATE OF TEXAS
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N

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 31 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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DATE: 02/2022
FILE: 0023-404-11
CAD: I/IIC-5_REGIONAL LINEAMENT MAP.DWG

DRAWN BY: CRA
DESIGN BY: AKE
REVIEWED BY: AKE

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# MAJOR PERMIT AMENDMENT
# REGIONAL LINEAMENT MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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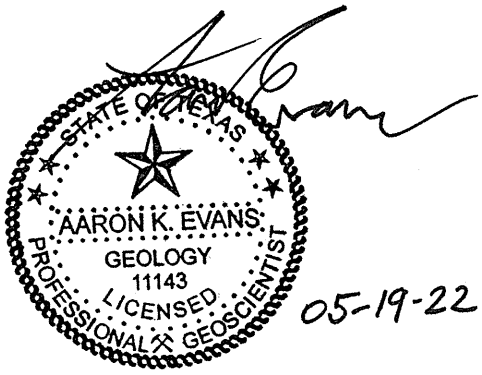
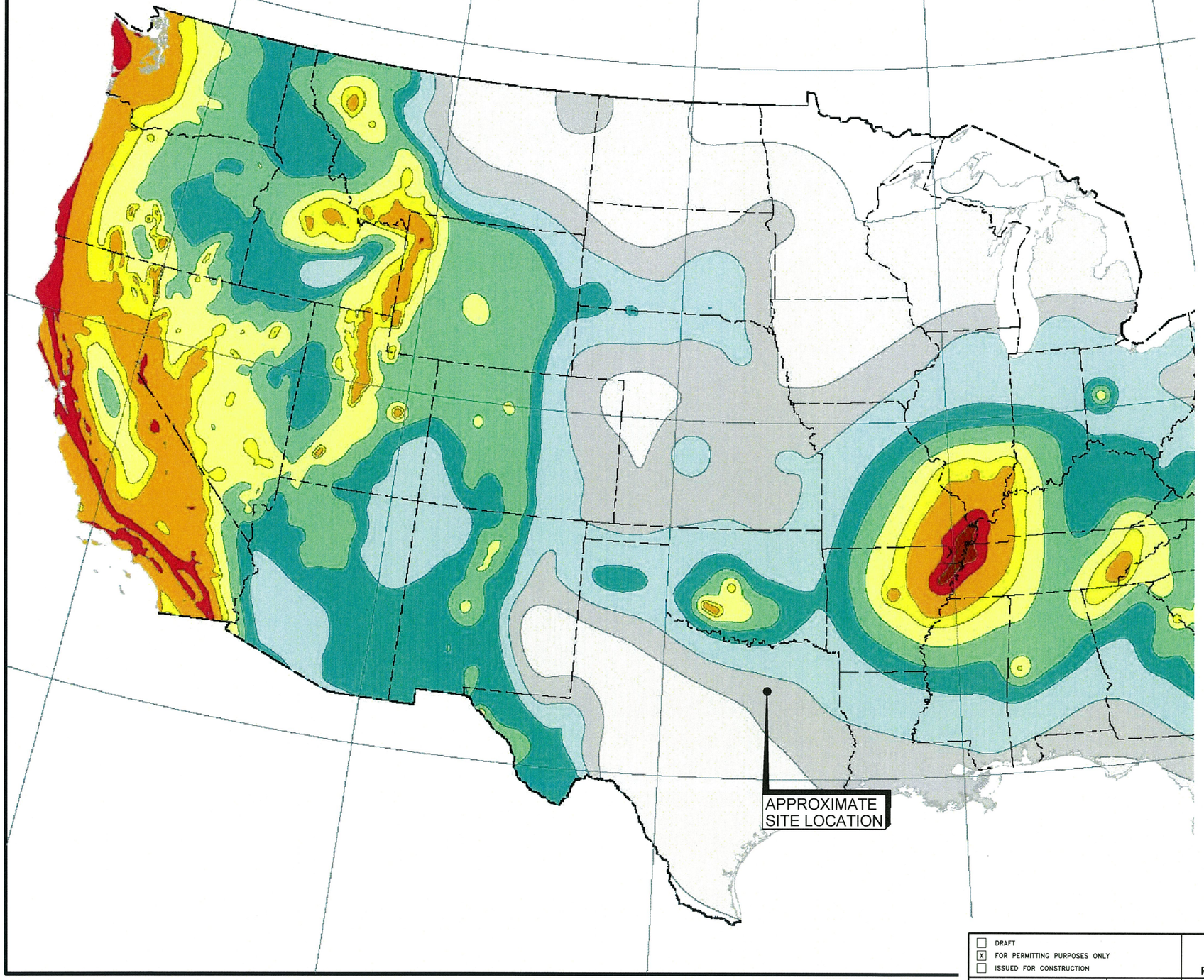
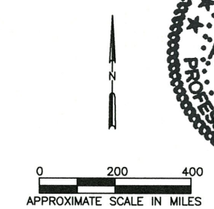
# 9 SEISMIC IMPACT ZONES

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-6 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.






STATE OF TEXAS
AARON K. EVANS
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05-19-22

**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 0.1g IN A 250-YEAR TIME PERIOD AT THE ARLINGTON LANDFILL IS 4.57 PERCENT.

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DATE: 02/2022
FILE: 0023-404-11
CAD: I/IIC-6_SEISMIC ZONE MAP.DWG

DRAWN BY: CRA
DESIGN BY: AKE
REVIEWED BY: AKE

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MAJOR PERMIT AMENDMENT
SEISMIC IMPACT ZONE MAP

THE CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING I/IIC-6

SHEET I/IIC-17

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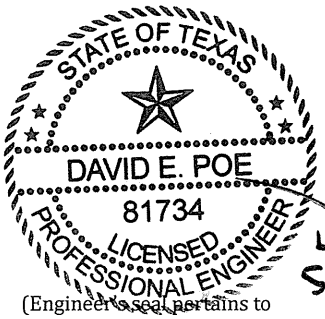
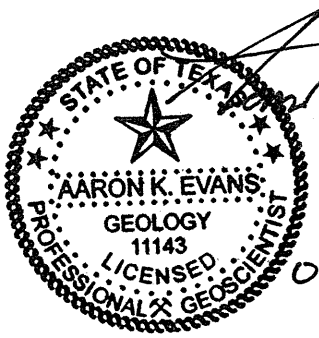



(Engineer's seal pertains to non-italicized text in Section 10 of Appendix I/IIC.)




(Geoscientist's seal pertains to italicized text in Section 10 of Appendix I/IIC.)

# 10 UNSTABLE AREAS

## 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 and overliner 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

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 both liner systems 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 final settlement of the foundation soils has occurred.

*Onsite 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. The area obtains its water resources largely from surface water reservoirs. Only 17 registered water wells are present within a one-mile radius of the permit boundary.*

*For these reasons, there is no significant potential for landfill subsidence due to groundwater withdrawal.*

Given the above, it is concluded that no naturally induced event or forces will adversely affect the landfill or the landfill components.

### 10.2.2 Pre-Subtitle D Overliner Foundation Condition

The geotechnical design in Appendix IIIE includes a demonstration that the pre-Subtitle D waste underlying the proposed separatory overliner will not cause unstable conditions for the proposed vertical expansion area. The purpose of the overliner system settlement analysis, included in Appendix IIIE (refer to Section 7.4), is to (1) show that positive drainage is maintained for the overliner leachate collection system consistent with the demonstration included in Appendix IIIC and (2) to verify that the strain induced on the overliner system components due to differential settlement of the waste below the overliner is within acceptable limits. The post-settlement slopes of the overliner system were used to demonstrate that the overliner leachate collection system will maintain less than 1 foot of leachate over the floor of the overliner system. The strain demonstration included in Appendix IIIE shows that the overliner areas and overliner leachate collection pipes will be stable and maintain positive drainage after settlement. The overliner will be stable given that the estimated strain on components of the overliner system is within the acceptable range for these materials.

### 10.2.3 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 5 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, overliner, 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 factors 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, overliner, and final cover systems and are discussed in more detail in Section 5.5.2 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 (Euless, TX and Hurst, TX; 2019), Google Earth aerial imagery of Tarrant County (accessed January 2022), site boring logs data, and performed onsite field investigations of the City of Arlington Landfill and the surrounding areas (conducted February 2022).*

*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 generally founded in the low-permeability weathered and unweathered shale of the Woodbine Formation. In addition, the final cover and pre-Subtitle D area overliner systems are 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 potential for karst development to occur.*

Given the above, it is concluded that no naturally 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, *the expected groundwater usage* and development around the site, and the facility operations itself; *there are no onsite local soil conditions, geologic conditions, geomorphologic features, or potential for karst development to occur* 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. The site is and will continue to be in compliance with this location restriction.

# 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.

Given that the City of Arlington Landfill does not accept Class 1 Industrial Solid Waste and is located more than 1,000 feet from the nearest coastal shoreline, 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 City of Arlington 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

# TRANSPORTATION INFORMATION

- Traffic Study
- Transportation Data and Coordination Report Form for Municipal Solid Waste Type I Landfills (Form 20719)

REPUBLIC SERVICES

City of Arlington Landfill – 800 Mosier Valley Road, Euless, TX 76040
o 817-317-2047 m 903-539-4065 ahart2@republicservices.com

May 19, 2022

Mr. Carl L. Johnson, P.E.
District Engineer
Texas Department of Transportation, Fort Worth District #2
2501 SW Loop 820
Fort Worth, TX 76133

Re: Traffic Study
City of Arlington Landfill
Tarrant County, Texas

Dear Mr. Johnson:

The purpose of this letter is to demonstrate coordination with the Texas Department of Transportation (TxDOT), consistent with Title 30 Texas Administrative Code (TAC) §330.61(i)(4). This regulation requires that a permit 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 permit amendment application, under contract with Republic Waste Services of Texas, Ltd. and the City of Arlington to reconfigure the City of Arlington Landfill located in Tarrant, County.

To assist you in your review, please find attached a traffic impact analysis prepared by Lee Engineering, and a project summary and site location maps to provide an overview of the landfill and the proposed reconfiguration.

The attached traffic impact analysis was prepared to show that the surrounding transportation infrastructure will provide adequate access to the site after the existing permit is amended.

To verify compliance with Title 30 Texas Administrative Code, §330.61(i)(4), we will need to include a letter from TxDOT in the permit amendment application regarding the adequacy of the site access roads and any traffic or locations restrictions at or near the site.

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

Sincerely,
**Republic Waste Services of Texas, Ltd.**

Adam Hart
Environmental Manager – South Area

Attachments: Attachment 1 – Traffic Study
Attachment 2 – Project Summary and Site Location Maps

cc: Ryne J. Spicer, P.E., Weaver Consultants Group, LLC

# ATTACHMENT 1

# TRAFFIC STUDY

# TRAFFIC IMPACT ANALYSIS FOR ARLINGTON LANDFILL ARLINGTON, TEXAS

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May 2022

T1855.04

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# EXECUTIVE SUMMARY

The purpose of this traffic study is to determine the adequacy of the surrounding transportation infrastructure with respect to the proposed permit amendment for the reconfiguration of the existing City of Arlington Landfill Facility located on the southwest corner of the intersection of FM 157 (Collins Street) and Mosier Valley Road in Arlington, Texas. The purpose of the permit amendment is to extend the life of the site. No changes to the traffic patterns in and out of the site are anticipated. The amended expected life of the facility is estimated to be the year 2054.

The facility provides municipal and non-hazardous industrial solid waste disposal services to residents and businesses in the City of Arlington and surrounding communities. The landfill accepts waste from municipal, private, and public haulers. The current landfill entrance roadway (Allan Saxe Parkway) is on Mosier Valley Road approximately 320 feet west of FM 157. The existing facility is open to the public from 7:00 AM to 4:30 PM Monday through Saturday.

Background traffic counts were collected on the surrounding roadway network for use in the traffic analysis on Tuesday, March 8, 2022. Analysis for the year 2024 (assumed year of amended permit issuance), and 2054 (projected facility closure/design life) are presented in this study. Based on the existing traffic counts, the site currently generates 1,778 trips per day. The peak hour of the facility occurs between 12:30 PM and 1:30 PM, with 196 trips occurring (approximately 11% of the daily total).

The future traffic analysis assumed variable growth rates from a Weaver Consultants Group report dated November 2021. Traffic volumes for 2024 were estimated by applying an annual growth rate of 1.35% per year to existing volumes for two years. Traffic volumes for 2054 were estimated using the noted variable growth rates, with an overall increase of 43.69% applied to existing volumes. Based on the assumed growth, the facility was predicted to generate 1,826 trips per day by 2024 and 2,554 trips per day by the peak year of the facility in 2054.

Analysis was performed for the AM peak hour of FM 157 (7:15-8:15 AM), PM peak hour of FM 157 (4:45-5:45 PM), and the facility peak hour (12:30 PM – 1:30 PM) for the years 2024 and 2054. Intersection capacity analysis indicates the site access driveway (Allan Saxe Parkway) operates at acceptable levels of service for both existing and future scenarios.

Under projected 2054 traffic volumes, the implementation of improved traffic signal timing and coordination along FM 157 allows for all study intersections to operate at LOS D or better in all time periods studied with two exceptions:

1. FM 157 and Trinity Boulevard (PM peak hour)
2. FM 157 and Green Oaks Boulevard (PM peak hour)

Low levels of service at the signals referenced above occur during the PM peak hour regardless of whether facility traffic is present or not. During the PM peak hour, site traffic volumes account for less than 1% of total traffic on FM 157. Improved signal timing and coordination along FM 157 will be necessary to accommodate background traffic in the area, regardless of facility traffic.

The primary access roads to the site provide good access to the facility. Based on the results of this study and traffic volumes projected, no roadway improvements are necessary to accommodate facility traffic.

# INTRODUCTION

The purpose of this traffic study is to determine the adequacy of the surrounding transportation infrastructure with respect to the proposed permit amendment for the reconfiguration of the existing City of Arlington Landfill Facility to extend the site life. While the site life will be extended, no changes to the traffic patterns in and out of the site are anticipated. Similarly, no changes are anticipated for access routes to and from the site. The waste facility is located on the southwest corner of the intersection of FM 157 (Collins Street) and Mosier Valley Road in Arlington, Texas. The facility provides municipal and non-hazardous industrial solid waste disposal services to residents and businesses in the City of Arlington and surrounding communities. The landfill accepts waste from municipal, private, and public haulers.

The current landfill entrance (Allan Saxe Parkway) is on Mosier Valley Road approximately 320 feet west of FM 157. The site is owned by the City of Arlington and operated by Republic Services. The existing facility is open to the public from 7:00 AM to 4:30 PM Monday through Saturday. **Figure 1** presents an aerial photo of the study area that depicts the general location of the facility, the surrounding roadway network, and traffic count locations.

TCEQ Municipal Solid Waste Regulations require data and analysis of traffic on access roadways within 1-mile of the site for the existing year and expected life of the facility – currently estimated to be the year 2054.

Three analysis scenarios for the facility were included in this study:

- Existing (2022) Operations – Site traffic is included in traffic counts collected on Tuesday, March 8, 2022.

- Assumed Year of Amended Permit Issuance (2024) – Facility Site Traffic was estimated based on applying the anticipated growth rates provided by Weaver Consultants Group to Lee Engineering's collected traffic counts and growing volumes to the year 2024.

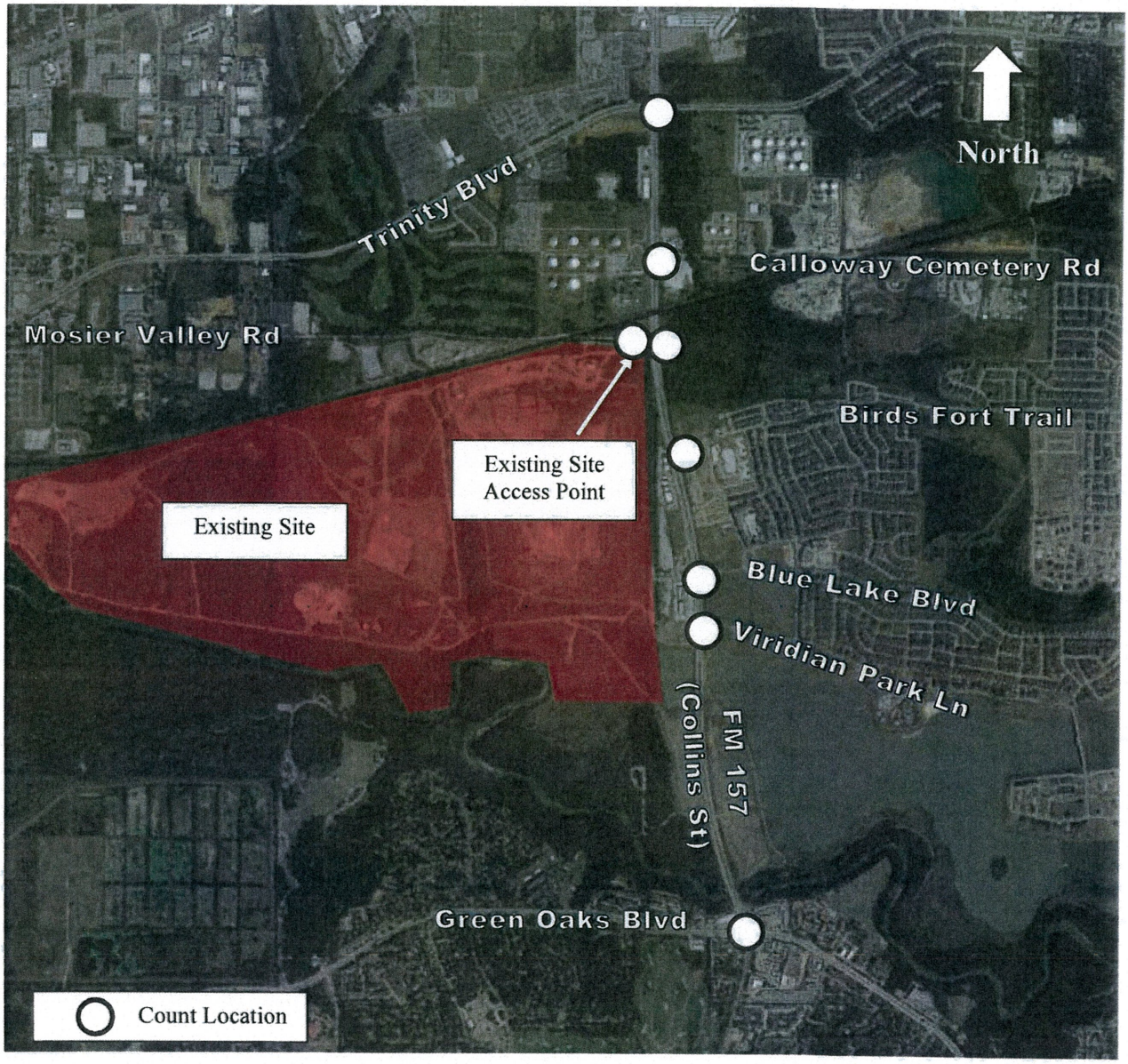
- Peak Year Operations in the Year (2054) Prior to Site Closure – Site Traffic was estimated based on applying the anticipated growth provided by Weaver Consultants Group to Lee Engineering's existing counts to the year 2054.

For each scenario, the AM peak hour, PM peak hour, and peak hour of the facility were analyzed. The study intersections include:

- FM 157 at Trinity Boulevard
- FM 157 at Calloway Cemetery Road
- FM 157 at Mosier Valley Road
- FM 157 at Birds Fort Trail
- FM 157 at Blue Lake Boulevard
- FM 157 at Viridian Park Lane

- Mosier Valley Road at Allan Saxe Parkway (facility entrance)

**Figure 1: Aerial Photo of the Study Area**



The study area for this traffic study is based on a review of likely access routes within one mile of the facility. A brief description of the existing area roadways selected for study is provided below:

*Primary Access Roadways*

Based on discussions with the site operator, a field investigation at the site, and traffic volumes collected, FM 157 and Mosier Valley Road are the primary access roadways for waste hauling vehicles to the existing site using the existing entrance from Mosier Valley Road. The site access roadway is named Allan Saxe Parkway.

**FM 157** – FM 157 (Collins Street) is presently a six-lane divided roadway north of Green Oaks Boulevard with a posted speed limit of 50 miles per hour (mph) in the vicinity of the existing facility entrance. South of Green Oaks Boulevard, FM 157 narrows to a four-lane roadway with a two-way left-turn lane. FM 157 is classified as a Major Arterial on the City of Arlington *2017 Thoroughfare Development Plan,* a System Link on the City of Fort Worth *Master Thoroughfare Plan,* and a Principal Arterial on the TxDOT Statewide Planning Map.

**Mosier Valley Road** – Mosier Valley Road is currently a two-lane divided roadway with an assumed speed limit of 30 mph. Between the facility entrance (Allan Saxe Parkway) and FM 157, Mosier Valley Road is divided and includes two eastbound lanes. Mosier Valley Road is classified as a local roadway on the City of Arlington *2017 Thoroughfare Development Plan,* the City of Fort Worth *Master Thoroughfare Plan,* and the TxDOT Statewide Planning Map. The existing intersection of Mosier Valley Road at FM 157 operates with traffic signal control as a "Tee" intersection because there is no eastern leg or westbound approach to the intersection.

**Allan Saxe Parkway** – Allan Saxe Parkway is currently a two-lane divided roadway with a posted speed limit of 15 mph, which is gated when the facility is not open. Allan Saxe Parkway is classified as a local roadway on the City of Arlington *2017 Thoroughfare Development Plan,* the City of Fort Worth *Master Thoroughfare Plan,* and the TxDOT Statewide Planning Map Allan Saxe Parkway intersects Mosier Valley Road at a skewed angle and is stop-controlled.

*Other Roadways in the Study Area*

**Trinity Boulevard** – Trinity Boulevard is presently a six-lane divided roadway with a posted speed limit of 40 mph. Trinity Boulevard is classified as a System Link on the City of Fort Worth *Master Thoroughfare Plan* and a Minor Arterial on the TxDOT Statewide Planning Map. The existing intersection of Trinity Boulevard at FM 157 operates with traffic signal control.

**Green Oaks Boulevard** – Green Oaks Boulevard is presently a six-lane divided roadway with a posted speed limit of 45 mph. Green Oaks Boulevard is classified as a Major Arterial on the City of Arlington *2017 Thoroughfare Development Plan* and a Principal Arterial on the TxDOT Statewide Planning Map. The existing intersection of Green Oaks Boulevard at FM 157 operates with traffic signal control.

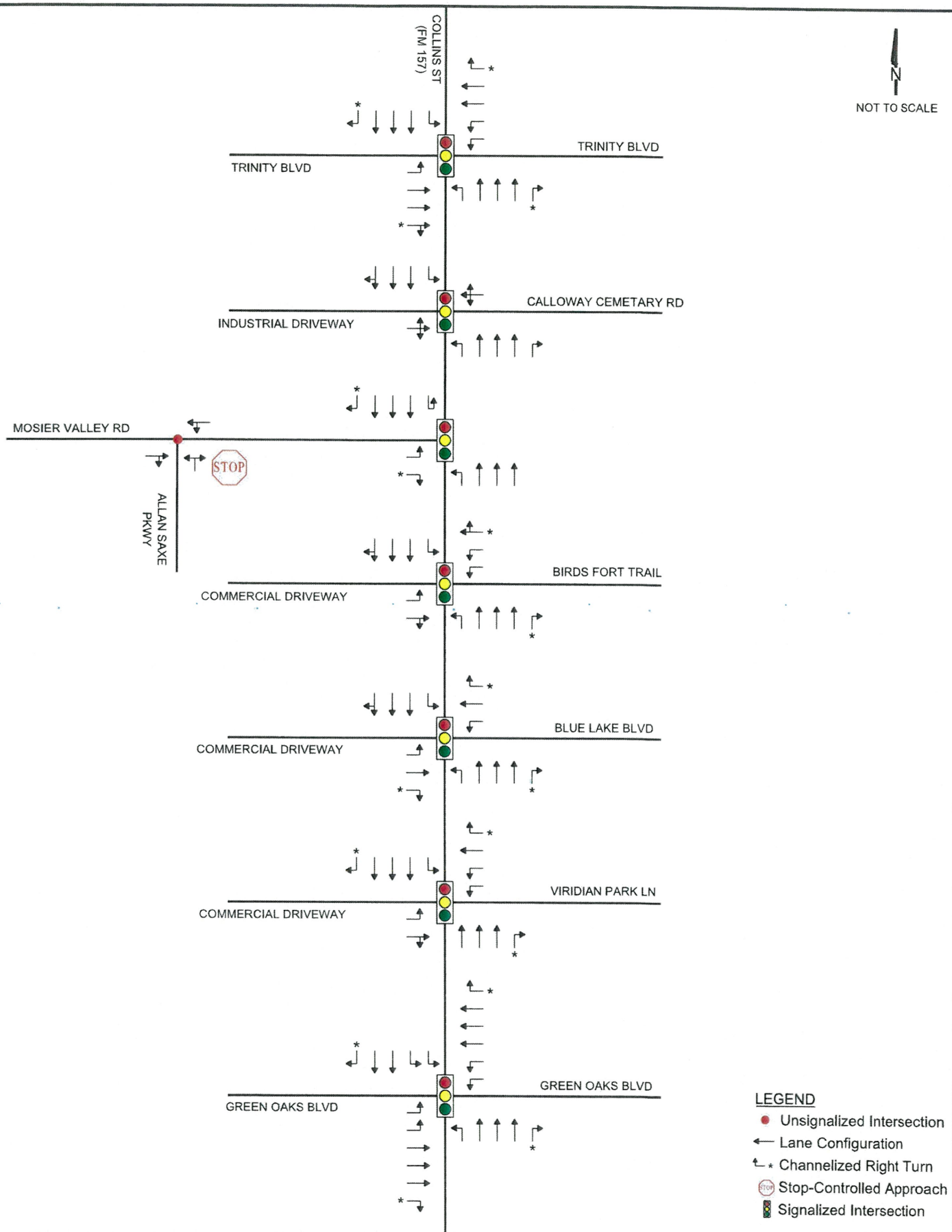
**Calloway Cemetery Road** – Calloway Cemetery Road is presently a two-lane undivided roadway with an assumed speed limit of 30 mph. Calloway Cemetery Road is classified as a local roadway on the City of Fort Worth *Master Thoroughfare Plan* and the TxDOT Statewide Planning Map. The existing intersection of Calloway Cemetery Road at FM 157 operates with traffic signal control. The eastbound approach at this intersection is an industrial driveway.

**Birds Fort Trail** – Birds Fort Trail is presently a four-lane undivided roadway with a posted speed limit of 30 mph, which widens to include a median approximately 800 feet upstream of FM 157. Birds Fort Trail is classified as a local roadway on the City of Arlington *2017 Thoroughfare Development Plan* and the TxDOT Statewide Planning Map. The existing intersection of Birds Fort Trail at FM 157 operates with traffic signal control. The eastbound approach at this intersection is a commercial driveway.

**Blue Lake Boulevard** – Blue Lake Boulevard is presently a two-lane undivided roadway with an assumed speed limit of 30 mph, which widens to include a median approximately 400 feet upstream of FM 157. Blue Lake Boulevard is classified as a local roadway on the City of Arlington *2017 Thoroughfare Development Plan* and the TxDOT Statewide Planning Map. The existing intersection of Blue Lake Boulevard at FM 157 operates with traffic signal control. The eastbound approach at this intersection is a commercial driveway.

**Viridian Park Lane** – Viridian Park Lane is presently a two-lane undivided roadway with an assumed speed limit of 30 mph, which widens to include a median approximately 400 feet upstream of FM 157. Viridian Park Lane is classified as a local roadway on the City of Arlington *2017 Thoroughfare Development Plan* and the TxDOT Statewide Planning Map. The existing intersection of Viridian Park Lane at FM 157 operates with traffic signal control. The eastbound approach at this intersection is a commercial driveway. Note that northbound left-turns are currently prohibited at this intersection.

The existing intersection lane configurations are shown in **Figure 2**.




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Existing Intersection Lane Configurations

Figure 2

# EXISTING TRAFFIC VOLUMES

Twenty-four hour turning movement volumes were collected at the study intersections on Tuesday, March 8, 2022. All local school districts were in session and having in-school instruction at the time of count collection. The collected directional volumes in the study area are summarized in **Table 1**. Peak hour turning movement volumes for Existing (2022) conditions are shown in **Figure 3, Figure 4,** and **Figure 5** for the AM, PM, and site peak hours, respectively. The AM peak hour for the FM 157 in the study area occurred between 7:15 AM and 8:15 AM, the PM peak hour for FM 157 in the study area occurred between 4:45 PM and 5:45 PM, and the peak hour of the facility occurred between 12:30 PM and 1:30 PM. For reference, the daily (24-hour) turning movement volumes are shown in **Figure 6**.

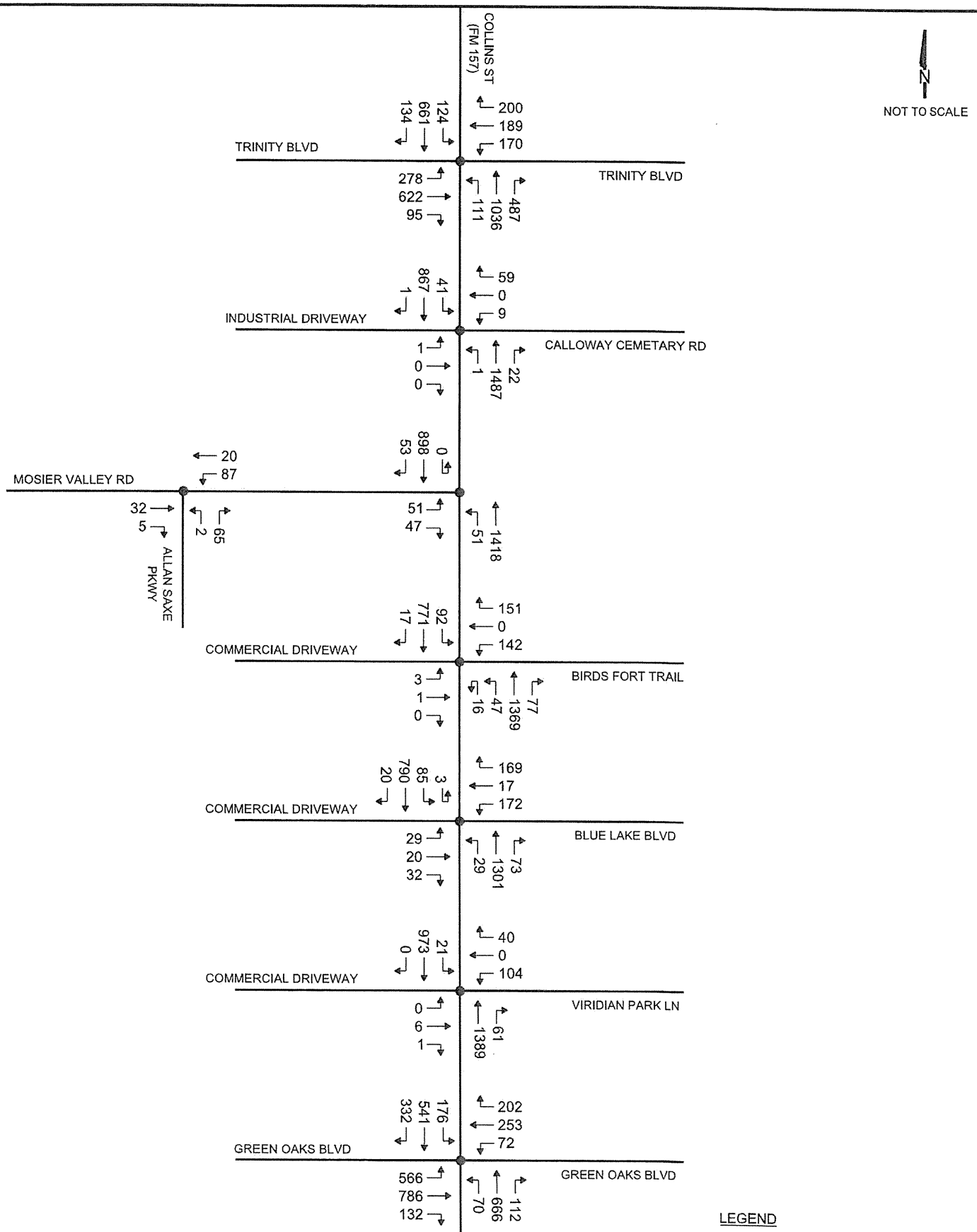
**Table 1: Traffic Volumes Collected**

| Roadway | Daily Volume | Direction[1] | AM Peak Hour | PM Peak Hour | Facility Peak Hour[2] |
|---|---|---|---|---|---|
| FM 157 – South of Trinity Boulevard | 31,277 | NB | 1,634 | 1,241 | 792 |
| | | SB | 926 | 2,194 | 738 |
| FM 157 – North of Trinity Boulevard | 28,736 | NB | 1,514 | 1,253 | 795 |
| | | SB | 919 | 1,495 | 725 |
| Trinity Boulevard – West of FM 157 | 13,374 | EB | 995 | 513 | 282 |
| | | WB | 434 | 1,006 | 294 |
| Trinity Boulevard – East of FM 157 | 19,493 | EB | 1,233 | 595 | 389 |
| | | WB | 559 | 1,799 | 417 |
| FM 157 – South of Calloway Cemetery Road | 30,131 | NB | 1,510 | 1,190 | 781 |
| | | SB | 876 | 2,283 | 678 |
| FM 157 – North of Calloway Cemetery Road | 31,049 | NB | 1,547 | 1,221 | 817 |
| | | SB | 909 | 2,258 | 725 |
| Calloway Cemetery Road – East of FM 157 | 2,588 | EB | 63 | 51 | 95 |
| | | WB | 68 | 107 | 84 |
| FM 157 – South of Mosier Valley Road | 30,308 | NB | 1,469 | 1,178 | 751 |
| | | SB | 945 | 2,349 | 667 |
| FM 157 – North of Mosier Valley Road | 30,276 | NB | 1,469 | 1,168 | 769 |
| | | SB | 951 | 2,310 | 686 |
| Mosier Valley Road – West of FM 157 | 2,428 | EB | 98 | 60 | 117 |
| | | WB | 104 | 31 | 118 |

| Roadway | Daily Volume | Direction[1] | AM Peak Hour | PM Peak Hour | Facility Peak Hour[2] |
|---|---|---|---|---|---|
| FM 157 – South of Birds Fort Trail | 31,092 | NB | 1,509 | 1,250 | 813 |
| | | SB | 929 | 2,284 | 715 |
| FM 157 – North of Birds Fort Trail | 30,293 | NB | 1,523 | 1,239 | 773 |
| | | SB | 880 | 2,277 | 666 |
| Birds Fort Trail – East of FM 157 | 5,121 | EB | 170 | 237 | 136 |
| | | WB | 293 | 213 | 163 |
| FM 157 – South of Blue Lake Boulevard | 32,172 | NB | 1,403 | 1,389 | 825 |
| | | SB | 994 | 2,351 | 769 |
| FM 157 – North of Blue Lake Boulevard | 31,097 | NB | 1,502 | 1,341 | 810 |
| | | SB | 898 | 2,281 | 710 |
| Blue Lake Boulevard – East of FM 157 | 4,995 | EB | 178 | 264 | 117 |
| | | WB | 358 | 201 | 145 |
| FM 157 – South of Viridian Park Lane | 33,408 | NB | 1,450 | 1,333 | 882 |
| | | SB | 1,078 | 2,422 | 785 |
| FM 157 – North of Viridian Park Lane | 32,056 | NB | 1,429 | 1,239 | 830 |
| | | SB | 994 | 2,349 | 758 |
| Viridian Park Lane – East of FM 157 | 2,557 | EB | 88 | 151 | 82 |
| | | WB | 144 | 124 | 53 |
| FM 157 – South of Green Oaks Boulevard | 25,189 | NB | 848 | 1,066 | 776 |
| | | SB | 745 | 1,424 | 716 |
| FM 157 – North of Green Oaks Boulevard | 33,807 | NB | 1,434 | 1,386 | 895 |
| | | SB | 1,049 | 2,439 | 776 |
| Green Oaks Boulevard – West of FM 157 | 24,736 | EB | 1,484 | 1,073 | 562 |
| | | WB | 655 | 1,930 | 501 |
| Green Oaks Boulevard – East of FM 157 | 20,124 | EB | 1,074 | 1,062 | 486 |
| | | WB | 527 | 1,224 | 484 |
| Mosier Valley Road – West of Allan Saxe Parkway | 773 | EB | 37 | 25 | 25 |
| | | WB | 22 | 20 | 28 |
| Mosier Valley Road – East of Allan Saxe Parkway | 2,419 | EB | 97 | 51 | 118 |
| | | WB | 107 | 31 | 119 |
| Allan Saxe Parkway – South of Mosier Valley Road | 1,792 | NB | 67 | 31 | 99 |
| | | SB | 92 | 16 | 97 |

[1] NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

[2] Based on volumes for the existing site driveway, 12:30 PM to 1:30 PM appears to be the typical daily peak hour.




24-hour turning movement volumes collected on Tuesday, March 8, 2022.

3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
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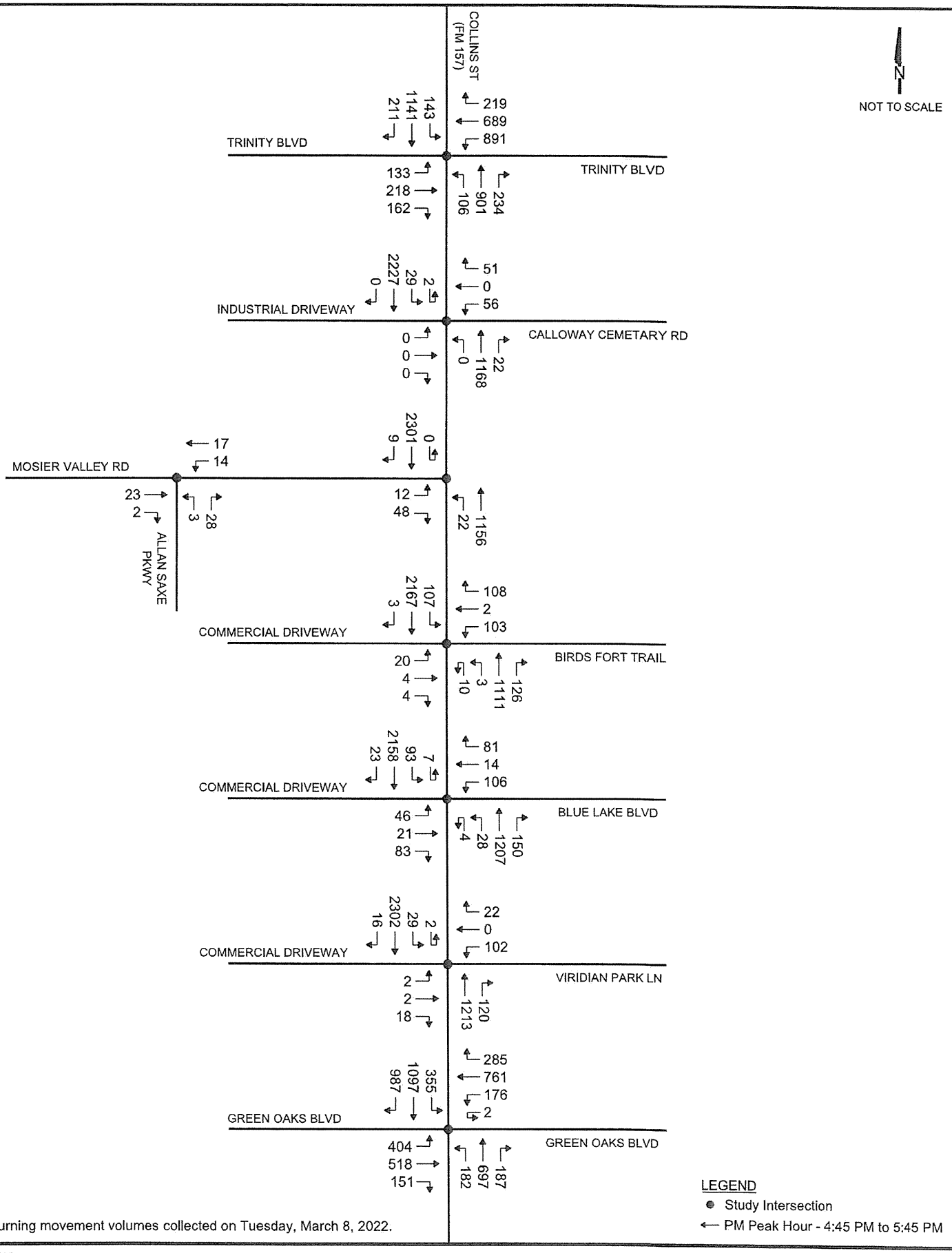
Existing (2022) Traffic Volumes - AM Peak

Figure 3

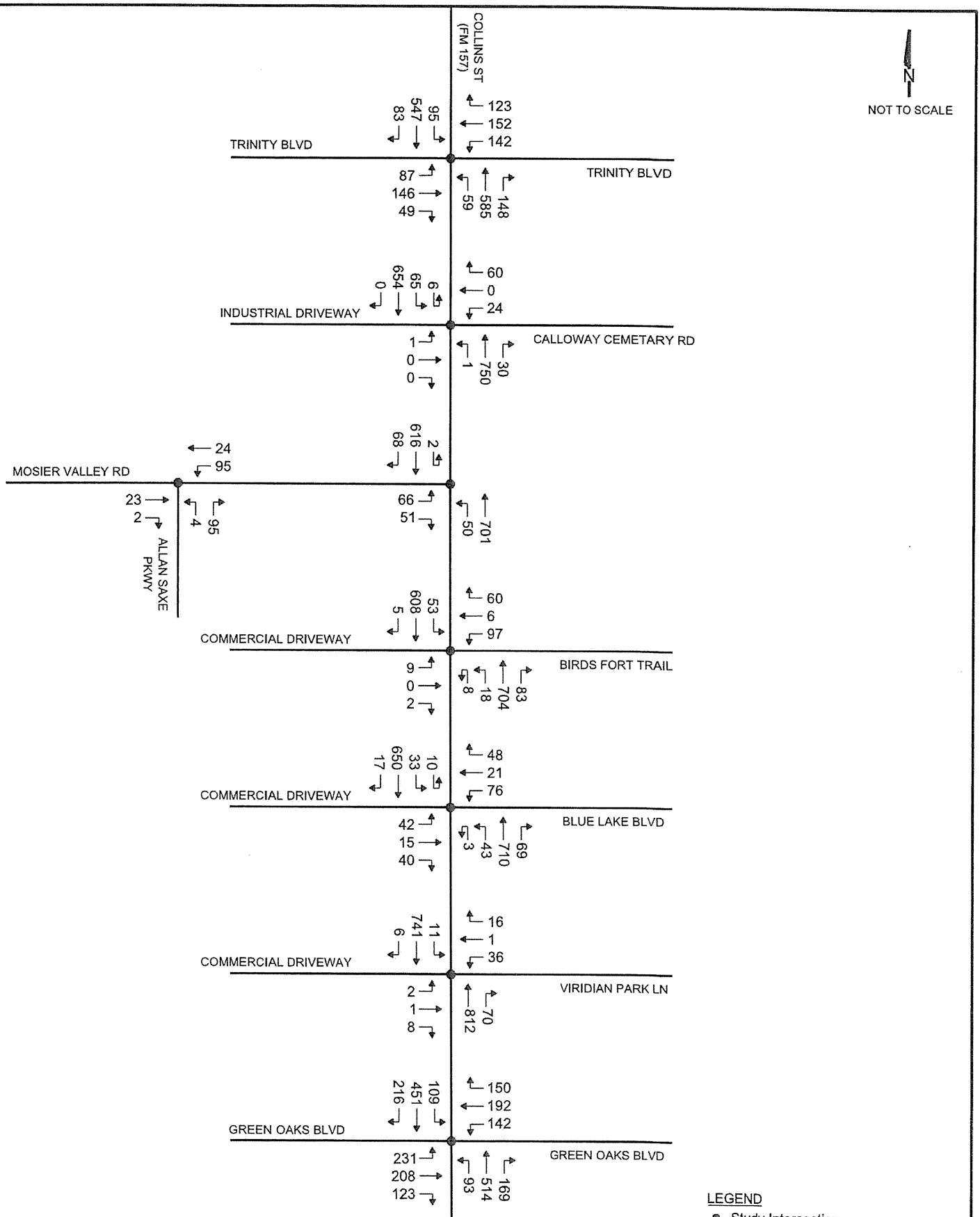



24-hour turning movement volumes collected on Tuesday, March 8, 2022.

3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Existing (2022) Traffic Volumes - PM Peak

Figure 4

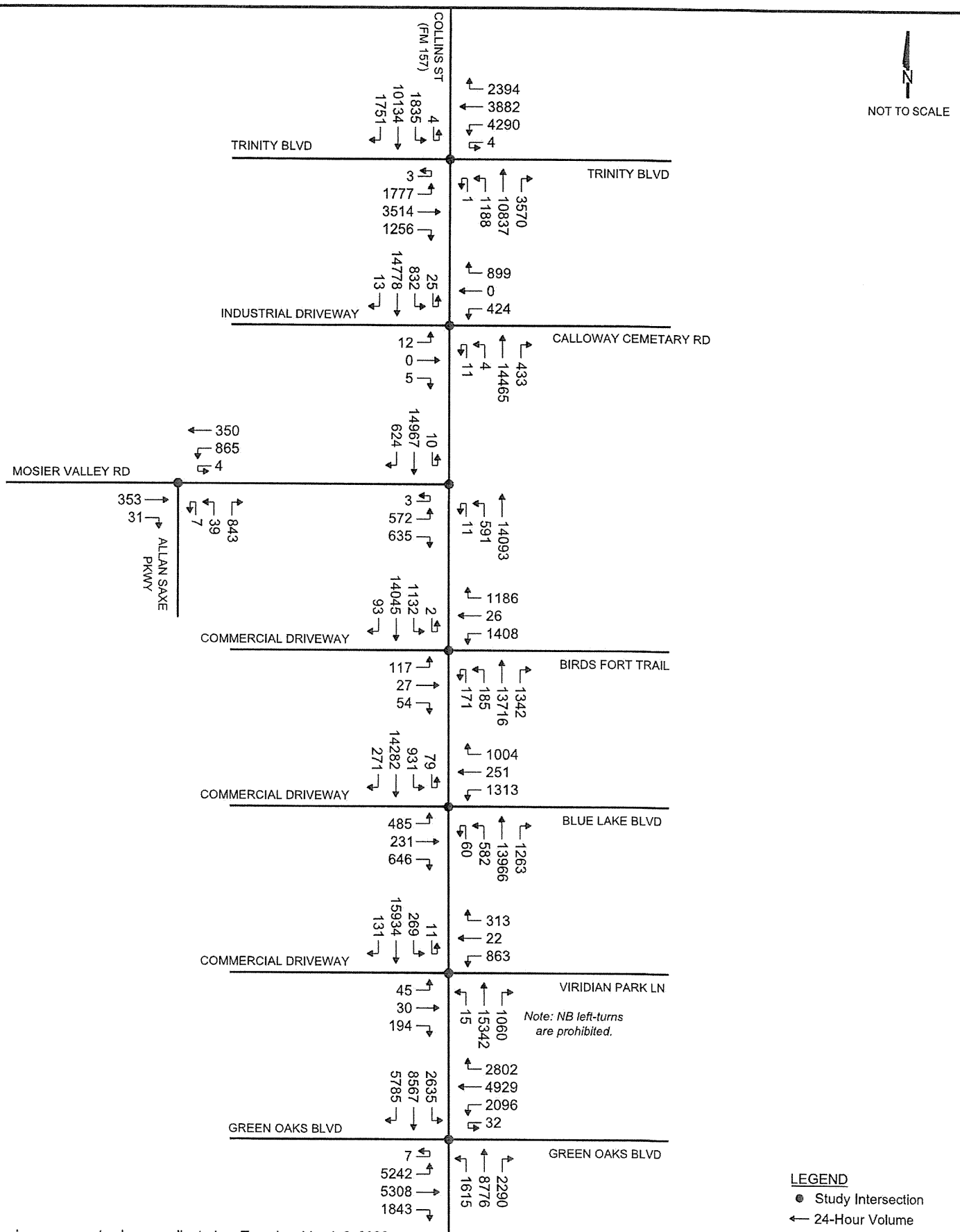



24-hour turning movement volumes collected on Tuesday, March 8, 2022.

3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Existing (2022) Traffic Volumes - Peak of Site

Figure 5




24-hour turning movement volumes collected on Tuesday, March 8, 2022.

3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Existing (2022) Traffic Volumes - Daily

Figure 6

# BACKGROUND TRAFFIC VOLUMES

Lee Engineering gathered historical count volumes at locations near the existing facility from TxDOT and from the North Central Texas Council of Governments (NCTCOG). These volumes are presented in **Table 2** below. The historical data indicates there has been fluctuations in traffic volumes near the existing facility over the past several years but volumes within the study area have generally remained the same or exhibited little to no growth over the past 15 years.

**Table 2: Historic Daily Traffic Volumes (Bidirectional)**

| Count Year | FM 157 North of IH-30[1] | FM 157 South of SH 10[1] | FM 157 North of Blue Lake[2] | FM 157 North of Birds Fort[2] | FM 157 South of Green Oaks[2] | Trinity Blvd East of FM 157[2] | Green Oaks Blvd West of FM 157[2] |
|---|---|---|---|---|---|---|---|
| 2007 | 45,000 | 27,000 | 36,552 | - | - | - | - |
| 2008 | 45,000 | 25,000 | - | - | - | - | - |
| 2009 | 46,000 | 27,000 | - | - | 25,713 | 20,361 | 26,000 |
| 2010 | 36,000 | 24,000 | 26,824 | - | - | - | - |
| 2011 | 33,000 | 27,000 | 43,851 | - | - | - | - |
| 2012 | 37,000 | 28,000 | 42,916 | - | - | - | - |
| 2013 | 33,340 | 24,988 | - | - | - | - | - |
| 2014 | 34,982 | 28,059 | - | - | 26,692 | 19,282 | 25,152 |
| 2015 | 36,635 | 29,948 | - | - | - | - | - |
| 2016 | 40,195 | 32,920 | - | - | - | - | - |
| 2017 | 38,466 | 28,559 | - | 28,712 | - | - | - |
| 2018 | 40,470 | 29,259 | - | - | - | - | - |
| 2019 | 38,928 | 32,870 | - | 32,833 | - | - | 26,766 |
| 2020 | 38,466 | 26,296 | 25,026 | - | - | - | - |
| 2021 | - | - | - | - | - | - | - |
| 2022 | - | - | 31,097[3] | 30,293[3] | 25,189[3] | 19,493[3] | 24,736[3] |
| **Average Annual Growth** | **-2% (2007-2019)** | **2% (2007-2019)** | **-1% (2007-2022)** | **1% (2017-2022)** | **0% (2009-2022)** | **0% (2009-2022)** | **0% (2009-2022)** |

[1] *Source: https://www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html*
[2] *Source: https://trafficcounts.nctcog.org/trafficcount/*
[3] *Source: Lee Engineering traffic counts dated March 8, 2022*

For the purposes of this study, the anticipated growth of the City of Arlington Landfill was also applied to traffic volumes in the study area as the projected growth of the facility is similar or greater than historical growth trends in the area. The facility is existing and in operation, and all traffic associated with the facility is already included in the collected traffic counts. Because the background traffic was projected to grow at the same rate used for facility traffic, no separate background analysis scenarios were analyzed in this study. Anticipated growth is further discussed in the next section.

# SITE DATA AND TOTAL TRAFFIC

Lee Engineering collected vehicles counts (on March 8, 2022) at the existing City of Arlington Landfill access at Mosier Valley Road and Allen Saxe Parkway. Based on this information, the traffic volume observed exiting the site was 882 outbound vehicles during a 24-hour period. The entering total was slightly higher at 896 inbound vehicles during a 24-hour period. The number of vehicles accessing the site for critical time periods are shown in **Table 3**. As shown, the peak hour of the facility occurred between 12:30 PM and 1:30 PM, with 99 outbound vehicles and 97 inbound vehicles. Thus, approximately 11% of the daily site traffic volumes occur during the peak hour of the site. During the AM peak hour, approximately 10% of inbound and 7% of outbound traffic occurs. During the PM peak hour, approximately 2% of inbound and 3% of outbound traffic occurs.

**Table 3: Vehicles Accessing Facility – Existing (2022)**

| Time Period | Vehicles per Period | | |
|---|---|---|---|
| | Entering | Exiting | Total |
| AM Peak Hour (7:15 AM to 8:15 AM) | 92 | 67 | 159 |
| Facility Peak Hour (12:30 PM to 1:30 PM) | 97 | 99 | 196 |
| PM Peak Hour (4:45 PM to 5:45 PM) | 16 | 31 | 47 |
| **Daily (24-Hours)** | **896** | **882** | **1,778** |

Weaver Consultants Group report (dated November 2021 and attached in the appendix) provided the assumed growth rates for waste flow at the site, which were based on county population projections (Dallas, Denton, Johnson, and Tarrant) from the Texas Water Development Board (2021 Regional and 2022 State Water Plan). For the purposes of this study, it was assumed that traffic accessing the City of Arlington Landfill site facility would grow at the same rates as the waste and county populations. The annual growth rates over the life of the facility are identified in **Table 4**. Overall, this represents a total increase of 43.69% from 2022 to 2054.

**Table 4: Annual Growth Rates**

| Years Applied | Annual Growth Rate |
|---|---|
| 2023-2030 | 1.35% |
| 2031-2040 | 1.25% |
| 2041-2050 | 0.98% |
| 2051-2054 | 0.84% |

Lee Engineering estimated the future facility traffic volumes by growing the existing 2022 volumes by the annual growth rates in Table 4. As stated in the previous section, these annual growth rates were also applied to all traffic volumes at the study intersections to account for background growth.

It should be emphasized that no changes to the facility's existing truck routes or traffic patterns are proposed as part of this permit amendment. Based on the anticipated growth shown in Table 4, the projected volumes accessing the facility in the years 2024 and 2054 are shown in **Table 5**.

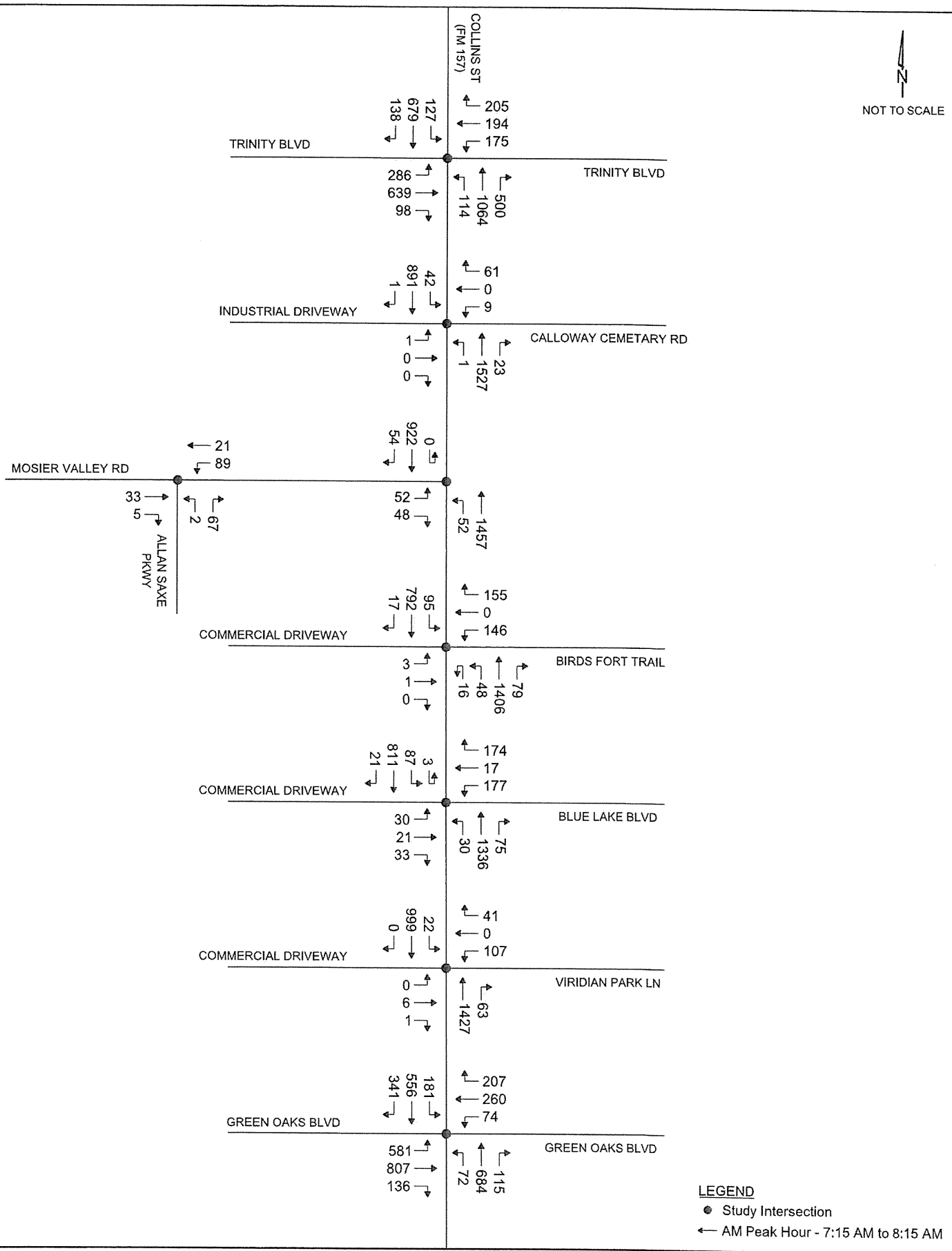
**Table 5: Projected Vehicles Accessing Facility**

| Time Period | Assumed Year of Amended Permit Issuance (2024) Vehicles per Period | | | Peak Year (2054) Vehicles per Period | | |
|---|---|---|---|---|---|---|
| | Entering | Exiting | Total | Entering | Exiting | Total |
| AM Peak Hour (7:15 AM to 8:15 AM) | 94 | 69 | 163 | 132 | 96 | 228 |
| Facility Peak Hour (12:30 PM to 1:30 PM) | 100 | 102 | 202 | 140 | 143 | 283 |
| PM Peak Hour (4:45 PM to 5:45 PM) | 16 | 32 | 48 | 23 | 44 | 67 |
| **Daily (24-Hours)** | **920** | **906** | **1,826** | **1,287** | **1,267** | **2,554** |

*Projected Total Traffic Volumes*

To obtain the projected total traffic volumes for the Assumed Year of Amended Permit Issuance (2024) of the amended permit facility, the existing 2022 volumes (Figures 3-5) were increased by an annual growth rate of 1.35% for two years. The projected total traffic volumes for the Assumed Year of Amended Permit Issuance (2024) are shown in **Figure 7, Figure 8,** and **Figure 9** for the AM, PM, and site peak hours, respectively.

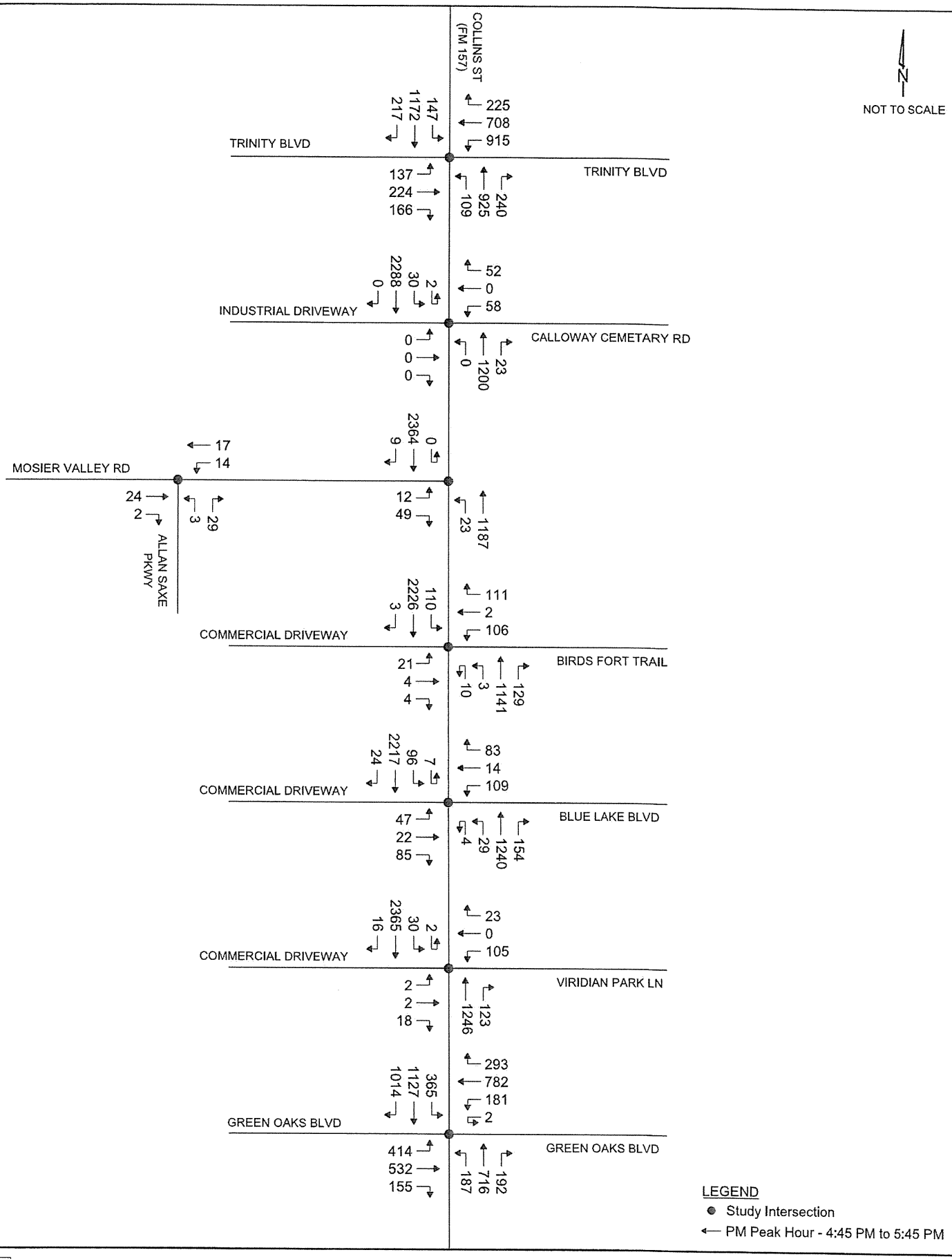
To obtain the projected total traffic volumes for the Peak Year (2054) of the amended permit facility, the existing 2022 volumes (Figures 3-5) were increased by the growth rates in Table 3, for an overall increase of 43.69%. The projected total traffic volumes for the Peak Year (2054) are shown in **Figure 10, Figure 11,** and **Figure 12** for the AM, PM, and site peak hours, respectively.




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Assumed Year of Amended Permit Issuance (2024)
Projected Traffic Volumes - AM Peak

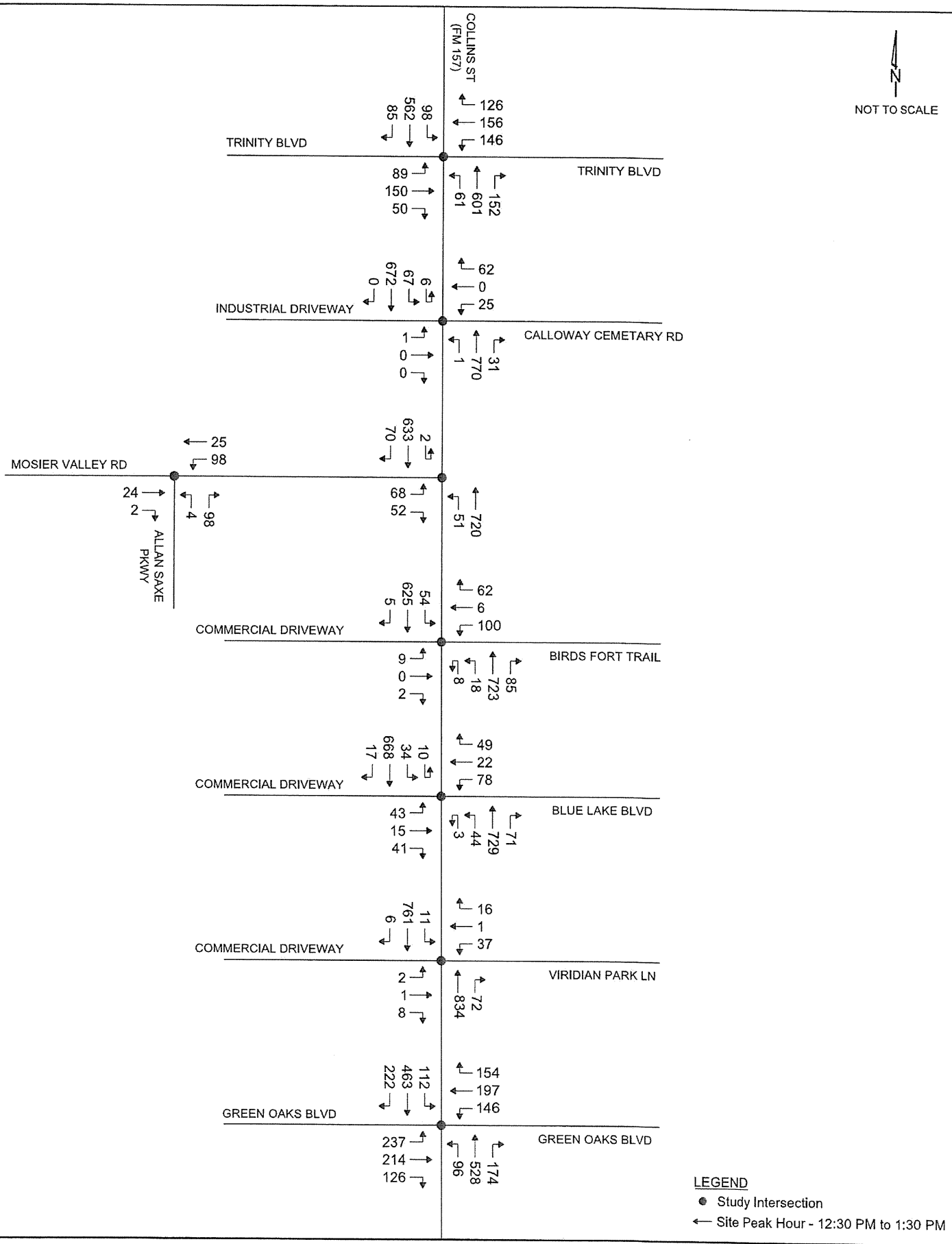
Figure 7




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Assumed Year of Amended Permit Issuance (2024)
Projected Traffic Volumes - PM Peak

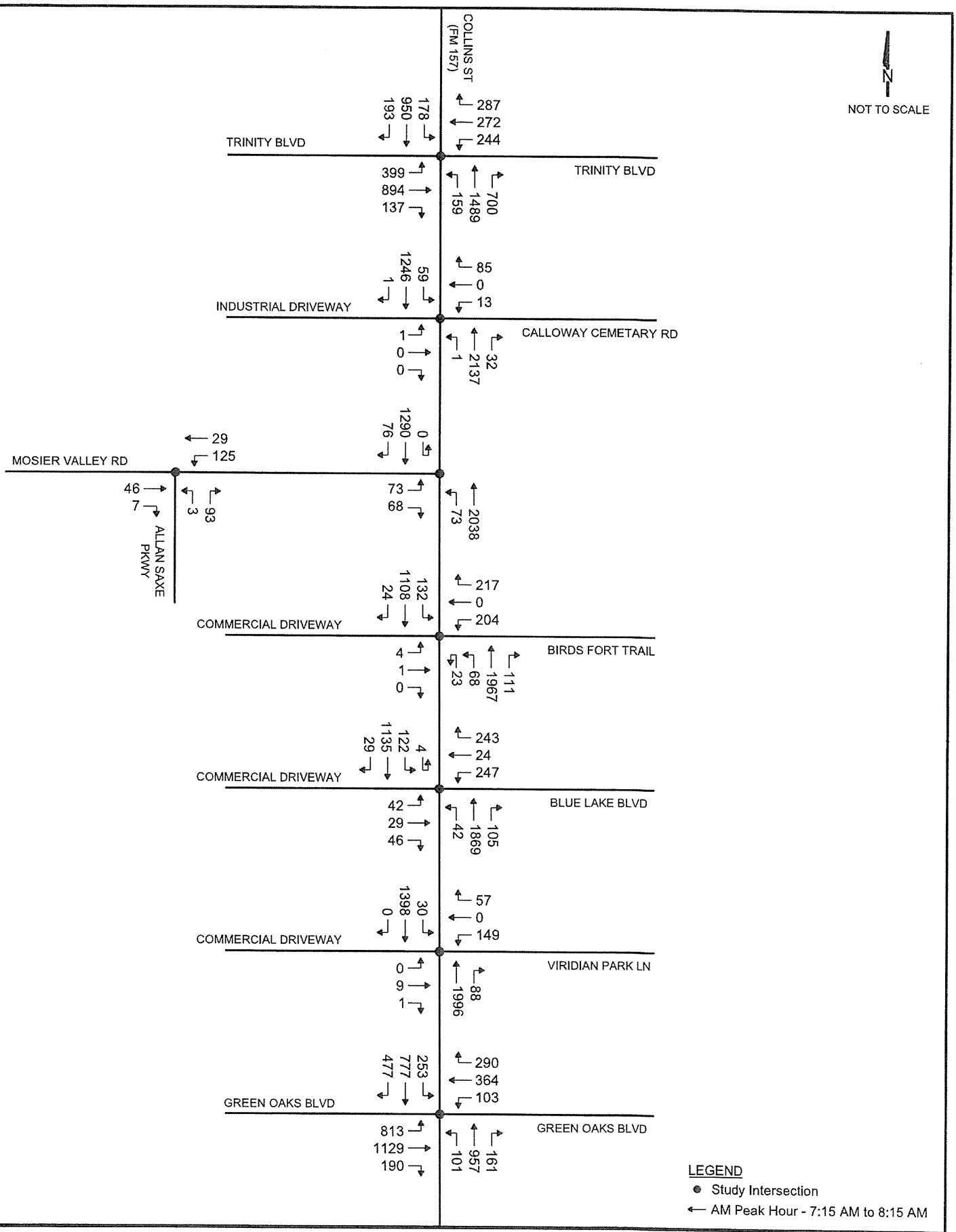
Figure 8




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Assumed Year of Amended Permit Issuance (2024)
Projected Traffic Volumes - Peak of Site

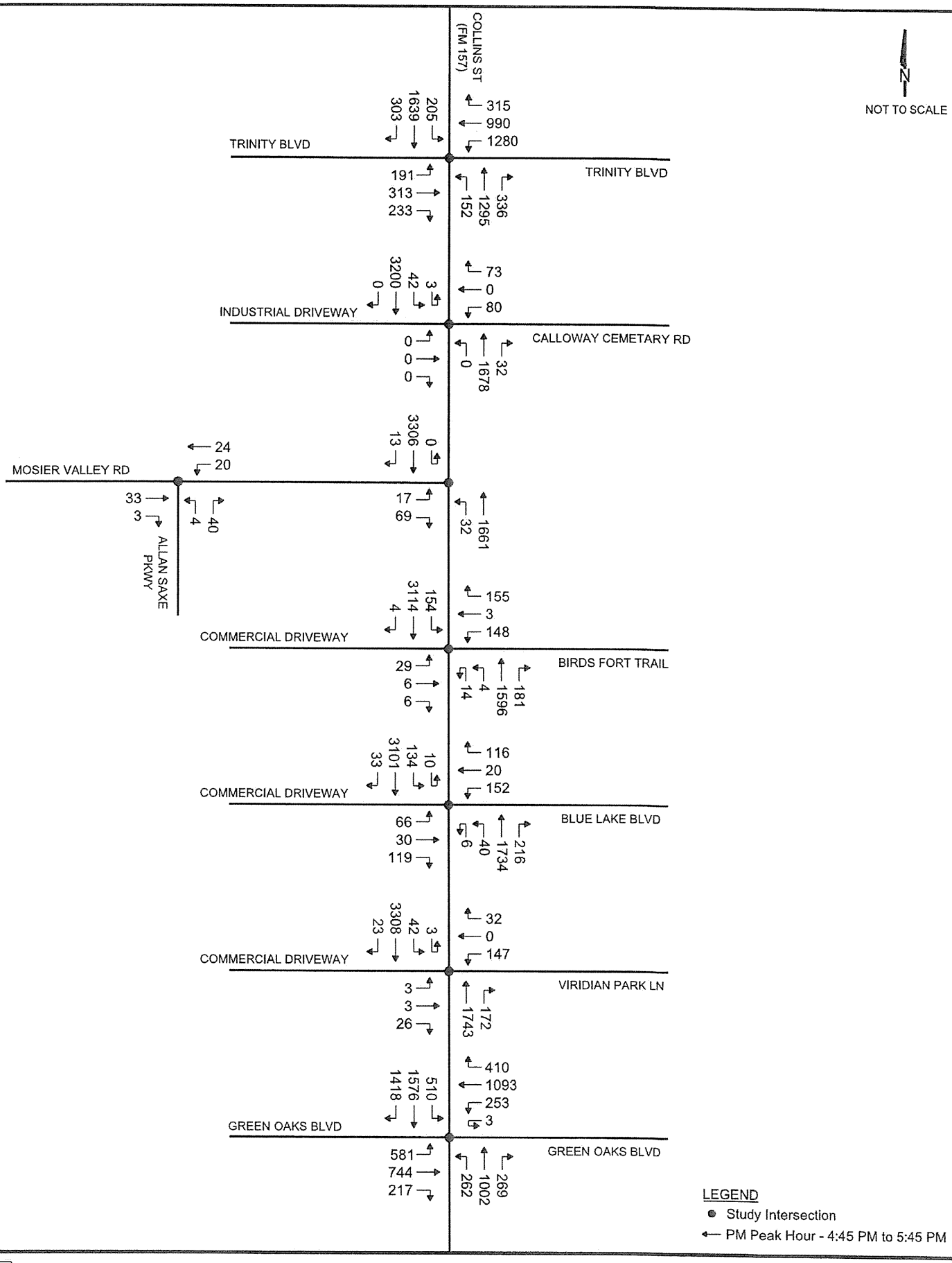
Figure 9




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Peak Year (2054) Projected Traffic Volumes - AM Peak

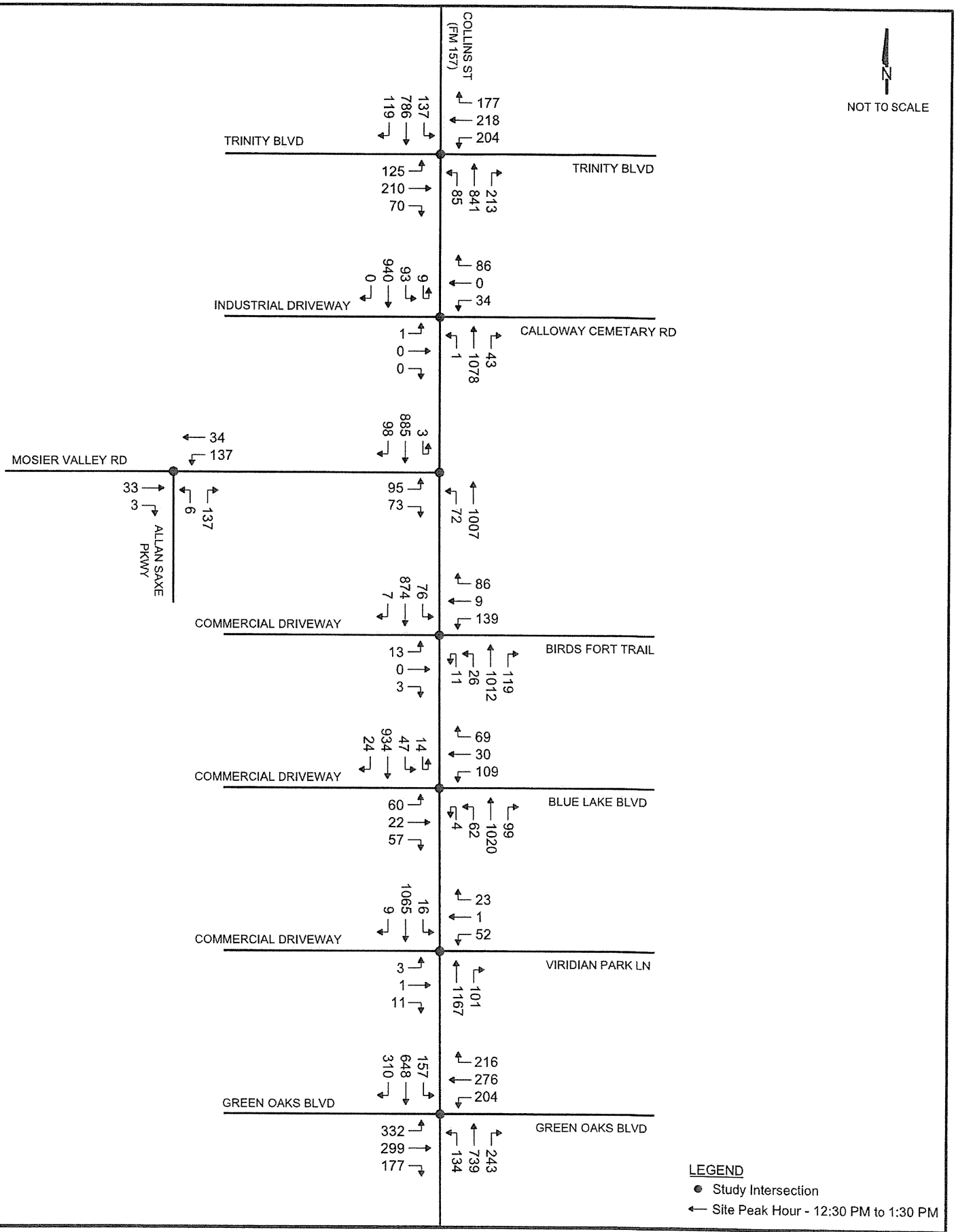
Figure 10




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Peak Year (2054) Projected Traffic Volumes - PM Peak

Figure 11




3030 LBJ FREEWAY
SUITE 1660
DALLAS, TEXAS 75234
972-248-3006
LEE ENGINEERING

Peak Year (2054) Projected Traffic Volumes - Peak of Site

Figure 12

# ROADWAY CAPACITY ANALYSIS

Planning level capacity analysis allows for the assessment of a roadway's ability to adequately serve the projected traffic volumes by comparing projected volumes to the capacity of the roadway. The North Central Texas Council of Governments (NCTCOG) maintains a regional travel demand model that contains service volumes for various roadway and area types. The service volumes from the NCTCOG model are used in this analysis to conduct the roadway link analysis for each segment on the primary access roadways. These service volumes represent the planning level capacity of each roadway type. Capacity values by area type, facility type and functional class are presented in **Table 6**.

**Table 6: NCTCOG Roadway Capacity Analysis and Level of Service Guidelines**

**Hourly Service Volume per Lane***
**(Divided or One-Way Roads)**

| Area Type | Functional Class | | | | | | |
|---|---|---|---|---|---|---|---|
| | Freeway | Principal Arterial | Minor Arterial | Collector | Ramp | Frontage Road | HOV |
| CBD | 2300 | 725 | 725 | 475 | 1250 | 725 | 2050 |
| Outer Business District | 2300 | 775 | 775 | 500 | 1375 | 775 | 2125 |
| Urban Residential | 2300 | 850 | 825 | 525 | 1425 | 850 | 2150 |
| Suburban Residential | 2300 | 925 | 900 | 575 | 1600 | 900 | 2225 |
| Rural | 2300 | 1025 | 975 | 600 | 1725 | 975 | 2300 |

* Service volumes at Level of Service E (the model requires LOS E service volumes)

**Hourly Service Volume per Lane***
**(Undivided Roads)**

| Area Type | Functional Class | | | | | | |
|---|---|---|---|---|---|---|---|
| | Freeway | Principal Arterial | Minor Arterial | Collector | Ramp | Frontage Road | HOV |
| CBD | n/a | 650 | 650 | 425 | 1250 | 650 | n/a |
| Outer Business District | n/a | 725 | 725 | 450 | 1375 | 725 | n/a |
| Urban Residential | n/a | 775 | 750 | 475 | 1425 | 750 | n/a |
| Suburban Residential | n/a | 875 | 825 | 525 | 1600 | 825 | n/a |
| Rural | n/a | 925 | 875 | 550 | 1725 | 875 | n/a |

* Service volumes at Level of Service E (the model requires LOS E service volumes)

The *Highway Capacity Manual* defines levels of service for automobiles within a range from "A" to "F" with "A" being free-flow, higher-speed, low-density operation and "F" being a dense traffic stream with constrained or congested operations. Typically, Level of Service "D" is the desirable level of service within a built-up urban environment.

For purposes of the roadway link analysis, the volume to capacity ratio, V/C, was calculated. Level of Service (LOS) was then estimated for each facility based on the V/C ratio according to the following breakdown.

- if Volume/Service Volume Ratio is <= 0.45, then LOS = A or B
- if Volume/Service Volume Ratio is > 0.45 and <= 0.65, then LOS = C
- if Volume/Service Volume Ratio is > 0.65 and <= 0.80, then LOS = D
- if Volume/Service Volume Ratio is > 0.80 and <= 1.00, then LOS = E
- if Volume/Service Volume Ratio is > 1.00, then LOS = F

As previously stated, FM 157 is classified as a Major Arterial on the City of Arlington *2017 Thoroughfare Development Plan,* a System Link on the City of Fort Worth *Master Thoroughfare Plan,* and a Principal Arterial on the TxDOT Statewide Planning Map. For this study, FM 157 was assumed to be a Principal Arterial in a Suburban Residential area based on the NCTCOG area types. FM 157 is a six-lane divided roadway north of Green Oaks Boulevard and a four-lane divided roadway south of Green Oaks Boulevard. Based on that information, the appropriate capacity volume would be 2,775 vehicles per hour in each direction (925 vehicles/hour/lane x 3 lanes) north of Green Oaks Boulevard. South of Green Oaks Boulevard, the appropriate capacity volume would be 1,850 vehicles per hour in each direction (925 vehicles/hour/lane x 2 lanes).

Mosier Valley Road is considered a local roadway in all of the previously referenced thoroughfare plans. For the purposes of this study, the capacity of a Collector in a Suburban Residential area will be utilized. Mosier Valley Road is currently a two-lane undivided roadway. Based on that information, the appropriate capacity volume would be 575 vehicles per hour in each direction.

The resulting roadway link level of service values for the roadway links within each scenario are provided in **Table 7** and **Table 8** for FM 157 and Mosier Valley Road, respectively. Shaded cells indicate roadway links operating at LOS E or F.

**Table 7: Roadway Capacity Analysis – FM 157**

| Roadway Link | Direction | Capacity (vph)[1] | AM Peak Hour | | | PM Peak Hour | | | Facility Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Volume | V/C | LOS | Volume | V/C | LOS | Volume | V/C | LOS |
| **Existing (2022)** | | | | | | | | | | | |
| North of Trinity | NB | 2775 | 1514 | 0.55 | C | 1253 | 0.45 | C | 795 | 0.29 | A/B |
| | SB | 2775 | 919 | 0.33 | A/B | 1495 | 0.54 | C | 725 | 0.26 | A/B |
| Trinity to Calloway Cemetery | NB | 2775 | 1634 | 0.59 | C | 1241 | 0.45 | A/B | 792 | 0.29 | A/B |
| | SB | 2775 | 926 | 0.33 | A/B | 2194 | 0.79 | D | 738 | 0.27 | A/B |
| Calloway Cemetery to Mosier Valley | NB | 2775 | 1510 | 0.54 | C | 1190 | 0.43 | A/B | 781 | 0.28 | A/B |
| | SB | 2775 | 876 | 0.32 | A/B | 2283 | 0.82 | E | 678 | 0.24 | A/B |
| Mosier Valley to Birds Fort | NB | 2775 | 1470 | 0.53 | C | 1179 | 0.42 | A/B | 751 | 0.27 | A/B |
| | SB | 2775 | 946 | 0.34 | A/B | 2350 | 0.85 | E | 667 | 0.24 | A/B |
| Birds Fort to Blue Lake | NB | 2775 | 1509 | 0.54 | C | 1250 | 0.45 | C | 813 | 0.29 | A/B |
| | SB | 2775 | 926 | 0.33 | A/B | 2284 | 0.82 | E | 715 | 0.26 | A/B |
| Blue Lake to Viridian Park | NB | 2775 | 1404 | 0.51 | C | 1389 | 0.50 | C | 825 | 0.30 | A/B |
| | SB | 2775 | 995 | 0.36 | A/B | 2351 | 0.85 | E | 769 | 0.28 | A/B |
| Viridian Park to Green Oaks | NB | 2775 | 1451 | 0.52 | C | 1334 | 0.48 | C | 882 | 0.32 | A/B |
| | SB | 2775 | 1078 | 0.39 | A/B | 2422 | 0.87 | E | 785 | 0.28 | A/B |
| South of Green Oaks | NB | 1850 | 848 | 0.46 | C | 1066 | 0.58 | C | 776 | 0.42 | A/B |
| | SB | 1850 | 745 | 0.40 | A/B | 1424 | 0.77 | D | 716 | 0.39 | A/B |
| **Assumed Year of Amended Permit Issuance (2024)** | | | | | | | | | | | |
| North of Trinity | NB | 2775 | 1555 | 0.56 | C | 1287 | 0.46 | C | 817 | 0.29 | A/B |
| | SB | 2775 | 944 | 0.34 | A/B | 1536 | 0.55 | C | 745 | 0.27 | A/B |
| Trinity to Calloway Cemetery | NB | 2775 | 1678 | 0.60 | C | 1275 | 0.46 | C | 814 | 0.29 | A/B |
| | SB | 2775 | 951 | 0.34 | A/B | 2254 | 0.81 | E | 758 | 0.27 | A/B |
| Calloway Cemetery to Mosier Valley | NB | 2775 | 1551 | 0.56 | C | 1222 | 0.44 | A/B | 802 | 0.29 | A/B |
| | SB | 2775 | 900 | 0.32 | A/B | 2345 | 0.85 | E | 696 | 0.25 | A/B |

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| Roadway Link | Direction | Capacity (vph) | AM Peak Hour | | | PM Peak Hour | | | Facility Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Volume | V/C | LOS | Volume | V/C | LOS | Volume | V/C | LOS |
| Mosier Valley to Birds Fort | NB | 2775 | 1510 | 0.54 | C | 1211 | 0.44 | A/B | 771 | 0.28 | A/B |
| | SB | 2775 | 972 | 0.35 | A/B | 2414 | 0.87 | E | 685 | 0.25 | A/B |
| Birds Fort to Blue Lake | NB | 2775 | 1550 | 0.56 | C | 1284 | 0.46 | C | 835 | 0.30 | A/B |
| | SB | 2775 | 951 | 0.34 | A/B | 2346 | 0.85 | E | 734 | 0.26 | A/B |
| Blue Lake to Viridian Park | NB | 2775 | 1442 | 0.52 | C | 1427 | 0.51 | C | 847 | 0.31 | A/B |
| | SB | 2775 | 1022 | 0.37 | A/B | 2415 | 0.87 | E | 790 | 0.28 | A/B |
| Viridian Park to Green Oaks | NB | 2775 | 1490 | 0.54 | C | 1370 | 0.49 | C | 906 | 0.33 | A/B |
| | SB | 2775 | 1107 | 0.40 | A/B | 2488 | 0.90 | E | 806 | 0.29 | A/B |
| South of Green Oaks | NB | 1850 | 871 | 0.47 | C | 1095 | 0.59 | C | 797 | 0.43 | A/B |
| | SB | 1850 | 765 | 0.41 | A/B | 1463 | 0.79 | D | 735 | 0.40 | A/B |
| **Peak Year (2054)** | | | | | | | | | | | |
| North of Trinity | NB | 2775 | 2175 | 0.78 | D | 1800 | 0.65 | C | 1142 | 0.41 | A/B |
| | SB | 2775 | 1321 | 0.48 | C | 2148 | 0.77 | D | 1042 | 0.38 | A/B |
| Trinity to Calloway Cemetery | NB | 2775 | 2348 | 0.85 | E | 1783 | 0.64 | C | 1138 | 0.41 | A/B |
| | SB | 2775 | 1331 | 0.48 | C | 3153 | 1.14 | F | 1060 | 0.38 | A/B |
| Calloway Cemetery to Mosier Valley | NB | 2775 | 2170 | 0.78 | D | 1710 | 0.62 | C | 1122 | 0.40 | A/B |
| | SB | 2775 | 1259 | 0.45 | C | 3280 | 1.18 | F | 974 | 0.35 | A/B |
| Mosier Valley to Birds Fort | NB | 2775 | 2112 | 0.76 | D | 1694 | 0.61 | C | 1079 | 0.39 | A/B |
| | SB | 2775 | 1359 | 0.49 | C | 3377 | 1.22 | F | 958 | 0.35 | A/B |
| Birds Fort to Blue Lake | NB | 2775 | 2168 | 0.78 | D | 1796 | 0.65 | C | 1168 | 0.42 | A/B |
| | SB | 2775 | 1331 | 0.48 | C | 3282 | 1.18 | F | 1027 | 0.37 | A/B |
| Blue Lake to Viridian Park | NB | 2775 | 2017 | 0.73 | D | 1996 | 0.72 | D | 1185 | 0.43 | A/B |
| | SB | 2775 | 1430 | 0.52 | C | 3378 | 1.22 | F | 1105 | 0.40 | A/B |
| Viridian Park to Green Oaks | NB | 2775 | 2085 | 0.75 | D | 1917 | 0.69 | D | 1267 | 0.46 | C |
| | SB | 2775 | 1549 | 0.56 | C | 3480 | 1.25 | F | 1128 | 0.41 | A/B |
| South of Green Oaks | NB | 1850 | 1218 | 0.66 | D | 1532 | 0.83 | E | 1115 | 0.60 | C |
| | SB | 1850 | 1070 | 0.58 | C | 2046 | 1.11 | F | 1029 | 0.56 | C |

[1] – Refer to page 26 for NCTCOG Service Volumes

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**Table 8: Roadway Capacity Analysis – Mosier Valley Road**

| Roadway Link | Direction | Capacity (vph)[1] | AM Peak Hour | | | PM Peak Hour | | | Facility Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Volume | V/C | LOS | Volume | V/C | LOS | Volume | V/C | LOS |
| **Existing (2022)** | | | | | | | | | | | |
| West of Allen Saxe | EB | 575 | 37 | 0.06 | A/B | 25 | 0.04 | A/B | 25 | 0.04 | A/B |
| | WB | 575 | 22 | 0.04 | A/B | 20 | 0.03 | A/B | 20 | 0.03 | A/B |
| Allen Saxe to FM 157 | EB | 575 | 98 | 0.17 | A/B | 60 | 0.10 | A/B | 118 | 0.21 | A/B |
| | WB | 575 | 107 | 0.19 | A/B | 31 | 0.05 | A/B | 119 | 0.21 | A/B |
| **Assumed Year of Amended Permit Issuance (2024)** | | | | | | | | | | | |
| West of Allen Saxe | EB | 575 | 38 | 0.07 | A/B | 26 | 0.05 | A/B | 26 | 0.05 | A/B |
| | WB | 575 | 23 | 0.04 | A/B | 21 | 0.04 | A/B | 21 | 0.04 | A/B |
| Allen Saxe to FM 157 | EB | 575 | 101 | 0.18 | A/B | 62 | 0.11 | A/B | 121 | 0.21 | A/B |
| | WB | 575 | 110 | 0.19 | A/B | 32 | 0.06 | A/B | 122 | 0.21 | A/B |
| **Peak Year (2054)** | | | | | | | | | | | |
| West of Allen Saxe | EB | 575 | 53 | 0.09 | A/B | 36 | 0.06 | A/B | 36 | 0.06 | A/B |
| | WB | 575 | 32 | 0.06 | A/B | 29 | 0.05 | A/B | 29 | 0.05 | A/B |
| Allen Saxe to FM 157 | EB | 575 | 141 | 0.25 | A/B | 86 | 0.15 | A/B | 170 | 0.30 | A/B |
| | WB | 575 | 154 | 0.27 | A/B | 45 | 0.08 | A/B | 171 | 0.30 | A/B |

[1] – Refer to page 26 for NCTCOG Service Volumes

I/IID-33

As shown, Mosier Valley Road is predicted to operate at acceptable levels of service for all scenarios. FM 157 currently operates at LOS D/E in the southbound direction during the PM peak hour. By 2054, FM 157 is predicted to operate at LOS F in the southbound direction during the PM peak hour, with some additional northbound segments beginning to operate at LOS E during the AM and PM peak hours. Based on these results, intersection capacity analyses will be utilized to better identify predicted operation along the study corridor.

It is important to note that background traffic in the area is the primary contributor to the Levels of Service on FM 157, as the facility traffic does not constitute more than 4.1% of the traffic along FM 157 in either the AM or PM peak hours. For reference, the estimated percentage of site traffic on FM 157 north and south of Mosier Valley Road is shown in **Table 9**. Volumes are shown for the Peak Year (2054). Similar proportions of site to total traffic would be obtained for the other analysis years, as all traffic was grown at the same rate. For the purposes of this comparison, it was assumed that 40% of the site traffic was going to or coming from the north on FM 157, while the remainder (60%) was going to or coming from the south.

**Table 9: Facility Traffic as a Proportion of Traffic on FM 157**

| Time Period | Volume | FM 157 North of Mosier Valley | | FM 157 South of Mosier Valley | |
|---|---|---|---|---|---|
| | | NB | SB | NB | SB |
| 2054 AM Peak | Total | 2170 | 1259 | 2112 | 1359 |
| | Site | 37 | 50 | 75 | 56 |
| | Percentage | 1.7% | 4.0% | 3.6% | 4.1% |
| 2054 PM Peak | Total | 1710 | 3280 | 1694 | 3377 |
| | Site | 16 | 8 | 12 | 24 |
| | Percentage | 0.9% | 0.2% | 0.7% | 0.7% |
| 2054 Site Peak | Total | 1122 | 974 | 1079 | 958 |
| | Site | 55 | 55 | 82 | 82 |
| | Percentage | 4.9% | 5.6% | 7.6% | 8.6% |

As shown, the facility accounts for approximately 4.1% of the AM peak hour traffic volumes in the southbound direction and approximately 1.7-3.6% of AM peak hour traffic volumes in the northbound direction. The proportion of traffic volumes attributed to the facility during the peak hour of the site (12:30 PM to 1:30 PM) is higher as the traffic on FM 157 is overall lower.

Poor level of service on FM 157 occurs primarily in the PM peak hour, when facility traffic accounts for less than 1% of the volume and background traffic volumes are at higher levels than any other time of the day.

# INTERSECTION CAPACITY ANALYSIS

The Level of Service (LOS) of an intersection is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay. The LOS criteria for unsignalized and signalized intersections are shown in **Table 10**. LOS is given a letter designation from A to F, with LOS A representing very short delays and LOS F representing very long delays or over-capacity conditions. For both signalized and unsignalized intersections, LOS D is typically considered as the minimum acceptable condition.

**Table 10: Level of Service Criteria for Intersections**

| Level-of-Service (LOS) | Average Delay (seconds/vehicle) | |
|---|---|---|
| | Unsignalized | Signalized |
| A | ≤ 10.0 | ≤ 10.0 |
| B | 10.1 to 15.0 | 10.1 to 20.0 |
| C | 15.1 to 25.0 | 20.1 to 35.0 |
| D | 25.1 to 35.0 | 35.1 to 55.0 |
| E | 35.1 to 50.0 | 55.1 to 80.0 |
| F | > 50.0 or Volume exceeds Capacity | > 80.0 or Volume exceeds Capacity |

SOURCE: *Highway Capacity Manual (HCM) 6th Edition*, Transportation Research Board, 2016

Capacity analyses were conducted for the study area intersections under the following analysis scenarios:

- Existing (2022) traffic conditions;
- Assumed Year of Amended Permit Issuance (2024) traffic conditions; and
- Peak Year (2054) traffic conditions.

Results were obtained using the macroscopic traffic analysis software package *Synchro 11*. Software output sheets are included in Appendix C. It should be noted that HCM methodology does not provide intersection-wide delay or level of service for intersections operating under two-way stop control.

### *Existing (2022) and Assumed Year of Amended Permit Issuance (2024) Traffic Conditions*

**Table 11** presents the results of the existing 2022 capacity analysis for the study area intersections. The existing lane configurations shown in Figure 2 and the traffic volumes shown in Figures 3-5, were used for this analysis. Table 8 also presents the results for Assumed Year of Amended Permit Issuance (2024). The traffic volumes shown in Figures 7-9 were used for this analysis. The shaded cells indicate movements which are currently operating below acceptable levels of service (LOS D).

**Table 11: Intersection Capacity Analyses Results –**
**Existing (2022) and Assumed Year of Amended Permit Issuance (2024) Traffic Conditions**

| FM 157 and Trinity Boulevard (Signalized) | | | | | | |
|---|---|---|---|---|---|---|
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 47.2 (D)[1] | 52.7 (D) | 56.4 (E) | 54.7 (D) | 25.7 (C) |
| | Facility Peak | 23.6 (C) | 26.1 (C) | 24.1 (C) | 23.2 (C) | 22.8 (C) |
| | PM | 54.4 (D) | 78.8 (E) | 56.3 (E) | 44.5 (D) | 53.3 (D) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 47.8 (D) | 52.7 (D) | 56.7 (E) | 55.9 (E) | 26.5 (C) |
| | Facility Peak | 23.8 (C) | 26.2 (C) | 24.2 (C) | 23.4 (C) | 23.0 (C) |
| | PM | 55.3 (E) | 81.5 (F) | 57.1 (E) | 44.8 (D) | 54.2 (D) |
| **FM 157 and Calloway Cemetery Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 11.1 (B) | 52.8 (D) | 61.1 (E) | 8.4 (A) | 11.8 (B) |
| | Facility Peak | 13.3 (B) | 41.6 (D) | 47.9 (D) | 9.1 (A) | 13.7 (B) |
| | PM | 9.4 (A) | 0.0 (A) | 63.3 (E) | 21.3 (C) | 0.6 (A) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 11.2 (B) | 52.6 (D) | 61.0 (E) | 8.6 (A) | 11.9 (B) |
| | Facility Peak | 13.6 (B) | 41.7 (D) | 48.1 (D) | 9.4 (A) | 14.1 (B) |
| | PM | 9.5 (A) | 0.0 (A) | 63.2 (E) | 21.6 (C) | 0.6 (A) |
| **FM 157 and Mosier Valley Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 6.7 (A) | 39.3 (D) | -- | 4.6 (A) | 8.4 (A) |
| | Facility Peak | 7.7 (A) | 47.2 (D) | -- | 4.1 (A) | 7.8 (A) |
| | PM | 7.6 (A) | 46.0 (D) | -- | 2.8 (A) | 9.9 (A) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 6.8 (A) | 39.5 (D) | -- | 4.7 (A) | 8.5 (A) |
| | Facility Peak | 7.8 (A) | 48.4 (D) | -- | 4.1 (A) | 7.9 (A) |
| | PM | 8.0 (A) | 46.2 (D) | -- | 2.8 (A) | 10.4 (B) |
| **FM 157 and Birds Fort Trail (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 16.3 (B) | 40.1 (D) | 42.0 (D) | 15.3 (B) | 13.6 (B) |
| | Facility Peak | 15.3 (B) | 23.4 (C) | 26.3 (C) | 14.5 (B) | 14.4 (B) |
| | PM | 15.5 (B) | 44.7 (D) | 48.9 (D) | 12.9 (B) | 14.8 (B) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 16.5 (B) | 41.1 (D) | 43.0 (D) | 15.5 (B) | 13.8 (B) |
| | Facility Peak | 15.3 (B) | 23.7 (C) | 26.7 (C) | 14.5 (B) | 14.4 (B) |
| | PM | 15.9 (B) | 45.0 (D) | 49.4 (D) | 13.3 (B) | 15.2 (B) |
| **FM 157 and Blue Lake Boulevard (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 22.3 (C) | 56.9 (E) | 45.2 (D) | 20.4 (C) | 18.4 (B) |
| | Facility Peak | 18.1 (B) | 36.3 (D) | 30.4 (C) | 16.6 (B) | 16.5 (B) |
| | PM | 22.4 (C) | 59.7 (E) | 55.1 (E) | 16.9 (B) | 22.5 (C) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 22.8 (C) | 57.8 (E) | 46.5 (D) | 20.9 (C) | 18.7 (B) |
| | Facility Peak | 18.2 (B) | 36.7 (D) | 30.3 (C) | 16.7 (B) | 16.7 (B) |
| | PM | 23.3 (C) | 60.0 (E) | 55.5 (E) | 17.3 (B) | 23.8 (C) |
| **FM 157 and Viridian Park Lane (Signalized)** | | | | | | |

| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
|---|---|---|---|---|---|---|
| Existing (2022) | AM | 12.3 (B) | 38.4 (D) | 31.7 (C) | 14.1 (B) | 7.7 (A) |
| | Facility Peak | 10.3 (B) | 27.3 (C) | 24.0 (C) | 12.4 (B) | 7.2 (A) |
| | PM | 14.4 (B) | 36.0 (D) | 31.4 (C) | 14.4 (B) | 13.4 (B) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 12.4 (B) | 38.9 (D) | 32.2 (C) | 14.2 (B) | 7.7 (A) |
| | Facility Peak | 10.3 (B) | 27.7 (C) | 24.3 (C) | 12.4 (B) | 7.2 (A) |
| | PM | 14.8 (B) | 36.1 (D) | 31.5 (C) | 14.6 (B) | 14.0 (B) |
| **FM 157 and Green Oaks Boulevard (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Existing (2022) | AM | 45.2 (D) | 46.7 (D) | 55.3 (E) | 23.2 (C) | 60.2 (E) |
| | Facility Peak | 36.3 (D) | 58.9 (E) | 53.8 (D) | 22.8 (C) | 22.8 (C) |
| | PM | 68.6 (E) | 74.8 (E) | 71.7 (E) | 104.9 (F) | 40.8 (D) |
| Assumed Year of Amended Permit Issuance (2024) | AM | 45.3 (D) | 46.5 (D) | 55.3 (E) | 24.0 (C) | 60.2 (E) |
| | Facility Peak | 36.6 (D) | 59.2 (E) | 53.7 (D) | 23.2 (C) | 23.1 (C) |
| | PM | 70.3 (E) | 77.8 (E) | 72.1 (E) | 107.0 (F) | 42.3 (D) |
| **Mosier Valley Road and Allen Saxe Parkway (Site Entrance) (Side Street Stop-Controlled)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB Left | NB | SB |
| Existing (2022) | AM | -- [2] | 0.0 (A) | 8.1 (A) | 9.8 (A) | -- |
| | Facility Peak | -- | 0.0 (A) | 8.3 (A) | 9.9 (A) | -- |
| | PM | -- | 0.0 (A) | 8.1 (A) | 9.3 (A) | -- |
| Assumed Year of Amended Permit Issuance (2024) | AM | -- | 0.0 (A) | 8.1 (A) | 9.8 (A) | -- |
| | Facility Peak | -- | 0.0 (A) | 8.3 (A) | 10.0 (B) | -- |
| | PM | -- | 0.0 (A) | 8.1 (A) | 9.3 (A) | -- |

[1] Delay in seconds/vehicle (Level of Service)
[2] HCM methodology does not provide intersection-wide delay/level of service for Side-Street/Two-Way Stop-Controlled analysis

As shown, the study intersections are predicted to operate very similar to existing conditions for the Assumed Year of Amended Permit Issuance (2024) conditions. In general, the signalized intersections are predicted to operate at acceptable levels of service. Cross street approaches at Calloway Cemetery Road and Blue Lake Boulevard are predicted to operate at LOS E during the AM and PM peak hours. Similarly, the eastbound and westbound approaches of Trinity Boulevard at FM 157 are predicted to operate at poor levels of service during the AM and PM peak hours, with the overall intersection operating just above the threshold for LOS E during the 2024 PM peak hour.

The intersection of Green Oaks Boulevard and FM 157 operates at LOS E during the PM peak hour, with multiple approaches operating at LOS E and F during the AM and PM peak hours.

Finally, the site access roadway (Allen Saxe Parkway) is predicted to operate with minimal delay.

### *Peak Year (2054) Traffic Conditions (Site Closure)*

**Table 12** presents the results of the 2054 capacity analysis for the study area intersections. The existing lane configurations shown in Figure 2 and the traffic volumes shown in Figures 10-12 were used for this analysis. The shaded cells indicate movements which are currently operating below acceptable levels of service (LOS D). For the preliminary analysis of 2054 conditions, no changes were made to the existing lane configurations or signal timings along the corridor.

**Table 12: Intersection Capacity Analyses Results – Peak Year (2054) Traffic Conditions**

| FM 157 and Trinity Boulevard (Signalized) | | | | | | |
|---|---|---|---|---|---|---|
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 90.0 (F) | 54.0 (D) | 62.1 (E) | 159.6 (F) | 42.2 (D) |
| | Facility Peak | 26.5 (C) | 33.4 (C) | 30.3 (C) | 25.2 (C) | 23.5 (C) |
| | PM | 134.6 (F) | 131.0 (F) | 143.8 (F) | 108.3 (F) | 145.0 (F) |
| **FM 157 and Calloway Cemetery Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 17.8 (B) | 50.0 (D) | 59.5 (E) | 14.6 (B) | 20.0 (C) |
| | Facility Peak | 17.8 (B) | 42.3 (D) | 50.2 (D) | 13.9 (B) | 18.1 (B) |
| | PM | 10.9 (B) | 0.0 (A) | 65.2 (E) | 25.4 (C) | 0.8 (A) |
| **FM 157 and Mosier Valley Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 8.9 (A) | 56.5 (E) | -- | 6.5 (A) | 10.3 (B) |
| | Facility Peak | 8.9 (A) | 47.3 (D) | -- | 5.0 (A) | 9.6 (A) |
| | PM | 61.0 (E) | 45.1 (D) | -- | 3.3 (A) | 90.7 (F) |
| **FM 157 and Birds Fort Trail (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 21.9 (C) | 50.6 (D) | 54.5 (D) | 21.9 (C) | 16.5 (B) |
| | Facility Peak | 16.3 (B) | 30.1 (C) | 33.5 (C) | 15.3 (B) | 14.4 (B) |
| | PM | 31.2 (C) | 46.8 (D) | 51.9 (D) | 18.4 (B) | 36.2 (D) |
| **FM 157 and Blue Lake Boulevard (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 33.7 (C) | 69.8 (E) | 85.1 (F) | 31.6 (C) | 24.1 (C) |
| | Facility Peak | 20.0 (B) | 40.5 (D) | 35.1 (D) | 17.3 (B) | 19.1 (B) |
| | PM | 79.0 (E) | 62.3 (E) | 61.2 (E) | 25.4 (C) | 109.5 (F) |
| **FM 157 and Viridian Park Lane (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 15.5 (B) | 42.4 (D) | 36.7 (D) | 18.8 (B) | 8.4 (A) |
| | Facility Peak | 11.1 (B) | 32.9 (C) | 29.3 (C) | 13.1 (B) | 7.6 (A) |
| | PM | 46.9 (D) | 40.5 (D) | 36.8 (D) | 17.6 (B) | 62.7 (E) |

| FM 157 and Green Oaks Boulevard (Signalized) | | | | | | |
|---|---|---|---|---|---|---|
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) (Closing Year) | AM | 48.5 (D) | 45.6 (D) | 54.3 (D) | 37.8 (D) | 62.5 (E) |
| | Facility Peak | 44.5 (D) | 70.5 (E) | 52.9 (D) | 36.0 (D) | 28.5 (C) |
| | PM | 103.0 (F) | 145.1 (F) | 110.8 (F) | 146.8 (F) | 44.7 (D) |
| **Mosier Valley Road and Allen Saxe Parkway (Site Entrance) (Side Street Stop-Controlled)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB Left | NB | SB |
| Peak Year (2054) (Closing Year) | AM | -- | 0.0 (A) | 8.3 (A) | 10.3 (B) | -- |
| | Facility Peak | -- | 0.0 (A) | 8.4 (A) | 10.5 (B) | -- |
| | PM | -- | 0.0 (A) | 8.2 (A) | 9.5 (A) | -- |

[1] Delay in seconds/vehicle (Level of Service)
[2] HCM methodology does not provide intersection-wide delay/level of service for Side-Street/Two-Way Stop-Controlled analysis

As shown, additional delay is anticipated at the study intersections for the Peak Year (2054) conditions. The intersections of Blue Lake Boulevard at FM 157 and Mosier Valley Road at FM 157 are predicted to operate at LOS E during the PM peak hours, particularly due to poor level of service for southbound FM 157. The intersection of Trinity Boulevard at FM 157 is predicted to begin to operate at LOS F during the AM and PM peak hours, and all approaches are predicted to operate at LOS F during the PM peak hour. The intersection of Green Oaks Boulevard and FM 157 is predicted to operate at LOS F during the PM peak hour, with most approaches operating at LOS F as well.

The site access roadway (Allen Saxe Parkway) at Mosier Valley Road is predicted to continue to operate with minimal delay.

***Peak Year (2054) Recommended Mitigation***

In order to improve the predicted operation at the study intersections, the following mitigation measures were evaluated:

- Increase the cycle length and apply the same cycle length at each of the signalized intersections along the corridor.
- Optimize timing and splits at each signalized intersection.
- Implement coordination along FM 157.

The mitigated results for the signalized study intersections are shown in **Table 13**. Only the AM and PM peak hours are shown. During the peak of the site, traffic volumes are generally lower and existing signal timing produces acceptable levels of service for all of the signalized intersections in 2054.

**Table 13: Intersection Capacity Analyses Results – Peak Year (2054) Traffic Conditions with Mitigation**

| FM 157 and Trinity Boulevard (Signalized) | | | | | | |
|---|---|---|---|---|---|---|
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 53.9 (D) | 82.7 (F) | 76.6 (E) | 30.1 (C) | 45.2 (D) |
| | PM | 102.5 (F) | 96.2 (F) | 100.3 (F) | 90.1 (F) | 116.5 (F) |
| **FM 157 and Calloway Cemetery Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 4.1 (A) | 62.8 (E) | 74.9 (E) | 1.9 (A) | 2.4 (A) |
| | PM | 3.7 (A) | 0.0 (A) | 93.0 (F) | 0.5 (A) | 1.1 (A) |
| **FM 157 and Mosier Valley Road (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 6.2 (A) | 89.2 (F) | -- | 6.9 (A) | 0.3 (A) |
| | PM | 1.8 (A) | 132.6 (F) | -- | 2.8 (A) | 0.5 (A) |
| **FM 157 and Birds Fort Trail (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 13.2 (B) | 65.0 (E) | 77.0 (E) | 2.9 (A) | 19.4 (B) |
| | PM | 17.8 (B) | 79.5 (E) | 93.8 (F) | 0.6 (A) | 21.9 (C) |
| **FM 157 and Blue Lake Boulevard (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 14.1 (B) | 77.1 (E) | 78.8 (E) | 3.3 (A) | 13.0 (B) |
| | PM | 28.9 (C) | 93.9 (F) | 115.0 (F) | 18.8 (B) | 27.9 (C) |
| **FM 157 and Viridian Park Lane (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 10.5 (B) | 74.8 (E) | 72.0 (E) | 11.8 (B) | 1.8 (A) |
| | PM | 7.4 (A) | 89.4 (F) | 91.7 (F) | 10.6 (B) | 1.3 (A) |
| **FM 157 and Green Oaks Boulevard (Signalized)** | | | | | | |
| Scenario | Peak Hour | Intersection | EB | WB | NB | SB |
| Peak Year (2054) With Mitigation | AM | 52.8 (D) | 54.9 (D) | 68.0 (E) | 44.5 (D) | 50.4 (D) |
| | PM | 98.7 (F) | 124.5 (F) | 103.0 (F) | 115.4 (F) | 69.4 (E) |

[1] Delay in seconds/vehicle (Level of Service)

As shown, the intersections are generally predicted to improve with signal timing mitigation and operate at acceptable levels of service overall. Multiple minor street approaches are predicted to operate at LOS E or F. However, this is a result of the increased cycle length and coordination along FM 157. The intersection of Trinity Boulevard at FM 157 continues to operate at LOS F during the PM peak hour, although delay is generally improved for all approaches. Similarly, the intersection of Green Oaks Boulevard at FM 157 continues to operate at LOS F during the PM peak hour, although delay is improved. As previously shown in Table 9, site traffic is predicted to account for less than 1% of total traffic along FM 157 during the PM peak hour and will thus account for minimal traffic at the intersections with Trinity Boulevard and Green Oaks Boulevard.

# AUXILIARY LANE ANALYSIS

As part of this study, access management analyses were performed to consider the need for deceleration lanes at the site access roadway.

*Right Turn Deceleration Lane Analysis*

Access to the facility will continue to be provided via Allan Saxe Parkway at Mosier Valley Road. Allan Saxe Parkway (site entrance) intersects Mosier Valley Road approximately 300 feet west of FM 157.

Guidelines contained in TxDOT's *Access Management Manual* for roadways with a posted speed less or equal to 45 mph indicate that right turn deceleration lanes should be considered for right turn volumes greater than 60 vehicles per hour.

Based on the estimated driveway volumes shown in Figure 10, Figure 11 and Figure 12, the eastbound right turn volume into the site is unlikely to exceed 60 right turns per hour during the life of the facility. Additionally, adjacent through volumes on Mosier Valley Road are relatively low (fewer than one vehicle per minute) and the speed on Mosier Valley Road is low (30 mph). Thus, a right turn lane is unlikely to be necessary to improve safety or efficiency at the site access roadway.

*Left Turn Deceleration Lane Analysis*

At the site access point, westbound Mosier Valley Road is approximately 26 feet wide and is separated from the eastbound direction by a raised median. It appears that the left side of the roadway functions as a de facto left-turn lane into the site due to the pavement width. Predicted operation for left-turns into the site was LOS A for all scenarios.

# CONCLUSIONS & RECOMMENDATIONS

Based on the results of this study for the City of Arlington Landfill Facility in Arlington, Texas, the following conclusions are made:

- The proposed permit amendment reconfigures the existing facility and extends the life of the site. The proposed amendment does not result in any changes to the proposed traffic flow or access route along FM 157 into the site.

- The facility currently generates 1,778 trips per day, including 196 trips during the peak hour of the site (12:30 PM to 1:30 PM) based on the collected traffic counts. These trips are already a part of the traffic on the surrounding roadway network. Based on the assumed growth, 1,826 trips per day were estimated by 2024 and 2,554 trips per day were estimated by the peak year of the facility in 2054.

- Intersection capacity analysis indicates the site access driveway (Allan Saxe Parkway) operates at acceptable levels of service for both existing and future scenarios.

- Under projected 2054 traffic volumes the implementation of improved traffic signal timing and coordination along FM 157 allows for all study intersections to operate at LOS D or better in all time periods studied with two exceptions:
  1. FM 157 and Trinity Boulevard (PM peak hour)
  2. FM 157 and Green Oaks Boulevard (PM peak hour)

  During the PM peak hour along FM 157, site traffic volumes account for less than 1% of total traffic on FM 157 and relatively poor operations would result at the two intersections regardless of whether facility traffic is present or not. Improved signal timing and coordination along FM 157 will be necessary to accommodate background traffic in the area, regardless of facility traffic.

- The primary access roads to the site provide good access to the facility. No roadway improvements are necessary to accommodate facility traffic based on the traffic volumes projected. The facility is presently in operation and the intersection of Mosier Valley and FM 157 already has traffic signal control and turn lanes in place. The traffic signal allows for safe left-turn access to and from FM 157 for both facility and background traffic in the area.

# APPENDIX

# Appendix A:
# Collected Traffic Counts

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | TRINITY BLVD Westbound | | | | | | FM 157 Northbound | | | | | | TRINITY BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 2 | 20 | 1 | 0 | 0 | 23 | 17 | 12 | 5 | 0 | 0 | 34 | 2 | 22 | 6 | 0 | 0 | 30 | 3 | 9 | 0 | 0 | 0 | 12 | 99 |
| 12:15 AM | 5 | 21 | 1 | 0 | 0 | 27 | 15 | 8 | 4 | 0 | 0 | 27 | 1 | 16 | 4 | 0 | 0 | 21 | 0 | 12 | 3 | 0 | 0 | 15 | 90 |
| 12:30 AM | 3 | 16 | 2 | 0 | 0 | 21 | 3 | 3 | 4 | 0 | 0 | 10 | 2 | 18 | 9 | 0 | 0 | 29 | 1 | 3 | 3 | 0 | 0 | 7 | 67 |
| 12:45 AM | 0 | 7 | 2 | 0 | 0 | 9 | 3 | 4 | 6 | 0 | 0 | 13 | 1 | 13 | 2 | 0 | 0 | 16 | 0 | 4 | 0 | 0 | 0 | 4 | 42 |
| Hourly Total | 10 | 64 | 6 | 0 | 0 | 80 | 38 | 27 | 19 | 0 | 0 | 84 | 6 | 69 | 21 | 0 | 0 | 96 | 4 | 28 | 6 | 0 | 0 | 38 | 298 |
| 1:00 AM | 2 | 15 | 3 | 0 | 0 | 20 | 6 | 3 | 8 | 0 | 0 | 17 | 0 | 7 | 9 | 0 | 0 | 16 | 1 | 1 | 1 | 0 | 1 | 3 | 56 |
| 1:15 AM | 1 | 8 | 1 | 0 | 0 | 10 | 3 | 8 | 7 | 0 | 0 | 18 | 1 | 10 | 1 | 0 | 0 | 12 | 1 | 3 | 2 | 0 | 0 | 6 | 46 |
| 1:30 AM | 5 | 16 | 3 | 0 | 0 | 24 | 4 | 2 | 4 | 0 | 0 | 10 | 0 | 6 | 5 | 0 | 0 | 11 | 1 | 1 | 1 | 0 | 0 | 3 | 48 |
| 1:45 AM | 6 | 12 | 3 | 0 | 0 | 21 | 5 | 1 | 3 | 0 | 0 | 9 | 2 | 10 | 12 | 0 | 0 | 24 | 1 | 3 | 0 | 0 | 0 | 4 | 58 |
| Hourly Total | 14 | 51 | 10 | 0 | 0 | 75 | 18 | 14 | 22 | 0 | 0 | 54 | 3 | 33 | 27 | 0 | 0 | 63 | 4 | 8 | 4 | 0 | 1 | 16 | 208 |
| 2:00 AM | 3 | 15 | 1 | 0 | 0 | 19 | 5 | 6 | 1 | 0 | 0 | 12 | 1 | 17 | 9 | 0 | 0 | 27 | 0 | 3 | 3 | 0 | 0 | 6 | 64 |
| 2:15 AM | 1 | 15 | 1 | 0 | 0 | 17 | 5 | 1 | 3 | 0 | 0 | 9 | 2 | 17 | 5 | 0 | 0 | 24 | 1 | 2 | 1 | 0 | 0 | 4 | 54 |
| 2:30 AM | 2 | 11 | 1 | 0 | 0 | 14 | 4 | 5 | 3 | 0 | 0 | 12 | 0 | 10 | 5 | 0 | 0 | 15 | 1 | 10 | 5 | 0 | 0 | 16 | 57 |
| 2:45 AM | 1 | 14 | 3 | 0 | 0 | 18 | 3 | 5 | 2 | 0 | 0 | 10 | 3 | 13 | 7 | 0 | 0 | 23 | 1 | 1 | 4 | 0 | 1 | 6 | 57 |
| Hourly Total | 7 | 55 | 6 | 0 | 0 | 68 | 17 | 17 | 9 | 0 | 0 | 43 | 6 | 57 | 26 | 0 | 0 | 89 | 3 | 16 | 13 | 0 | 1 | 32 | 232 |
| 3:00 AM | 3 | 10 | 0 | 0 | 0 | 13 | 4 | 5 | 4 | 0 | 0 | 13 | 3 | 6 | 11 | 0 | 0 | 20 | 2 | 1 | 1 | 0 | 0 | 4 | 50 |
| 3:15 AM | 3 | 6 | 0 | 0 | 0 | 9 | 6 | 3 | 6 | 0 | 0 | 15 | 0 | 21 | 6 | 0 | 0 | 27 | 3 | 3 | 2 | 0 | 0 | 8 | 59 |
| 3:30 AM | 3 | 7 | 1 | 0 | 0 | 11 | 2 | 3 | 4 | 0 | 0 | 9 | 1 | 17 | 7 | 0 | 0 | 25 | 1 | 9 | 0 | 0 | 0 | 10 | 55 |
| 3:45 AM | 2 | 9 | 0 | 0 | 0 | 11 | 1 | 2 | 8 | 0 | 0 | 11 | 1 | 15 | 3 | 0 | 0 | 19 | 3 | 4 | 1 | 0 | 0 | 8 | 49 |
| Hourly Total | 11 | 32 | 1 | 0 | 0 | 44 | 13 | 13 | 22 | 0 | 0 | 48 | 5 | 59 | 27 | 0 | 0 | 91 | 9 | 17 | 4 | 0 | 0 | 30 | 213 |
| 4:00 AM | 6 | 11 | 0 | 0 | 0 | 17 | 2 | 8 | 4 | 0 | 0 | 14 | 1 | 24 | 11 | 0 | 0 | 36 | 0 | 8 | 2 | 0 | 0 | 10 | 77 |
| 4:15 AM | 4 | 21 | 1 | 0 | 0 | 26 | 4 | 4 | 8 | 0 | 0 | 16 | 3 | 16 | 11 | 0 | 0 | 30 | 9 | 11 | 2 | 0 | 0 | 22 | 94 |
| 4:30 AM | 6 | 13 | 4 | 0 | 0 | 23 | 6 | 6 | 11 | 0 | 0 | 23 | 7 | 28 | 12 | 0 | 0 | 47 | 6 | 14 | 7 | 0 | 0 | 27 | 120 |
| 4:45 AM | 7 | 27 | 5 | 0 | 0 | 39 | 2 | 10 | 10 | 0 | 0 | 22 | 7 | 35 | 13 | 0 | 0 | 55 | 8 | 26 | 2 | 0 | 0 | 36 | 152 |
| Hourly Total | 23 | 72 | 10 | 0 | 0 | 105 | 14 | 28 | 33 | 0 | 0 | 75 | 18 | 103 | 47 | 0 | 0 | 168 | 23 | 59 | 13 | 0 | 0 | 95 | 443 |
| 5:00 AM | 3 | 29 | 1 | 0 | 0 | 33 | 5 | 6 | 5 | 0 | 0 | 16 | 3 | 42 | 24 | 0 | 0 | 69 | 5 | 24 | 2 | 0 | 0 | 31 | 149 |
| 5:15 AM | 10 | 24 | 3 | 0 | 0 | 37 | 10 | 9 | 8 | 0 | 0 | 27 | 5 | 65 | 27 | 0 | 0 | 97 | 10 | 35 | 3 | 0 | 0 | 48 | 209 |
| 5:30 AM | 9 | 28 | 6 | 0 | 0 | 43 | 8 | 8 | 12 | 0 | 0 | 28 | 14 | 75 | 54 | 0 | 0 | 143 | 23 | 54 | 7 | 0 | 0 | 84 | 298 |
| 5:45 AM | 7 | 43 | 9 | 0 | 0 | 59 | 22 | 18 | 21 | 0 | 0 | 61 | 13 | 90 | 41 | 0 | 0 | 144 | 12 | 39 | 6 | 0 | 0 | 57 | 321 |
| Hourly Total | 29 | 124 | 19 | 0 | 0 | 172 | 45 | 41 | 46 | 0 | 0 | 132 | 35 | 272 | 146 | 0 | 0 | 453 | 50 | 152 | 18 | 0 | 0 | 220 | 977 |
| 6:00 AM | 12 | 43 | 8 | 0 | 0 | 63 | 14 | 23 | 8 | 0 | 0 | 45 | 14 | 111 | 48 | 0 | 0 | 173 | 13 | 54 | 7 | 0 | 0 | 74 | 355 |
| 6:15 AM | 17 | 57 | 8 | 0 | 0 | 82 | 18 | 28 | 17 | 0 | 0 | 63 | 16 | 138 | 54 | 0 | 0 | 208 | 31 | 64 | 17 | 0 | 0 | 112 | 465 |
| 6:30 AM | 22 | 67 | 19 | 0 | 0 | 108 | 26 | 25 | 17 | 0 | 0 | 68 | 20 | 180 | 94 | 0 | 0 | 294 | 42 | 98 | 18 | 0 | 0 | 158 | 628 |
| 6:45 AM | 28 | 85 | 15 | 0 | 0 | 128 | 17 | 40 | 28 | 0 | 0 | 85 | 25 | 216 | 97 | 0 | 0 | 338 | 54 | 93 | 17 | 0 | 0 | 164 | 715 |
| Hourly Total | 79 | 252 | 50 | 0 | 0 | 381 | 75 | 116 | 70 | 0 | 0 | 261 | 75 | 645 | 293 | 0 | 0 | 1013 | 140 | 309 | 59 | 0 | 0 | 508 | 2163 |
| 7:00 AM | 14 | 89 | 18 | 0 | 0 | 121 | 55 | 45 | 37 | 0 | 0 | 137 | 24 | 205 | 72 | 0 | 0 | 301 | 49 | 110 | 18 | 0 | 0 | 177 | 736 |
| 7:15 AM | 32 | 126 | 24 | 0 | 0 | 182 | 28 | 37 | 53 | 0 | 0 | 118 | 19 | 273 | 121 | 0 | 0 | 413 | 88 | 125 | 26 | 0 | 0 | 239 | 952 |
| 7:30 AM | 36 | 177 | 37 | 0 | 0 | 250 | 50 | 58 | 56 | 0 | 0 | 164 | 34 | 266 | 133 | 0 | 0 | 433 | 76 | 186 | 26 | 0 | 0 | 288 | 1135 |
| 7:45 AM | 36 | 194 | 38 | 0 | 0 | 268 | 41 | 51 | 49 | 0 | 0 | 141 | 39 | 300 | 122 | 0 | 0 | 461 | 63 | 155 | 28 | 0 | 0 | 246 | 1116 |
| Hourly Total | 118 | 586 | 117 | 0 | 0 | 821 | 174 | 191 | 195 | 0 | 0 | 560 | 116 | 1044 | 448 | 0 | 0 | 1608 | 276 | 576 | 98 | 0 | 0 | 950 | 3939 |
| 8:00 AM | 20 | 164 | 35 | 0 | 0 | 219 | 51 | 43 | 42 | 0 | 1 | 136 | 19 | 197 | 111 | 0 | 0 | 327 | 51 | 156 | 15 | 0 | 0 | 222 | 904 |
| 8:15 AM | 25 | 156 | 19 | 0 | 0 | 200 | 29 | 25 | 24 | 0 | 0 | 78 | 16 | 207 | 100 | 0 | 0 | 323 | 36 | 127 | 23 | 0 | 0 | 186 | 787 |
| 8:30 AM | 21 | 99 | 31 | 0 | 0 | 151 | 17 | 20 | 29 | 0 | 0 | 66 | 12 | 175 | 89 | 0 | 0 | 276 | 39 | 148 | 12 | 0 | 0 | 199 | 692 |
| 8:45 AM | 19 | 154 | 17 | 0 | 0 | 190 | 43 | 21 | 33 | 0 | 0 | 97 | 20 | 167 | 89 | 0 | 0 | 276 | 29 | 74 | 18 | 0 | 0 | 121 | 684 |
| Hourly Total | 85 | 573 | 102 | 0 | 0 | 760 | 140 | 109 | 128 | 0 | 1 | 377 | 67 | 746 | 389 | 0 | 0 | 1202 | 155 | 505 | 68 | 0 | 0 | 728 | 3067 |
| 9:00 AM | 17 | 109 | 23 | 0 | 0 | 149 | 34 | 27 | 22 | 0 | 0 | 83 | 13 | 192 | 46 | 0 | 0 | 251 | 30 | 55 | 14 | 0 | 0 | 99 | 582 |
| 9:15 AM | 15 | 96 | 15 | 0 | 0 | 126 | 32 | 19 | 31 | 0 | 0 | 82 | 16 | 146 | 39 | 0 | 0 | 201 | 15 | 41 | 15 | 0 | 0 | 71 | 480 |
| 9:30 AM | 14 | 123 | 18 | 0 | 0 | 155 | 23 | 28 | 26 | 0 | 0 | 77 | 11 | 152 | 36 | 0 | 0 | 199 | 24 | 36 | 13 | 0 | 0 | 73 | 504 |
| 9:45 AM | 13 | 101 | 10 | 0 | 0 | 124 | 30 | 25 | 37 | 0 | 0 | 92 | 17 | 147 | 36 | 0 | 0 | 200 | 18 | 46 | 15 | 0 | 0 | 79 | 495 |
| Hourly Total | 59 | 429 | 66 | 0 | 0 | 554 | 119 | 99 | 116 | 0 | 0 | 334 | 57 | 637 | 157 | 0 | 0 | 851 | 87 | 178 | 57 | 0 | 0 | 322 | 2061 |
| 10:00 AM | 13 | 107 | 12 | 0 | 0 | 132 | 37 | 17 | 22 | 0 | 0 | 76 | 10 | 115 | 40 | 0 | 0 | 165 | 19 | 29 | 22 | 0 | 0 | 70 | 443 |
| 10:15 AM | 17 | 116 | 25 | 0 | 0 | 158 | 32 | 34 | 28 | 0 | 0 | 94 | 13 | 112 | 30 | 0 | 0 | 155 | 16 | 25 | 13 | 0 | 0 | 54 | 461 |
| 10:30 AM | 14 | 91 | 17 | 0 | 0 | 122 | 39 | 24 | 30 | 0 | 0 | 93 | 13 | 151 | 33 | 0 | 0 | 197 | 17 | 29 | 10 | 0 | 0 | 56 | 468 |
| 10:45 AM | 22 | 106 | 20 | 0 | 0 | 148 | 27 | 29 | 27 | 0 | 0 | 83 | 18 | 137 | 34 | 0 | 0 | 189 | 20 | 33 | 6 | 0 | 0 | 59 | 479 |
| Hourly Total | 66 | 420 | 74 | 0 | 0 | 560 | 135 | 104 | 107 | 0 | 0 | 346 | 54 | 515 | 137 | 0 | 0 | 706 | 72 | 116 | 51 | 0 | 0 | 239 | 1851 |
| 11:00 AM | 17 | 111 | 20 | 1 | 0 | 149 | 37 | 28 | 32 | 0 | 0 | 97 | 18 | 133 | 27 | 0 | 0 | 178 | 25 | 36 | 11 | 0 | 0 | 72 | 496 |
| 11:15 AM | 19 | 111 | 22 | 0 | 0 | 152 | 33 | 27 | 27 | 0 | 0 | 87 | 12 | 120 | 24 | 0 | 0 | 156 | 18 | 32 | 17 | 0 | 0 | 67 | 462 |
| 11:30 AM | 28 | 113 | 21 | 0 | 0 | 162 | 29 | 26 | 25 | 0 | 0 | 80 | 14 | 131 | 43 | 0 | 0 | 188 | 26 | 24 | 11 | 1 | 0 | 62 | 492 |
| 11:45 AM | 24 | 117 | 19 | 0 | 0 | 160 | 36 | 29 | 40 | 0 | 0 | 105 | 15 | 138 | 39 | 0 | 0 | 192 | 26 | 28 | 13 | 0 | 0 | 67 | 524 |
| Hourly Total | 88 | 452 | 82 | 1 | 0 | 623 | 135 | 110 | 124 | 0 | 0 | 369 | 59 | 522 | 133 | 0 | 0 | 714 | 95 | 120 | 52 | 1 | 0 | 268 | 1974 |
| 12:00 PM | 21 | 119 | 28 | 0 | 0 | 168 | 40 | 28 | 35 | 0 | 0 | 103 | 19 | 170 | 33 | 0 | 0 | 222 | 20 | 33 | 10 | 0 | 0 | 63 | 556 |
| 12:15 PM | 18 | 112 | 37 | 0 | 0 | 167 | 31 | 37 | 31 | 1 | 0 | 100 | 16 | 146 | 34 | 0 | 0 | 196 | 27 | 39 | 16 | 0 | 0 | 82 | 545 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 33 | 129 | 24 | 0 | 0 | 186 | 33 | 40 | 39 | 0 | 0 | 112 | 16 | 144 | 30 | 0 | 0 | 190 | 19 | 32 | 12 | 0 | 0 | 63 | 551 |
| 12:45 PM | 16 | 136 | 21 | 0 | 0 | 173 | 43 | 38 | 31 | 0 | 0 | 112 | 16 | 142 | 34 | 1 | 0 | 193 | 13 | 40 | 12 | 0 | 0 | 65 | 543 |
| Hourly Total | 88 | 496 | 110 | 0 | 0 | 694 | 147 | 143 | 136 | 1 | 0 | 427 | 67 | 602 | 131 | 1 | 0 | 801 | 79 | 144 | 50 | 0 | 0 | 273 | 2195 |
| 1:00 PM | 22 | 134 | 17 | 0 | 0 | 173 | 22 | 34 | 24 | 0 | 0 | 80 | 15 | 151 | 46 | 0 | 0 | 212 | 25 | 37 | 13 | 0 | 0 | 75 | 540 |
| 1:15 PM | 24 | 148 | 21 | 0 | 0 | 193 | 44 | 40 | 29 | 0 | 0 | 113 | 12 | 148 | 38 | 0 | 0 | 198 | 30 | 37 | 12 | 0 | 0 | 79 | 583 |
| 1:30 PM | 27 | 118 | 24 | 0 | 0 | 169 | 39 | 38 | 38 | 0 | 0 | 115 | 20 | 153 | 57 | 0 | 0 | 230 | 18 | 39 | 19 | 0 | 0 | 76 | 590 |
| 1:45 PM | 20 | 151 | 29 | 0 | 0 | 200 | 38 | 55 | 35 | 0 | 0 | 128 | 14 | 136 | 44 | 0 | 0 | 194 | 22 | 27 | 13 | 0 | 0 | 62 | 584 |
| Hourly Total | 93 | 551 | 91 | 0 | 0 | 735 | 143 | 167 | 126 | 0 | 0 | 436 | 61 | 588 | 185 | 0 | 0 | 834 | 95 | 140 | 57 | 0 | 0 | 292 | 2297 |
| 2:00 PM | 27 | 116 | 28 | 0 | 0 | 171 | 42 | 39 | 37 | 0 | 0 | 118 | 23 | 115 | 46 | 0 | 0 | 184 | 21 | 40 | 22 | 0 | 0 | 83 | 556 |
| 2:15 PM | 30 | 167 | 29 | 0 | 0 | 226 | 42 | 51 | 31 | 0 | 0 | 124 | 15 | 143 | 44 | 0 | 0 | 202 | 27 | 35 | 23 | 0 | 0 | 85 | 637 |
| 2:30 PM | 32 | 142 | 22 | 0 | 0 | 196 | 69 | 69 | 36 | 0 | 0 | 174 | 23 | 141 | 38 | 0 | 0 | 202 | 26 | 37 | 35 | 0 | 0 | 98 | 670 |
| 2:45 PM | 39 | 201 | 43 | 0 | 0 | 283 | 87 | 76 | 35 | 0 | 0 | 198 | 27 | 164 | 37 | 0 | 0 | 228 | 30 | 30 | 20 | 0 | 0 | 80 | 789 |
| Hourly Total | 128 | 626 | 122 | 0 | 0 | 876 | 240 | 235 | 139 | 0 | 0 | 614 | 88 | 563 | 165 | 0 | 0 | 816 | 104 | 142 | 100 | 0 | 0 | 346 | 2652 |
| 3:00 PM | 27 | 166 | 30 | 0 | 0 | 223 | 90 | 93 | 44 | 1 | 0 | 228 | 19 | 185 | 39 | 0 | 0 | 243 | 25 | 39 | 25 | 0 | 1 | 89 | 783 |
| 3:15 PM | 41 | 201 | 47 | 1 | 0 | 290 | 75 | 76 | 52 | 0 | 0 | 203 | 29 | 164 | 47 | 0 | 0 | 240 | 33 | 37 | 16 | 0 | 1 | 86 | 819 |
| 3:30 PM | 32 | 205 | 33 | 0 | 0 | 270 | 94 | 76 | 67 | 0 | 0 | 237 | 25 | 159 | 48 | 0 | 0 | 232 | 35 | 46 | 49 | 0 | 2 | 130 | 869 |
| 3:45 PM | 46 | 244 | 57 | 0 | 0 | 347 | 114 | 120 | 46 | 0 | 0 | 280 | 24 | 178 | 47 | 0 | 0 | 249 | 31 | 54 | 28 | 1 | 0 | 114 | 990 |
| Hourly Total | 146 | 816 | 167 | 1 | 0 | 1130 | 373 | 365 | 209 | 1 | 0 | 948 | 97 | 686 | 181 | 0 | 0 | 964 | 124 | 176 | 118 | 1 | 4 | 419 | 3461 |
| 4:00 PM | 42 | 233 | 57 | 0 | 0 | 332 | 124 | 130 | 57 | 0 | 0 | 311 | 32 | 163 | 55 | 0 | 0 | 250 | 43 | 54 | 41 | 0 | 0 | 138 | 1031 |
| 4:15 PM | 32 | 275 | 51 | 1 | 0 | 359 | 141 | 165 | 50 | 0 | 0 | 356 | 19 | 192 | 44 | 0 | 0 | 255 | 31 | 44 | 39 | 0 | 1 | 114 | 1084 |
| 4:30 PM | 37 | 284 | 56 | 0 | 0 | 377 | 164 | 166 | 48 | 0 | 1 | 378 | 29 | 206 | 37 | 0 | 0 | 272 | 30 | 56 | 43 | 0 | 0 | 129 | 1156 |
| 4:45 PM | 37 | 307 | 64 | 0 | 0 | 408 | 211 | 163 | 43 | 0 | 0 | 417 | 22 | 194 | 58 | 0 | 0 | 274 | 28 | 58 | 30 | 0 | 0 | 116 | 1215 |
| Hourly Total | 148 | 1099 | 228 | 1 | 0 | 1476 | 640 | 624 | 198 | 0 | 1 | 1462 | 102 | 755 | 194 | 0 | 0 | 1051 | 132 | 212 | 153 | 0 | 1 | 497 | 4486 |
| 5:00 PM | 25 | 263 | 51 | 0 | 0 | 339 | 228 | 159 | 57 | 0 | 0 | 444 | 27 | 234 | 55 | 0 | 0 | 316 | 33 | 41 | 44 | 0 | 0 | 118 | 1217 |
| 5:15 PM | 52 | 315 | 36 | 0 | 0 | 403 | 228 | 196 | 61 | 0 | 0 | 485 | 29 | 238 | 73 | 0 | 0 | 340 | 41 | 53 | 42 | 0 | 0 | 136 | 1364 |
| 5:30 PM | 29 | 256 | 60 | 0 | 0 | 345 | 224 | 171 | 58 | 0 | 0 | 453 | 28 | 235 | 48 | 0 | 0 | 311 | 31 | 66 | 46 | 0 | 0 | 143 | 1252 |
| 5:45 PM | 46 | 224 | 46 | 0 | 0 | 316 | 213 | 150 | 55 | 0 | 0 | 418 | 34 | 203 | 57 | 0 | 0 | 294 | 35 | 53 | 32 | 0 | 1 | 120 | 1148 |
| Hourly Total | 152 | 1058 | 193 | 0 | 0 | 1403 | 893 | 676 | 231 | 0 | 0 | 1800 | 118 | 910 | 233 | 0 | 0 | 1261 | 140 | 213 | 164 | 0 | 1 | 517 | 4981 |
| 6:00 PM | 30 | 239 | 37 | 0 | 0 | 306 | 203 | 131 | 43 | 0 | 0 | 377 | 24 | 162 | 47 | 0 | 0 | 233 | 20 | 49 | 22 | 0 | 0 | 91 | 1007 |
| 6:15 PM | 34 | 231 | 40 | 0 | 1 | 305 | 142 | 121 | 54 | 1 | 0 | 318 | 20 | 176 | 46 | 0 | 0 | 242 | 20 | 33 | 15 | 0 | 2 | 68 | 933 |
| 6:30 PM | 49 | 198 | 30 | 0 | 0 | 277 | 76 | 99 | 41 | 0 | 0 | 216 | 16 | 134 | 43 | 0 | 0 | 193 | 17 | 45 | 13 | 0 | 1 | 75 | 761 |
| 6:45 PM | 35 | 165 | 19 | 0 | 0 | 219 | 70 | 44 | 40 | 0 | 1 | 154 | 10 | 147 | 39 | 0 | 0 | 196 | 23 | 27 | 14 | 1 | 0 | 65 | 634 |
| Hourly Total | 148 | 833 | 126 | 0 | 1 | 1107 | 491 | 395 | 178 | 1 | 1 | 1065 | 70 | 619 | 175 | 0 | 0 | 864 | 80 | 154 | 64 | 1 | 3 | 299 | 3335 |
| 7:00 PM | 29 | 159 | 27 | 0 | 0 | 215 | 47 | 44 | 33 | 0 | 1 | 124 | 8 | 150 | 52 | 0 | 0 | 210 | 14 | 28 | 12 | 0 | 0 | 54 | 603 |
| 7:15 PM | 28 | 132 | 16 | 0 | 0 | 176 | 39 | 38 | 30 | 0 | 0 | 107 | 8 | 142 | 42 | 0 | 0 | 192 | 11 | 18 | 14 | 0 | 0 | 43 | 518 |
| 7:30 PM | 25 | 139 | 14 | 0 | 0 | 178 | 42 | 33 | 17 | 0 | 0 | 92 | 4 | 115 | 35 | 0 | 0 | 154 | 13 | 24 | 12 | 0 | 0 | 49 | 473 |
| 7:45 PM | 35 | 107 | 11 | 0 | 0 | 153 | 25 | 29 | 17 | 0 | 0 | 71 | 9 | 116 | 35 | 0 | 0 | 160 | 7 | 20 | 10 | 0 | 0 | 37 | 421 |
| Hourly Total | 117 | 537 | 68 | 0 | 0 | 722 | 153 | 144 | 97 | 0 | 1 | 394 | 29 | 523 | 164 | 0 | 0 | 716 | 45 | 90 | 48 | 0 | 0 | 183 | 2015 |
| 8:00 PM | 30 | 103 | 8 | 0 | 0 | 141 | 27 | 37 | 27 | 0 | 0 | 91 | 6 | 79 | 28 | 0 | 0 | 113 | 3 | 14 | 6 | 0 | 0 | 23 | 368 |
| 8:15 PM | 21 | 106 | 10 | 0 | 0 | 137 | 24 | 27 | 19 | 0 | 0 | 70 | 5 | 78 | 30 | 0 | 0 | 113 | 7 | 14 | 6 | 0 | 0 | 27 | 347 |
| 8:30 PM | 23 | 100 | 9 | 0 | 0 | 132 | 19 | 13 | 19 | 0 | 0 | 51 | 3 | 102 | 19 | 0 | 0 | 124 | 5 | 13 | 2 | 0 | 0 | 20 | 327 |
| 8:45 PM | 17 | 87 | 6 | 0 | 0 | 110 | 20 | 22 | 12 | 0 | 0 | 54 | 2 | 68 | 28 | 0 | 0 | 98 | 5 | 14 | 3 | 0 | 0 | 22 | 284 |
| Hourly Total | 91 | 396 | 33 | 0 | 0 | 520 | 90 | 99 | 77 | 0 | 0 | 266 | 16 | 327 | 105 | 0 | 0 | 448 | 20 | 55 | 17 | 0 | 0 | 92 | 1326 |
| 9:00 PM | 15 | 87 | 9 | 0 | 0 | 111 | 18 | 19 | 14 | 0 | 0 | 51 | 10 | 70 | 18 | 0 | 0 | 98 | 7 | 10 | 6 | 0 | 0 | 23 | 283 |
| 9:15 PM | 23 | 69 | 4 | 0 | 0 | 96 | 17 | 21 | 13 | 0 | 0 | 51 | 2 | 62 | 29 | 0 | 0 | 93 | 8 | 14 | 6 | 0 | 0 | 28 | 268 |
| 9:30 PM | 22 | 75 | 13 | 0 | 0 | 110 | 20 | 11 | 14 | 0 | 0 | 45 | 6 | 73 | 27 | 0 | 0 | 106 | 1 | 20 | 4 | 0 | 0 | 25 | 286 |
| 9:45 PM | 13 | 62 | 3 | 0 | 0 | 78 | 25 | 8 | 9 | 0 | 0 | 42 | 5 | 42 | 16 | 0 | 0 | 63 | 2 | 18 | 4 | 0 | 0 | 24 | 207 |
| Hourly Total | 73 | 293 | 29 | 0 | 0 | 395 | 80 | 59 | 50 | 0 | 0 | 189 | 23 | 247 | 90 | 0 | 0 | 360 | 18 | 62 | 20 | 0 | 0 | 100 | 1044 |
| 10:00 PM | 12 | 61 | 9 | 0 | 0 | 82 | 19 | 21 | 12 | 0 | 0 | 52 | 5 | 55 | 18 | 0 | 0 | 78 | 4 | 10 | 5 | 0 | 0 | 19 | 231 |
| 10:15 PM | 10 | 55 | 7 | 0 | 0 | 72 | 18 | 16 | 13 | 0 | 0 | 47 | 3 | 50 | 12 | 0 | 0 | 65 | 7 | 4 | 3 | 0 | 0 | 14 | 198 |
| 10:30 PM | 8 | 38 | 4 | 0 | 0 | 50 | 15 | 11 | 6 | 0 | 0 | 32 | 3 | 57 | 14 | 0 | 0 | 74 | 3 | 8 | 7 | 0 | 0 | 18 | 174 |
| 10:45 PM | 3 | 36 | 5 | 0 | 0 | 44 | 18 | 9 | 3 | 0 | 0 | 30 | 1 | 39 | 13 | 0 | 0 | 53 | 1 | 4 | 2 | 0 | 0 | 7 | 134 |
| Hourly Total | 33 | 190 | 25 | 0 | 0 | 248 | 70 | 57 | 34 | 0 | 0 | 161 | 12 | 201 | 57 | 0 | 0 | 270 | 15 | 26 | 17 | 0 | 0 | 58 | 737 |
| 11:00 PM | 8 | 49 | 4 | 0 | 0 | 61 | 21 | 14 | 8 | 0 | 0 | 43 | 1 | 27 | 10 | 0 | 0 | 38 | 4 | 7 | 1 | 0 | 0 | 12 | 154 |
| 11:15 PM | 11 | 37 | 3 | 0 | 0 | 51 | 5 | 14 | 9 | 1 | 0 | 29 | 3 | 37 | 10 | 0 | 0 | 50 | 1 | 3 | 1 | 0 | 0 | 5 | 135 |
| 11:30 PM | 6 | 26 | 5 | 1 | 0 | 38 | 14 | 12 | 5 | 0 | 0 | 31 | 0 | 26 | 11 | 0 | 0 | 37 | 2 | 3 | 1 | 0 | 0 | 6 | 112 |
| 11:45 PM | 4 | 17 | 4 | 0 | 0 | 25 | 7 | 9 | 6 | 0 | 0 | 22 | 0 | 24 | 8 | 0 | 0 | 32 | 0 | 3 | 2 | 0 | 0 | 5 | 84 |
| Hourly Total | 29 | 129 | 16 | 1 | 0 | 175 | 47 | 49 | 28 | 1 | 0 | 125 | 4 | 114 | 39 | 0 | 0 | 157 | 7 | 16 | 5 | 0 | 0 | 28 | 485 |
| Grand Total | 1635 | 10134 | 1751 | 4 | 1 | 13724 | 4290 | 3882 | 2394 | 4 | 4 | 10570 | 1188 | 10837 | 3570 | 1 | 0 | 15596 | 1777 | 3514 | 1256 | 3 | 11 | 6550 | 46440 |
| Approach % | 13.4 | 73.8 | 12.8 | 0.0 | - | - | 40.6 | 36.7 | 22.6 | 0.0 | - | - | 7.6 | 69.5 | 22.9 | 0.0 | - | - | 27.1 | 53.6 | 19.2 | 0.0 | - | - | - |
| Total % | 4.0 | 21.8 | 3.8 | 0.0 | - | 29.6 | 9.2 | 8.4 | 5.2 | 0.0 | - | 22.8 | 2.6 | 23.3 | 7.7 | 0.0 | - | 33.6 | 3.8 | 7.6 | 2.7 | 0.0 | - | 14.1 | - |
| Motorcycles | 0 | 0 | 3 | 0 | - | 3 | 1 | 1 | 3 | 0 | - | 5 | 0 | 1 | 0 | 0 | - | 1 | 3 | 1 | 0 | 0 | - | 4 | 13 |
| % Motorcycles | 0.0 | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 |
| Cars & Light Goods | 1633 | 9327 | 1642 | 4 | - | 12606 | 4005 | 3712 | 2085 | 4 | - | 9806 | 1009 | 10017 | 3293 | 1 | - | 14320 | 1674 | 3274 | 1105 | 3 | - | 6056 | 42788 |
| % Cars & Light Goods | 89.0 | 92.0 | 93.8 | 100.0 | - | 91.9 | 93.4 | 95.6 | 87.1 | 100.0 | - | 92.8 | 84.9 | 92.4 | 92.2 | 100.0 | - | 91.8 | 94.2 | 93.2 | 88.0 | 100.0 | - | 92.5 | 92.1 |
| Buses | 12 | 10 | 5 | 0 | - | 27 | 4 | 18 | 12 | 0 | - | 34 | 1 | 12 | 4 | 0 | - | 17 | 14 | 11 | 1 | 0 | - | 26 | 104 |
| % Buses | 0.7 | 0.1 | 0.3 | 0.0 | - | 0.2 | 0.1 | 0.5 | 0.5 | 0.0 | - | 0.3 | 0.1 | 0.1 | 0.1 | 0.0 | - | 0.1 | 0.8 | 0.3 | 0.1 | 0.0 | - | 0.4 | 0.2 |
| Single-Unit Trucks | 46 | 504 | 51 | 0 | - | 601 | 162 | 79 | 57 | 0 | - | 298 | 128 | 494 | 139 | 0 | - | 761 | 36 | 100 | 91 | 0 | - | 227 | 1887 |
| % Single-Unit Trucks | 2.5 | 5.0 | 2.9 | 0.0 | - | 4.4 | 3.8 | 2.0 | 2.4 | 0.0 | - | 2.8 | 10.8 | 4.6 | 3.9 | 0.0 | - | 4.9 | 2.0 | 2.8 | 7.2 | 0.0 | - | 3.5 | 4.1 |
| Articulated Trucks | 144 | 293 | 50 | 0 | - | 487 | 118 | 72 | 237 | 0 | - | 427 | 50 | 313 | 134 | 0 | - | 497 | 50 | 128 | 59 | 0 | - | 237 | 1648 |
| % Articulated Trucks | 7.8 | 2.9 | 2.9 | 0.0 | - | 3.5 | 2.8 | 1.9 | 9.9 | 0.0 | - | 4.0 | 4.2 | 2.9 | 3.8 | 0.0 | - | 3.2 | 2.8 | 3.6 | 4.7 | 0.0 | - | 3.6 | 3.5 |

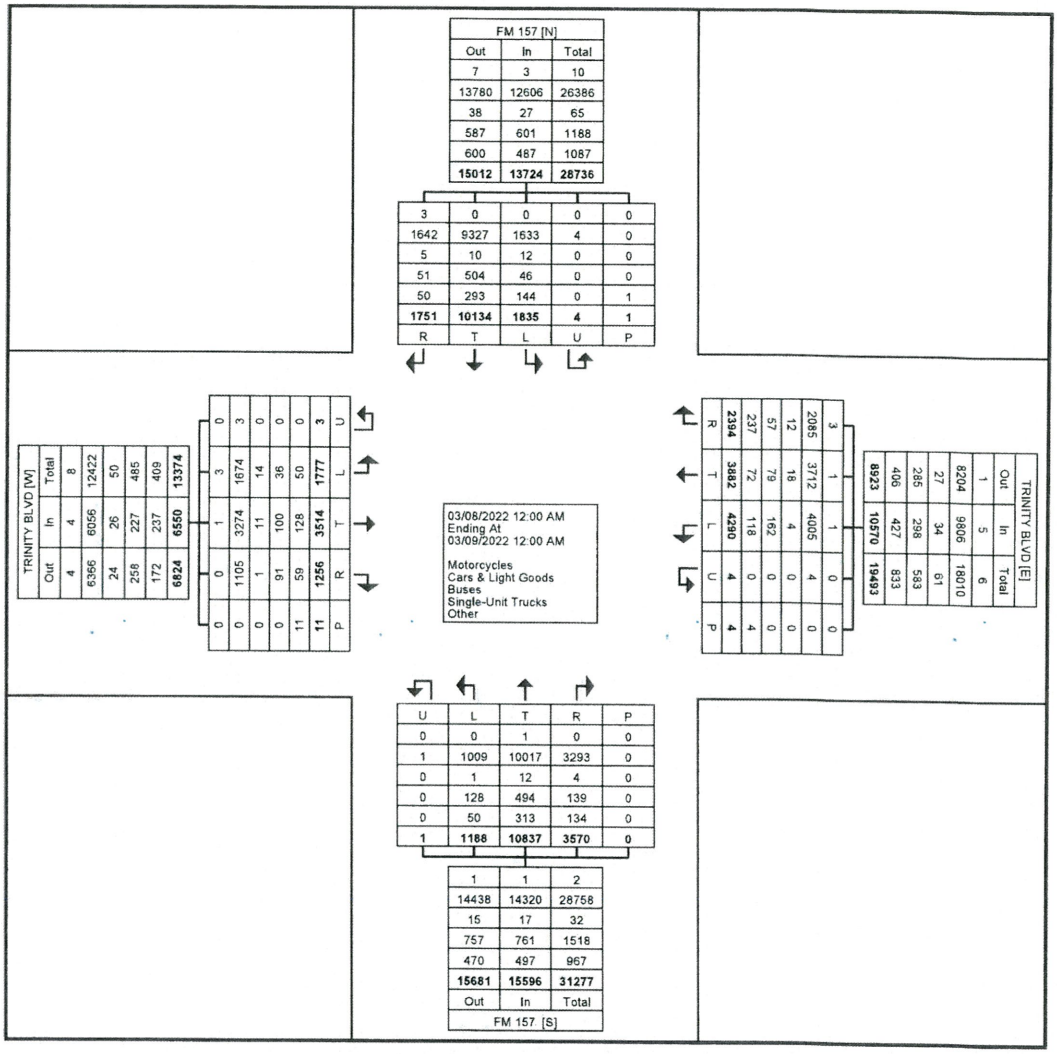
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 4 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 25.0 | - | - | - | - | - | - | - | - | - | - | - | 36.4 | - | - |
| Pedestrians | - | - | - | - | 1 | - | - | - | - | - | 3 | - | - | - | - | - | 0 | - | - | - | - | - | 7 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 75.0 | - | - | - | - | - | - | - | - | - | - | - | 63.6 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022
Page No: 5

## Turning Movement Peak Hour Data (7:15 AM)

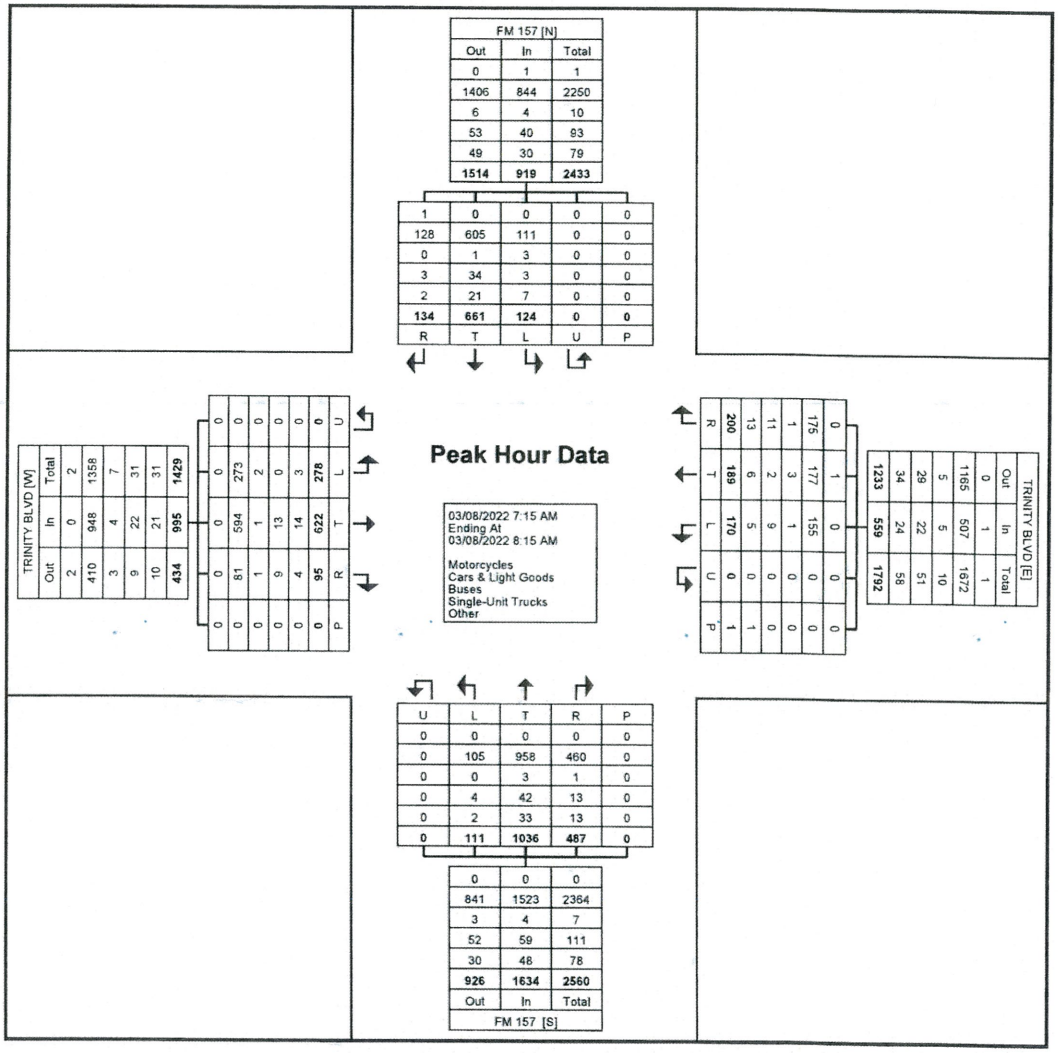
| Start Time | FM 157 Southbound | | | | | | TRINITY BLVD Westbound | | | | | | FM 157 Northbound | | | | | | TRINITY BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 32 | 126 | 24 | 0 | 0 | 182 | 28 | 37 | 53 | 0 | 0 | 118 | 19 | 273 | 121 | 0 | 0 | 413 | 88 | 125 | 26 | 0 | 0 | 239 | 952 |
| 7:30 AM | 36 | 177 | 37 | 0 | 0 | 250 | 50 | 58 | 56 | 0 | 0 | 164 | 34 | 266 | 133 | 0 | 0 | 433 | 76 | 186 | 26 | 0 | 0 | 288 | 1135 |
| 7:45 AM | 36 | 194 | 38 | 0 | 0 | 268 | 41 | 51 | 49 | 0 | 0 | 141 | 39 | 300 | 122 | 0 | 0 | 461 | 63 | 155 | 28 | 0 | 0 | 246 | 1116 |
| 8:00 AM | 20 | 164 | 35 | 0 | 0 | 219 | 51 | 43 | 42 | 0 | 1 | 136 | 19 | 197 | 111 | 0 | 0 | 327 | 51 | 156 | 15 | 0 | 0 | 222 | 904 |
| Total | 124 | 661 | 134 | 0 | 0 | 919 | 170 | 189 | 200 | 0 | 1 | 559 | 111 | 1036 | 487 | 0 | 0 | 1634 | 278 | 622 | 95 | 0 | 0 | 995 | 4107 |
| Approach % | 13.5 | 71.9 | 14.6 | 0.0 | - | - | 30.4 | 33.8 | 35.8 | 0.0 | - | - | 6.8 | 63.4 | 29.8 | 0.0 | - | - | 27.9 | 62.5 | 9.5 | 0.0 | - | - | - |
| Total % | 3.0 | 16.1 | 3.3 | 0.0 | - | 22.4 | 4.1 | 4.6 | 4.9 | 0.0 | - | 13.6 | 2.7 | 25.2 | 11.9 | 0.0 | - | 39.8 | 6.8 | 15.1 | 2.3 | 0.0 | - | 24.2 | - |
| PHF | 0.861 | 0.852 | 0.882 | 0.000 | - | 0.857 | 0.833 | 0.815 | 0.893 | 0.000 | - | 0.852 | 0.712 | 0.863 | 0.915 | 0.000 | - | 0.886 | 0.790 | 0.836 | 0.848 | 0.000 | - | 0.864 | 0.905 |
| Motorcycles | 0 | 0 | 1 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Motorcycles | 0.0 | 0.0 | 0.7 | - | - | 0.1 | 0.0 | 0.5 | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 111 | 605 | 128 | 0 | - | 844 | 155 | 177 | 175 | 0 | - | 507 | 105 | 958 | 460 | 0 | - | 1523 | 273 | 594 | 81 | 0 | - | 948 | 3822 |
| % Cars & Light Goods | 89.5 | 91.5 | 95.5 | - | - | 91.8 | 91.2 | 93.7 | 87.5 | - | - | 90.7 | 94.6 | 92.5 | 94.5 | - | - | 93.2 | 98.2 | 95.5 | 85.3 | - | - | 95.3 | 93.1 |
| Buses | 3 | 1 | 0 | 0 | - | 4 | 1 | 3 | 1 | 0 | - | 5 | 0 | 3 | 1 | 0 | - | 4 | 2 | 1 | 1 | 0 | - | 4 | 17 |
| % Buses | 2.4 | 0.2 | 0.0 | - | - | 0.4 | 0.6 | 1.6 | 0.5 | - | - | 0.9 | 0.0 | 0.3 | 0.2 | - | - | 0.2 | 0.7 | 0.2 | 1.1 | - | - | 0.4 | 0.4 |
| Single-Unit Trucks | 3 | 34 | 3 | 0 | - | 40 | 9 | 2 | 11 | 0 | - | 22 | 4 | 42 | 13 | 0 | - | 59 | 0 | 13 | 9 | 0 | - | 22 | 143 |
| % Single-Unit Trucks | 2.4 | 5.1 | 2.2 | - | - | 4.4 | 5.3 | 1.1 | 5.5 | - | - | 3.9 | 3.6 | 4.1 | 2.7 | - | - | 3.6 | 0.0 | 2.1 | 9.5 | - | - | 2.2 | 3.5 |
| Articulated Trucks | 7 | 21 | 2 | 0 | - | 30 | 5 | 6 | 13 | 0 | - | 24 | 2 | 33 | 13 | 0 | - | 48 | 3 | 14 | 4 | 0 | - | 21 | 123 |
| % Articulated Trucks | 5.6 | 3.2 | 1.5 | - | - | 3.3 | 2.9 | 3.2 | 6.5 | - | - | 4.3 | 1.8 | 3.2 | 2.7 | - | - | 2.9 | 1.1 | 2.3 | 4.2 | - | - | 2.1 | 3.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (4:45 PM)

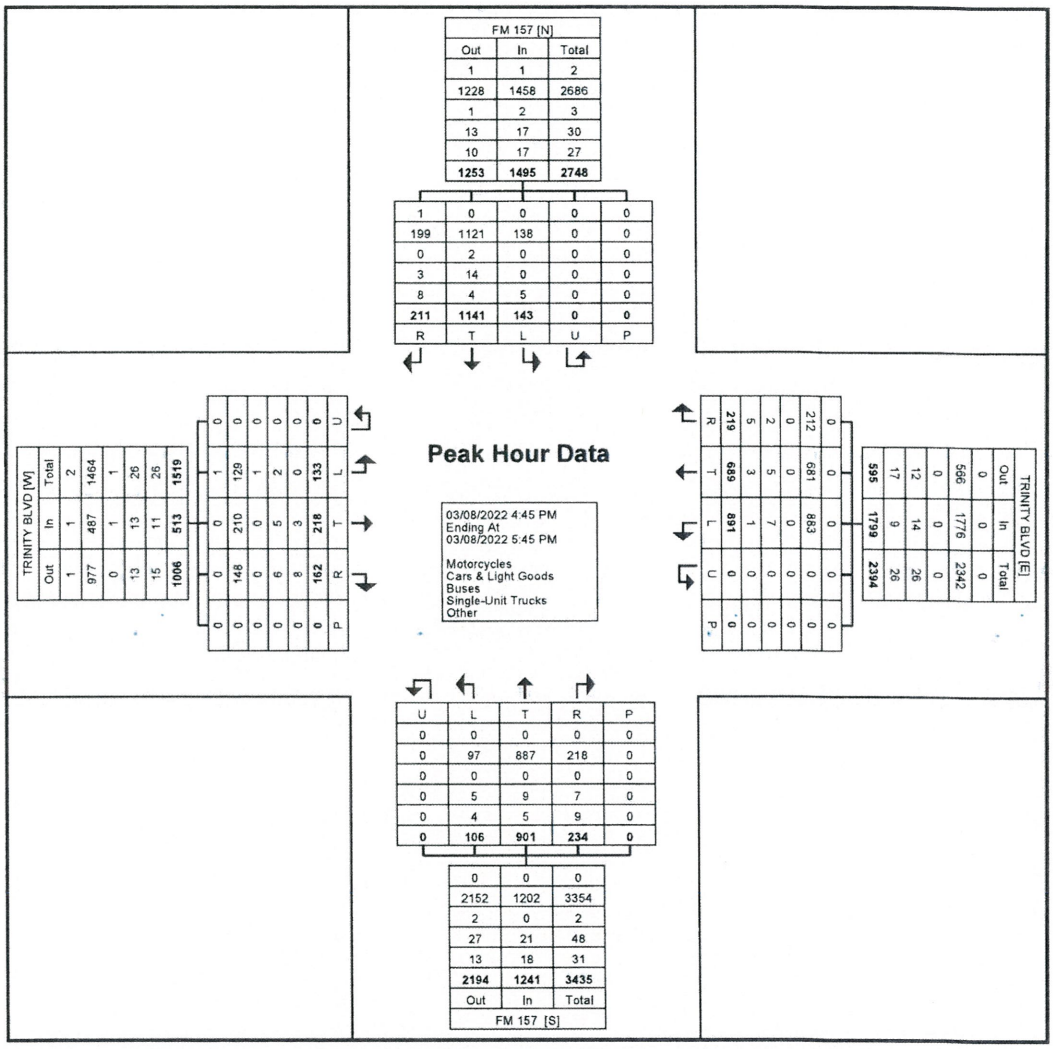
| Start Time | FM 157 Southbound | | | | | | TRINITY BLVD Westbound | | | | | | FM 157 Northbound | | | | | | TRINITY BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:45 PM | 37 | 307 | 64 | 0 | 0 | 408 | 211 | 163 | 43 | 0 | 0 | 417 | 22 | 194 | 58 | 0 | 0 | 274 | 28 | 58 | 30 | 0 | 0 | 116 | 1215 |
| 5:00 PM | 25 | 263 | 51 | 0 | 0 | 339 | 228 | 159 | 57 | 0 | 0 | 444 | 27 | 234 | 55 | 0 | 0 | 316 | 33 | 41 | 44 | 0 | 0 | 118 | 1217 |
| 5:15 PM | 52 | 315 | 36 | 0 | 0 | 403 | 228 | 196 | 61 | 0 | 0 | 485 | 29 | 238 | 73 | 0 | 0 | 340 | 41 | 53 | 42 | 0 | 0 | 136 | 1364 |
| 5:30 PM | 29 | 256 | 60 | 0 | 0 | 345 | 224 | 171 | 58 | 0 | 0 | 453 | 28 | 235 | 48 | 0 | 0 | 311 | 31 | 66 | 46 | 0 | 0 | 143 | 1252 |
| Total | 143 | 1141 | 211 | 0 | 0 | 1495 | 891 | 689 | 219 | 0 | 0 | 1799 | 106 | 901 | 234 | 0 | 0 | 1241 | 133 | 218 | 162 | 0 | 0 | 513 | 5048 |
| Approach % | 9.6 | 76.3 | 14.1 | 0.0 | - | - | 49.5 | 38.3 | 12.2 | 0.0 | - | - | 8.5 | 72.6 | 18.9 | 0.0 | - | - | 25.9 | 42.5 | 31.6 | 0.0 | - | - | - |
| Total % | 2.8 | 22.6 | 4.2 | 0.0 | - | 29.6 | 17.7 | 13.6 | 4.3 | 0.0 | - | 35.6 | 2.1 | 17.8 | 4.6 | 0.0 | - | 24.6 | 2.6 | 4.3 | 3.2 | 0.0 | - | 10.2 | - |
| PHF | 0.688 | 0.906 | 0.824 | 0.000 | - | 0.916 | 0.977 | 0.879 | 0.898 | 0.000 | - | 0.927 | 0.914 | 0.946 | 0.801 | 0.000 | - | 0.913 | 0.811 | 0.826 | 0.880 | 0.000 | - | 0.897 | 0.925 |
| Motorcycles | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 2 |
| % Motorcycles | 0.0 | 0.0 | 0.5 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.8 | 0.0 | 0.0 | - | - | 0.2 | 0.0 |
| Cars & Light Goods | 138 | 1121 | 199 | 0 | - | 1458 | 883 | 681 | 212 | 0 | - | 1776 | 97 | 887 | 218 | 0 | - | 1202 | 129 | 210 | 148 | 0 | - | 487 | 4923 |
| % Cars & Light Goods | 96.5 | 98.2 | 94.3 | - | - | 97.5 | 99.1 | 98.8 | 96.8 | - | - | 98.7 | 91.5 | 98.4 | 93.2 | - | - | 96.9 | 97.0 | 96.3 | 91.4 | - | - | 94.9 | 97.5 |
| Buses | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 3 |
| % Buses | 0.0 | 0.2 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.8 | 0.0 | 0.0 | - | - | 0.2 | 0.1 |
| Single-Unit Trucks | 0 | 14 | 3 | 0 | - | 17 | 7 | 5 | 2 | 0 | - | 14 | 5 | 9 | 7 | 0 | - | 21 | 2 | 5 | 6 | 0 | - | 13 | 65 |
| % Single-Unit Trucks | 0.0 | 1.2 | 1.4 | - | - | 1.1 | 0.8 | 0.7 | 0.9 | - | - | 0.8 | 4.7 | 1.0 | 3.0 | - | - | 1.7 | 1.5 | 2.3 | 3.7 | - | - | 2.5 | 1.3 |
| Articulated Trucks | 5 | 4 | 8 | 0 | - | 17 | 1 | 3 | 5 | 0 | - | 9 | 4 | 5 | 9 | 0 | - | 18 | 0 | 3 | 8 | 0 | - | 11 | 55 |
| % Articulated Trucks | 3.5 | 0.4 | 3.8 | - | - | 1.1 | 0.1 | 0.4 | 2.3 | - | - | 0.5 | 3.8 | 0.6 | 3.8 | - | - | 1.5 | 0.0 | 1.4 | 4.9 | - | - | 2.1 | 1.1 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ TRINITY BLVD
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | CALLOWAY CEMETERY RD Westbound | | | | | | FM 157 Northbound | | | | | | CALLOWAY CEMETERY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 7 | 28 | 1 | 0 | 0 | 36 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 27 | 1 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 67 |
| 12:15 AM | 8 | 31 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 1 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| 12:30 AM | 5 | 17 | 0 | 1 | 0 | 23 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 22 | 2 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 52 |
| 12:45 AM | 0 | 10 | 0 | 0 | 0 | 10 | 1 | 0 | 6 | 0 | 0 | 7 | 0 | 12 | 1 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Hourly Total | 20 | 86 | 1 | 1 | 0 | 108 | 2 | 0 | 13 | 0 | 0 | 15 | 0 | 82 | 5 | 0 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 210 |
| 1:00 AM | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 9 | 4 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 1:15 AM | 1 | 13 | 0 | 0 | 0 | 14 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 12 | 2 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 1:30 AM | 1 | 16 | 1 | 0 | 0 | 18 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 9 | 1 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 1 | 31 |
| 1:45 AM | 4 | 15 | 0 | 0 | 0 | 19 | 4 | 0 | 10 | 0 | 0 | 14 | 0 | 12 | 3 | 0 | 0 | 15 | 1 | 0 | 0 | 0 | 0 | 1 | 49 |
| Hourly Total | 6 | 66 | 1 | 0 | 0 | 73 | 7 | 0 | 18 | 0 | 0 | 25 | 0 | 42 | 10 | 0 | 0 | 52 | 1 | 0 | 1 | 0 | 0 | 2 | 152 |
| 2:00 AM | 6 | 16 | 0 | 0 | 0 | 22 | 3 | 0 | 11 | 0 | 1 | 14 | 0 | 16 | 7 | 0 | 1 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 59 |
| 2:15 AM | 5 | 17 | 0 | 0 | 0 | 22 | 4 | 0 | 14 | 0 | 0 | 18 | 0 | 10 | 2 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 52 |
| 2:30 AM | 2 | 16 | 0 | 0 | 0 | 18 | 5 | 0 | 3 | 0 | 0 | 8 | 0 | 9 | 3 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 2:45 AM | 4 | 14 | 0 | 0 | 0 | 18 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 16 | 2 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| Hourly Total | 17 | 63 | 0 | 0 | 0 | 80 | 12 | 0 | 35 | 0 | 1 | 47 | 0 | 51 | 14 | 0 | 1 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 192 |
| 3:00 AM | 7 | 8 | 0 | 0 | 0 | 15 | 3 | 0 | 6 | 0 | 0 | 9 | 0 | 13 | 3 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 3:15 AM | 4 | 10 | 0 | 0 | 0 | 14 | 2 | 0 | 7 | 0 | 0 | 9 | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| 3:30 AM | 2 | 7 | 0 | 0 | 0 | 9 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 21 | 1 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 3:45 AM | 3 | 7 | 0 | 0 | 0 | 10 | 2 | 0 | 2 | 0 | 0 | 4 | 0 | 17 | 3 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| Hourly Total | 16 | 32 | 0 | 0 | 0 | 48 | 8 | 0 | 19 | 0 | 0 | 27 | 0 | 71 | 7 | 0 | 0 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 153 |
| 4:00 AM | 1 | 15 | 0 | 0 | 0 | 16 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 30 | 2 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 52 |
| 4:15 AM | 4 | 21 | 0 | 1 | 0 | 26 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| 4:30 AM | 10 | 15 | 0 | 0 | 0 | 25 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 43 | 1 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| 4:45 AM | 7 | 22 | 0 | 0 | 0 | 29 | 1 | 0 | 3 | 0 | 0 | 4 | 0 | 48 | 3 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 84 |
| Hourly Total | 22 | 73 | 0 | 1 | 0 | 96 | 3 | 0 | 10 | 0 | 0 | 13 | 0 | 151 | 6 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 266 |
| 5:00 AM | 10 | 23 | 0 | 0 | 0 | 33 | 2 | 0 | 7 | 0 | 0 | 9 | 0 | 68 | 4 | 0 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 114 |
| 5:15 AM | 12 | 27 | 0 | 0 | 0 | 39 | 2 | 0 | 5 | 0 | 0 | 7 | 0 | 89 | 2 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 137 |
| 5:30 AM | 5 | 40 | 0 | 0 | 0 | 45 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 143 | 8 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 201 |
| 5:45 AM | 12 | 59 | 0 | 0 | 0 | 71 | 2 | 0 | 7 | 0 | 0 | 9 | 0 | 131 | 3 | 0 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 0 | 214 |
| Hourly Total | 39 | 149 | 0 | 0 | 0 | 188 | 7 | 0 | 23 | 0 | 0 | 30 | 0 | 431 | 17 | 0 | 0 | 448 | 0 | 0 | 0 | 0 | 0 | 0 | 666 |
| 6:00 AM | 7 | 56 | 1 | 0 | 0 | 64 | 1 | 0 | 9 | 0 | 0 | 10 | 0 | 174 | 2 | 1 | 0 | 177 | 0 | 0 | 0 | 0 | 0 | 0 | 251 |
| 6:15 AM | 11 | 77 | 0 | 0 | 0 | 88 | 3 | 0 | 7 | 0 | 0 | 10 | 0 | 193 | 7 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 298 |
| 6:30 AM | 15 | 95 | 0 | 0 | 0 | 110 | 3 | 0 | 4 | 0 | 0 | 7 | 0 | 316 | 5 | 1 | 0 | 322 | 0 | 0 | 0 | 0 | 0 | 0 | 439 |
| 6:45 AM | 14 | 102 | 0 | 0 | 0 | 116 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 292 | 9 | 0 | 0 | 301 | 0 | 0 | 0 | 0 | 0 | 0 | 424 |
| Hourly Total | 47 | 330 | 1 | 0 | 0 | 378 | 7 | 0 | 27 | 0 | 0 | 34 | 0 | 975 | 23 | 2 | 0 | 1000 | 0 | 0 | 0 | 0 | 0 | 0 | 1412 |
| 7:00 AM | 20 | 145 | 0 | 0 | 0 | 165 | 2 | 0 | 18 | 0 | 0 | 20 | 0 | 280 | 3 | 0 | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | 468 |
| 7:15 AM | 7 | 162 | 1 | 0 | 0 | 170 | 3 | 0 | 20 | 0 | 0 | 23 | 1 | 354 | 3 | 0 | 0 | 358 | 0 | 0 | 0 | 0 | 0 | 0 | 551 |
| 7:30 AM | 12 | 247 | 0 | 0 | 0 | 259 | 0 | 0 | 16 | 0 | 0 | 16 | 0 | 437 | 7 | 0 | 0 | 444 | 0 | 0 | 0 | 0 | 0 | 0 | 719 |
| 7:45 AM | 8 | 226 | 0 | 1 | 0 | 235 | 1 | 0 | 10 | 0 | 0 | 11 | 0 | 373 | 7 | 0 | 0 | 380 | 1 | 0 | 0 | 0 | 0 | 1 | 627 |
| Hourly Total | 47 | 780 | 1 | 1 | 0 | 829 | 6 | 0 | 64 | 0 | 0 | 70 | 1 | 1444 | 20 | 0 | 0 | 1465 | 1 | 0 | 0 | 0 | 0 | 1 | 2365 |
| 8:00 AM | 14 | 232 | 0 | 0 | 0 | 246 | 5 | 0 | 13 | 0 | 1 | 18 | 0 | 323 | 5 | 0 | 0 | 328 | 0 | 0 | 0 | 0 | 0 | 0 | 592 |
| 8:15 AM | 11 | 183 | 0 | 0 | 0 | 194 | 2 | 0 | 9 | 0 | 0 | 11 | 1 | 296 | 1 | 0 | 0 | 298 | 0 | 0 | 0 | 0 | 0 | 0 | 503 |
| 8:30 AM | 8 | 132 | 1 | 0 | 0 | 141 | 4 | 0 | 11 | 0 | 0 | 15 | 0 | 300 | 3 | 0 | 0 | 303 | 0 | 0 | 0 | 0 | 0 | 0 | 459 |
| 8:45 AM | 13 | 197 | 1 | 0 | 0 | 211 | 2 | 0 | 11 | 0 | 0 | 13 | 0 | 230 | 6 | 1 | 0 | 237 | 2 | 0 | 1 | 0 | 0 | 3 | 464 |
| Hourly Total | 46 | 744 | 2 | 0 | 0 | 792 | 13 | 0 | 44 | 0 | 1 | 57 | 1 | 1149 | 15 | 1 | 0 | 1166 | 2 | 0 | 1 | 0 | 0 | 3 | 2018 |
| 9:00 AM | 7 | 156 | 0 | 0 | 0 | 163 | 3 | 0 | 20 | 0 | 0 | 23 | 0 | 212 | 4 | 0 | 0 | 216 | 0 | 0 | 0 | 0 | 0 | 0 | 402 |
| 9:15 AM | 8 | 132 | 0 | 0 | 0 | 140 | 5 | 0 | 11 | 0 | 0 | 16 | 0 | 175 | 8 | 0 | 0 | 183 | 0 | 0 | 0 | 0 | 0 | 0 | 339 |
| 9:30 AM | 18 | 141 | 0 | 1 | 0 | 160 | 2 | 0 | 11 | 0 | 0 | 13 | 0 | 201 | 4 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 378 |
| 9:45 AM | 18 | 133 | 0 | 0 | 0 | 151 | 9 | 0 | 12 | 0 | 0 | 21 | 0 | 161 | 8 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 341 |
| Hourly Total | 51 | 562 | 0 | 1 | 0 | 614 | 19 | 0 | 54 | 0 | 0 | 73 | 0 | 749 | 24 | 0 | 0 | 773 | 0 | 0 | 0 | 0 | 0 | 0 | 1460 |
| 10:00 AM | 24 | 132 | 0 | 0 | 0 | 156 | 7 | 0 | 17 | 0 | 0 | 24 | 0 | 147 | 4 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 331 |
| 10:15 AM | 17 | 148 | 0 | 0 | 0 | 165 | 5 | 0 | 19 | 0 | 0 | 24 | 1 | 151 | 7 | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 348 |
| 10:30 AM | 7 | 139 | 0 | 0 | 0 | 146 | 3 | 0 | 16 | 0 | 0 | 19 | 0 | 167 | 7 | 0 | 0 | 174 | 0 | 0 | 0 | 0 | 0 | 0 | 339 |
| 10:45 AM | 15 | 123 | 0 | 0 | 0 | 138 | 9 | 0 | 18 | 0 | 0 | 27 | 0 | 187 | 10 | 0 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 362 |
| Hourly Total | 63 | 542 | 0 | 0 | 0 | 605 | 24 | 0 | 70 | 0 | 0 | 94 | 1 | 652 | 28 | 0 | 0 | 681 | 0 | 0 | 0 | 0 | 0 | 0 | 1380 |
| 11:00 AM | 12 | 145 | 0 | 0 | 0 | 157 | 9 | 0 | 9 | 0 | 0 | 18 | 0 | 159 | 4 | 0 | 0 | 163 | 0 | 0 | 0 | 0 | 0 | 0 | 338 |
| 11:15 AM | 13 | 148 | 0 | 0 | 0 | 161 | 4 | 0 | 12 | 0 | 0 | 16 | 0 | 155 | 5 | 0 | 0 | 160 | 1 | 0 | 0 | 0 | 0 | 1 | 338 |
| 11:30 AM | 13 | 142 | 0 | 1 | 0 | 156 | 5 | 0 | 12 | 0 | 0 | 17 | 0 | 165 | 7 | 0 | 0 | 172 | 0 | 0 | 0 | 0 | 0 | 0 | 345 |
| 11:45 AM | 18 | 151 | 0 | 0 | 0 | 169 | 7 | 0 | 13 | 0 | 0 | 20 | 0 | 187 | 9 | 0 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 385 |
| Hourly Total | 56 | 586 | 0 | 1 | 0 | 643 | 25 | 0 | 46 | 0 | 0 | 71 | 0 | 666 | 25 | 0 | 0 | 691 | 1 | 0 | 0 | 0 | 0 | 1 | 1406 |
| 12:00 PM | 14 | 157 | 0 | 2 | 0 | 173 | 8 | 0 | 15 | 0 | 0 | 23 | 0 | 196 | 1 | 1 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 0 | 394 |
| 12:15 PM | 17 | 146 | 0 | 0 | 0 | 163 | 4 | 0 | 22 | 0 | 0 | 26 | 0 | 170 | 5 | 0 | 0 | 175 | 0 | 0 | 0 | 0 | 0 | 0 | 364 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 14 | 159 | 0 | 1 | 0 | 174 | 2 | 0 | 13 | 0 | 0 | 15 | 0 | 216 | 7 | 0 | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 0 | 412 |
| 12:45 PM | 18 | 158 | 0 | 1 | 0 | 177 | 8 | 0 | 18 | 0 | 0 | 26 | 0 | 155 | 4 | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 362 |
| Hourly Total | 63 | 620 | 0 | 4 | 0 | 687 | 22 | 0 | 68 | 0 | 0 | 90 | 0 | 737 | 17 | 1 | 0 | 755 | 0 | 0 | 0 | 0 | 0 | 0 | 1532 |
| 1:00 PM | 20 | 150 | 0 | 3 | 0 | 173 | 5 | 0 | 12 | 0 | 0 | 17 | 1 | 178 | 12 | 0 | 0 | 191 | 1 | 0 | 0 | 0 | 0 | 1 | 382 |
| 1:15 PM | 13 | 187 | 0 | 1 | 0 | 201 | 9 | 0 | 17 | 0 | 0 | 26 | 0 | 201 | 7 | 0 | 0 | 208 | 0 | 0 | 0 | 0 | 0 | 0 | 435 |
| 1:30 PM | 17 | 170 | 0 | 0 | 0 | 187 | 7 | 0 | 17 | 0 | 0 | 24 | 0 | 191 | 7 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 0 | 409 |
| 1:45 PM | 20 | 181 | 4 | 0 | 0 | 205 | 8 | 0 | 15 | 0 | 0 | 23 | 0 | 181 | 10 | 1 | 0 | 192 | 1 | 0 | 2 | 0 | 0 | 3 | 423 |
| Hourly Total | 70 | 688 | 4 | 4 | 0 | 766 | 29 | 0 | 61 | 0 | 0 | 90 | 1 | 751 | 36 | 1 | 0 | 789 | 2 | 0 | 2 | 0 | 0 | 4 | 1649 |
| 2:00 PM | 9 | 160 | 0 | 0 | 0 | 169 | 4 | 0 | 12 | 0 | 0 | 16 | 0 | 170 | 5 | 1 | 0 | 176 | 0 | 0 | 0 | 0 | 0 | 0 | 361 |
| 2:15 PM | 11 | 232 | 1 | 1 | 0 | 245 | 7 | 0 | 12 | 0 | 0 | 19 | 0 | 195 | 10 | 0 | 0 | 205 | 1 | 0 | 0 | 0 | 0 | 1 | 470 |
| 2:30 PM | 14 | 230 | 0 | 1 | 0 | 245 | 9 | 0 | 16 | 0 | 0 | 25 | 0 | 189 | 8 | 1 | 0 | 198 | 1 | 0 | 0 | 0 | 0 | 1 | 469 |
| 2:45 PM | 13 | 269 | 0 | 1 | 0 | 283 | 8 | 0 | 12 | 0 | 0 | 20 | 0 | 204 | 9 | 0 | 0 | 213 | 1 | 0 | 1 | 0 | 1 | 2 | 518 |
| Hourly Total | 47 | 891 | 1 | 3 | 0 | 942 | 28 | 0 | 52 | 0 | 0 | 80 | 0 | 758 | 32 | 2 | 0 | 792 | 3 | 0 | 1 | 0 | 1 | 4 | 1818 |
| 3:00 PM | 10 | 301 | 0 | 0 | 0 | 311 | 5 | 0 | 20 | 0 | 0 | 25 | 0 | 228 | 7 | 0 | 0 | 235 | 0 | 0 | 0 | 0 | 0 | 0 | 571 |
| 3:15 PM | 14 | 267 | 1 | 0 | 0 | 282 | 7 | 0 | 16 | 0 | 0 | 23 | 0 | 238 | 14 | 0 | 0 | 252 | 1 | 0 | 0 | 0 | 1 | 1 | 558 |
| 3:30 PM | 10 | 306 | 0 | 0 | 0 | 316 | 10 | 0 | 12 | 0 | 0 | 22 | 0 | 261 | 10 | 0 | 0 | 271 | 0 | 0 | 0 | 0 | 2 | 0 | 609 |
| 3:45 PM | 13 | 366 | 0 | 0 | 0 | 379 | 11 | 0 | 15 | 0 | 0 | 26 | 0 | 201 | 9 | 0 | 0 | 210 | 0 | 0 | 0 | 0 | 0 | 0 | 615 |
| Hourly Total | 47 | 1240 | 1 | 0 | 0 | 1288 | 33 | 0 | 63 | 0 | 0 | 96 | 0 | 928 | 40 | 0 | 0 | 968 | 1 | 0 | 0 | 0 | 3 | 1 | 2353 |
| 4:00 PM | 8 | 381 | 0 | 0 | 0 | 389 | 9 | 0 | 15 | 0 | 0 | 24 | 0 | 245 | 2 | 0 | 0 | 247 | 0 | 0 | 0 | 0 | 1 | 0 | 660 |
| 4:15 PM | 10 | 450 | 0 | 0 | 0 | 460 | 12 | 0 | 11 | 0 | 0 | 23 | 0 | 227 | 4 | 1 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 715 |
| 4:30 PM | 10 | 504 | 0 | 0 | 0 | 514 | 12 | 0 | 13 | 0 | 0 | 25 | 0 | 270 | 6 | 0 | 0 | 276 | 0 | 0 | 0 | 0 | 0 | 0 | 815 |
| 4:45 PM | 7 | 554 | 0 | 0 | 0 | 561 | 21 | 0 | 16 | 0 | 0 | 37 | 0 | 239 | 5 | 0 | 0 | 244 | 0 | 0 | 0 | 0 | 0 | 0 | 842 |
| Hourly Total | 35 | 1889 | 0 | 0 | 0 | 1924 | 54 | 0 | 55 | 0 | 0 | 109 | 0 | 981 | 17 | 1 | 0 | 999 | 0 | 0 | 0 | 0 | 1 | 0 | 3032 |
| 5:00 PM | 10 | 548 | 0 | 0 | 0 | 558 | 14 | 0 | 11 | 0 | 0 | 25 | 0 | 314 | 6 | 0 | 0 | 320 | 0 | 0 | 0 | 0 | 1 | 0 | 903 |
| 5:15 PM | 8 | 588 | 0 | 2 | 0 | 598 | 8 | 0 | 14 | 0 | 0 | 22 | 0 | 317 | 6 | 0 | 0 | 323 | 0 | 0 | 0 | 0 | 0 | 0 | 943 |
| 5:30 PM | 4 | 537 | 0 | 0 | 0 | 541 | 13 | 0 | 10 | 0 | 0 | 23 | 0 | 298 | 5 | 0 | 0 | 303 | 0 | 0 | 0 | 0 | 0 | 0 | 867 |
| 5:45 PM | 3 | 472 | 0 | 1 | 0 | 476 | 13 | 0 | 11 | 0 | 0 | 24 | 0 | 284 | 4 | 0 | 0 | 288 | 0 | 0 | 0 | 0 | 1 | 0 | 788 |
| Hourly Total | 25 | 2145 | 0 | 3 | 0 | 2173 | 48 | 0 | 46 | 0 | 0 | 94 | 0 | 1213 | 21 | 0 | 0 | 1234 | 0 | 0 | 0 | 0 | 2 | 0 | 3501 |
| 6:00 PM | 10 | 444 | 1 | 1 | 0 | 456 | 10 | 0 | 13 | 0 | 0 | 23 | 0 | 210 | 3 | 0 | 0 | 213 | 1 | 0 | 0 | 0 | 1 | 1 | 693 |
| 6:15 PM | 2 | 367 | 0 | 0 | 0 | 369 | 5 | 0 | 10 | 0 | 0 | 15 | 0 | 227 | 5 | 2 | 0 | 234 | 0 | 0 | 0 | 0 | 0 | 0 | 618 |
| 6:30 PM | 6 | 273 | 0 | 1 | 0 | 280 | 8 | 0 | 8 | 0 | 0 | 16 | 0 | 205 | 2 | 0 | 0 | 207 | 0 | 0 | 0 | 0 | 0 | 0 | 503 |
| 6:45 PM | 11 | 230 | 0 | 1 | 0 | 242 | 6 | 0 | 8 | 0 | 0 | 14 | 0 | 184 | 3 | 1 | 0 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 444 |
| Hourly Total | 29 | 1314 | 1 | 3 | 0 | 1347 | 29 | 0 | 39 | 0 | 0 | 68 | 0 | 826 | 13 | 3 | 0 | 842 | 1 | 0 | 0 | 0 | 1 | 1 | 2258 |
| 7:00 PM | 4 | 204 | 0 | 0 | 0 | 208 | 4 | 0 | 6 | 0 | 0 | 10 | 0 | 184 | 7 | 0 | 0 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 409 |
| 7:15 PM | 1 | 185 | 0 | 1 | 0 | 187 | 4 | 0 | 7 | 0 | 0 | 11 | 0 | 192 | 7 | 0 | 0 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 397 |
| 7:30 PM | 2 | 198 | 0 | 0 | 0 | 200 | 4 | 0 | 3 | 0 | 0 | 7 | 0 | 140 | 2 | 0 | 0 | 142 | 0 | 0 | 0 | 0 | 0 | 0 | 349 |
| 7:45 PM | 9 | 126 | 0 | 1 | 0 | 136 | 2 | 0 | 3 | 0 | 0 | 5 | 0 | 131 | 0 | 0 | 0 | 131 | 0 | 0 | 0 | 0 | 0 | 0 | 272 |
| Hourly Total | 16 | 713 | 0 | 2 | 0 | 731 | 14 | 0 | 19 | 0 | 0 | 33 | 0 | 647 | 16 | 0 | 0 | 663 | 0 | 0 | 0 | 0 | 0 | 0 | 1427 |
| 8:00 PM | 3 | 135 | 0 | 0 | 0 | 138 | 4 | 0 | 9 | 0 | 0 | 13 | 0 | 104 | 3 | 0 | 0 | 107 | 0 | 0 | 0 | 0 | 0 | 0 | 258 |
| 8:15 PM | 1 | 132 | 0 | 0 | 0 | 133 | 1 | 0 | 6 | 0 | 0 | 7 | 0 | 119 | 3 | 0 | 0 | 122 | 0 | 0 | 0 | 0 | 0 | 0 | 262 |
| 8:30 PM | 5 | 115 | 0 | 0 | 0 | 120 | 4 | 0 | 5 | 0 | 0 | 9 | 0 | 114 | 3 | 0 | 0 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 246 |
| 8:45 PM | 8 | 102 | 0 | 0 | 0 | 110 | 3 | 0 | 5 | 0 | 0 | 8 | 0 | 93 | 2 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 213 |
| Hourly Total | 17 | 484 | 0 | 0 | 0 | 501 | 12 | 0 | 25 | 0 | 0 | 37 | 0 | 430 | 11 | 0 | 0 | 441 | 0 | 0 | 0 | 0 | 0 | 0 | 979 |
| 9:00 PM | 8 | 97 | 0 | 0 | 0 | 105 | 3 | 0 | 6 | 0 | 0 | 9 | 0 | 77 | 4 | 0 | 0 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | 195 |
| 9:15 PM | 3 | 88 | 0 | 0 | 0 | 91 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 90 | 6 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 192 |
| 9:30 PM | 2 | 94 | 0 | 0 | 0 | 96 | 1 | 0 | 3 | 0 | 0 | 4 | 0 | 105 | 5 | 0 | 0 | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 210 |
| 9:45 PM | 6 | 85 | 0 | 0 | 0 | 91 | 1 | 0 | 6 | 0 | 0 | 7 | 0 | 58 | 1 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 157 |
| Hourly Total | 19 | 364 | 0 | 0 | 0 | 383 | 6 | 0 | 19 | 0 | 0 | 25 | 0 | 330 | 16 | 0 | 0 | 346 | 0 | 0 | 0 | 0 | 0 | 0 | 754 |
| 10:00 PM | 4 | 82 | 0 | 0 | 0 | 86 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 75 | 2 | 0 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 168 |
| 10:15 PM | 4 | 75 | 0 | 0 | 0 | 79 | 2 | 0 | 4 | 0 | 0 | 6 | 0 | 59 | 3 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 147 |
| 10:30 PM | 5 | 54 | 0 | 0 | 0 | 59 | 3 | 0 | 3 | 0 | 0 | 6 | 0 | 71 | 3 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 139 |
| 10:45 PM | 7 | 50 | 0 | 0 | 0 | 57 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 54 | 2 | 0 | 0 | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 117 |
| Hourly Total | 20 | 261 | 0 | 0 | 0 | 281 | 6 | 0 | 15 | 0 | 0 | 21 | 0 | 259 | 10 | 0 | 0 | 269 | 0 | 0 | 0 | 0 | 0 | 0 | 571 |
| 11:00 PM | 7 | 57 | 0 | 1 | 0 | 65 | 2 | 0 | 4 | 0 | 0 | 6 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 107 |
| 11:15 PM | 4 | 40 | 0 | 0 | 0 | 44 | 5 | 0 | 4 | 0 | 0 | 9 | 0 | 43 | 2 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 98 |
| 11:30 PM | 2 | 37 | 0 | 0 | 0 | 39 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 33 | 3 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 80 |
| 11:45 PM | 1 | 22 | 0 | 0 | 0 | 23 | 2 | 0 | 2 | 0 | 0 | 4 | 0 | 31 | 4 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| Hourly Total | 14 | 156 | 0 | 1 | 0 | 171 | 10 | 0 | 14 | 0 | 0 | 24 | 0 | 142 | 10 | 0 | 0 | 152 | 0 | 0 | 0 | 0 | 0 | 0 | 347 |
| Grand Total | 832 | 14778 | 13 | 25 | 0 | 15648 | 424 | 0 | 899 | 0 | 2 | 1323 | 4 | 14465 | 433 | 11 | 1 | 14913 | 12 | 0 | 5 | 0 | 8 | 17 | 31901 |
| Approach % | 5.3 | 94.4 | 0.1 | 0.2 | - | - | 32.0 | 0.0 | 68.0 | 0.0 | - | - | 0.0 | 97.0 | 2.9 | 0.1 | - | - | 70.6 | 0.0 | 29.4 | 0.0 | - | - | - |
| Total % | 2.6 | 46.3 | 0.0 | 0.1 | - | 49.1 | 1.3 | 0.0 | 2.8 | 0.0 | - | 4.1 | 0.0 | 45.3 | 1.4 | 0.0 | - | 46.7 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | - |
| Motorcycles | 0 | 3 | 0 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 4 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 334 | 14051 | 12 | 24 | - | 14421 | 245 | 0 | 379 | 0 | - | 624 | 4 | 13713 | 253 | 10 | - | 13980 | 11 | 0 | 5 | 0 | - | 16 | 29041 |
| % Cars & Light Goods | 40.1 | 95.1 | 92.3 | 96.0 | - | 92.2 | 57.8 | - | 42.2 | - | - | 47.2 | 100.0 | 94.8 | 58.4 | 90.9 | - | 93.7 | 91.7 | - | 100.0 | - | - | 94.1 | 91.0 |
| Buses | 1 | 12 | 0 | 0 | - | 13 | 0 | 0 | 1 | 0 | - | 1 | 0 | 16 | 0 | 0 | - | 16 | 0 | 0 | 0 | 0 | - | 0 | 30 |
| % Buses | 0.1 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | 0.1 | - | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | 0.0 | - | - | 0.0 | 0.1 |
| Single-Unit Trucks | 208 | 541 | 1 | 0 | - | 750 | 99 | 0 | 219 | 0 | - | 318 | 0 | 551 | 112 | 1 | - | 664 | 1 | 0 | 0 | 0 | - | 1 | 1733 |
| % Single-Unit Trucks | 25.0 | 3.7 | 7.7 | 0.0 | - | 4.8 | 23.3 | - | 24.4 | - | - | 24.0 | 0.0 | 3.8 | 25.9 | 9.1 | - | 4.5 | 8.3 | - | 0.0 | - | - | 5.9 | 5.4 |
| Articulated Trucks | 289 | 171 | 0 | 1 | - | 461 | 80 | 0 | 300 | 0 | - | 380 | 0 | 184 | 68 | 0 | - | 252 | 0 | 0 | 0 | 0 | - | 0 | 1093 |
| % Articulated Trucks | 34.7 | 1.2 | 0.0 | 4.0 | - | 2.9 | 18.9 | - | 33.4 | - | - | 28.7 | 0.0 | 1.3 | 15.7 | 0.0 | - | 1.7 | 0.0 | - | 0.0 | - | - | 0.0 | 3.4 |

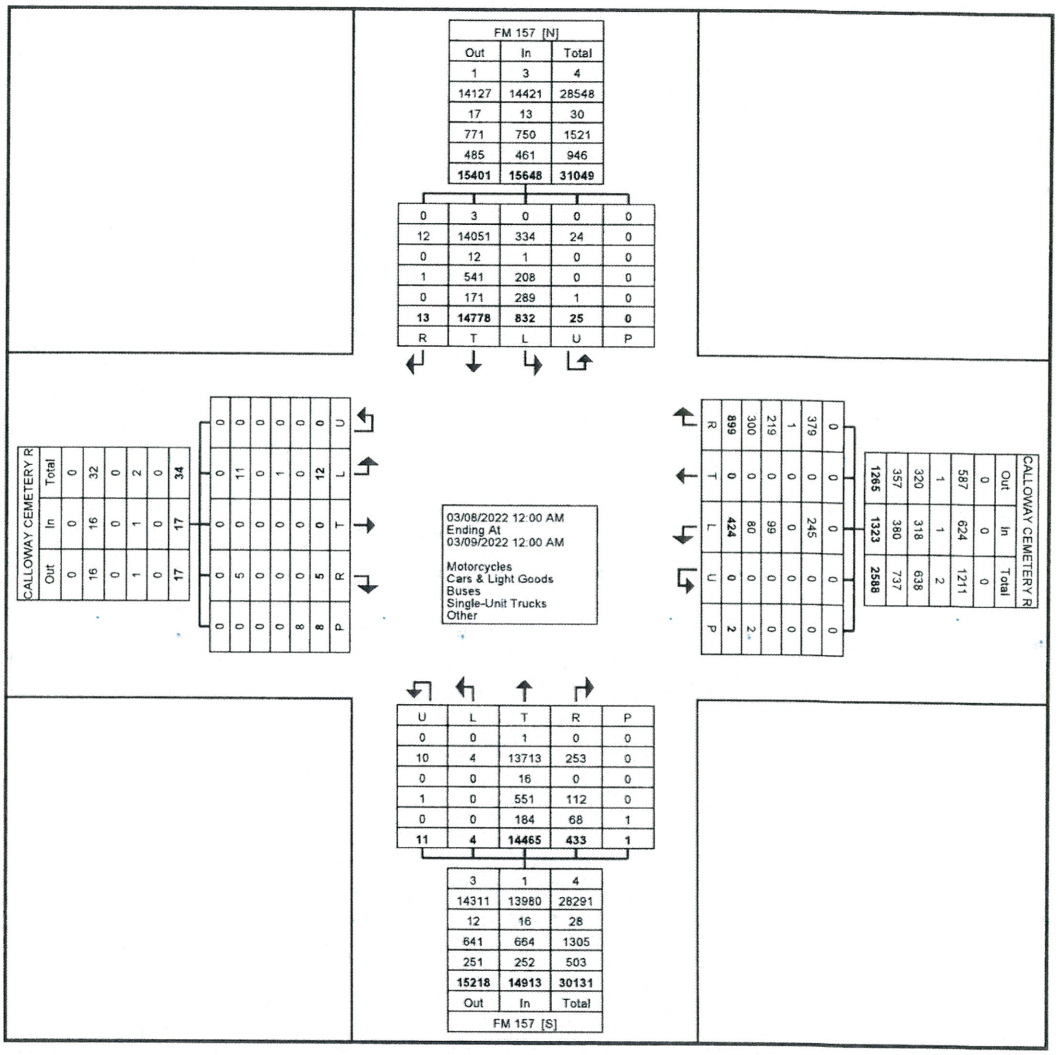
| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 5 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 62.5 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 2 | - | - | - | - | - | 1 | - | - | - | - | - | 3 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 37.5 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022


## Turning Movement Peak Hour Data (7:15 AM)

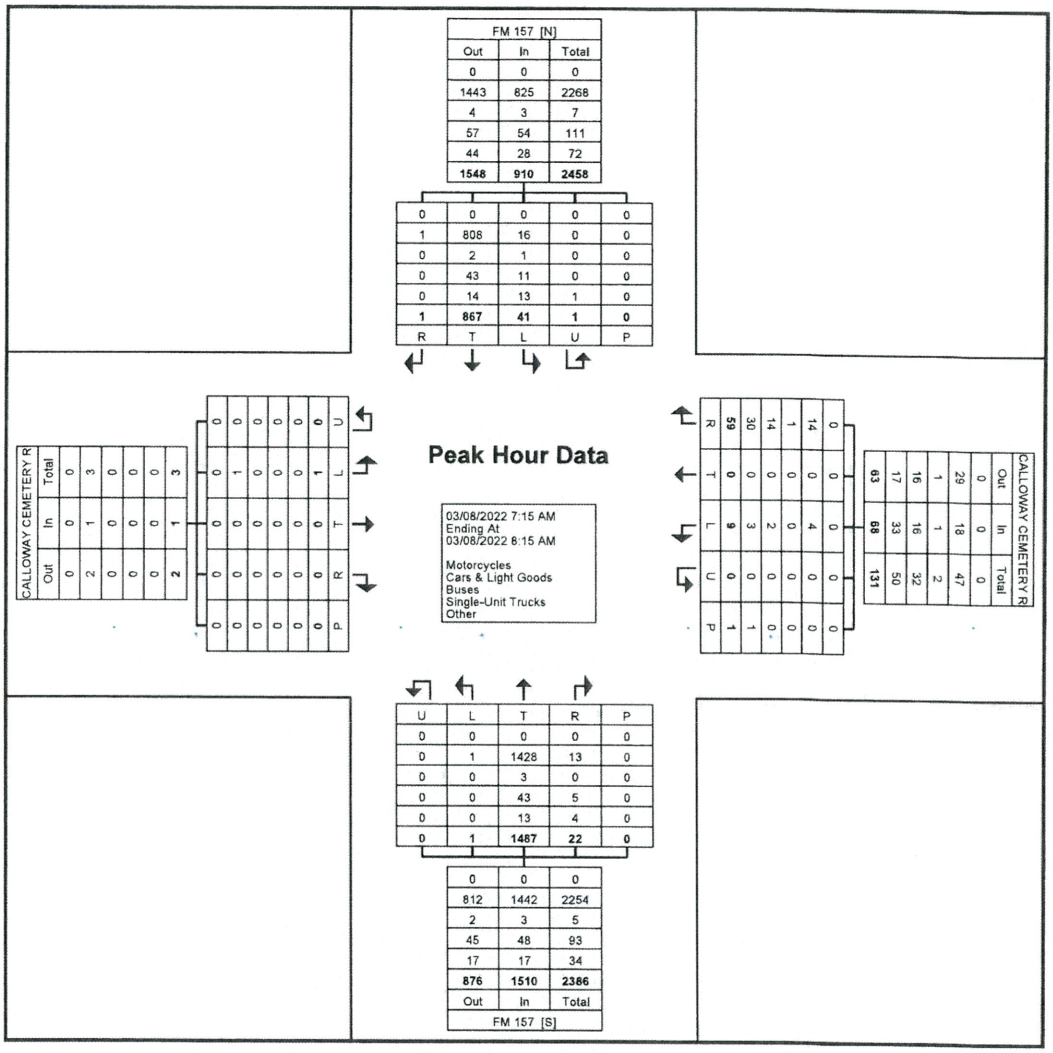
| Start Time | FM 157 Southbound | | | | | | CALLOWAY CEMETERY RD Westbound | | | | | | FM 157 Northbound | | | | | | CALLOWAY CEMETERY RD Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 7:15 AM | 7 | 162 | 1 | 0 | 0 | 170 | 3 | 0 | 20 | 0 | 0 | 23 | 1 | 354 | 3 | 0 | 0 | 358 | 0 | 0 | 0 | 0 | 0 | 0 | 551 |
| 7:30 AM | 12 | 247 | 0 | 0 | 0 | 259 | 0 | 0 | 16 | 0 | 0 | 16 | 0 | 437 | 7 | 0 | 0 | 444 | 0 | 0 | 0 | 0 | 0 | 0 | 719 |
| 7:45 AM | 8 | 226 | 0 | 1 | 0 | 235 | 1 | 0 | 10 | 0 | 0 | 11 | 0 | 373 | 7 | 0 | 0 | 380 | 1 | 0 | 0 | 0 | 0 | 1 | 627 |
| 8:00 AM | 14 | 232 | 0 | 0 | 0 | 246 | 5 | 0 | 13 | 0 | 1 | 18 | 0 | 323 | 5 | 0 | 0 | 328 | 0 | 0 | 0 | 0 | 0 | 0 | 592 |
| Total | 41 | 867 | 1 | 1 | 0 | 910 | 9 | 0 | 59 | 0 | 1 | 68 | 1 | 1487 | 22 | 0 | 0 | 1510 | 1 | 0 | 0 | 0 | 0 | 1 | 2489 |
| Approach % | 4.5 | 95.3 | 0.1 | 0.1 | - | - | 13.2 | 0.0 | 86.8 | 0.0 | - | - | 0.1 | 98.5 | 1.5 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 1.6 | 34.8 | 0.0 | 0.0 | - | 36.6 | 0.4 | 0.0 | 2.4 | 0.0 | - | 2.7 | 0.0 | 59.7 | 0.9 | 0.0 | - | 60.7 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.732 | 0.878 | 0.250 | 0.250 | - | 0.878 | 0.450 | 0.000 | 0.738 | 0.000 | - | 0.739 | 0.250 | 0.851 | 0.786 | 0.000 | - | 0.850 | 0.250 | 0.000 | 0.000 | 0.000 | - | 0.250 | 0.865 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 16 | 808 | 1 | 0 | - | 825 | 4 | 0 | 14 | 0 | - | 18 | 1 | 1428 | 13 | 0 | - | 1442 | 1 | 0 | 0 | 0 | - | 1 | 2286 |
| % Cars & Light Goods | 39.0 | 93.2 | 100.0 | 0.0 | - | 90.7 | 44.4 | - | 23.7 | - | - | 26.5 | 100.0 | 96.0 | 59.1 | - | - | 95.5 | 100.0 | - | - | - | - | 100.0 | 91.8 |
| Buses | 1 | 2 | 0 | 0 | - | 3 | 0 | 0 | 1 | 0 | - | 1 | 0 | 3 | 0 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 7 |
| % Buses | 2.4 | 0.2 | 0.0 | 0.0 | - | 0.3 | 0.0 | - | 1.7 | - | - | 1.5 | 0.0 | 0.2 | 0.0 | - | - | 0.2 | 0.0 | - | - | - | - | 0.0 | 0.3 |
| Single-Unit Trucks | 11 | 43 | 0 | 0 | - | 54 | 2 | 0 | 14 | 0 | - | 16 | 0 | 43 | 5 | 0 | - | 48 | 0 | 0 | 0 | 0 | - | 0 | 118 |
| % Single-Unit Trucks | 26.8 | 5.0 | 0.0 | 0.0 | - | 5.9 | 22.2 | - | 23.7 | - | - | 23.5 | 0.0 | 2.9 | 22.7 | - | - | 3.2 | 0.0 | - | - | - | - | 0.0 | 4.7 |
| Articulated Trucks | 13 | 14 | 0 | 1 | - | 28 | 3 | 0 | 30 | 0 | - | 33 | 0 | 13 | 4 | 0 | - | 17 | 0 | 0 | 0 | 0 | - | 0 | 78 |
| % Articulated Trucks | 31.7 | 1.6 | 0.0 | 100.0 | - | 3.1 | 33.3 | - | 50.8 | - | - | 48.5 | 0.0 | 0.9 | 18.2 | - | - | 1.1 | 0.0 | - | - | - | - | 0.0 | 3.1 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022
Page No: 6




Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (4:45 PM)

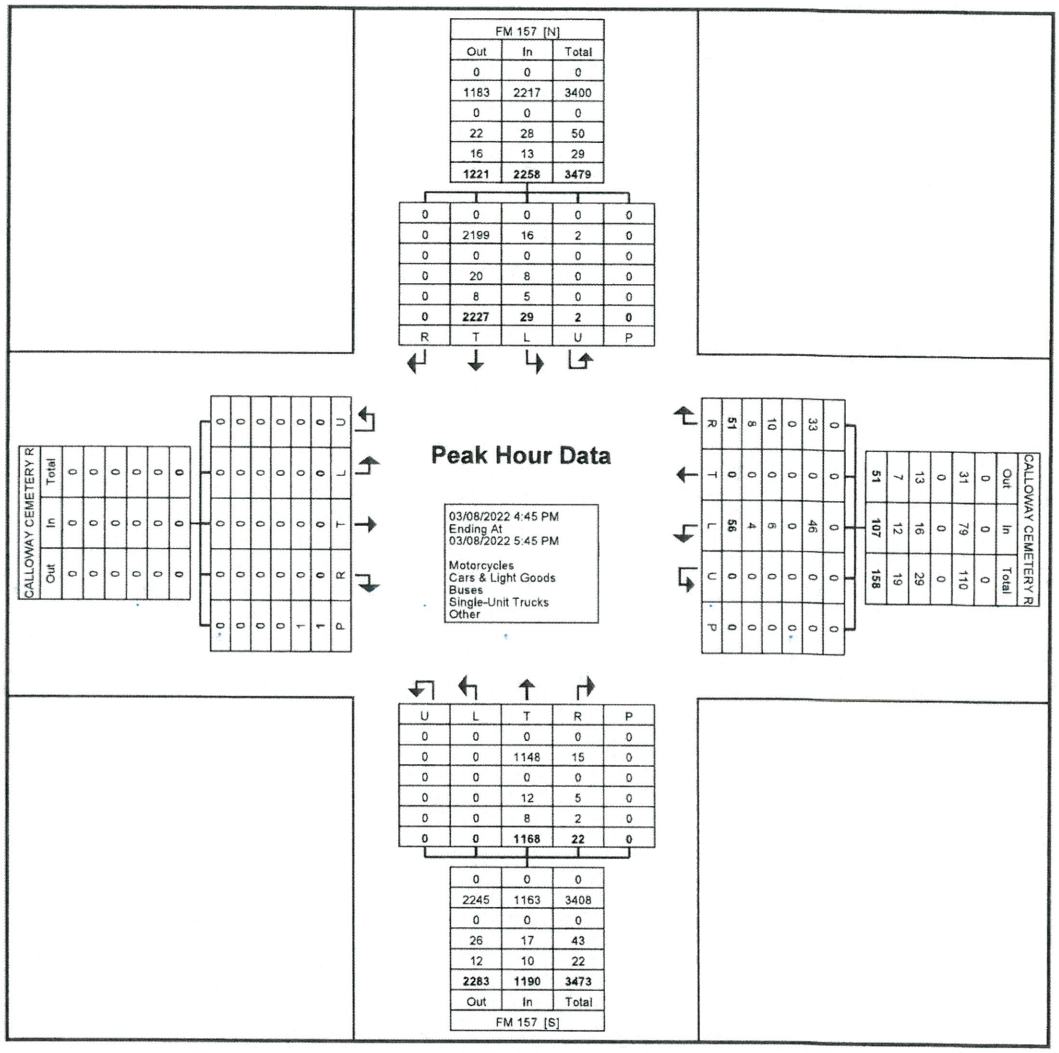
| Start Time | FM 157 Southbound | | | | | | CALLOWAY CEMETERY RD Westbound | | | | | | FM 157 Northbound | | | | | | CALLOWAY CEMETERY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:45 PM | 7 | 554 | 0 | 0 | 0 | 561 | 21 | 0 | 16 | 0 | 0 | 37 | 0 | 239 | 5 | 0 | 0 | 244 | 0 | 0 | 0 | 0 | 0 | 0 | 842 |
| 5:00 PM | 10 | 548 | 0 | 0 | 0 | 558 | 14 | 0 | 11 | 0 | 0 | 25 | 0 | 314 | 6 | 0 | 0 | 320 | 0 | 0 | 0 | 0 | 1 | 0 | 903 |
| 5:15 PM | 8 | 588 | 0 | 2 | 0 | 598 | 8 | 0 | 14 | 0 | 0 | 22 | 0 | 317 | 6 | 0 | 0 | 323 | 0 | 0 | 0 | 0 | 0 | 0 | 943 |
| 5:30 PM | 4 | 537 | 0 | 0 | 0 | 541 | 13 | 0 | 10 | 0 | 0 | 23 | 0 | 298 | 5 | 0 | 0 | 303 | 0 | 0 | 0 | 0 | 0 | 0 | 867 |
| Total | 29 | 2227 | 0 | 2 | 0 | 2258 | 56 | 0 | 51 | 0 | 0 | 107 | 0 | 1168 | 22 | 0 | 0 | 1190 | 0 | 0 | 0 | 0 | 1 | 0 | 3555 |
| Approach % | 1.3 | 98.6 | 0.0 | 0.1 | - | - | 52.3 | 0.0 | 47.7 | 0.0 | - | - | 0.0 | 98.2 | 1.8 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.8 | 62.6 | 0.0 | 0.1 | - | 63.5 | 1.6 | 0.0 | 1.4 | 0.0 | - | 3.0 | 0.0 | 32.9 | 0.6 | 0.0 | - | 33.5 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.725 | 0.947 | 0.000 | 0.250 | - | 0.944 | 0.667 | 0.000 | 0.797 | 0.000 | - | 0.723 | 0.000 | 0.921 | 0.917 | 0.000 | - | 0.921 | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.942 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 |
| Cars & Light Goods | 16 | 2199 | 0 | 2 | - | 2217 | 46 | 0 | 33 | 0 | - | 79 | 0 | 1148 | 15 | 0 | - | 1163 | 0 | 0 | 0 | 0 | - | 0 | 3459 |
| % Cars & Light Goods | 55.2 | 98.7 | - | 100.0 | - | 98.2 | 82.1 | - | 64.7 | - | - | 73.8 | - | 98.3 | 68.2 | - | - | 97.7 | - | - | - | - | - | - | 97.3 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 |
| Single-Unit Trucks | 8 | 20 | 0 | 0 | - | 28 | 6 | 0 | 10 | 0 | - | 16 | 0 | 12 | 5 | 0 | - | 17 | 0 | 0 | 0 | 0 | - | 0 | 61 |
| % Single-Unit Trucks | 27.6 | 0.9 | - | 0.0 | - | 1.2 | 10.7 | - | 19.6 | - | - | 15.0 | - | 1.0 | 22.7 | - | - | 1.4 | - | - | - | - | - | - | 1.7 |
| Articulated Trucks | 5 | 8 | 0 | 0 | - | 13 | 4 | 0 | 8 | 0 | - | 12 | 0 | 8 | 2 | 0 | - | 10 | 0 | 0 | 0 | 0 | - | 0 | 35 |
| % Articulated Trucks | 17.2 | 0.4 | - | 0.0 | - | 0.6 | 7.1 | - | 15.7 | - | - | 11.2 | - | 0.7 | 9.1 | - | - | 0.8 | - | - | - | - | - | - | 1.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ CALLOWAY CEMETERY RD
Site Code:
Start Date: 03/08/2022
Page No: 8




Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | Westbound St. Westbound | | | | | | FM 157 Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 0 | 27 | 0 | 1 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 12:15 AM | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| 12:30 AM | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 12:45 AM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| Hourly Total | 0 | 87 | 0 | 1 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 0 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 174 |
| 1:00 AM | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 1:15 AM | 0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 1:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 1:45 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 35 |
| Hourly Total | 0 | 75 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 52 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 128 |
| 2:00 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 1 | 42 |
| 2:15 AM | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 2:30 AM | 0 | 21 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 2:45 AM | 0 | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 1 | 0 | 0 | 1 | 32 |
| Hourly Total | 0 | 74 | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 64 | 0 | 0 | 2 | 0 | 0 | 2 | 140 |
| 3:00 AM | 0 | 12 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 3:15 AM | 0 | 12 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 3:30 AM | 0 | 7 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 22 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 3:45 AM | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Hourly Total | 0 | 40 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 78 | 0 | 0 | 0 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | 121 |
| 4:00 AM | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 4:15 AM | 0 | 18 | 2 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 52 |
| 4:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 41 | 0 | 0 | 0 | 43 | 0 | 0 | 1 | 0 | 0 | 1 | 63 |
| 4:45 AM | 0 | 21 | 3 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 55 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| Hourly Total | 0 | 74 | 5 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 160 | 0 | 0 | 0 | 166 | 0 | 0 | 1 | 0 | 0 | 1 | 246 |
| 5:00 AM | 0 | 23 | 4 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 69 | 0 | 0 | 0 | 74 | 1 | 0 | 1 | 0 | 0 | 2 | 103 |
| 5:15 AM | 0 | 27 | 2 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 87 | 0 | 0 | 0 | 91 | 5 | 0 | 5 | 0 | 0 | 10 | 130 |
| 5:30 AM | 0 | 35 | 6 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 141 | 0 | 0 | 0 | 144 | 2 | 0 | 4 | 0 | 0 | 6 | 191 |
| 5:45 AM | 0 | 53 | 7 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 132 | 0 | 0 | 0 | 141 | 4 | 0 | 0 | 0 | 0 | 4 | 205 |
| Hourly Total | 0 | 138 | 19 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 429 | 0 | 0 | 0 | 450 | 12 | 0 | 10 | 0 | 0 | 22 | 629 |
| 6:00 AM | 0 | 54 | 6 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 166 | 0 | 0 | 0 | 177 | 6 | 0 | 6 | 0 | 0 | 12 | 249 |
| 6:15 AM | 0 | 73 | 9 | 0 | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 198 | 0 | 0 | 0 | 214 | 2 | 0 | 5 | 0 | 0 | 7 | 303 |
| 6:30 AM | 0 | 95 | 8 | 0 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 302 | 0 | 0 | 0 | 316 | 8 | 0 | 6 | 0 | 0 | 14 | 433 |
| 6:45 AM | 0 | 95 | 9 | 0 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 320 | 0 | 0 | 0 | 336 | 4 | 0 | 7 | 0 | 0 | 11 | 451 |
| Hourly Total | 0 | 317 | 32 | 0 | 0 | 349 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 986 | 0 | 0 | 0 | 1043 | 20 | 0 | 24 | 0 | 0 | 44 | 1436 |
| 7:00 AM | 0 | 129 | 12 | 0 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 278 | 0 | 0 | 0 | 291 | 6 | 0 | 6 | 0 | 0 | 12 | 444 |
| 7:15 AM | 0 | 171 | 8 | 0 | 0 | 179 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 350 | 0 | 0 | 0 | 361 | 9 | 0 | 8 | 0 | 0 | 17 | 557 |
| 7:30 AM | 0 | 262 | 17 | 0 | 0 | 279 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 403 | 0 | 0 | 0 | 417 | 12 | 0 | 12 | 0 | 0 | 24 | 720 |
| 7:45 AM | 0 | 244 | 11 | 0 | 0 | 255 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 354 | 0 | 1 | 0 | 367 | 10 | 0 | 9 | 0 | 0 | 19 | 641 |
| Hourly Total | 0 | 806 | 48 | 0 | 0 | 854 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 1385 | 0 | 1 | 0 | 1436 | 37 | 0 | 35 | 0 | 0 | 72 | 2362 |
| 8:00 AM | 0 | 221 | 17 | 0 | 0 | 238 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 311 | 0 | 0 | 0 | 325 | 20 | 0 | 18 | 0 | 0 | 38 | 601 |
| 8:15 AM | 0 | 192 | 7 | 0 | 0 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 277 | 0 | 0 | 0 | 293 | 10 | 0 | 6 | 0 | 0 | 16 | 508 |
| 8:30 AM | 0 | 125 | 11 | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 285 | 0 | 0 | 0 | 294 | 14 | 0 | 13 | 0 | 0 | 27 | 457 |
| 8:45 AM | 0 | 190 | 14 | 0 | 0 | 204 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 223 | 0 | 1 | 0 | 241 | 7 | 0 | 10 | 0 | 0 | 17 | 462 |
| Hourly Total | 0 | 728 | 49 | 0 | 0 | 777 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 1096 | 0 | 1 | 0 | 1153 | 51 | 0 | 47 | 0 | 0 | 98 | 2028 |
| 9:00 AM | 0 | 139 | 19 | 1 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 206 | 0 | 0 | 0 | 214 | 11 | 0 | 8 | 0 | 0 | 19 | 392 |
| 9:15 AM | 0 | 115 | 10 | 0 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 162 | 0 | 0 | 0 | 175 | 21 | 0 | 16 | 0 | 0 | 37 | 337 |
| 9:30 AM | 0 | 135 | 11 | 0 | 0 | 146 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 178 | 0 | 0 | 0 | 192 | 14 | 0 | 8 | 0 | 0 | 22 | 360 |
| 9:45 AM | 0 | 133 | 12 | 0 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 145 | 0 | 0 | 0 | 159 | 13 | 0 | 16 | 0 | 0 | 29 | 333 |
| Hourly Total | 0 | 522 | 52 | 1 | 0 | 575 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 691 | 0 | 0 | 0 | 740 | 59 | 0 | 48 | 0 | 0 | 107 | 1422 |
| 10:00 AM | 0 | 132 | 12 | 0 | 0 | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 141 | 0 | 0 | 0 | 151 | 12 | 0 | 14 | 0 | 0 | 26 | 321 |
| 10:15 AM | 0 | 137 | 17 | 0 | 0 | 154 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 137 | 0 | 0 | 0 | 150 | 9 | 0 | 8 | 0 | 0 | 17 | 321 |
| 10:30 AM | 0 | 119 | 21 | 0 | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 149 | 0 | 0 | 0 | 161 | 15 | 0 | 14 | 2 | 0 | 31 | 332 |
| 10:45 AM | 0 | 123 | 11 | 0 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 155 | 0 | 0 | 0 | 171 | 16 | 0 | 15 | 0 | 0 | 31 | 336 |
| Hourly Total | 0 | 511 | 61 | 0 | 0 | 572 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 582 | 0 | 0 | 0 | 633 | 52 | 0 | 51 | 2 | 0 | 105 | 1310 |
| 11:00 AM | 0 | 140 | 17 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 151 | 0 | 0 | 0 | 160 | 9 | 0 | 15 | 0 | 0 | 24 | 341 |
| 11:15 AM | 0 | 128 | 15 | 0 | 0 | 143 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 141 | 0 | 1 | 0 | 149 | 19 | 0 | 10 | 0 | 0 | 29 | 321 |
| 11:30 AM | 0 | 141 | 17 | 0 | 0 | 158 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 163 | 0 | 0 | 0 | 179 | 13 | 0 | 9 | 0 | 0 | 22 | 359 |
| 11:45 AM | 0 | 134 | 16 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 174 | 0 | 0 | 0 | 190 | 15 | 0 | 12 | 0 | 0 | 27 | 367 |
| Hourly Total | 0 | 543 | 65 | 0 | 0 | 608 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 629 | 0 | 1 | 0 | 678 | 56 | 0 | 46 | 0 | 0 | 102 | 1388 |
| 12:00 PM | 0 | 154 | 15 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 178 | 0 | 0 | 0 | 192 | 18 | 0 | 17 | 0 | 0 | 35 | 396 |
| 12:15 PM | 0 | 149 | 15 | 1 | 0 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 170 | 0 | 0 | 0 | 181 | 10 | 0 | 17 | 0 | 0 | 27 | 373 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 0 | 146 | 18 | 1 | 0 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 196 | 0 | 0 | 0 | 211 | 10 | 0 | 12 | 0 | 0 | 22 | 398 |
| 12:45 PM | 0 | 152 | 19 | 0 | 0 | 171 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 156 | 0 | 0 | 0 | 166 | 12 | 0 | 15 | 0 | 0 | 27 | 364 |
| Hourly Total | 0 | 601 | 67 | 2 | 0 | 670 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 700 | 0 | 0 | 0 | 750 | 50 | 0 | 61 | 0 | 0 | 111 | 1531 |
| 1:00 PM | 0 | 152 | 11 | 1 | 0 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 162 | 0 | 0 | 0 | 175 | 24 | 0 | 13 | 1 | 0 | 38 | 377 |
| 1:15 PM | 0 | 166 | 20 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 187 | 0 | 1 | 0 | 200 | 20 | 0 | 11 | 0 | 0 | 31 | 417 |
| 1:30 PM | 0 | 166 | 14 | 0 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 183 | 0 | 1 | 0 | 194 | 14 | 0 | 8 | 0 | 0 | 22 | 396 |
| 1:45 PM | 0 | 182 | 23 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 177 | 0 | 0 | 0 | 184 | 13 | 0 | 20 | 0 | 0 | 33 | 422 |
| Hourly Total | 0 | 666 | 68 | 1 | 0 | 735 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 709 | 0 | 2 | 0 | 753 | 71 | 0 | 52 | 1 | 0 | 124 | 1612 |
| 2:00 PM | 0 | 154 | 10 | 0 | 0 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 159 | 0 | 0 | 0 | 170 | 14 | 0 | 13 | 0 | 0 | 27 | 361 |
| 2:15 PM | 0 | 203 | 27 | 0 | 0 | 230 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 197 | 0 | 1 | 0 | 204 | 16 | 0 | 10 | 0 | 0 | 26 | 460 |
| 2:30 PM | 0 | 241 | 9 | 0 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 179 | 0 | 0 | 0 | 192 | 11 | 0 | 9 | 0 | 0 | 20 | 462 |
| 2:45 PM | 0 | 269 | 25 | 0 | 0 | 294 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 221 | 0 | 0 | 0 | 232 | 16 | 0 | 13 | 0 | 0 | 29 | 555 |
| Hourly Total | 0 | 867 | 71 | 0 | 0 | 938 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 756 | 0 | 1 | 0 | 798 | 57 | 0 | 45 | 0 | 0 | 102 | 1838 |
| 3:00 PM | 0 | 290 | 15 | 0 | 0 | 305 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 188 | 0 | 0 | 0 | 196 | 17 | 0 | 12 | 0 | 0 | 29 | 530 |
| 3:15 PM | 0 | 289 | 7 | 0 | 0 | 296 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 257 | 0 | 1 | 0 | 268 | 15 | 0 | 8 | 0 | 0 | 23 | 587 |
| 3:30 PM | 0 | 317 | 14 | 0 | 0 | 331 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 249 | 0 | 0 | 0 | 268 | 9 | 0 | 21 | 0 | 2 | 30 | 629 |
| 3:45 PM | 0 | 380 | 13 | 0 | 0 | 393 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 207 | 0 | 0 | 0 | 215 | 10 | 0 | 13 | 0 | 0 | 23 | 631 |
| Hourly Total | 0 | 1276 | 49 | 0 | 0 | 1325 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 901 | 0 | 1 | 0 | 947 | 51 | 0 | 54 | 0 | 2 | 105 | 2377 |
| 4:00 PM | 0 | 396 | 12 | 1 | 0 | 409 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 265 | 0 | 0 | 0 | 278 | 12 | 0 | 16 | 0 | 1 | 28 | 715 |
| 4:15 PM | 0 | 479 | 6 | 1 | 0 | 486 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 226 | 0 | 0 | 0 | 231 | 9 | 0 | 23 | 0 | 0 | 32 | 749 |
| 4:30 PM | 0 | 543 | 4 | 0 | 0 | 547 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 230 | 0 | 0 | 0 | 239 | 6 | 0 | 18 | 0 | 0 | 24 | 810 |
| 4:45 PM | 0 | 606 | 3 | 0 | 0 | 609 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 264 | 0 | 0 | 0 | 271 | 5 | 0 | 21 | 0 | 0 | 26 | 906 |
| Hourly Total | 0 | 2024 | 25 | 2 | 0 | 2051 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 985 | 0 | 0 | 0 | 1019 | 32 | 0 | 78 | 0 | 1 | 110 | 3180 |
| 5:00 PM | 0 | 545 | 1 | 0 | 0 | 546 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 282 | 0 | 0 | 0 | 286 | 0 | 0 | 12 | 0 | 1 | 12 | 844 |
| 5:15 PM | 0 | 600 | 3 | 0 | 0 | 603 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 308 | 0 | 0 | 0 | 313 | 5 | 0 | 7 | 0 | 0 | 12 | 928 |
| 5:30 PM | 0 | 550 | 2 | 0 | 0 | 552 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 302 | 0 | 1 | 0 | 309 | 2 | 0 | 8 | 0 | 0 | 10 | 871 |
| 5:45 PM | 0 | 491 | 2 | 0 | 0 | 493 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 251 | 0 | 1 | 0 | 257 | 3 | 0 | 8 | 0 | 1 | 11 | 761 |
| Hourly Total | 0 | 2186 | 8 | 0 | 0 | 2194 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 1143 | 0 | 2 | 0 | 1165 | 10 | 0 | 35 | 0 | 2 | 45 | 3404 |
| 6:00 PM | 0 | 465 | 0 | 0 | 0 | 465 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 205 | 0 | 1 | 0 | 207 | 2 | 0 | 13 | 0 | 1 | 15 | 687 |
| 6:15 PM | 0 | 390 | 1 | 0 | 0 | 391 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 235 | 0 | 1 | 0 | 237 | 3 | 0 | 5 | 0 | 0 | 8 | 636 |
| 6:30 PM | 0 | 282 | 1 | 0 | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 203 | 0 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 489 |
| 6:45 PM | 0 | 243 | 0 | 0 | 0 | 243 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 182 | 0 | 0 | 0 | 183 | 3 | 0 | 3 | 0 | 0 | 6 | 432 |
| Hourly Total | 0 | 1380 | 2 | 0 | 0 | 1382 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 825 | 0 | 2 | 0 | 833 | 8 | 0 | 21 | 0 | 1 | 29 | 2244 |
| 7:00 PM | 0 | 205 | 1 | 2 | 0 | 208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 187 | 0 | 0 | 0 | 187 | 0 | 0 | 2 | 0 | 0 | 2 | 397 |
| 7:15 PM | 0 | 203 | 0 | 0 | 0 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 199 | 0 | 0 | 0 | 200 | 1 | 0 | 3 | 0 | 0 | 4 | 407 |
| 7:30 PM | 0 | 205 | 0 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 138 | 0 | 0 | 0 | 140 | 0 | 0 | 3 | 0 | 0 | 3 | 348 |
| 7:45 PM | 0 | 137 | 1 | 0 | 0 | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 125 | 0 | 0 | 0 | 127 | 4 | 0 | 7 | 0 | 0 | 11 | 276 |
| Hourly Total | 0 | 750 | 2 | 2 | 0 | 754 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 649 | 0 | 0 | 0 | 654 | 5 | 0 | 15 | 0 | 0 | 20 | 1428 |
| 8:00 PM | 0 | 136 | 0 | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 0 | 0 | 105 | 0 | 0 | 3 | 0 | 0 | 3 | 244 |
| 8:15 PM | 0 | 131 | 0 | 0 | 0 | 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 0 | 0 | 124 | 0 | 0 | 2 | 0 | 0 | 2 | 257 |
| 8:30 PM | 0 | 120 | 0 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 110 | 0 | 0 | 0 | 112 | 0 | 0 | 1 | 0 | 0 | 1 | 233 |
| 8:45 PM | 0 | 106 | 0 | 0 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 99 | 0 | 0 | 0 | 100 | 0 | 0 | 1 | 0 | 0 | 1 | 207 |
| Hourly Total | 0 | 493 | 0 | 0 | 0 | 493 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 438 | 0 | 0 | 0 | 441 | 0 | 0 | 7 | 0 | 0 | 7 | 941 |
| 9:00 PM | 0 | 90 | 1 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 170 |
| 9:15 PM | 0 | 101 | 0 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 88 | 0 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 189 |
| 9:30 PM | 0 | 93 | 0 | 0 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 0 | 0 | 0 | 108 | 0 | 0 | 1 | 0 | 0 | 1 | 202 |
| 9:45 PM | 0 | 87 | 0 | 0 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 57 | 0 | 0 | 1 | 0 | 0 | 1 | 145 |
| Hourly Total | 0 | 371 | 1 | 0 | 0 | 372 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 332 | 0 | 0 | 0 | 332 | 0 | 0 | 2 | 0 | 0 | 2 | 706 |
| 10:00 PM | 0 | 84 | 0 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 0 | 0 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 162 |
| 10:15 PM | 0 | 77 | 0 | 0 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 63 | 0 | 0 | 0 | 64 | 1 | 0 | 0 | 0 | 0 | 1 | 142 |
| 10:30 PM | 0 | 57 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | 0 | 0 | 0 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |
| 10:45 PM | 0 | 48 | 0 | 1 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 52 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 102 |
| Hourly Total | 0 | 266 | 0 | 1 | 0 | 267 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 269 | 0 | 0 | 0 | 271 | 1 | 0 | 0 | 0 | 0 | 1 | 539 |
| 11:00 PM | 0 | 59 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 34 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 94 |
| 11:15 PM | 0 | 48 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 45 | 0 | 0 | 1 | 0 | 0 | 1 | 94 |
| 11:30 PM | 0 | 40 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 76 |
| 11:45 PM | 0 | 25 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Hourly Total | 0 | 172 | 0 | 0 | 0 | 172 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 148 | 0 | 0 | 0 | 149 | 0 | 0 | 1 | 0 | 0 | 1 | 322 |
| Grand Total | 0 | 14967 | 624 | 10 | 0 | 15601 | 0 | 0 | 0 | 0 | 0 | 0 | 591 | 14093 | 0 | 11 | 0 | 14695 | 572 | 0 | 635 | 3 | 6 | 1210 | 31506 |
| Approach % | 0.0 | 95.9 | 4.0 | 0.1 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 4.0 | 95.9 | 0.0 | 0.1 | - | - | 47.3 | 0.0 | 52.5 | 0.2 | - | - | - |
| Total % | 0.0 | 47.5 | 2.0 | 0.0 | - | 49.5 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.9 | 44.7 | 0.0 | 0.0 | - | 46.6 | 1.8 | 0.0 | 2.0 | 0.0 | - | 3.8 | - |
| Motorcycles | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Motorcycles | - | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 14534 | 136 | 10 | - | 14680 | 0 | 0 | 0 | 0 | - | 0 | 248 | 13610 | 0 | 11 | - | 13869 | 130 | 0 | 253 | 0 | - | 383 | 28932 |
| % Cars & Light Goods | - | 97.1 | 21.8 | 100.0 | - | 94.1 | - | - | - | - | - | - | 42.0 | 96.6 | - | 100.0 | - | 94.4 | 22.7 | - | 39.8 | 0.0 | - | 31.7 | 91.8 |
| Buses | 0 | 12 | 0 | 0 | - | 12 | 0 | 0 | 0 | 0 | - | 0 | 0 | 16 | 0 | 0 | - | 16 | 0 | 0 | 0 | 0 | - | 0 | 28 |
| % Buses | - | 0.1 | 0.0 | 0.0 | - | 0.1 | - | - | - | - | - | - | 0.0 | 0.1 | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.1 |
| Single-Unit Trucks | 0 | 252 | 400 | 0 | - | 652 | 0 | 0 | 0 | 0 | - | 0 | 260 | 297 | 0 | 0 | - | 557 | 354 | 0 | 297 | 2 | - | 653 | 1862 |
| % Single-Unit Trucks | - | 1.7 | 64.1 | 0.0 | - | 4.2 | - | - | - | - | - | - | 44.0 | 2.1 | - | 0.0 | - | 3.8 | 61.9 | - | 46.8 | 66.7 | - | 54.0 | 5.9 |
| Articulated Trucks | 0 | 167 | 88 | 0 | - | 255 | 0 | 0 | 0 | 0 | - | 0 | 83 | 170 | 0 | 0 | - | 253 | 88 | 0 | 85 | 1 | - | 174 | 682 |
| % Articulated Trucks | - | 1.1 | 14.1 | 0.0 | - | 1.6 | - | - | - | - | - | - | 14.0 | 1.2 | - | 0.0 | - | 1.7 | 15.4 | - | 13.4 | 33.3 | - | 14.4 | 2.2 |

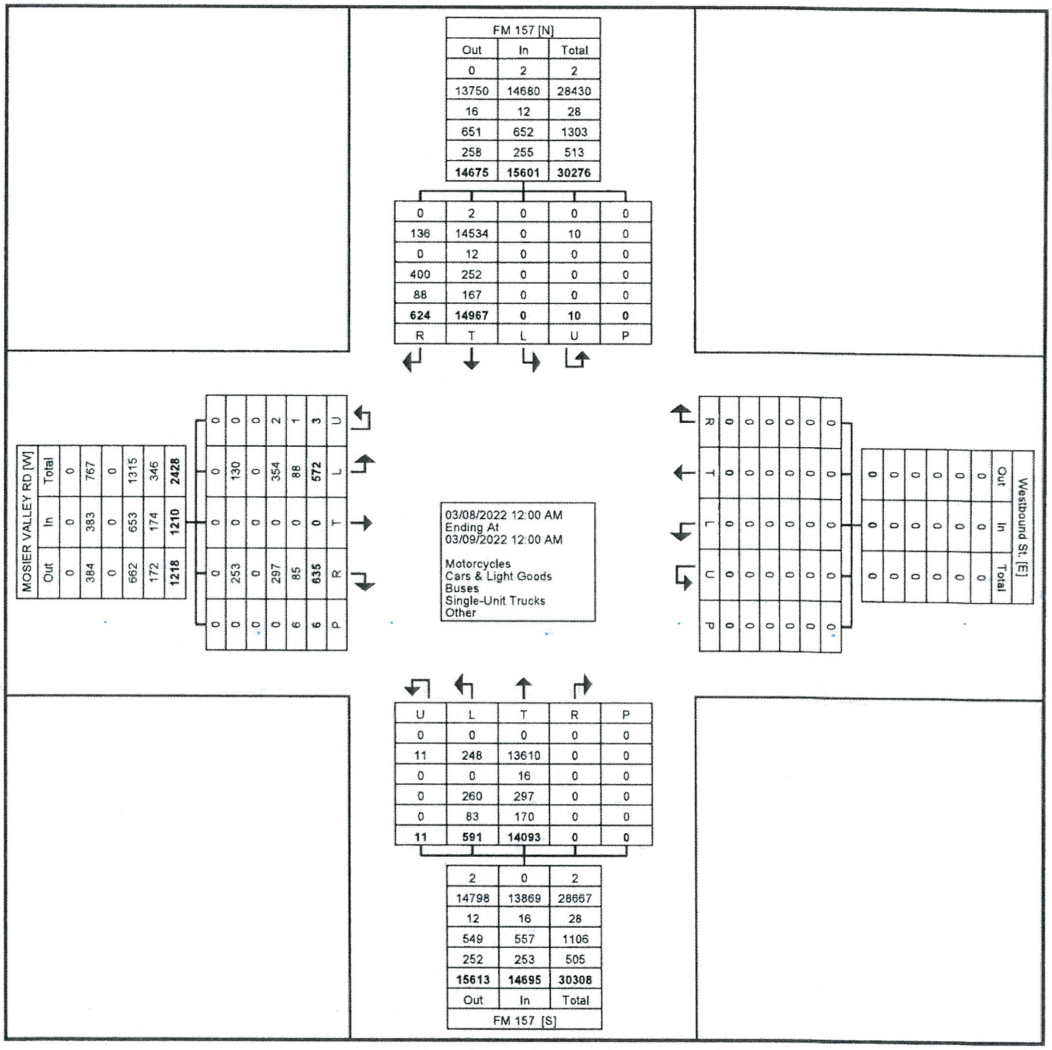
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 4 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 66.7 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 2 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 33.3 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 5

## Turning Movement Peak Hour Data (7:15 AM)

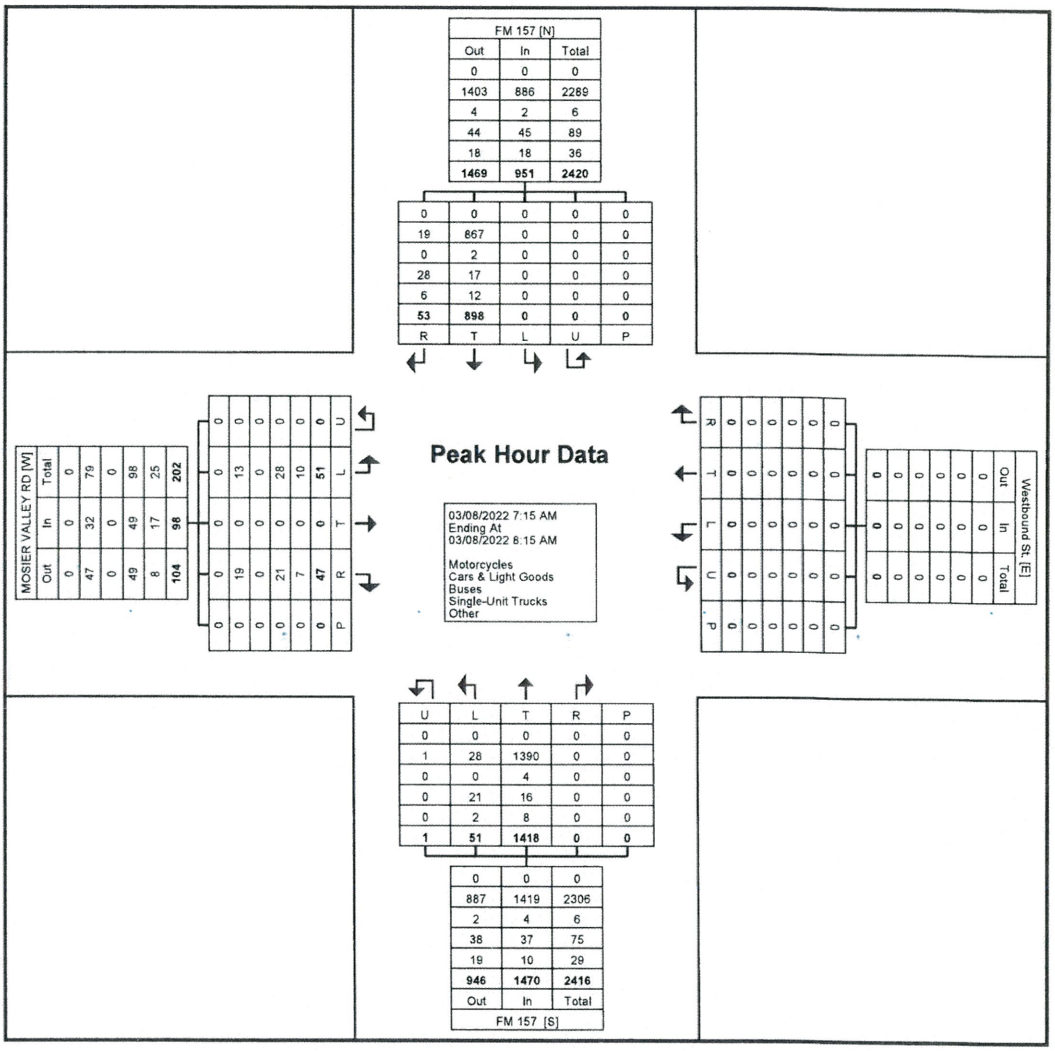
| Start Time | FM 157 Southbound | | | | | | Westbound St. Westbound | | | | | | FM 157 Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 7:15 AM | 0 | 171 | 8 | 0 | 0 | 179 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 350 | 0 | 0 | 0 | 361 | 9 | 0 | 8 | 0 | 0 | 17 | 557 |
| 7:30 AM | 0 | 262 | 17 | 0 | 0 | 279 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 403 | 0 | 0 | 0 | 417 | 12 | 0 | 12 | 0 | 0 | 24 | 720 |
| 7:45 AM | 0 | 244 | 11 | 0 | 0 | 255 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 354 | 0 | 1 | 0 | 367 | 10 | 0 | 9 | 0 | 0 | 19 | 641 |
| 8:00 AM | 0 | 221 | 17 | 0 | 0 | 238 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 311 | 0 | 0 | 0 | 325 | 20 | 0 | 18 | 0 | 0 | 38 | 601 |
| Total | 0 | 898 | 53 | 0 | 0 | 951 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 1418 | 0 | 1 | 0 | 1470 | 51 | 0 | 47 | 0 | 0 | 98 | 2519 |
| Approach % | 0.0 | 94.4 | 5.6 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 3.5 | 96.5 | 0.0 | 0.1 | - | - | 52.0 | 0.0 | 48.0 | 0.0 | - | - | - |
| Total % | 0.0 | 35.6 | 2.1 | 0.0 | - | 37.8 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.0 | 56.3 | 0.0 | 0.0 | - | 58.4 | 2.0 | 0.0 | 1.9 | 0.0 | - | 3.9 | - |
| PHF | 0.000 | 0.857 | 0.779 | 0.000 | - | 0.852 | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.911 | 0.880 | 0.000 | 0.250 | - | 0.881 | 0.638 | 0.000 | 0.653 | 0.000 | - | 0.645 | 0.875 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 867 | 19 | 0 | - | 886 | 0 | 0 | 0 | 0 | - | 0 | 28 | 1390 | 0 | 1 | - | 1419 | 13 | 0 | 19 | 0 | - | 32 | 2337 |
| % Cars & Light Goods | - | 96.5 | 35.8 | - | - | 93.2 | - | - | - | - | - | - | 54.9 | 98.0 | - | 100.0 | - | 96.5 | 25.5 | - | 40.4 | - | - | 32.7 | 92.8 |
| Buses | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 4 | 0 | 0 | - | 4 | 0 | 0 | 0 | 0 | - | 0 | 6 |
| % Buses | - | 0.2 | 0.0 | - | - | 0.2 | - | - | - | - | - | - | 0.0 | 0.3 | - | 0.0 | - | 0.3 | 0.0 | - | 0.0 | - | - | 0.0 | 0.2 |
| Single-Unit Trucks | 0 | 17 | 28 | 0 | - | 45 | 0 | 0 | 0 | 0 | - | 0 | 21 | 16 | 0 | 0 | - | 37 | 28 | 0 | 21 | 0 | - | 49 | 131 |
| % Single-Unit Trucks | - | 1.9 | 52.8 | - | - | 4.7 | - | - | - | - | - | - | 41.2 | 1.1 | - | 0.0 | - | 2.5 | 54.9 | - | 44.7 | - | - | 50.0 | 5.2 |
| Articulated Trucks | 0 | 12 | 6 | 0 | - | 18 | 0 | 0 | 0 | 0 | - | 0 | 2 | 8 | 0 | 0 | - | 10 | 10 | 0 | 7 | 0 | - | 17 | 45 |
| % Articulated Trucks | - | 1.3 | 11.3 | - | - | 1.9 | - | - | - | - | - | - | 3.9 | 0.6 | - | 0.0 | - | 0.7 | 19.6 | - | 14.9 | - | - | 17.3 | 1.8 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 6




Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (4:45 PM)

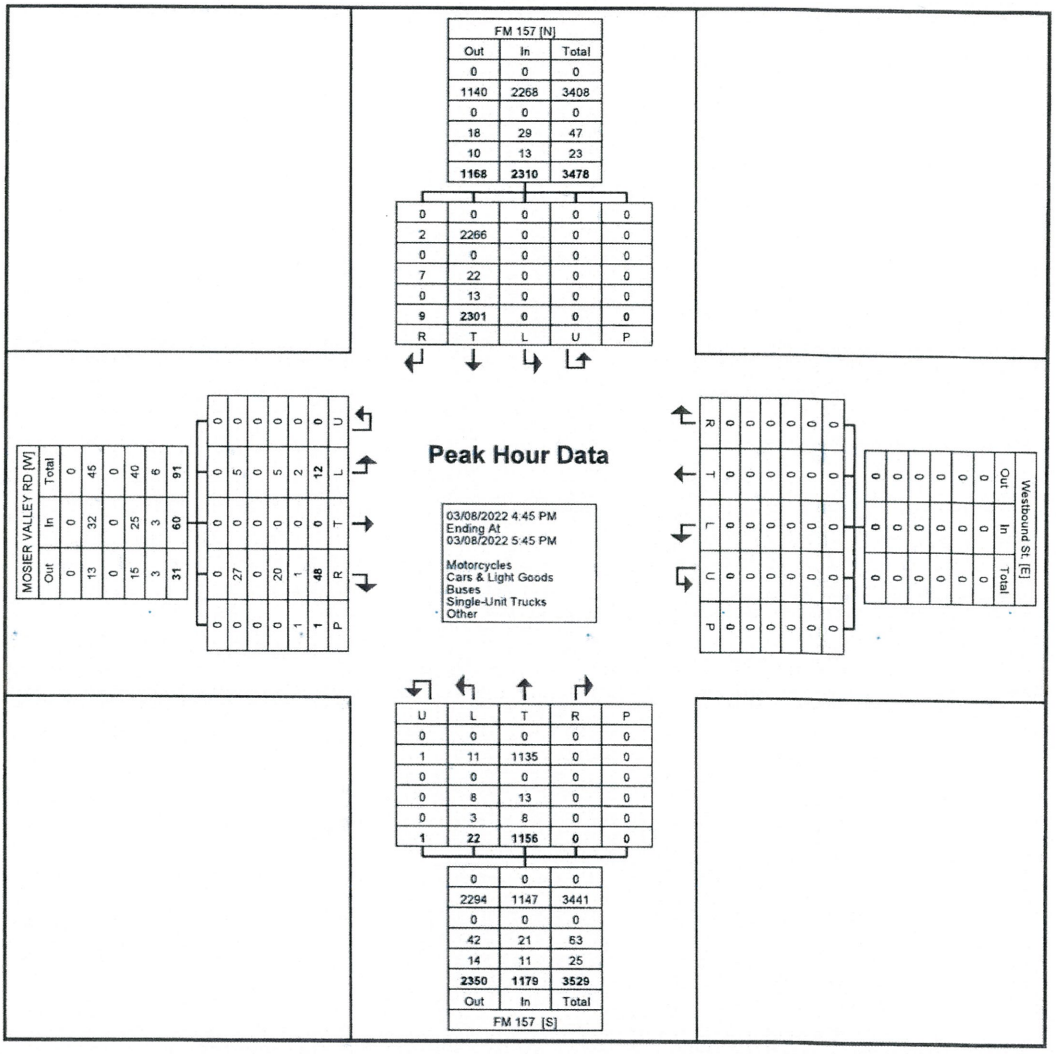
| Start Time | FM 157 Southbound | | | | | | Westbound St. Westbound | | | | | | FM 157 Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 4:45 PM | 0 | 606 | 3 | 0 | 0 | 609 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 264 | 0 | 0 | 0 | 271 | 5 | 0 | 21 | 0 | 0 | 26 | 906 |
| 5:00 PM | 0 | 545 | 1 | 0 | 0 | 546 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 282 | 0 | 0 | 0 | 286 | 0 | 0 | 12 | 0 | 1 | 12 | 844 |
| 5:15 PM | 0 | 600 | 3 | 0 | 0 | 603 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 308 | 0 | 0 | 0 | 313 | 5 | 0 | 7 | 0 | 0 | 12 | 928 |
| 5:30 PM | 0 | 550 | 2 | 0 | 0 | 552 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 302 | 0 | 1 | 0 | 309 | 2 | 0 | 8 | 0 | 0 | 10 | 871 |
| Total | 0 | 2301 | 9 | 0 | 0 | 2310 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 1156 | 0 | 1 | 0 | 1179 | 12 | 0 | 48 | 0 | 1 | 60 | 3549 |
| Approach % | 0.0 | 99.6 | 0.4 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 1.9 | 98.0 | 0.0 | 0.1 | - | - | 20.0 | 0.0 | 80.0 | 0.0 | - | - | - |
| Total % | 0.0 | 64.8 | 0.3 | 0.0 | - | 65.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.6 | 32.6 | 0.0 | 0.0 | - | 33.2 | 0.3 | 0.0 | 1.4 | 0.0 | - | 1.7 | - |
| PHF | 0.000 | 0.949 | 0.750 | 0.000 | - | 0.948 | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.786 | 0.938 | 0.000 | 0.250 | - | 0.942 | 0.600 | 0.000 | 0.571 | 0.000 | - | 0.577 | 0.956 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 2266 | 2 | 0 | - | 2268 | 0 | 0 | 0 | 0 | - | 0 | 11 | 1135 | 0 | 1 | - | 1147 | 5 | 0 | 27 | 0 | - | 32 | 3447 |
| % Cars & Light Goods | - | 98.5 | 22.2 | - | - | 98.2 | - | - | - | - | - | - | 50.0 | 98.2 | - | 100.0 | - | 97.3 | 41.7 | - | 56.3 | - | - | 53.3 | 97.1 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 22 | 7 | 0 | - | 29 | 0 | 0 | 0 | 0 | - | 0 | 8 | 13 | 0 | 0 | - | 21 | 5 | 0 | 20 | 0 | - | 25 | 75 |
| % Single-Unit Trucks | - | 1.0 | 77.8 | - | - | 1.3 | - | - | - | - | - | - | 36.4 | 1.1 | - | 0.0 | - | 1.8 | 41.7 | - | 41.7 | - | - | 41.7 | 2.1 |
| Articulated Trucks | 0 | 13 | 0 | 0 | - | 13 | 0 | 0 | 0 | 0 | - | 0 | 3 | 8 | 0 | 0 | - | 11 | 2 | 0 | 1 | 0 | - | 3 | 27 |
| % Articulated Trucks | - | 0.6 | 0.0 | - | - | 0.6 | - | - | - | - | - | - | 13.6 | 0.7 | - | 0.0 | - | 0.9 | 16.7 | - | 2.1 | - | - | 5.0 | 0.8 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ MOSIER VALLEY RD
Site Code:
Start Date: 03/08/2022
Page No: 8




Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | BIRDS FORT TRAIL Westbound | | | | | | FM 157 Northbound | | | | | | BIRDS FORT TRAIL Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 2 | 26 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| 12:15 AM | 3 | 27 | 0 | 0 | 0 | 30 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 20 | 1 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 12:30 AM | 0 | 18 | 0 | 0 | 0 | 18 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 12:45 AM | 2 | 11 | 0 | 0 | 0 | 13 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 14 | 4 | 1 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| Hourly Total | 7 | 82 | 0 | 0 | 0 | 89 | 3 | 0 | 2 | 0 | 0 | 5 | 0 | 84 | 6 | 1 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 185 |
| 1:00 AM | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 9 | 4 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 1:15 AM | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 13 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 1:30 AM | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 1:45 AM | 1 | 16 | 0 | 0 | 0 | 17 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 1 | 0 | 35 |
| Hourly Total | 2 | 71 | 0 | 0 | 0 | 73 | 1 | 0 | 6 | 0 | 0 | 7 | 0 | 48 | 5 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 1 | 0 | 133 |
| 2:00 AM | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| 2:15 AM | 2 | 19 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 2:30 AM | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 1 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 35 |
| 2:45 AM | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Hourly Total | 4 | 74 | 0 | 0 | 0 | 78 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 62 | 1 | 0 | 0 | 63 | 0 | 0 | 0 | 0 | 0 | 0 | 143 |
| 3:00 AM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 3:15 AM | 1 | 12 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 2 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 3:30 AM | 1 | 6 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 3:45 AM | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Hourly Total | 2 | 38 | 0 | 0 | 0 | 40 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 83 | 2 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 126 |
| 4:00 AM | 0 | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 34 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 49 |
| 4:15 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 28 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 4:30 AM | 0 | 18 | 0 | 0 | 0 | 18 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 49 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 70 |
| 4:45 AM | 0 | 23 | 0 | 0 | 0 | 23 | 8 | 0 | 6 | 0 | 0 | 14 | 0 | 48 | 3 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 88 |
| Hourly Total | 0 | 74 | 0 | 0 | 0 | 74 | 11 | 0 | 8 | 0 | 0 | 19 | 0 | 159 | 3 | 0 | 0 | 162 | 0 | 0 | 0 | 0 | 0 | 0 | 255 |
| 5:00 AM | 0 | 22 | 0 | 0 | 0 | 22 | 6 | 0 | 1 | 0 | 0 | 7 | 0 | 75 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 104 |
| 5:15 AM | 0 | 31 | 0 | 0 | 0 | 31 | 5 | 0 | 5 | 0 | 0 | 10 | 0 | 93 | 0 | 0 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 134 |
| 5:30 AM | 0 | 42 | 0 | 0 | 0 | 42 | 7 | 0 | 8 | 0 | 0 | 15 | 0 | 145 | 0 | 0 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 0 | 202 |
| 5:45 AM | 2 | 49 | 0 | 0 | 0 | 51 | 7 | 0 | 8 | 0 | 0 | 15 | 0 | 138 | 3 | 0 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 207 |
| Hourly Total | 2 | 144 | 0 | 0 | 0 | 146 | 25 | 0 | 22 | 0 | 0 | 47 | 0 | 451 | 3 | 0 | 0 | 454 | 0 | 0 | 0 | 0 | 0 | 0 | 647 |
| 6:00 AM | 4 | 52 | 0 | 0 | 0 | 56 | 9 | 0 | 13 | 0 | 0 | 22 | 0 | 180 | 10 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 268 |
| 6:15 AM | 2 | 63 | 2 | 0 | 0 | 67 | 10 | 0 | 9 | 0 | 0 | 19 | 0 | 215 | 10 | 0 | 0 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 311 |
| 6:30 AM | 7 | 104 | 0 | 0 | 0 | 111 | 13 | 1 | 23 | 0 | 0 | 37 | 1 | 295 | 7 | 0 | 0 | 303 | 0 | 0 | 0 | 0 | 0 | 0 | 451 |
| 6:45 AM | 8 | 90 | 0 | 0 | 0 | 98 | 16 | 1 | 16 | 0 | 0 | 33 | 1 | 320 | 15 | 1 | 0 | 337 | 0 | 0 | 0 | 0 | 0 | 0 | 468 |
| Hourly Total | 21 | 309 | 2 | 0 | 0 | 332 | 48 | 2 | 61 | 0 | 0 | 111 | 2 | 1010 | 42 | 1 | 0 | 1055 | 0 | 0 | 0 | 0 | 0 | 0 | 1498 |
| 7:00 AM | 23 | 106 | 1 | 0 | 0 | 130 | 25 | 0 | 30 | 0 | 0 | 55 | 3 | 273 | 11 | 0 | 0 | 287 | 0 | 0 | 0 | 0 | 0 | 0 | 472 |
| 7:15 AM | 24 | 156 | 2 | 0 | 0 | 182 | 43 | 0 | 33 | 0 | 0 | 76 | 4 | 382 | 14 | 0 | 0 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 658 |
| 7:30 AM | 27 | 201 | 3 | 0 | 0 | 231 | 34 | 0 | 51 | 0 | 0 | 85 | 8 | 339 | 15 | 2 | 0 | 364 | 0 | 1 | 0 | 0 | 0 | 1 | 681 |
| 7:45 AM | 29 | 213 | 8 | 0 | 0 | 250 | 32 | 0 | 35 | 0 | 1 | 67 | 19 | 378 | 24 | 2 | 0 | 423 | 0 | 0 | 0 | 0 | 0 | 0 | 740 |
| Hourly Total | 103 | 676 | 14 | 0 | 0 | 793 | 134 | 0 | 149 | 0 | 1 | 283 | 34 | 1372 | 64 | 4 | 0 | 1474 | 0 | 1 | 0 | 0 | 0 | 1 | 2551 |
| 8:00 AM | 12 | 201 | 4 | 0 | 0 | 217 | 33 | 0 | 32 | 0 | 0 | 65 | 16 | 270 | 24 | 12 | 0 | 322 | 3 | 0 | 0 | 0 | 0 | 3 | 607 |
| 8:15 AM | 18 | 184 | 6 | 0 | 0 | 208 | 28 | 1 | 28 | 0 | 0 | 57 | 12 | 245 | 18 | 6 | 0 | 281 | 4 | 0 | 0 | 0 | 0 | 4 | 550 |
| 8:30 AM | 10 | 120 | 3 | 0 | 0 | 133 | 32 | 1 | 23 | 0 | 0 | 56 | 4 | 285 | 25 | 1 | 0 | 315 | 2 | 2 | 3 | 0 | 0 | 7 | 511 |
| 8:45 AM | 23 | 145 | 5 | 0 | 0 | 173 | 30 | 0 | 22 | 0 | 0 | 52 | 5 | 239 | 22 | 7 | 0 | 273 | 0 | 1 | 0 | 0 | 0 | 1 | 499 |
| Hourly Total | 63 | 650 | 18 | 0 | 0 | 731 | 123 | 2 | 105 | 0 | 0 | 230 | 37 | 1039 | 89 | 26 | 0 | 1191 | 9 | 3 | 3 | 0 | 0 | 15 | 2167 |
| 9:00 AM | 9 | 139 | 6 | 0 | 0 | 154 | 22 | 0 | 15 | 0 | 0 | 37 | 6 | 178 | 15 | 6 | 0 | 205 | 7 | 0 | 1 | 0 | 0 | 8 | 404 |
| 9:15 AM | 11 | 136 | 0 | 0 | 0 | 147 | 18 | 0 | 17 | 0 | 0 | 35 | 3 | 170 | 16 | 6 | 0 | 195 | 0 | 0 | 1 | 0 | 0 | 1 | 378 |
| 9:30 AM | 9 | 128 | 3 | 0 | 0 | 140 | 24 | 0 | 24 | 0 | 0 | 48 | 2 | 157 | 17 | 2 | 0 | 178 | 0 | 1 | 1 | 0 | 0 | 2 | 368 |
| 9:45 AM | 9 | 129 | 4 | 0 | 0 | 142 | 19 | 1 | 17 | 0 | 0 | 37 | 5 | 154 | 22 | 8 | 1 | 189 | 4 | 0 | 3 | 1 | 0 | 8 | 376 |
| Hourly Total | 38 | 532 | 13 | 0 | 0 | 583 | 83 | 1 | 73 | 0 | 0 | 157 | 16 | 659 | 70 | 22 | 1 | 767 | 11 | 1 | 6 | 1 | 0 | 19 | 1526 |
| 10:00 AM | 8 | 125 | 3 | 1 | 0 | 137 | 26 | 2 | 18 | 0 | 0 | 46 | 2 | 136 | 22 | 3 | 0 | 163 | 1 | 1 | 3 | 0 | 0 | 5 | 351 |
| 10:15 AM | 11 | 145 | 3 | 0 | 0 | 159 | 25 | 0 | 15 | 0 | 0 | 40 | 5 | 150 | 12 | 5 | 0 | 172 | 3 | 1 | 2 | 0 | 0 | 6 | 377 |
| 10:30 AM | 9 | 122 | 1 | 0 | 0 | 132 | 25 | 1 | 15 | 0 | 0 | 41 | 2 | 168 | 19 | 8 | 0 | 197 | 2 | 1 | 2 | 0 | 0 | 5 | 375 |
| 10:45 AM | 14 | 121 | 2 | 0 | 0 | 137 | 26 | 1 | 9 | 0 | 0 | 36 | 3 | 163 | 15 | 4 | 0 | 185 | 1 | 0 | 1 | 0 | 0 | 2 | 360 |
| Hourly Total | 42 | 513 | 9 | 1 | 0 | 565 | 102 | 4 | 57 | 0 | 0 | 163 | 12 | 617 | 68 | 20 | 0 | 717 | 7 | 3 | 8 | 0 | 0 | 18 | 1463 |
| 11:00 AM | 9 | 143 | 0 | 0 | 0 | 152 | 26 | 1 | 13 | 0 | 0 | 40 | 2 | 155 | 15 | 3 | 0 | 175 | 4 | 1 | 1 | 0 | 1 | 6 | 373 |
| 11:15 AM | 15 | 124 | 1 | 0 | 0 | 140 | 24 | 0 | 11 | 0 | 0 | 35 | 1 | 133 | 16 | 4 | 0 | 154 | 1 | 2 | 1 | 0 | 0 | 4 | 333 |
| 11:30 AM | 17 | 127 | 2 | 0 | 0 | 146 | 29 | 0 | 15 | 0 | 0 | 44 | 3 | 169 | 19 | 1 | 0 | 192 | 2 | 1 | 1 | 0 | 0 | 4 | 386 |
| 11:45 AM | 15 | 130 | 3 | 0 | 0 | 148 | 25 | 0 | 22 | 0 | 0 | 47 | 3 | 177 | 17 | 2 | 0 | 199 | 4 | 1 | 2 | 0 | 0 | 7 | 401 |
| Hourly Total | 56 | 524 | 6 | 0 | 0 | 586 | 104 | 1 | 61 | 0 | 0 | 166 | 9 | 634 | 67 | 10 | 0 | 720 | 11 | 5 | 5 | 0 | 1 | 21 | 1493 |
| 12:00 PM | 19 | 146 | 2 | 0 | 0 | 167 | 16 | 0 | 19 | 0 | 0 | 35 | 4 | 162 | 25 | 6 | 0 | 197 | 1 | 0 | 1 | 0 | 0 | 2 | 401 |
| 12:15 PM | 12 | 157 | 2 | 0 | 0 | 171 | 23 | 0 | 9 | 0 | 0 | 32 | 6 | 169 | 25 | 1 | 0 | 201 | 9 | 0 | 1 | 0 | 0 | 10 | 414 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 9 | 142 | 1 | 0 | 0 | 152 | 21 | 1 | 13 | 0 | 0 | 35 | 5 | 198 | 16 | 2 | 0 | 221 | 6 | 0 | 1 | 0 | 0 | 7 | 415 |
| 12:45 PM | 12 | 153 | 1 | 0 | 0 | 166 | 23 | 3 | 16 | 0 | 0 | 42 | 4 | 150 | 22 | 4 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 388 |
| Hourly Total | 52 | 598 | 6 | 0 | 0 | 656 | 83 | 4 | 57 | 0 | 0 | 144 | 19 | 679 | 88 | 13 | 0 | 799 | 16 | 0 | 3 | 0 | 0 | 19 | 1618 |
| 1:00 PM | 13 | 150 | 2 | 0 | 0 | 165 | 24 | 1 | 11 | 0 | 0 | 36 | 5 | 173 | 29 | 2 | 0 | 209 | 1 | 0 | 0 | 0 | 0 | 1 | 411 |
| 1:15 PM | 19 | 163 | 1 | 0 | 0 | 183 | 29 | 1 | 20 | 0 | 0 | 50 | 4 | 183 | 16 | 0 | 0 | 203 | 2 | 0 | 1 | 0 | 0 | 3 | 439 |
| 1:30 PM | 15 | 160 | 1 | 0 | 0 | 176 | 24 | 1 | 18 | 0 | 0 | 43 | 3 | 182 | 13 | 7 | 0 | 205 | 2 | 0 | 0 | 0 | 0 | 2 | 426 |
| 1:45 PM | 21 | 173 | 0 | 0 | 0 | 194 | 20 | 0 | 6 | 0 | 0 | 26 | 2 | 169 | 15 | 4 | 0 | 190 | 1 | 1 | 0 | 0 | 0 | 2 | 412 |
| Hourly Total | 68 | 646 | 4 | 0 | 0 | 718 | 97 | 3 | 55 | 0 | 0 | 155 | 14 | 707 | 73 | 13 | 0 | 807 | 6 | 1 | 1 | 0 | 0 | 8 | 1688 |
| 2:00 PM | 11 | 160 | 0 | 0 | 0 | 171 | 30 | 0 | 18 | 0 | 0 | 48 | 4 | 166 | 13 | 3 | 0 | 186 | 0 | 0 | 1 | 0 | 0 | 1 | 406 |
| 2:15 PM | 18 | 189 | 1 | 0 | 0 | 208 | 17 | 1 | 18 | 0 | 0 | 36 | 3 | 192 | 22 | 6 | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 0 | 467 |
| 2:30 PM | 18 | 221 | 1 | 0 | 0 | 240 | 10 | 0 | 16 | 0 | 0 | 26 | 4 | 192 | 25 | 2 | 0 | 223 | 5 | 1 | 2 | 0 | 0 | 8 | 497 |
| 2:45 PM | 21 | 265 | 1 | 0 | 0 | 287 | 16 | 0 | 15 | 0 | 0 | 31 | 3 | 206 | 16 | 4 | 0 | 229 | 1 | 1 | 2 | 0 | 1 | 4 | 551 |
| Hourly Total | 68 | 835 | 3 | 0 | 0 | 906 | 73 | 1 | 67 | 0 | 0 | 141 | 14 | 756 | 76 | 15 | 0 | 861 | 6 | 2 | 5 | 0 | 1 | 13 | 1921 |
| 3:00 PM | 17 | 287 | 2 | 0 | 0 | 306 | 19 | 0 | 18 | 0 | 0 | 37 | 2 | 203 | 27 | 6 | 0 | 238 | 1 | 1 | 2 | 0 | 0 | 4 | 585 |
| 3:15 PM | 16 | 248 | 1 | 0 | 0 | 265 | 23 | 2 | 24 | 0 | 0 | 49 | 6 | 219 | 7 | 0 | 0 | 232 | 3 | 1 | 1 | 0 | 1 | 5 | 551 |
| 3:30 PM | 25 | 330 | 1 | 0 | 0 | 356 | 28 | 0 | 18 | 0 | 0 | 46 | 1 | 218 | 20 | 2 | 0 | 241 | 7 | 1 | 3 | 0 | 2 | 11 | 654 |
| 3:45 PM | 30 | 329 | 2 | 0 | 0 | 361 | 21 | 2 | 17 | 0 | 0 | 40 | 3 | 200 | 18 | 6 | 0 | 227 | 2 | 0 | 2 | 0 | 2 | 4 | 632 |
| Hourly Total | 88 | 1194 | 6 | 0 | 0 | 1288 | 91 | 4 | 77 | 0 | 0 | 172 | 12 | 840 | 72 | 14 | 0 | 938 | 13 | 3 | 8 | 0 | 5 | 24 | 2422 |
| 4:00 PM | 19 | 379 | 0 | 0 | 0 | 398 | 7 | 0 | 18 | 0 | 0 | 25 | 3 | 246 | 22 | 7 | 0 | 278 | 3 | 0 | 2 | 0 | 0 | 5 | 706 |
| 4:15 PM | 22 | 435 | 0 | 0 | 0 | 457 | 31 | 2 | 21 | 0 | 0 | 54 | 3 | 205 | 22 | 3 | 0 | 233 | 3 | 0 | 2 | 0 | 0 | 5 | 749 |
| 4:30 PM | 24 | 478 | 6 | 0 | 0 | 508 | 29 | 0 | 14 | 0 | 0 | 43 | 1 | 221 | 28 | 4 | 0 | 254 | 6 | 3 | 2 | 0 | 0 | 11 | 816 |
| 4:45 PM | 29 | 533 | 1 | 0 | 0 | 563 | 20 | 1 | 30 | 0 | 0 | 51 | 2 | 246 | 32 | 3 | 0 | 283 | 3 | 0 | 0 | 0 | 0 | 3 | 900 |
| Hourly Total | 94 | 1825 | 7 | 0 | 0 | 1926 | 87 | 3 | 83 | 0 | 0 | 173 | 9 | 918 | 104 | 17 | 0 | 1048 | 15 | 3 | 6 | 0 | 0 | 24 | 3171 |
| 5:00 PM | 25 | 520 | 1 | 0 | 0 | 546 | 35 | 0 | 28 | 0 | 0 | 63 | 1 | 290 | 23 | 2 | 0 | 316 | 9 | 2 | 1 | 0 | 1 | 12 | 937 |
| 5:15 PM | 28 | 580 | 0 | 0 | 0 | 608 | 31 | 0 | 22 | 0 | 0 | 53 | 0 | 273 | 41 | 3 | 0 | 317 | 5 | 0 | 1 | 0 | 0 | 6 | 984 |
| 5:30 PM | 25 | 534 | 1 | 0 | 0 | 560 | 17 | 1 | 28 | 0 | 0 | 46 | 0 | 302 | 30 | 2 | 0 | 334 | 3 | 2 | 2 | 0 | 1 | 7 | 947 |
| 5:45 PM | 23 | 489 | 1 | 0 | 0 | 513 | 25 | 0 | 24 | 0 | 0 | 49 | 1 | 257 | 36 | 1 | 0 | 295 | 1 | 0 | 2 | 0 | 0 | 3 | 860 |
| Hourly Total | 101 | 2123 | 3 | 0 | 0 | 2227 | 108 | 1 | 102 | 0 | 0 | 211 | 2 | 1122 | 130 | 8 | 0 | 1262 | 18 | 4 | 6 | 0 | 2 | 28 | 3728 |
| 6:00 PM | 31 | 428 | 1 | 0 | 0 | 460 | 28 | 0 | 14 | 0 | 0 | 42 | 1 | 195 | 28 | 1 | 0 | 225 | 0 | 0 | 0 | 0 | 0 | 0 | 727 |
| 6:15 PM | 25 | 377 | 0 | 0 | 0 | 402 | 34 | 0 | 18 | 0 | 0 | 52 | 1 | 217 | 41 | 2 | 0 | 261 | 1 | 0 | 0 | 0 | 0 | 1 | 716 |
| 6:30 PM | 23 | 273 | 0 | 0 | 0 | 296 | 18 | 0 | 23 | 0 | 0 | 41 | 0 | 161 | 27 | 0 | 0 | 188 | 0 | 1 | 1 | 0 | 0 | 2 | 527 |
| 6:45 PM | 15 | 235 | 0 | 0 | 0 | 250 | 17 | 0 | 22 | 0 | 0 | 39 | 1 | 166 | 36 | 1 | 0 | 204 | 1 | 0 | 0 | 0 | 0 | 1 | 494 |
| Hourly Total | 94 | 1313 | 1 | 0 | 0 | 1408 | 97 | 0 | 77 | 0 | 0 | 174 | 3 | 739 | 132 | 4 | 0 | 878 | 2 | 1 | 1 | 0 | 0 | 4 | 2464 |
| 7:00 PM | 25 | 175 | 0 | 0 | 0 | 200 | 25 | 0 | 11 | 0 | 0 | 36 | 0 | 184 | 32 | 1 | 0 | 217 | 0 | 0 | 1 | 0 | 0 | 1 | 454 |
| 7:15 PM | 23 | 159 | 0 | 0 | 0 | 182 | 16 | 0 | 16 | 0 | 0 | 32 | 0 | 172 | 30 | 0 | 0 | 202 | 0 | 0 | 0 | 0 | 0 | 0 | 416 |
| 7:30 PM | 22 | 174 | 1 | 0 | 0 | 197 | 18 | 0 | 13 | 0 | 0 | 31 | 0 | 138 | 16 | 1 | 0 | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 383 |
| 7:45 PM | 18 | 132 | 0 | 0 | 0 | 150 | 10 | 0 | 14 | 0 | 0 | 24 | 0 | 117 | 23 | 0 | 0 | 140 | 2 | 0 | 1 | 0 | 0 | 3 | 317 |
| Hourly Total | 88 | 640 | 1 | 0 | 0 | 729 | 69 | 0 | 54 | 0 | 0 | 123 | 0 | 611 | 101 | 2 | 0 | 714 | 2 | 0 | 2 | 0 | 0 | 4 | 1570 |
| 8:00 PM | 20 | 129 | 0 | 0 | 0 | 149 | 1 | 0 | 15 | 0 | 0 | 16 | 1 | 86 | 21 | 0 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 273 |
| 8:15 PM | 21 | 111 | 0 | 0 | 0 | 132 | 6 | 0 | 10 | 0 | 0 | 16 | 1 | 112 | 14 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 0 | 275 |
| 8:30 PM | 12 | 108 | 0 | 0 | 0 | 120 | 10 | 0 | 3 | 0 | 0 | 13 | 0 | 109 | 16 | 0 | 0 | 125 | 1 | 0 | 0 | 0 | 0 | 1 | 259 |
| 8:45 PM | 9 | 97 | 0 | 0 | 0 | 106 | 9 | 0 | 6 | 0 | 0 | 15 | 0 | 93 | 11 | 0 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | 225 |
| Hourly Total | 62 | 445 | 0 | 0 | 0 | 507 | 26 | 0 | 34 | 0 | 0 | 60 | 2 | 400 | 62 | 0 | 0 | 464 | 1 | 0 | 0 | 0 | 0 | 1 | 1032 |
| 9:00 PM | 16 | 71 | 0 | 0 | 0 | 87 | 7 | 0 | 3 | 0 | 0 | 10 | 0 | 79 | 16 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 192 |
| 9:15 PM | 13 | 87 | 0 | 0 | 0 | 100 | 5 | 0 | 6 | 0 | 0 | 11 | 0 | 89 | 11 | 1 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 212 |
| 9:30 PM | 8 | 88 | 0 | 0 | 0 | 96 | 8 | 0 | 4 | 0 | 0 | 12 | 0 | 106 | 12 | 0 | 0 | 118 | 0 | 0 | 0 | 0 | 0 | 0 | 226 |
| 9:45 PM | 12 | 76 | 0 | 0 | 0 | 88 | 4 | 0 | 2 | 0 | 0 | 6 | 0 | 56 | 11 | 0 | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 161 |
| Hourly Total | 49 | 322 | 0 | 0 | 0 | 371 | 24 | 0 | 15 | 0 | 0 | 39 | 0 | 330 | 50 | 1 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 0 | 791 |
| 10:00 PM | 4 | 85 | 0 | 0 | 0 | 89 | 3 | 0 | 2 | 0 | 0 | 5 | 0 | 74 | 6 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 174 |
| 10:15 PM | 8 | 62 | 0 | 1 | 0 | 71 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 58 | 5 | 0 | 0 | 63 | 0 | 0 | 0 | 0 | 0 | 0 | 137 |
| 10:30 PM | 2 | 60 | 0 | 0 | 0 | 62 | 4 | 0 | 3 | 0 | 0 | 7 | 0 | 75 | 4 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 148 |
| 10:45 PM | 3 | 46 | 0 | 0 | 0 | 49 | 2 | 0 | 4 | 0 | 0 | 6 | 0 | 47 | 2 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 104 |
| Hourly Total | 17 | 253 | 0 | 1 | 0 | 271 | 10 | 0 | 11 | 0 | 0 | 21 | 0 | 254 | 17 | 0 | 0 | 271 | 0 | 0 | 0 | 0 | 0 | 0 | 563 |
| 11:00 PM | 6 | 52 | 0 | 0 | 0 | 58 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 34 | 7 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 104 |
| 11:15 PM | 2 | 48 | 0 | 0 | 0 | 50 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 44 | 5 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 102 |
| 11:30 PM | 3 | 37 | 0 | 0 | 0 | 40 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 35 | 4 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| 11:45 PM | 0 | 27 | 0 | 0 | 0 | 27 | 1 | 0 | 3 | 0 | 0 | 4 | 0 | 29 | 1 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| Hourly Total | 11 | 164 | 0 | 0 | 0 | 175 | 8 | 0 | 8 | 0 | 0 | 16 | 0 | 142 | 17 | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 350 |
| Grand Total | 1132 | 14045 | 93 | 2 | 0 | 15272 | 1408 | 26 | 1186 | 0 | 1 | 2620 | 185 | 13716 | 1342 | 171 | 1 | 15414 | 117 | 27 | 54 | 1 | 10 | 199 | 33505 |
| Approach % | 7.4 | 92.0 | 0.6 | 0.0 | - | - | 53.7 | 1.0 | 45.3 | 0.0 | - | - | 1.2 | 89.0 | 8.7 | 1.1 | - | - | 58.8 | 13.6 | 27.1 | 0.5 | - | - | - |
| Total % | 3.4 | 41.9 | 0.3 | 0.0 | - | 45.6 | 4.2 | 0.1 | 3.5 | 0.0 | - | 7.8 | 0.6 | 40.9 | 4.0 | 0.5 | - | 46.0 | 0.3 | 0.1 | 0.2 | 0.0 | - | 0.6 | - |
| Motorcycles | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 2 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 4 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Cars & Light Goods | 1079 | 13310 | 91 | 2 | - | 14482 | 1370 | 26 | 1123 | 0 | - | 2519 | 182 | 12928 | 1308 | 169 | - | 14587 | 116 | 27 | 52 | 1 | - | 196 | 31784 |
| % Cars & Light Goods | 95.3 | 94.8 | 97.8 | 100.0 | - | 94.8 | 97.3 | 100.0 | 94.7 | - | - | 96.1 | 98.4 | 94.3 | 97.5 | 98.8 | - | 94.6 | 99.1 | 100.0 | 96.3 | 100.0 | - | 98.5 | 94.9 |
| Buses | 1 | 10 | 0 | 0 | - | 11 | 0 | 0 | 5 | 0 | - | 5 | 0 | 13 | 0 | 0 | - | 13 | 0 | 0 | 0 | 0 | - | 0 | 29 |
| % Buses | 0.1 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.4 | - | - | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 |
| Single-Unit Trucks | 30 | 506 | 2 | 0 | - | 538 | 32 | 0 | 40 | 0 | - | 72 | 3 | 516 | 29 | 2 | - | 550 | 1 | 0 | 2 | 0 | - | 3 | 1163 |
| % Single-Unit Trucks | 2.7 | 3.6 | 2.2 | 0.0 | - | 3.5 | 2.3 | 0.0 | 3.4 | - | - | 2.7 | 1.6 | 3.8 | 2.2 | 1.2 | - | 3.6 | 0.9 | 0.0 | 3.7 | 0.0 | - | 1.5 | 3.5 |
| Articulated Trucks | 22 | 218 | 0 | 0 | - | 240 | 6 | 0 | 18 | 0 | - | 24 | 0 | 258 | 3 | 0 | - | 261 | 0 | 0 | 0 | 0 | - | 0 | 525 |
| % Articulated Trucks | 1.9 | 1.6 | 0.0 | 0.0 | - | 1.6 | 0.4 | 0.0 | 1.5 | - | - | 0.9 | 0.0 | 1.9 | 0.2 | 0.0 | - | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.6 |

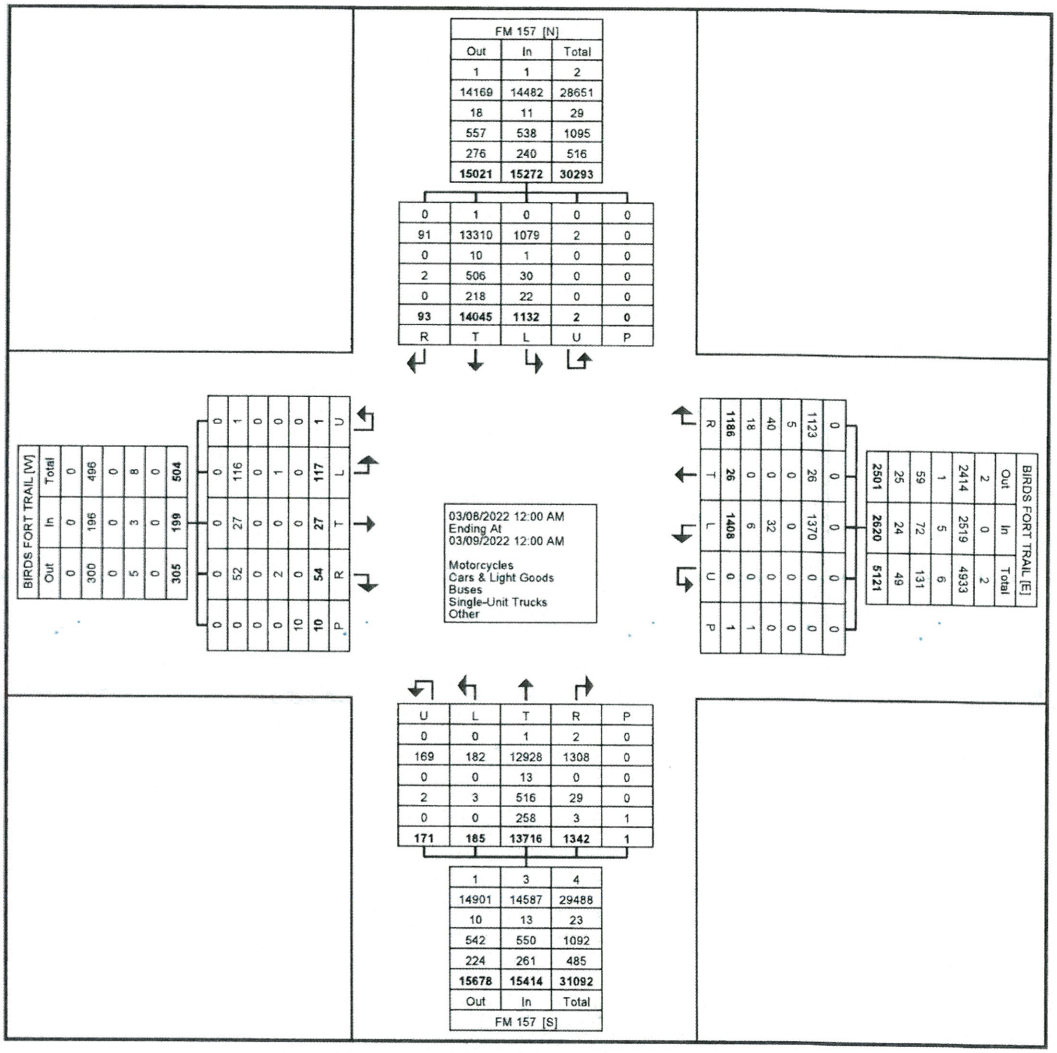
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 3 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 30.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 7 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 70.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022


## Turning Movement Peak Hour Data (7:15 AM)

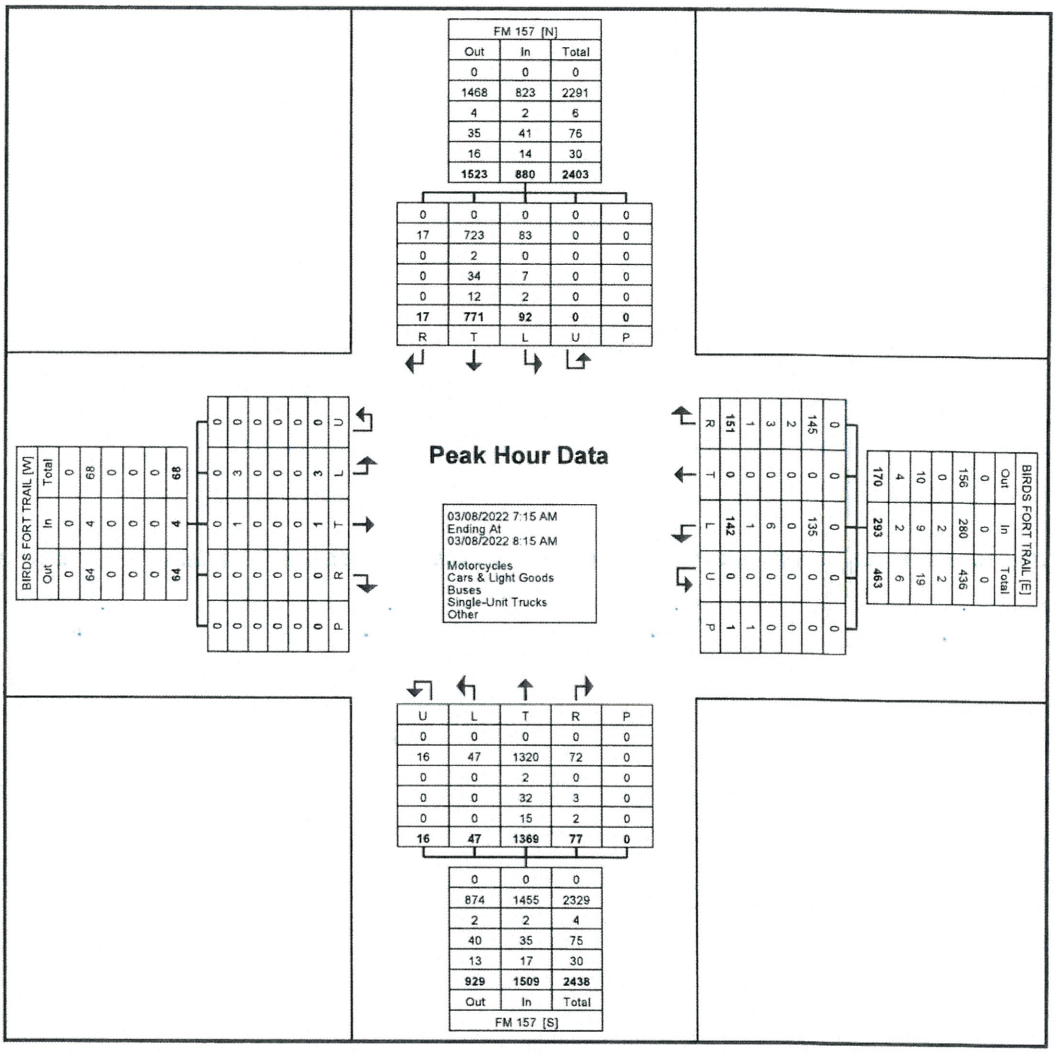
| Start Time | FM 157 Southbound | | | | | | BIRDS FORT TRAIL Westbound | | | | | | FM 157 Northbound | | | | | | BIRDS FORT TRAIL Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 24 | 156 | 2 | 0 | 0 | 182 | 43 | 0 | 33 | 0 | 0 | 76 | 4 | 382 | 14 | 0 | 0 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 658 |
| 7:30 AM | 27 | 201 | 3 | 0 | 0 | 231 | 34 | 0 | 51 | 0 | 0 | 85 | 8 | 339 | 15 | 2 | 0 | 364 | 0 | 1 | 0 | 0 | 0 | 1 | 681 |
| 7:45 AM | 29 | 213 | 8 | 0 | 0 | 250 | 32 | 0 | 35 | 0 | 1 | 67 | 19 | 378 | 24 | 2 | 0 | 423 | 0 | 0 | 0 | 0 | 0 | 0 | 740 |
| 8:00 AM | 12 | 201 | 4 | 0 | 0 | 217 | 33 | 0 | 32 | 0 | 0 | 65 | 16 | 270 | 24 | 12 | 0 | 322 | 3 | 0 | 0 | 0 | 0 | 3 | 607 |
| Total | 92 | 771 | 17 | 0 | 0 | 880 | 142 | 0 | 151 | 0 | 1 | 293 | 47 | 1369 | 77 | 16 | 0 | 1509 | 3 | 1 | 0 | 0 | 0 | 4 | 2686 |
| Approach % | 10.5 | 87.6 | 1.9 | 0.0 | - | - | 48.5 | 0.0 | 51.5 | 0.0 | - | - | 3.1 | 90.7 | 5.1 | 1.1 | - | - | 75.0 | 25.0 | 0.0 | 0.0 | - | - | - |
| Total % | 3.4 | 28.7 | 0.6 | 0.0 | - | 32.8 | 5.3 | 0.0 | 5.6 | 0.0 | - | 10.9 | 1.7 | 51.0 | 2.9 | 0.6 | - | 56.2 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.1 | - |
| PHF | 0.793 | 0.905 | 0.531 | 0.000 | - | 0.880 | 0.826 | 0.000 | 0.740 | 0.000 | - | 0.862 | 0.618 | 0.896 | 0.802 | 0.333 | - | 0.892 | 0.250 | 0.250 | 0.000 | 0.000 | - | 0.333 | 0.907 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 83 | 723 | 17 | 0 | - | 823 | 135 | 0 | 145 | 0 | - | 280 | 47 | 1320 | 72 | 16 | - | 1455 | 3 | 1 | 0 | 0 | - | 4 | 2562 |
| % Cars & Light Goods | 90.2 | 93.8 | 100.0 | - | - | 93.5 | 95.1 | - | 96.0 | - | - | 95.6 | 100.0 | 96.4 | 93.5 | 100.0 | - | 96.4 | 100.0 | 100.0 | - | - | - | 100.0 | 95.4 |
| Buses | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 2 | 0 | - | 2 | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 6 |
| % Buses | 0.0 | 0.3 | 0.0 | - | - | 0.2 | 0.0 | - | 1.3 | - | - | 0.7 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 | 0.2 |
| Single-Unit Trucks | 7 | 34 | 0 | 0 | - | 41 | 6 | 0 | 3 | 0 | - | 9 | 0 | 32 | 3 | 0 | - | 35 | 0 | 0 | 0 | 0 | - | 0 | 85 |
| % Single-Unit Trucks | 7.6 | 4.4 | 0.0 | - | - | 4.7 | 4.2 | - | 2.0 | - | - | 3.1 | 0.0 | 2.3 | 3.9 | 0.0 | - | 2.3 | 0.0 | 0.0 | - | - | - | 0.0 | 3.2 |
| Articulated Trucks | 2 | 12 | 0 | 0 | - | 14 | 1 | 0 | 1 | 0 | - | 2 | 0 | 15 | 2 | 0 | - | 17 | 0 | 0 | 0 | 0 | - | 0 | 33 |
| % Articulated Trucks | 2.2 | 1.6 | 0.0 | - | - | 1.6 | 0.7 | - | 0.7 | - | - | 0.7 | 0.0 | 1.1 | 2.6 | 0.0 | - | 1.1 | 0.0 | 0.0 | - | - | - | 0.0 | 1.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (4:45 PM)

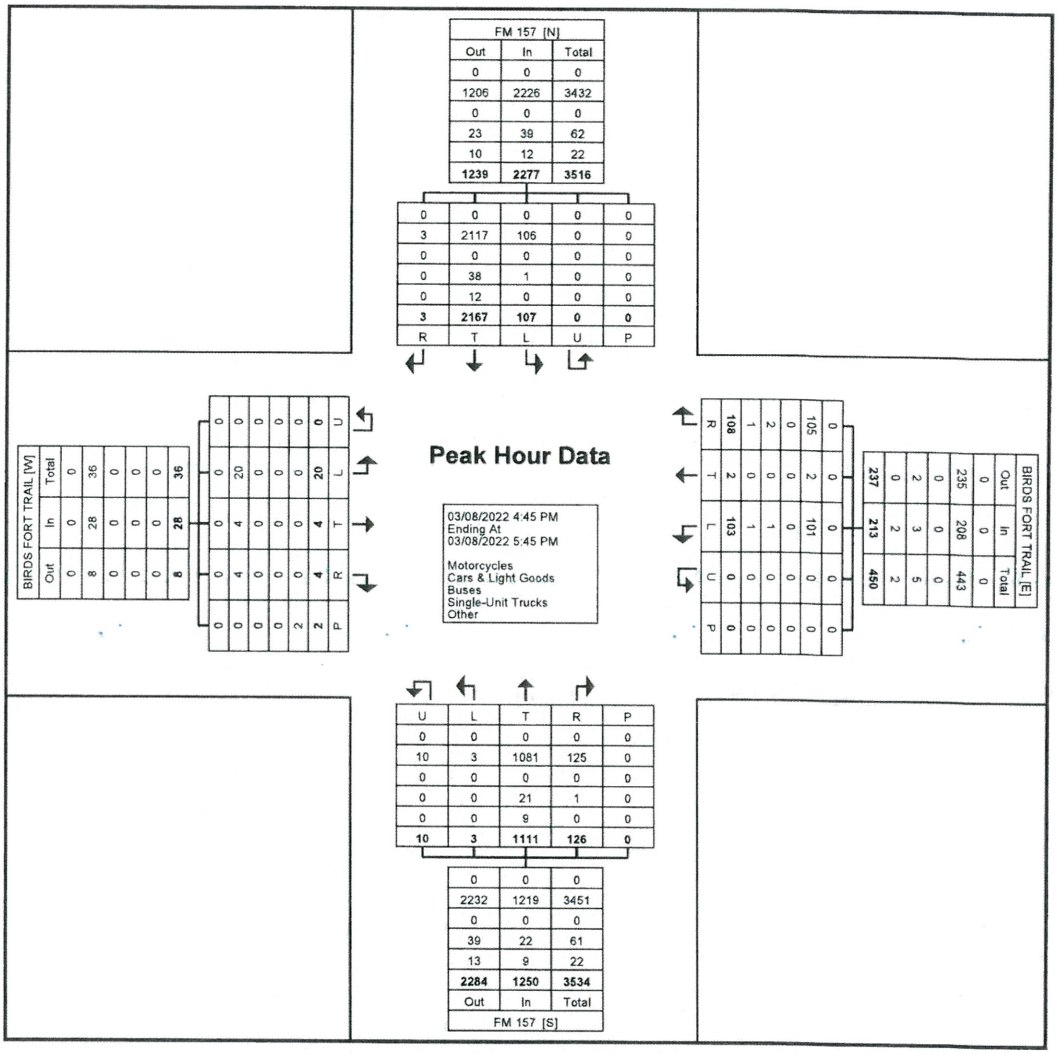
| Start Time | FM 157 Southbound | | | | | | BIRDS FORT TRAIL Westbound | | | | | | FM 157 Northbound | | | | | | BIRDS FORT TRAIL Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:45 PM | 29 | 533 | 1 | 0 | 0 | 563 | 20 | 1 | 30 | 0 | 0 | 51 | 2 | 246 | 32 | 3 | 0 | 283 | 3 | 0 | 0 | 0 | 0 | 3 | 900 |
| 5:00 PM | 25 | 520 | 1 | 0 | 0 | 546 | 35 | 0 | 28 | 0 | 0 | 63 | 1 | 290 | 23 | 2 | 0 | 316 | 9 | 2 | 1 | 0 | 1 | 12 | 937 |
| 5:15 PM | 28 | 580 | 0 | 0 | 0 | 608 | 31 | 0 | 22 | 0 | 0 | 53 | 0 | 273 | 41 | 3 | 0 | 317 | 5 | 0 | 1 | 0 | 0 | 6 | 984 |
| 5:30 PM | 25 | 534 | 1 | 0 | 0 | 560 | 17 | 1 | 28 | 0 | 0 | 46 | 0 | 302 | 30 | 2 | 0 | 334 | 3 | 2 | 2 | 0 | 1 | 7 | 947 |
| Total | 107 | 2167 | 3 | 0 | 0 | 2277 | 103 | 2 | 108 | 0 | 0 | 213 | 3 | 1111 | 126 | 10 | 0 | 1250 | 20 | 4 | 4 | 0 | 2 | 28 | 3768 |
| Approach % | 4.7 | 95.2 | 0.1 | 0.0 | - | - | 48.4 | 0.9 | 50.7 | 0.0 | - | - | 0.2 | 88.9 | 10.1 | 0.8 | - | - | 71.4 | 14.3 | 14.3 | 0.0 | - | - | - |
| Total % | 2.8 | 57.5 | 0.1 | 0.0 | - | 60.4 | 2.7 | 0.1 | 2.9 | 0.0 | - | 5.7 | 0.1 | 29.5 | 3.3 | 0.3 | - | 33.2 | 0.5 | 0.1 | 0.1 | 0.0 | - | 0.7 | - |
| PHF | 0.922 | 0.934 | 0.750 | 0.000 | - | 0.936 | 0.736 | 0.500 | 0.900 | 0.000 | - | 0.845 | 0.375 | 0.920 | 0.768 | 0.833 | - | 0.936 | 0.556 | 0.500 | 0.500 | 0.000 | - | 0.583 | 0.957 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 106 | 2117 | 3 | 0 | - | 2226 | 101 | 2 | 105 | 0 | - | 208 | 3 | 1081 | 125 | 10 | - | 1219 | 20 | 4 | 4 | 0 | - | 28 | 3681 |
| % Cars & Light Goods | 99.1 | 97.7 | 100.0 | - | - | 97.8 | 98.1 | 100.0 | 97.2 | - | - | 97.7 | 100.0 | 97.3 | 99.2 | 100.0 | - | 97.5 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 97.7 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 1 | 38 | 0 | 0 | - | 39 | 1 | 0 | 2 | 0 | - | 3 | 0 | 21 | 1 | 0 | - | 22 | 0 | 0 | 0 | 0 | - | 0 | 64 |
| % Single-Unit Trucks | 0.9 | 1.8 | 0.0 | - | - | 1.7 | 1.0 | 0.0 | 1.9 | - | - | 1.4 | 0.0 | 1.9 | 0.8 | 0.0 | - | 1.8 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 1.7 |
| Articulated Trucks | 0 | 12 | 0 | 0 | - | 12 | 1 | 0 | 1 | 0 | - | 2 | 0 | 9 | 0 | 0 | - | 9 | 0 | 0 | 0 | 0 | - | 0 | 23 |
| % Articulated Trucks | 0.0 | 0.6 | 0.0 | - | - | 0.5 | 1.0 | 0.0 | 0.9 | - | - | 0.9 | 0.0 | 0.8 | 0.0 | 0.0 | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.6 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 2 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BIRDS FORT TRAIL
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022


## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | BLUE LAKE BLVD Westbound | | | | | | FM 157 Northbound | | | | | | BLUE LAKE BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 1 | 19 | 0 | 0 | 0 | 20 | 3 | 0 | 1 | 0 | 0 | 4 | 2 | 26 | 4 | 1 | 0 | 33 | 0 | 0 | 1 | 0 | 0 | 1 | 58 |
| 12:15 AM | 0 | 31 | 0 | 1 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 19 | 1 | 0 | 0 | 22 | 2 | 0 | 1 | 0 | 0 | 3 | 57 |
| 12:30 AM | 2 | 16 | 0 | 0 | 0 | 18 | 1 | 1 | 3 | 0 | 0 | 5 | 1 | 21 | 1 | 0 | 0 | 23 | 1 | 2 | 0 | 0 | 0 | 3 | 49 |
| 12:45 AM | 0 | 14 | 0 | 0 | 0 | 14 | 1 | 2 | 0 | 0 | 0 | 3 | 0 | 17 | 1 | 0 | 0 | 18 | 1 | 1 | 2 | 0 | 0 | 4 | 39 |
| Hourly Total | 3 | 80 | 0 | 1 | 0 | 84 | 5 | 3 | 4 | 0 | 0 | 12 | 5 | 83 | 7 | 1 | 0 | 96 | 4 | 3 | 4 | 0 | 0 | 11 | 203 |
| 1:00 AM | 0 | 15 | 0 | 2 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 2 | 30 |
| 1:15 AM | 3 | 13 | 0 | 0 | 0 | 16 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 11 | 0 | 0 | 0 | 12 | 1 | 0 | 1 | 0 | 0 | 2 | 33 |
| 1:30 AM | 1 | 21 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 0 | 0 | 1 | 33 |
| 1:45 AM | 0 | 15 | 0 | 0 | 0 | 15 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 17 | 0 | 0 | 0 | 18 | 0 | 0 | 1 | 0 | 0 | 1 | 35 |
| Hourly Total | 4 | 64 | 0 | 2 | 0 | 70 | 3 | 0 | 1 | 0 | 0 | 4 | 3 | 48 | 0 | 0 | 0 | 51 | 2 | 0 | 4 | 0 | 0 | 6 | 131 |
| 2:00 AM | 1 | 17 | 0 | 0 | 0 | 18 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 20 | 3 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| 2:15 AM | 1 | 20 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 3 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 2:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 12 | 3 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| 2:45 AM | 1 | 13 | 0 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 16 | 1 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Hourly Total | 3 | 69 | 0 | 0 | 0 | 72 | 4 | 0 | 3 | 0 | 0 | 7 | 0 | 60 | 10 | 0 | 0 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 149 |
| 3:00 AM | 0 | 12 | 0 | 2 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 3 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| 3:15 AM | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 20 | 0 | 0 | 0 | 20 | 1 | 0 | 2 | 0 | 0 | 3 | 34 |
| 3:30 AM | 0 | 6 | 0 | 0 | 0 | 6 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 21 | 2 | 0 | 0 | 23 | 0 | 0 | 1 | 0 | 0 | 1 | 33 |
| 3:45 AM | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Hourly Total | 0 | 37 | 0 | 2 | 0 | 39 | 1 | 0 | 3 | 0 | 0 | 4 | 1 | 77 | 5 | 0 | 0 | 83 | 1 | 0 | 3 | 0 | 0 | 4 | 130 |
| 4:00 AM | 1 | 14 | 0 | 0 | 0 | 15 | 1 | 0 | 2 | 0 | 0 | 3 | 1 | 31 | 1 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| 4:15 AM | 0 | 19 | 0 | 0 | 0 | 19 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 28 | 0 | 0 | 0 | 29 | 1 | 0 | 0 | 0 | 0 | 1 | 51 |
| 4:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 2 | 0 | 3 | 0 | 0 | 5 | 1 | 44 | 2 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| 4:45 AM | 1 | 30 | 0 | 0 | 0 | 31 | 1 | 0 | 3 | 0 | 0 | 4 | 2 | 49 | 0 | 0 | 0 | 51 | 0 | 1 | 1 | 0 | 0 | 2 | 88 |
| Hourly Total | 2 | 82 | 0 | 0 | 0 | 84 | 5 | 0 | 9 | 0 | 0 | 14 | 5 | 152 | 3 | 0 | 0 | 160 | 1 | 1 | 1 | 0 | 0 | 3 | 261 |
| 5:00 AM | 1 | 25 | 1 | 0 | 0 | 27 | 5 | 0 | 3 | 0 | 0 | 8 | 0 | 70 | 2 | 0 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 107 |
| 5:15 AM | 0 | 34 | 0 | 0 | 0 | 34 | 4 | 2 | 3 | 0 | 0 | 9 | 2 | 85 | 1 | 0 | 0 | 88 | 3 | 0 | 1 | 0 | 0 | 4 | 135 |
| 5:30 AM | 0 | 46 | 1 | 0 | 1 | 47 | 11 | 0 | 6 | 0 | 0 | 17 | 3 | 131 | 0 | 0 | 1 | 134 | 3 | 0 | 2 | 0 | 0 | 5 | 203 |
| 5:45 AM | 1 | 55 | 0 | 0 | 0 | 56 | 6 | 3 | 5 | 0 | 0 | 14 | 7 | 138 | 2 | 0 | 0 | 147 | 3 | 0 | 2 | 0 | 0 | 5 | 222 |
| Hourly Total | 2 | 160 | 2 | 0 | 1 | 164 | 26 | 5 | 17 | 0 | 0 | 48 | 12 | 424 | 5 | 0 | 1 | 441 | 9 | 0 | 5 | 0 | 0 | 14 | 667 |
| 6:00 AM | 3 | 51 | 2 | 0 | 0 | 56 | 11 | 0 | 3 | 0 | 0 | 14 | 3 | 170 | 1 | 0 | 0 | 174 | 6 | 0 | 2 | 0 | 0 | 8 | 252 |
| 6:15 AM | 8 | 58 | 2 | 0 | 0 | 68 | 3 | 5 | 9 | 0 | 0 | 17 | 6 | 211 | 11 | 0 | 0 | 228 | 6 | 4 | 4 | 0 | 0 | 14 | 327 |
| 6:30 AM | 6 | 90 | 3 | 0 | 0 | 99 | 14 | 3 | 5 | 0 | 0 | 22 | 15 | 286 | 7 | 0 | 0 | 308 | 6 | 0 | 7 | 0 | 0 | 13 | 442 |
| 6:45 AM | 8 | 94 | 6 | 0 | 0 | 108 | 12 | 0 | 10 | 0 | 0 | 22 | 11 | 328 | 16 | 0 | 0 | 355 | 7 | 0 | 7 | 0 | 0 | 14 | 499 |
| Hourly Total | 25 | 293 | 13 | 0 | 0 | 331 | 40 | 8 | 27 | 0 | 0 | 75 | 35 | 995 | 35 | 0 | 0 | 1065 | 25 | 4 | 20 | 0 | 0 | 49 | 1520 |
| 7:00 AM | 22 | 102 | 7 | 0 | 0 | 131 | 23 | 2 | 23 | 0 | 0 | 48 | 9 | 269 | 11 | 0 | 0 | 289 | 6 | 2 | 3 | 0 | 0 | 11 | 479 |
| 7:15 AM | 18 | 152 | 2 | 0 | 0 | 172 | 49 | 3 | 51 | 0 | 0 | 103 | 5 | 338 | 21 | 0 | 0 | 364 | 6 | 10 | 5 | 0 | 0 | 21 | 660 |
| 7:30 AM | 37 | 202 | 3 | 1 | 0 | 243 | 55 | 8 | 51 | 0 | 1 | 114 | 10 | 296 | 18 | 0 | 0 | 324 | 9 | 3 | 6 | 0 | 0 | 18 | 699 |
| 7:45 AM | 14 | 210 | 8 | 0 | 0 | 232 | 32 | 5 | 43 | 0 | 0 | 80 | 6 | 382 | 21 | 0 | 0 | 409 | 8 | 6 | 13 | 0 | 0 | 27 | 748 |
| Hourly Total | 91 | 666 | 20 | 1 | 0 | 778 | 159 | 18 | 168 | 0 | 1 | 345 | 30 | 1285 | 71 | 0 | 0 | 1386 | 29 | 21 | 27 | 0 | 0 | 77 | 2586 |
| 8:00 AM | 16 | 226 | 7 | 2 | 0 | 251 | 36 | 1 | 24 | 0 | 0 | 61 | 8 | 285 | 13 | 1 | 0 | 307 | 6 | 1 | 8 | 0 | 0 | 15 | 634 |
| 8:15 AM | 18 | 175 | 3 | 1 | 0 | 197 | 29 | 2 | 20 | 0 | 0 | 51 | 16 | 296 | 12 | 0 | 0 | 324 | 3 | 7 | 8 | 0 | 0 | 18 | 590 |
| 8:30 AM | 9 | 145 | 5 | 1 | 0 | 160 | 23 | 4 | 15 | 0 | 0 | 42 | 9 | 244 | 16 | 0 | 0 | 269 | 8 | 5 | 14 | 0 | 0 | 27 | 498 |
| 8:45 AM | 7 | 173 | 4 | 0 | 0 | 184 | 16 | 6 | 22 | 0 | 0 | 44 | 7 | 254 | 13 | 0 | 0 | 274 | 6 | 3 | 6 | 0 | 0 | 15 | 517 |
| Hourly Total | 50 | 719 | 19 | 4 | 0 | 792 | 104 | 13 | 81 | 0 | 0 | 198 | 40 | 1079 | 54 | 1 | 0 | 1174 | 23 | 16 | 36 | 0 | 0 | 75 | 2239 |
| 9:00 AM | 10 | 160 | 2 | 4 | 0 | 176 | 21 | 4 | 24 | 0 | 0 | 49 | 12 | 179 | 17 | 0 | 0 | 208 | 4 | 4 | 11 | 0 | 0 | 19 | 452 |
| 9:15 AM | 10 | 141 | 2 | 0 | 0 | 153 | 13 | 3 | 9 | 0 | 0 | 25 | 13 | 182 | 17 | 0 | 0 | 212 | 5 | 2 | 9 | 0 | 0 | 16 | 406 |
| 9:30 AM | 5 | 137 | 8 | 2 | 0 | 152 | 20 | 5 | 11 | 0 | 0 | 36 | 8 | 158 | 8 | 0 | 0 | 174 | 6 | 2 | 9 | 0 | 0 | 17 | 379 |
| 9:45 AM | 4 | 152 | 8 | 0 | 0 | 164 | 23 | 2 | 14 | 0 | 0 | 39 | 10 | 176 | 16 | 3 | 0 | 205 | 11 | 4 | 5 | 0 | 0 | 20 | 428 |
| Hourly Total | 29 | 590 | 20 | 6 | 0 | 645 | 77 | 14 | 58 | 0 | 0 | 149 | 43 | 695 | 58 | 3 | 0 | 799 | 26 | 12 | 34 | 0 | 0 | 72 | 1665 |
| 10:00 AM | 9 | 144 | 4 | 0 | 0 | 157 | 18 | 5 | 7 | 0 | 0 | 30 | 14 | 143 | 9 | 2 | 0 | 168 | 9 | 2 | 8 | 0 | 0 | 19 | 374 |
| 10:15 AM | 11 | 139 | 8 | 3 | 0 | 161 | 16 | 2 | 11 | 0 | 0 | 29 | 7 | 137 | 3 | 1 | 0 | 148 | 10 | 2 | 8 | 0 | 0 | 20 | 358 |
| 10:30 AM | 8 | 133 | 6 | 5 | 0 | 152 | 16 | 5 | 11 | 0 | 0 | 32 | 15 | 180 | 6 | 1 | 0 | 202 | 9 | 1 | 5 | 0 | 0 | 15 | 401 |
| 10:45 AM | 6 | 155 | 5 | 2 | 0 | 168 | 15 | 7 | 12 | 0 | 0 | 34 | 9 | 167 | 15 | 0 | 0 | 191 | 8 | 1 | 11 | 0 | 0 | 20 | 413 |
| Hourly Total | 34 | 571 | 23 | 10 | 0 | 638 | 65 | 19 | 41 | 0 | 0 | 125 | 45 | 627 | 33 | 4 | 0 | 709 | 36 | 6 | 32 | 0 | 0 | 74 | 1546 |
| 11:00 AM | 8 | 156 | 3 | 0 | 0 | 167 | 22 | 7 | 9 | 0 | 0 | 38 | 13 | 152 | 12 | 0 | 0 | 177 | 10 | 2 | 15 | 0 | 1 | 27 | 409 |
| 11:15 AM | 11 | 130 | 6 | 1 | 0 | 148 | 18 | 4 | 7 | 0 | 0 | 29 | 12 | 138 | 8 | 3 | 0 | 161 | 2 | 3 | 18 | 0 | 0 | 23 | 361 |
| 11:30 AM | 8 | 150 | 3 | 0 | 0 | 161 | 19 | 5 | 10 | 0 | 0 | 34 | 12 | 178 | 16 | 0 | 0 | 206 | 10 | 3 | 10 | 0 | 0 | 23 | 424 |
| 11:45 AM | 3 | 150 | 5 | 2 | 0 | 160 | 32 | 9 | 14 | 0 | 0 | 55 | 12 | 169 | 17 | 0 | 0 | 198 | 12 | 10 | 10 | 0 | 0 | 32 | 445 |
| Hourly Total | 30 | 586 | 17 | 3 | 0 | 636 | 91 | 25 | 40 | 0 | 0 | 156 | 49 | 637 | 53 | 3 | 0 | 742 | 34 | 18 | 53 | 0 | 1 | 105 | 1639 |
| 12:00 PM | 12 | 132 | 4 | 2 | 0 | 150 | 26 | 14 | 15 | 0 | 0 | 55 | 14 | 188 | 21 | 0 | 0 | 223 | 11 | 8 | 14 | 0 | 0 | 33 | 461 |
| 12:15 PM | 12 | 167 | 4 | 3 | 0 | 186 | 27 | 5 | 15 | 0 | 0 | 47 | 13 | 158 | 17 | 0 | 0 | 188 | 13 | 3 | 16 | 0 | 0 | 32 | 453 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 12 | 139 | 6 | 3 | 0 | 160 | 23 | 6 | 20 | 0 | 0 | 49 | 7 | 178 | 22 | 0 | 0 | 207 | 18 | 1 | 14 | 0 | 0 | 33 | 449 |
| 12:45 PM | 8 | 160 | 5 | 3 | 0 | 176 | 20 | 5 | 4 | 0 | 0 | 29 | 11 | 169 | 16 | 1 | 0 | 197 | 10 | 2 | 7 | 0 | 0 | 19 | 421 |
| Hourly Total | 44 | 598 | 19 | 11 | 0 | 672 | 96 | 30 | 54 | 0 | 0 | 180 | 45 | 693 | 76 | 1 | 0 | 815 | 52 | 14 | 51 | 0 | 0 | 117 | 1784 |
| 1:00 PM | 6 | 170 | 2 | 3 | 0 | 181 | 16 | 7 | 13 | 0 | 0 | 36 | 17 | 179 | 7 | 1 | 0 | 204 | 7 | 6 | 11 | 0 | 0 | 24 | 445 |
| 1:15 PM | 7 | 181 | 4 | 1 | 0 | 193 | 17 | 3 | 11 | 0 | 0 | 31 | 8 | 184 | 24 | 1 | 0 | 217 | 7 | 6 | 8 | 0 | 0 | 21 | 462 |
| 1:30 PM | 12 | 162 | 3 | 1 | 0 | 178 | 11 | 4 | 9 | 0 | 0 | 24 | 10 | 185 | 23 | 3 | 0 | 221 | 6 | 6 | 6 | 0 | 0 | 18 | 441 |
| 1:45 PM | 8 | 181 | 4 | 3 | 0 | 196 | 16 | 2 | 9 | 0 | 0 | 27 | 7 | 181 | 19 | 1 | 0 | 208 | 4 | 5 | 12 | 0 | 0 | 21 | 452 |
| Hourly Total | 33 | 694 | 13 | 8 | 0 | 748 | 60 | 16 | 42 | 0 | 0 | 118 | 42 | 729 | 73 | 6 | 0 | 850 | 24 | 23 | 37 | 0 | 0 | 84 | 1800 |
| 2:00 PM | 13 | 172 | 6 | 0 | 0 | 191 | 18 | 0 | 5 | 0 | 0 | 23 | 9 | 175 | 18 | 0 | 0 | 202 | 4 | 3 | 7 | 0 | 0 | 14 | 430 |
| 2:15 PM | 14 | 180 | 9 | 0 | 1 | 203 | 18 | 4 | 12 | 0 | 0 | 34 | 7 | 190 | 18 | 1 | 0 | 216 | 7 | 4 | 11 | 0 | 0 | 22 | 475 |
| 2:30 PM | 22 | 189 | 5 | 1 | 1 | 217 | 17 | 5 | 11 | 0 | 0 | 33 | 7 | 187 | 23 | 2 | 0 | 219 | 11 | 4 | 14 | 0 | 0 | 29 | 498 |
| 2:45 PM | 33 | 253 | 4 | 1 | 0 | 291 | 15 | 7 | 8 | 0 | 0 | 30 | 11 | 210 | 27 | 0 | 0 | 248 | 8 | 3 | 10 | 0 | 0 | 21 | 590 |
| Hourly Total | 82 | 794 | 24 | 2 | 2 | 902 | 68 | 16 | 36 | 0 | 0 | 120 | 34 | 762 | 86 | 3 | 0 | 885 | 30 | 14 | 42 | 0 | 0 | 86 | 1993 |
| 3:00 PM | 29 | 244 | 7 | 2 | 0 | 282 | 33 | 2 | 41 | 1 | 0 | 77 | 12 | 200 | 18 | 0 | 0 | 230 | 7 | 3 | 18 | 0 | 0 | 28 | 617 |
| 3:15 PM | 15 | 290 | 2 | 0 | 0 | 307 | 17 | 6 | 38 | 0 | 0 | 61 | 11 | 172 | 18 | 1 | 0 | 202 | 11 | 3 | 11 | 0 | 0 | 25 | 595 |
| 3:30 PM | 22 | 330 | 4 | 1 | 0 | 357 | 19 | 3 | 22 | 0 | 0 | 44 | 9 | 223 | 23 | 0 | 0 | 255 | 14 | 1 | 14 | 0 | 0 | 29 | 685 |
| 3:45 PM | 22 | 339 | 7 | 2 | 0 | 370 | 16 | 2 | 14 | 0 | 0 | 32 | 12 | 218 | 22 | 1 | 0 | 253 | 8 | 5 | 13 | 0 | 0 | 26 | 681 |
| Hourly Total | 88 | 1203 | 20 | 5 | 0 | 1316 | 85 | 13 | 115 | 1 | 0 | 214 | 44 | 813 | 81 | 2 | 0 | 940 | 40 | 12 | 56 | 0 | 0 | 108 | 2578 |
| 4:00 PM | 18 | 351 | 4 | 1 | 0 | 374 | 22 | 2 | 25 | 0 | 0 | 49 | 11 | 242 | 26 | 1 | 0 | 280 | 12 | 6 | 18 | 0 | 0 | 36 | 739 |
| 4:15 PM | 24 | 415 | 10 | 1 | 0 | 450 | 24 | 2 | 24 | 0 | 0 | 50 | 10 | 216 | 24 | 0 | 0 | 250 | 5 | 2 | 15 | 0 | 0 | 22 | 772 |
| 4:30 PM | 11 | 518 | 4 | 1 | 0 | 534 | 22 | 3 | 19 | 0 | 0 | 44 | 15 | 208 | 22 | 1 | 0 | 246 | 7 | 0 | 17 | 0 | 0 | 24 | 848 |
| 4:45 PM | 32 | 496 | 5 | 5 | 0 | 538 | 16 | 5 | 20 | 0 | 0 | 41 | 10 | 252 | 40 | 3 | 0 | 305 | 10 | 7 | 21 | 0 | 0 | 38 | 922 |
| Hourly Total | 85 | 1780 | 23 | 8 | 0 | 1896 | 84 | 12 | 88 | 0 | 0 | 184 | 46 | 918 | 112 | 5 | 0 | 1081 | 34 | 15 | 71 | 0 | 0 | 120 | 3281 |
| 5:00 PM | 11 | 533 | 6 | 1 | 0 | 551 | 23 | 6 | 19 | 0 | 0 | 48 | 7 | 300 | 31 | 0 | 0 | 338 | 15 | 5 | 20 | 0 | 0 | 40 | 977 |
| 5:15 PM | 34 | 623 | 8 | 0 | 0 | 665 | 29 | 3 | 18 | 0 | 0 | 50 | 7 | 318 | 43 | 1 | 0 | 369 | 16 | 5 | 19 | 0 | 0 | 40 | 1124 |
| 5:30 PM | 16 | 506 | 4 | 1 | 0 | 527 | 38 | 0 | 24 | 0 | 0 | 62 | 4 | 337 | 36 | 0 | 0 | 377 | 5 | 4 | 23 | 0 | 0 | 32 | 998 |
| 5:45 PM | 21 | 508 | 6 | 0 | 0 | 535 | 23 | 7 | 23 | 0 | 0 | 53 | 14 | 280 | 29 | 3 | 0 | 326 | 7 | 2 | 13 | 0 | 0 | 22 | 936 |
| Hourly Total | 82 | 2170 | 24 | 2 | 0 | 2278 | 113 | 16 | 84 | 0 | 0 | 213 | 32 | 1235 | 139 | 4 | 0 | 1410 | 43 | 16 | 75 | 0 | 0 | 134 | 4035 |
| 6:00 PM | 25 | 436 | 3 | 1 | 0 | 465 | 25 | 3 | 18 | 0 | 0 | 46 | 2 | 223 | 34 | 0 | 0 | 259 | 5 | 8 | 14 | 0 | 0 | 27 | 797 |
| 6:15 PM | 34 | 401 | 3 | 0 | 0 | 438 | 30 | 6 | 20 | 0 | 0 | 56 | 7 | 234 | 34 | 0 | 0 | 275 | 4 | 3 | 10 | 0 | 0 | 17 | 786 |
| 6:30 PM | 21 | 241 | 3 | 2 | 0 | 267 | 21 | 4 | 13 | 0 | 0 | 38 | 2 | 167 | 27 | 1 | 0 | 197 | 6 | 3 | 8 | 0 | 0 | 17 | 519 |
| 6:45 PM | 15 | 244 | 2 | 1 | 0 | 262 | 20 | 3 | 12 | 0 | 0 | 35 | 4 | 188 | 30 | 1 | 0 | 223 | 2 | 5 | 7 | 0 | 0 | 14 | 534 |
| Hourly Total | 95 | 1322 | 11 | 4 | 0 | 1432 | 96 | 16 | 63 | 0 | 0 | 175 | 15 | 812 | 125 | 2 | 0 | 954 | 17 | 19 | 39 | 0 | 0 | 75 | 2636 |
| 7:00 PM | 18 | 184 | 1 | 1 | 0 | 204 | 20 | 5 | 8 | 0 | 0 | 33 | 5 | 208 | 18 | 4 | 0 | 235 | 4 | 7 | 6 | 0 | 0 | 17 | 489 |
| 7:15 PM | 8 | 179 | 3 | 0 | 0 | 190 | 15 | 7 | 3 | 0 | 0 | 25 | 10 | 187 | 21 | 2 | 0 | 220 | 10 | 7 | 4 | 0 | 0 | 21 | 456 |
| 7:30 PM | 16 | 189 | 3 | 1 | 0 | 209 | 14 | 1 | 10 | 0 | 0 | 25 | 5 | 133 | 22 | 0 | 0 | 160 | 3 | 3 | 4 | 0 | 0 | 10 | 404 |
| 7:45 PM | 13 | 124 | 2 | 2 | 0 | 141 | 19 | 0 | 6 | 0 | 0 | 25 | 5 | 139 | 15 | 7 | 0 | 166 | 2 | 2 | 7 | 0 | 0 | 11 | 343 |
| Hourly Total | 55 | 676 | 9 | 4 | 0 | 744 | 68 | 13 | 27 | 0 | 0 | 108 | 25 | 667 | 76 | 13 | 0 | 781 | 19 | 19 | 21 | 0 | 0 | 59 | 1692 |
| 8:00 PM | 12 | 117 | 2 | 2 | 0 | 133 | 10 | 0 | 2 | 0 | 0 | 12 | 3 | 95 | 15 | 3 | 0 | 116 | 6 | 3 | 4 | 0 | 0 | 13 | 274 |
| 8:15 PM | 12 | 104 | 1 | 1 | 0 | 118 | 12 | 2 | 2 | 0 | 0 | 16 | 2 | 112 | 21 | 2 | 0 | 137 | 2 | 1 | 2 | 0 | 0 | 5 | 276 |
| 8:30 PM | 11 | 106 | 0 | 0 | 0 | 117 | 8 | 1 | 13 | 0 | 0 | 22 | 4 | 108 | 19 | 1 | 0 | 132 | 0 | 2 | 3 | 0 | 0 | 5 | 276 |
| 8:45 PM | 8 | 94 | 2 | 0 | 0 | 104 | 2 | 4 | 7 | 0 | 0 | 13 | 2 | 97 | 19 | 1 | 0 | 119 | 3 | 2 | 3 | 0 | 0 | 8 | 244 |
| Hourly Total | 43 | 421 | 5 | 3 | 0 | 472 | 32 | 7 | 24 | 0 | 0 | 63 | 11 | 412 | 74 | 7 | 0 | 504 | 11 | 8 | 12 | 0 | 0 | 31 | 1070 |
| 9:00 PM | 7 | 76 | 0 | 0 | 0 | 83 | 2 | 1 | 2 | 0 | 0 | 5 | 5 | 84 | 17 | 1 | 0 | 107 | 3 | 4 | 2 | 0 | 0 | 9 | 204 |
| 9:15 PM | 4 | 81 | 1 | 0 | 0 | 86 | 5 | 0 | 2 | 0 | 0 | 7 | 6 | 101 | 7 | 0 | 0 | 114 | 0 | 0 | 2 | 0 | 0 | 2 | 209 |
| 9:30 PM | 6 | 90 | 1 | 0 | 0 | 97 | 0 | 1 | 4 | 0 | 0 | 5 | 2 | 107 | 10 | 3 | 0 | 122 | 5 | 1 | 0 | 0 | 0 | 6 | 230 |
| 9:45 PM | 6 | 66 | 1 | 1 | 0 | 74 | 4 | 3 | 1 | 0 | 0 | 8 | 2 | 64 | 10 | 0 | 0 | 76 | 2 | 2 | 3 | 0 | 0 | 7 | 165 |
| Hourly Total | 23 | 313 | 3 | 1 | 0 | 340 | 11 | 5 | 9 | 0 | 0 | 25 | 15 | 356 | 44 | 4 | 0 | 419 | 10 | 7 | 7 | 0 | 0 | 24 | 808 |
| 10:00 PM | 10 | 79 | 1 | 1 | 0 | 91 | 3 | 0 | 5 | 0 | 0 | 8 | 1 | 68 | 6 | 0 | 0 | 75 | 3 | 0 | 2 | 0 | 0 | 5 | 179 |
| 10:15 PM | 5 | 59 | 1 | 0 | 0 | 65 | 2 | 0 | 1 | 0 | 0 | 3 | 2 | 64 | 10 | 0 | 0 | 76 | 2 | 1 | 2 | 0 | 0 | 5 | 149 |
| 10:30 PM | 2 | 58 | 0 | 0 | 0 | 60 | 5 | 1 | 0 | 0 | 0 | 6 | 0 | 75 | 4 | 0 | 0 | 79 | 4 | 2 | 1 | 0 | 0 | 7 | 152 |
| 10:45 PM | 5 | 42 | 2 | 0 | 0 | 49 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 50 | 6 | 0 | 0 | 56 | 1 | 0 | 2 | 0 | 0 | 3 | 112 |
| Hourly Total | 22 | 238 | 4 | 1 | 0 | 265 | 13 | 2 | 6 | 0 | 0 | 21 | 3 | 257 | 26 | 0 | 0 | 286 | 10 | 3 | 7 | 0 | 0 | 20 | 592 |
| 11:00 PM | 2 | 49 | 0 | 1 | 0 | 52 | 4 | 0 | 2 | 0 | 0 | 6 | 0 | 39 | 2 | 1 | 0 | 42 | 2 | 0 | 1 | 0 | 0 | 3 | 103 |
| 11:15 PM | 1 | 43 | 1 | 0 | 0 | 45 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 45 | 6 | 0 | 0 | 52 | 2 | 0 | 2 | 0 | 0 | 4 | 102 |
| 11:30 PM | 2 | 37 | 0 | 0 | 0 | 39 | 1 | 0 | 2 | 0 | 0 | 3 | 1 | 35 | 3 | 0 | 0 | 39 | 1 | 0 | 5 | 0 | 0 | 6 | 87 |
| 11:45 PM | 1 | 27 | 1 | 0 | 0 | 29 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 31 | 6 | 0 | 0 | 37 | 0 | 0 | 1 | 0 | 0 | 1 | 68 |
| Hourly Total | 6 | 156 | 2 | 1 | 0 | 165 | 7 | 0 | 4 | 0 | 0 | 11 | 2 | 150 | 17 | 1 | 0 | 170 | 5 | 0 | 9 | 0 | 0 | 14 | 360 |
| Grand Total | 931 | 14282 | 271 | 79 | 3 | 15563 | 1313 | 251 | 1004 | 1 | 1 | 2569 | 582 | 13956 | 1263 | 60 | 1 | 15871 | 485 | 231 | 646 | 0 | 1 | 1362 | 35365 |
| Approach % | 6.0 | 91.8 | 1.7 | 0.5 | - | - | 51.1 | 9.8 | 39.1 | 0.0 | - | - | 3.7 | 88.0 | 8.0 | 0.4 | - | - | 35.6 | 17.0 | 47.4 | 0.0 | - | - | - |
| Total % | 2.6 | 40.4 | 0.8 | 0.2 | - | 44.0 | 3.7 | 0.7 | 2.8 | 0.0 | - | 7.3 | 1.6 | 39.5 | 3.6 | 0.2 | - | 44.9 | 1.4 | 0.7 | 1.8 | 0.0 | - | 3.9 | - |
| Motorcycles | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 909 | 13571 | 223 | 78 | - | 14781 | 1297 | 241 | 979 | 1 | - | 2518 | 445 | 13256 | 1250 | 60 | - | 15011 | 417 | 223 | 500 | 0 | - | 1140 | 33450 |
| % Cars & Light Goods | 97.6 | 95.0 | 82.3 | 98.7 | - | 95.0 | 98.8 | 96.0 | 97.5 | 100.0 | - | 98.0 | 76.5 | 94.9 | 99.0 | 100.0 | - | 94.6 | 86.0 | 96.5 | 77.4 | - | - | 83.7 | 94.6 |
| Buses | 8 | 3 | 0 | 0 | - | 11 | 3 | 0 | 2 | 0 | - | 5 | 0 | 8 | 1 | 0 | - | 9 | 0 | 0 | 0 | 0 | - | 0 | 25 |
| % Buses | 0.9 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 |
| Single-Unit Trucks | 13 | 485 | 40 | 0 | - | 538 | 12 | 10 | 22 | 0 | - | 44 | 96 | 486 | 11 | 0 | - | 593 | 49 | 8 | 108 | 0 | - | 165 | 1340 |
| % Single-Unit Trucks | 1.4 | 3.4 | 14.8 | 0.0 | - | 3.5 | 0.9 | 4.0 | 2.2 | 0.0 | - | 1.7 | 16.5 | 3.5 | 0.9 | 0.0 | - | 3.7 | 10.1 | 3.5 | 16.7 | - | - | 12.1 | 3.8 |
| Articulated Trucks | 1 | 222 | 8 | 1 | - | 232 | 1 | 0 | 1 | 0 | - | 2 | 41 | 214 | 1 | 0 | - | 256 | 19 | 0 | 38 | 0 | - | 57 | 547 |
| % Articulated Trucks | 0.1 | 1.6 | 3.0 | 1.3 | - | 1.5 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.1 | 7.0 | 1.5 | 0.1 | 0.0 | - | 1.6 | 3.9 | 0.0 | 5.9 | - | - | 4.2 | 1.5 |

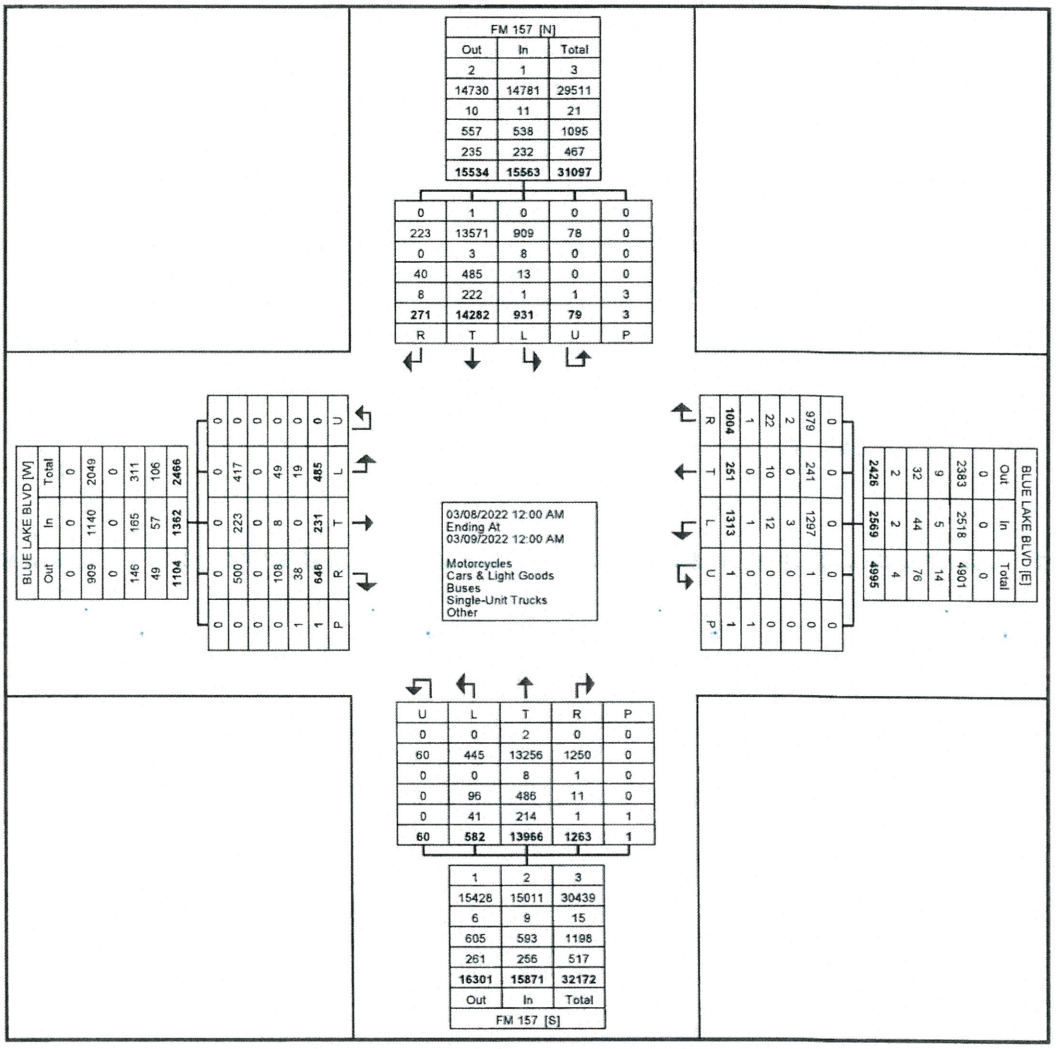
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 3 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022
Page No: 5

## Turning Movement Peak Hour Data (7:15 AM)

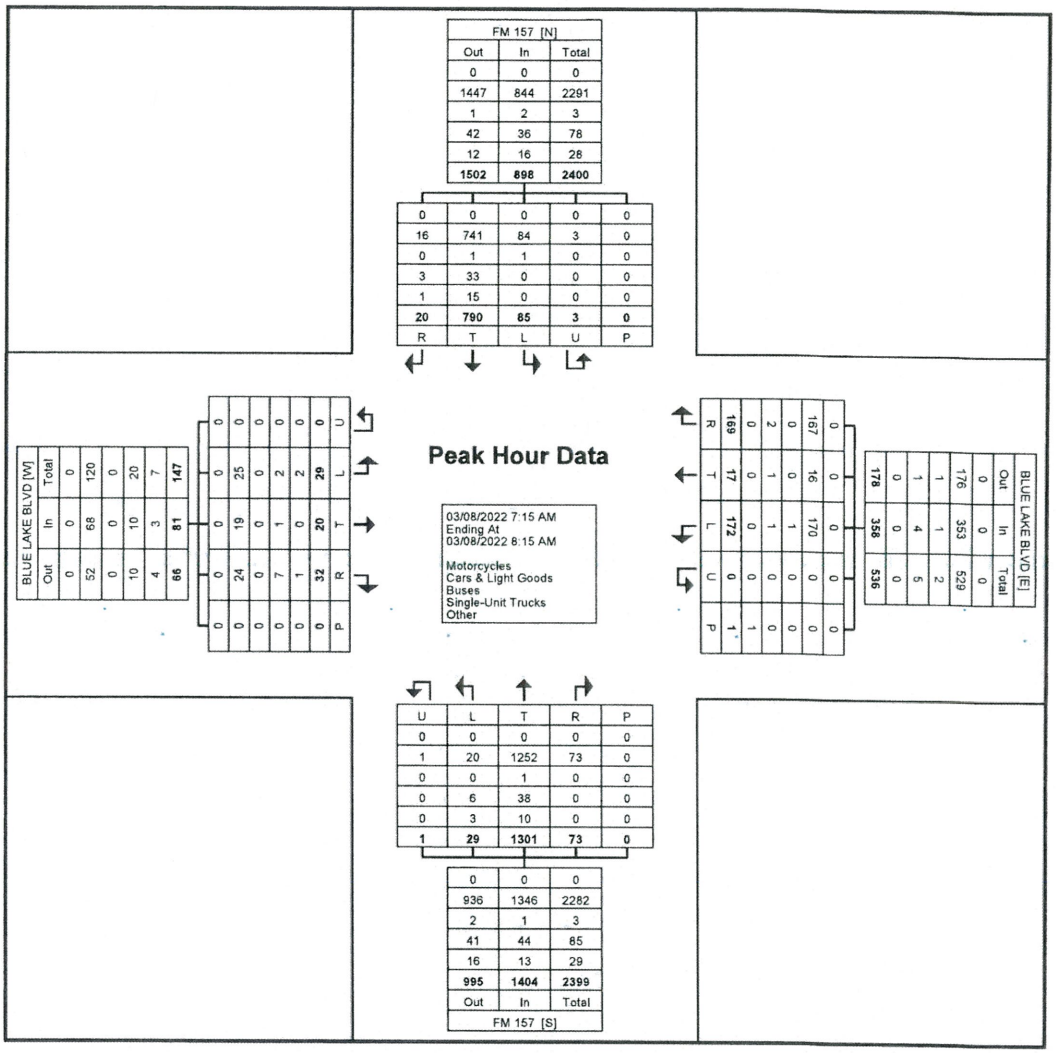
| Start Time | FM 157 Southbound | | | | | | BLUE LAKE BLVD Westbound | | | | | | FM 157 Northbound | | | | | | BLUE LAKE BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 18 | 152 | 2 | 0 | 0 | 172 | 49 | 3 | 51 | 0 | 0 | 103 | 5 | 338 | 21 | 0 | 0 | 364 | 6 | 10 | 5 | 0 | 0 | 21 | 660 |
| 7:30 AM | 37 | 202 | 3 | 1 | 0 | 243 | 55 | 8 | 51 | 0 | 1 | 114 | 10 | 296 | 18 | 0 | 0 | 324 | 9 | 3 | 6 | 0 | 0 | 18 | 699 |
| 7:45 AM | 14 | 210 | 8 | 0 | 0 | 232 | 32 | 5 | 43 | 0 | 0 | 80 | 6 | 382 | 21 | 0 | 0 | 409 | 8 | 6 | 13 | 0 | 0 | 27 | 748 |
| 8:00 AM | 16 | 226 | 7 | 2 | 0 | 251 | 36 | 1 | 24 | 0 | 0 | 61 | 8 | 285 | 13 | 1 | 0 | 307 | 6 | 1 | 8 | 0 | 0 | 15 | 634 |
| Total | 85 | 790 | 20 | 3 | 0 | 898 | 172 | 17 | 169 | 0 | 1 | 358 | 29 | 1301 | 73 | 1 | 0 | 1404 | 29 | 20 | 32 | 0 | 0 | 81 | 2741 |
| Approach % | 9.5 | 88.0 | 2.2 | 0.3 | - | - | 48.0 | 4.7 | 47.2 | 0.0 | - | - | 2.1 | 92.7 | 5.2 | 0.1 | - | - | 35.8 | 24.7 | 39.5 | 0.0 | - | - | - |
| Total % | 3.1 | 28.8 | 0.7 | 0.1 | - | 32.8 | 6.3 | 0.6 | 6.2 | 0.0 | - | 13.1 | 1.1 | 47.5 | 2.7 | 0.0 | - | 51.2 | 1.1 | 0.7 | 1.2 | 0.0 | - | 3.0 | - |
| PHF | 0.574 | 0.874 | 0.625 | 0.375 | - | 0.894 | 0.782 | 0.531 | 0.828 | 0.000 | - | 0.785 | 0.725 | 0.851 | 0.869 | 0.250 | - | 0.858 | 0.806 | 0.500 | 0.615 | 0.000 | - | 0.750 | 0.916 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 84 | 741 | 16 | 3 | - | 844 | 170 | 16 | 167 | 0 | - | 353 | 20 | 1252 | 73 | 1 | - | 1346 | 25 | 19 | 24 | 0 | - | 68 | 2611 |
| % Cars & Light Goods | 98.8 | 93.8 | 80.0 | 100.0 | - | 94.0 | 98.8 | 94.1 | 98.8 | - | - | 98.6 | 69.0 | 96.2 | 100.0 | 100.0 | - | 95.9 | 86.2 | 95.0 | 75.0 | - | - | 84.0 | 95.3 |
| Buses | 1 | 1 | 0 | 0 | - | 2 | 1 | 0 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 4 |
| % Buses | 1.2 | 0.1 | 0.0 | 0.0 | - | 0.2 | 0.6 | 0.0 | 0.0 | - | - | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 |
| Single-Unit Trucks | 0 | 33 | 3 | 0 | - | 36 | 1 | 1 | 2 | 0 | - | 4 | 6 | 38 | 0 | 0 | - | 44 | 2 | 1 | 7 | 0 | - | 10 | 94 |
| % Single-Unit Trucks | 0.0 | 4.2 | 15.0 | 0.0 | - | 4.0 | 0.6 | 5.9 | 1.2 | - | - | 1.1 | 20.7 | 2.9 | 0.0 | 0.0 | - | 3.1 | 6.9 | 5.0 | 21.9 | - | - | 12.3 | 3.4 |
| Articulated Trucks | 0 | 15 | 1 | 0 | - | 16 | 0 | 0 | 0 | 0 | - | 0 | 3 | 10 | 0 | 0 | - | 13 | 2 | 0 | 1 | 0 | - | 3 | 32 |
| % Articulated Trucks | 0.0 | 1.9 | 5.0 | 0.0 | - | 1.8 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 10.3 | 0.8 | 0.0 | 0.0 | - | 0.9 | 6.9 | 0.0 | 3.1 | - | - | 3.7 | 1.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (5:00 PM)

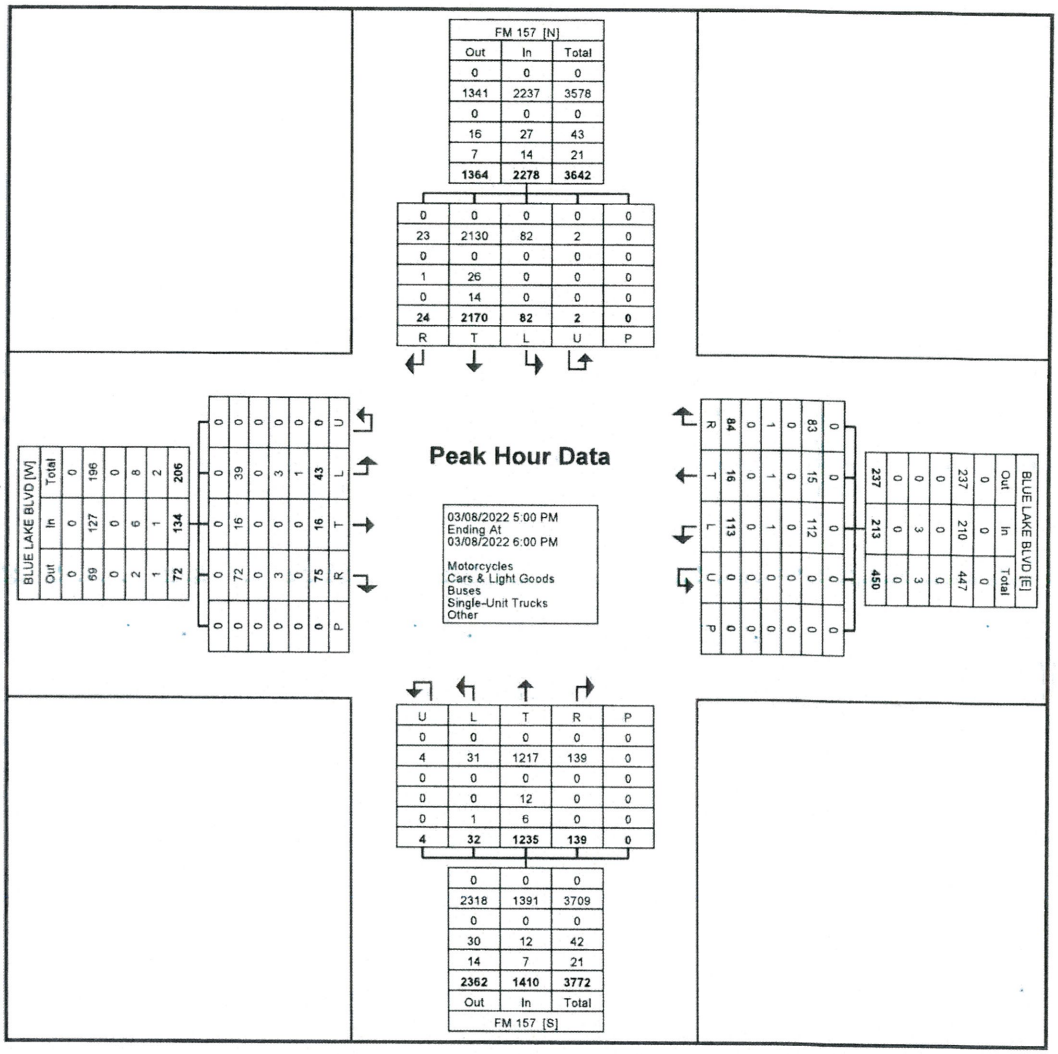
| Start Time | FM 157 Southbound | | | | | | BLUE LAKE BLVD Westbound | | | | | | FM 157 Northbound | | | | | | BLUE LAKE BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 5:00 PM | 11 | 533 | 6 | 1 | 0 | 551 | 23 | 6 | 19 | 0 | 0 | 48 | 7 | 300 | 31 | 0 | 0 | 338 | 15 | 5 | 20 | 0 | 0 | 40 | 977 |
| 5:15 PM | 34 | 623 | 8 | 0 | 0 | 665 | 29 | 3 | 18 | 0 | 0 | 50 | 7 | 318 | 43 | 1 | 0 | 369 | 16 | 5 | 19 | 0 | 0 | 40 | 1124 |
| 5:30 PM | 16 | 506 | 4 | 1 | 0 | 527 | 38 | 0 | 24 | 0 | 0 | 62 | 4 | 337 | 36 | 0 | 0 | 377 | 5 | 4 | 23 | 0 | 0 | 32 | 998 |
| 5:45 PM | 21 | 508 | 6 | 0 | 0 | 535 | 23 | 7 | 23 | 0 | 0 | 53 | 14 | 280 | 29 | 3 | 0 | 326 | 7 | 2 | 13 | 0 | 0 | 22 | 936 |
| Total | 82 | 2170 | 24 | 2 | 0 | 2278 | 113 | 16 | 84 | 0 | 0 | 213 | 32 | 1235 | 139 | 4 | 0 | 1410 | 43 | 16 | 75 | 0 | 0 | 134 | 4035 |
| Approach % | 3.6 | 95.3 | 1.1 | 0.1 | - | - | 53.1 | 7.5 | 39.4 | 0.0 | - | - | 2.3 | 87.6 | 9.9 | 0.3 | - | - | 32.1 | 11.9 | 56.0 | 0.0 | - | - | - |
| Total % | 2.0 | 53.8 | 0.6 | 0.0 | - | 56.5 | 2.8 | 0.4 | 2.1 | 0.0 | - | 5.3 | 0.8 | 30.6 | 3.4 | 0.1 | - | 34.9 | 1.1 | 0.4 | 1.9 | 0.0 | - | 3.3 | - |
| PHF | 0.603 | 0.871 | 0.750 | 0.500 | - | 0.856 | 0.743 | 0.571 | 0.875 | 0.000 | - | 0.859 | 0.571 | 0.916 | 0.808 | 0.333 | - | 0.935 | 0.672 | 0.800 | 0.815 | 0.000 | - | 0.838 | 0.897 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 82 | 2130 | 23 | 2 | - | 2237 | 112 | 15 | 83 | 0 | - | 210 | 31 | 1217 | 139 | 4 | - | 1391 | 39 | 16 | 72 | 0 | - | 127 | 3965 |
| % Cars & Light Goods | 100.0 | 98.2 | 95.8 | 100.0 | - | 98.2 | 99.1 | 93.8 | 98.8 | - | - | 98.6 | 96.9 | 98.5 | 100.0 | 100.0 | - | 98.7 | 90.7 | 100.0 | 96.0 | - | - | 94.8 | 98.3 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 26 | 1 | 0 | - | 27 | 1 | 1 | 1 | 0 | - | 3 | 0 | 12 | 0 | 0 | - | 12 | 3 | 0 | 3 | 0 | - | 6 | 48 |
| % Single-Unit Trucks | 0.0 | 1.2 | 4.2 | 0.0 | - | 1.2 | 0.9 | 6.3 | 1.2 | - | - | 1.4 | 0.0 | 1.0 | 0.0 | 0.0 | - | 0.9 | 7.0 | 0.0 | 4.0 | - | - | 4.5 | 1.2 |
| Articulated Trucks | 0 | 14 | 0 | 0 | - | 14 | 0 | 0 | 0 | 0 | - | 0 | 1 | 6 | 0 | 0 | - | 7 | 1 | 0 | 0 | 0 | - | 1 | 22 |
| % Articulated Trucks | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.6 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 3.1 | 0.5 | 0.0 | 0.0 | - | 0.5 | 2.3 | 0.0 | 0.0 | - | - | 0.7 | 0.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ BLUE LAKE BLVD
Site Code:
Start Date: 03/08/2022
Page No: 8




Turning Movement Peak Hour Data Plot (5:00 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | VIRIDIAN PARK LN Westbound | | | | | | FM 157 Northbound | | | | | | VIRIDIAN PARK LN Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 35 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| 12:15 AM | 0 | 25 | 1 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 1 | 0 | 0 | 20 | 1 | 0 | 1 | 0 | 0 | 2 | 48 |
| 12:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 24 | 0 | 1 | 0 | 0 | 0 | 1 | 44 |
| 12:45 AM | 1 | 14 | 0 | 0 | 0 | 15 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| Hourly Total | 1 | 88 | 1 | 0 | 0 | 90 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 95 | 1 | 0 | 0 | 96 | 1 | 1 | 1 | 0 | 0 | 3 | 191 |
| 1:00 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 1:15 AM | 0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 1 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 1:30 AM | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 1:45 AM | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 1 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| Hourly Total | 0 | 73 | 0 | 0 | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 3 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 126 |
| 2:00 AM | 0 | 20 | 0 | 0 | 0 | 20 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| 2:15 AM | 0 | 16 | 1 | 0 | 0 | 17 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 2:30 AM | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 2:45 AM | 0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| Hourly Total | 0 | 71 | 1 | 0 | 0 | 72 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 70 | 0 | 0 | 0 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 146 |
| 3:00 AM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 3:15 AM | 0 | 13 | 0 | 0 | 0 | 13 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 18 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 3:30 AM | 0 | 7 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 3:45 AM | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 21 | 1 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| Hourly Total | 0 | 41 | 0 | 0 | 0 | 41 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 77 | 1 | 0 | 0 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 121 |
| 4:00 AM | 0 | 13 | 0 | 0 | 0 | 13 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| 4:15 AM | 0 | 21 | 0 | 0 | 0 | 21 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 27 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 49 |
| 4:30 AM | 0 | 24 | 0 | 0 | 0 | 24 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 48 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 74 |
| 4:45 AM | 0 | 29 | 0 | 0 | 0 | 29 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 49 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 79 |
| Hourly Total | 0 | 87 | 0 | 0 | 0 | 87 | 3 | 0 | 3 | 0 | 0 | 6 | 0 | 156 | 0 | 0 | 0 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 249 |
| 5:00 AM | 0 | 30 | 0 | 0 | 0 | 30 | 5 | 0 | 1 | 0 | 0 | 6 | 0 | 73 | 0 | 0 | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 109 |
| 5:15 AM | 0 | 43 | 0 | 0 | 0 | 43 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 91 | 1 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 140 |
| 5:30 AM | 1 | 57 | 0 | 0 | 0 | 58 | 5 | 0 | 1 | 0 | 0 | 6 | 0 | 137 | 0 | 0 | 0 | 137 | 0 | 0 | 0 | 0 | 0 | 0 | 201 |
| 5:45 AM | 0 | 63 | 0 | 0 | 0 | 63 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 146 | 1 | 0 | 0 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 215 |
| Hourly Total | 1 | 193 | 0 | 0 | 0 | 194 | 18 | 0 | 4 | 0 | 0 | 22 | 0 | 447 | 2 | 0 | 0 | 449 | 0 | 0 | 0 | 0 | 0 | 0 | 665 |
| 6:00 AM | 0 | 65 | 0 | 0 | 0 | 65 | 7 | 0 | 1 | 0 | 0 | 8 | 0 | 179 | 1 | 0 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 253 |
| 6:15 AM | 0 | 70 | 0 | 0 | 0 | 70 | 5 | 0 | 1 | 0 | 0 | 6 | 0 | 225 | 2 | 0 | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 303 |
| 6:30 AM | 0 | 121 | 1 | 0 | 0 | 122 | 8 | 0 | 6 | 0 | 0 | 14 | 0 | 306 | 5 | 0 | 0 | 311 | 0 | 0 | 2 | 0 | 0 | 2 | 449 |
| 6:45 AM | 0 | 98 | 0 | 0 | 0 | 98 | 10 | 0 | 6 | 0 | 0 | 16 | 0 | 347 | 13 | 0 | 0 | 360 | 0 | 0 | 0 | 0 | 0 | 0 | 474 |
| Hourly Total | 0 | 354 | 1 | 0 | 0 | 355 | 30 | 0 | 14 | 0 | 0 | 44 | 0 | 1057 | 21 | 0 | 0 | 1078 | 0 | 0 | 2 | 0 | 0 | 2 | 1479 |
| 7:00 AM | 2 | 128 | 0 | 0 | 0 | 130 | 20 | 1 | 3 | 0 | 0 | 24 | 0 | 270 | 11 | 0 | 0 | 281 | 0 | 1 | 0 | 0 | 0 | 1 | 436 |
| 7:15 AM | 2 | 219 | 0 | 0 | 0 | 221 | 22 | 0 | 12 | 0 | 0 | 34 | 0 | 351 | 15 | 0 | 0 | 366 | 0 | 6 | 1 | 0 | 0 | 7 | 628 |
| 7:30 AM | 2 | 251 | 0 | 0 | 0 | 253 | 27 | 0 | 7 | 0 | 1 | 34 | 1 | 345 | 16 | 0 | 0 | 362 | 0 | 0 | 0 | 0 | 0 | 0 | 649 |
| 7:45 AM | 9 | 256 | 0 | 0 | 0 | 265 | 33 | 0 | 16 | 0 | 0 | 49 | 0 | 380 | 11 | 0 | 0 | 391 | 0 | 0 | 0 | 0 | 0 | 0 | 705 |
| Hourly Total | 15 | 854 | 0 | 0 | 0 | 869 | 102 | 1 | 38 | 0 | 1 | 141 | 1 | 1346 | 53 | 0 | 0 | 1400 | 0 | 7 | 1 | 0 | 0 | 8 | 2418 |
| 8:00 AM | 8 | 247 | 0 | 0 | 0 | 255 | 22 | 0 | 5 | 0 | 0 | 27 | 0 | 313 | 19 | 0 | 0 | 332 | 0 | 0 | 0 | 0 | 0 | 0 | 614 |
| 8:15 AM | 0 | 237 | 0 | 0 | 0 | 237 | 14 | 0 | 7 | 0 | 0 | 21 | 0 | 308 | 14 | 0 | 0 | 322 | 0 | 0 | 0 | 0 | 0 | 0 | 580 |
| 8:30 AM | 4 | 176 | 1 | 0 | 0 | 181 | 23 | 0 | 6 | 0 | 0 | 29 | 0 | 276 | 6 | 0 | 0 | 282 | 0 | 0 | 1 | 0 | 0 | 1 | 493 |
| 8:45 AM | 0 | 181 | 0 | 1 | 0 | 182 | 17 | 0 | 3 | 0 | 0 | 20 | 0 | 253 | 14 | 0 | 0 | 267 | 0 | 0 | 1 | 0 | 0 | 1 | 470 |
| Hourly Total | 12 | 841 | 1 | 1 | 0 | 855 | 76 | 0 | 21 | 0 | 0 | 97 | 0 | 1150 | 53 | 0 | 0 | 1203 | 0 | 0 | 2 | 0 | 0 | 2 | 2157 |
| 9:00 AM | 1 | 186 | 1 | 0 | 0 | 188 | 12 | 2 | 5 | 0 | 0 | 19 | 0 | 221 | 10 | 0 | 0 | 231 | 0 | 0 | 1 | 0 | 0 | 1 | 439 |
| 9:15 AM | 3 | 161 | 0 | 0 | 0 | 164 | 18 | 4 | 4 | 0 | 0 | 26 | 0 | 192 | 13 | 0 | 0 | 205 | 0 | 0 | 2 | 0 | 0 | 2 | 397 |
| 9:30 AM | 5 | 170 | 1 | 0 | 0 | 176 | 9 | 0 | 4 | 0 | 0 | 13 | 2 | 174 | 18 | 0 | 0 | 194 | 0 | 1 | 2 | 0 | 0 | 3 | 386 |
| 9:45 AM | 2 | 161 | 6 | 1 | 0 | 170 | 5 | 0 | 5 | 0 | 0 | 10 | 1 | 200 | 12 | 0 | 0 | 213 | 0 | 0 | 4 | 0 | 0 | 4 | 397 |
| Hourly Total | 11 | 678 | 8 | 1 | 0 | 698 | 44 | 6 | 18 | 0 | 0 | 68 | 3 | 787 | 53 | 0 | 0 | 843 | 0 | 1 | 9 | 0 | 0 | 10 | 1619 |
| 10:00 AM | 6 | 165 | 3 | 1 | 0 | 175 | 12 | 1 | 5 | 0 | 0 | 18 | 0 | 157 | 12 | 0 | 0 | 169 | 1 | 0 | 1 | 0 | 0 | 2 | 364 |
| 10:15 AM | 4 | 165 | 2 | 0 | 0 | 171 | 7 | 1 | 8 | 0 | 0 | 16 | 0 | 154 | 12 | 0 | 0 | 166 | 0 | 1 | 2 | 0 | 0 | 3 | 356 |
| 10:30 AM | 2 | 158 | 2 | 0 | 0 | 162 | 14 | 0 | 2 | 0 | 0 | 16 | 0 | 189 | 12 | 0 | 0 | 201 | 0 | 0 | 4 | 0 | 0 | 4 | 383 |
| 10:45 AM | 5 | 170 | 0 | 0 | 0 | 175 | 10 | 0 | 5 | 0 | 0 | 15 | 0 | 193 | 13 | 0 | 0 | 206 | 0 | 0 | 3 | 0 | 0 | 3 | 399 |
| Hourly Total | 17 | 658 | 7 | 1 | 0 | 683 | 43 | 2 | 20 | 0 | 0 | 65 | 0 | 693 | 49 | 0 | 0 | 742 | 1 | 1 | 10 | 0 | 0 | 12 | 1502 |
| 11:00 AM | 3 | 193 | 0 | 1 | 0 | 197 | 10 | 0 | 7 | 0 | 0 | 17 | 0 | 163 | 21 | 0 | 0 | 184 | 0 | 0 | 2 | 0 | 0 | 2 | 400 |
| 11:15 AM | 6 | 156 | 3 | 0 | 0 | 165 | 13 | 2 | 6 | 0 | 0 | 21 | 0 | 160 | 11 | 0 | 0 | 171 | 0 | 0 | 2 | 0 | 1 | 2 | 359 |
| 11:30 AM | 5 | 171 | 5 | 0 | 0 | 181 | 13 | 0 | 7 | 0 | 0 | 20 | 2 | 191 | 14 | 0 | 0 | 207 | 1 | 1 | 2 | 0 | 0 | 4 | 412 |
| 11:45 AM | 2 | 187 | 4 | 0 | 0 | 193 | 6 | 0 | 5 | 0 | 0 | 11 | 0 | 199 | 16 | 0 | 0 | 215 | 3 | 0 | 7 | 0 | 0 | 10 | 429 |
| Hourly Total | 16 | 707 | 12 | 1 | 0 | 736 | 42 | 2 | 25 | 0 | 0 | 69 | 2 | 713 | 62 | 0 | 0 | 777 | 4 | 1 | 13 | 0 | 1 | 18 | 1600 |
| 12:00 PM | 5 | 171 | 2 | 0 | 0 | 178 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 212 | 19 | 0 | 0 | 231 | 1 | 0 | 7 | 0 | 0 | 8 | 422 |
| 12:15 PM | 5 | 198 | 5 | 0 | 0 | 208 | 1 | 1 | 1 | 0 | 0 | 3 | 0 | 182 | 17 | 0 | 0 | 199 | 4 | 1 | 6 | 0 | 0 | 11 | 421 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 2 | 180 | 1 | 0 | 0 | 183 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 209 | 20 | 0 | 0 | 229 | 2 | 0 | 0 | 0 | 0 | 2 | 415 |
| 12:45 PM | 3 | 165 | 1 | 0 | 0 | 169 | 14 | 0 | 6 | 0 | 0 | 20 | 0 | 194 | 14 | 0 | 0 | 208 | 0 | 0 | 1 | 0 | 0 | 1 | 398 |
| Hourly Total | 15 | 714 | 9 | 0 | 0 | 738 | 17 | 1 | 11 | 0 | 0 | 29 | 0 | 797 | 70 | 0 | 0 | 867 | 7 | 1 | 14 | 0 | 0 | 22 | 1656 |
| 1:00 PM | 3 | 204 | 3 | 1 | 0 | 211 | 10 | 0 | 8 | 0 | 0 | 18 | 1 | 186 | 15 | 0 | 0 | 202 | 0 | 1 | 2 | 0 | 0 | 3 | 434 |
| 1:15 PM | 3 | 192 | 1 | 0 | 0 | 196 | 11 | 1 | 2 | 0 | 0 | 14 | 0 | 223 | 21 | 0 | 0 | 244 | 0 | 0 | 5 | 0 | 0 | 5 | 459 |
| 1:30 PM | 2 | 171 | 3 | 0 | 0 | 176 | 18 | 0 | 4 | 0 | 0 | 22 | 0 | 220 | 18 | 0 | 0 | 238 | 1 | 0 | 3 | 0 | 0 | 4 | 440 |
| 1:45 PM | 4 | 208 | 3 | 0 | 0 | 215 | 18 | 0 | 3 | 0 | 0 | 21 | 0 | 197 | 12 | 0 | 0 | 209 | 0 | 0 | 3 | 0 | 0 | 3 | 448 |
| Hourly Total | 12 | 775 | 10 | 1 | 0 | 798 | 57 | 1 | 17 | 0 | 0 | 75 | 1 | 826 | 66 | 0 | 0 | 893 | 1 | 1 | 13 | 0 | 0 | 15 | 1781 |
| 2:00 PM | 2 | 193 | 0 | 0 | 0 | 195 | 12 | 0 | 7 | 0 | 0 | 19 | 1 | 194 | 22 | 0 | 0 | 217 | 1 | 1 | 5 | 0 | 0 | 7 | 438 |
| 2:15 PM | 6 | 210 | 5 | 0 | 0 | 221 | 10 | 1 | 1 | 0 | 0 | 12 | 0 | 213 | 17 | 0 | 0 | 230 | 1 | 0 | 6 | 0 | 0 | 7 | 470 |
| 2:30 PM | 6 | 218 | 1 | 2 | 0 | 227 | 12 | 0 | 3 | 0 | 0 | 15 | 0 | 217 | 16 | 0 | 0 | 233 | 0 | 0 | 3 | 0 | 0 | 3 | 478 |
| 2:45 PM | 2 | 284 | 0 | 0 | 0 | 286 | 14 | 2 | 1 | 0 | 0 | 17 | 1 | 252 | 24 | 0 | 0 | 277 | 1 | 0 | 0 | 0 | 1 | 1 | 581 |
| Hourly Total | 16 | 905 | 6 | 2 | 0 | 929 | 48 | 3 | 12 | 0 | 0 | 63 | 2 | 876 | 79 | 0 | 0 | 957 | 3 | 1 | 14 | 0 | 1 | 18 | 1967 |
| 3:00 PM | 5 | 294 | 1 | 0 | 0 | 300 | 13 | 1 | 8 | 0 | 0 | 22 | 0 | 221 | 16 | 0 | 0 | 237 | 1 | 0 | 4 | 0 | 0 | 5 | 564 |
| 3:15 PM | 6 | 301 | 2 | 0 | 0 | 309 | 7 | 0 | 6 | 0 | 0 | 13 | 0 | 198 | 19 | 0 | 0 | 217 | 4 | 0 | 1 | 0 | 0 | 5 | 544 |
| 3:30 PM | 2 | 369 | 1 | 0 | 0 | 372 | 14 | 1 | 3 | 0 | 0 | 18 | 0 | 244 | 15 | 0 | 0 | 259 | 0 | 0 | 2 | 0 | 0 | 2 | 651 |
| 3:45 PM | 5 | 346 | 2 | 0 | 0 | 353 | 27 | 0 | 8 | 0 | 0 | 35 | 0 | 252 | 19 | 0 | 0 | 271 | 0 | 0 | 3 | 0 | 1 | 3 | 662 |
| Hourly Total | 18 | 1310 | 6 | 0 | 0 | 1334 | 61 | 2 | 25 | 0 | 0 | 88 | 0 | 915 | 69 | 0 | 0 | 984 | 5 | 0 | 10 | 0 | 1 | 15 | 2421 |
| 4:00 PM | 10 | 386 | 2 | 0 | 0 | 398 | 8 | 0 | 5 | 0 | 0 | 13 | 0 | 263 | 16 | 0 | 0 | 279 | 3 | 0 | 4 | 0 | 0 | 7 | 697 |
| 4:15 PM | 5 | 503 | 1 | 0 | 0 | 509 | 20 | 0 | 5 | 0 | 0 | 25 | 0 | 241 | 22 | 0 | 0 | 263 | 1 | 0 | 4 | 0 | 0 | 5 | 802 |
| 4:30 PM | 8 | 541 | 4 | 0 | 0 | 553 | 16 | 0 | 2 | 0 | 0 | 18 | 0 | 268 | 25 | 0 | 0 | 293 | 1 | 0 | 6 | 0 | 0 | 7 | 871 |
| 4:45 PM | 5 | 540 | 5 | 0 | 0 | 550 | 28 | 0 | 7 | 0 | 0 | 35 | 0 | 286 | 30 | 0 | 0 | 316 | 0 | 1 | 6 | 0 | 0 | 7 | 908 |
| Hourly Total | 28 | 1970 | 12 | 0 | 0 | 2010 | 72 | 0 | 19 | 0 | 0 | 91 | 0 | 1058 | 93 | 0 | 0 | 1151 | 5 | 1 | 20 | 0 | 0 | 26 | 3278 |
| 5:00 PM | 6 | 536 | 5 | 1 | 0 | 548 | 22 | 0 | 4 | 0 | 0 | 26 | 1 | 312 | 26 | 0 | 0 | 339 | 0 | 0 | 6 | 0 | 0 | 6 | 919 |
| 5:15 PM | 12 | 641 | 2 | 0 | 0 | 655 | 26 | 0 | 5 | 0 | 0 | 31 | 0 | 293 | 28 | 0 | 0 | 321 | 1 | 1 | 2 | 0 | 0 | 4 | 1011 |
| 5:30 PM | 6 | 585 | 4 | 1 | 0 | 596 | 26 | 0 | 6 | 0 | 0 | 32 | 0 | 322 | 36 | 0 | 0 | 358 | 1 | 0 | 4 | 0 | 1 | 5 | 991 |
| 5:45 PM | 9 | 512 | 2 | 1 | 0 | 524 | 17 | 0 | 7 | 0 | 0 | 24 | 1 | 283 | 32 | 0 | 0 | 316 | 2 | 1 | 3 | 0 | 0 | 6 | 870 |
| Hourly Total | 33 | 2274 | 13 | 3 | 0 | 2323 | 91 | 0 | 22 | 0 | 0 | 113 | 2 | 1210 | 122 | 0 | 0 | 1334 | 4 | 2 | 15 | 0 | 1 | 21 | 3791 |
| 6:00 PM | 6 | 470 | 1 | 0 | 0 | 477 | 23 | 0 | 7 | 0 | 0 | 30 | 0 | 235 | 22 | 0 | 1 | 257 | 2 | 2 | 6 | 0 | 0 | 10 | 774 |
| 6:15 PM | 8 | 427 | 0 | 0 | 0 | 435 | 20 | 1 | 4 | 0 | 0 | 25 | 0 | 266 | 38 | 0 | 0 | 304 | 0 | 1 | 1 | 0 | 0 | 2 | 766 |
| 6:30 PM | 3 | 272 | 3 | 0 | 0 | 278 | 14 | 0 | 6 | 0 | 0 | 20 | 0 | 209 | 19 | 0 | 0 | 228 | 0 | 2 | 4 | 0 | 0 | 6 | 532 |
| 6:45 PM | 3 | 262 | 6 | 0 | 0 | 271 | 16 | 0 | 6 | 0 | 0 | 22 | 0 | 209 | 23 | 0 | 0 | 232 | 3 | 0 | 7 | 0 | 0 | 10 | 535 |
| Hourly Total | 20 | 1431 | 10 | 0 | 0 | 1461 | 73 | 1 | 23 | 0 | 0 | 97 | 0 | 919 | 102 | 0 | 1 | 1021 | 5 | 5 | 18 | 0 | 0 | 28 | 2607 |
| 7:00 PM | 7 | 204 | 5 | 0 | 0 | 216 | 11 | 0 | 4 | 0 | 0 | 15 | 1 | 217 | 16 | 0 | 0 | 234 | 2 | 0 | 6 | 0 | 0 | 8 | 473 |
| 7:15 PM | 7 | 185 | 2 | 0 | 0 | 194 | 7 | 0 | 6 | 0 | 0 | 13 | 0 | 221 | 23 | 0 | 0 | 244 | 1 | 0 | 2 | 0 | 0 | 3 | 454 |
| 7:30 PM | 4 | 199 | 4 | 1 | 0 | 208 | 12 | 0 | 6 | 0 | 0 | 18 | 0 | 152 | 11 | 0 | 0 | 163 | 1 | 2 | 5 | 0 | 0 | 8 | 397 |
| 7:45 PM | 5 | 139 | 9 | 0 | 0 | 153 | 7 | 0 | 3 | 0 | 0 | 10 | 1 | 156 | 14 | 0 | 0 | 171 | 0 | 2 | 4 | 0 | 0 | 6 | 340 |
| Hourly Total | 23 | 727 | 20 | 1 | 0 | 771 | 37 | 0 | 19 | 0 | 0 | 56 | 2 | 746 | 64 | 0 | 0 | 812 | 4 | 4 | 17 | 0 | 0 | 25 | 1664 |
| 8:00 PM | 2 | 122 | 3 | 0 | 0 | 127 | 2 | 0 | 3 | 0 | 0 | 5 | 1 | 116 | 18 | 0 | 0 | 135 | 0 | 1 | 1 | 0 | 0 | 2 | 269 |
| 8:15 PM | 7 | 111 | 2 | 0 | 0 | 120 | 11 | 0 | 2 | 0 | 0 | 13 | 0 | 144 | 12 | 0 | 0 | 156 | 0 | 0 | 3 | 0 | 0 | 3 | 292 |
| 8:30 PM | 1 | 114 | 1 | 0 | 0 | 116 | 9 | 1 | 2 | 0 | 0 | 12 | 0 | 128 | 8 | 0 | 0 | 136 | 1 | 1 | 1 | 0 | 0 | 3 | 267 |
| 8:45 PM | 2 | 99 | 1 | 0 | 0 | 102 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 121 | 5 | 0 | 0 | 126 | 0 | 0 | 3 | 0 | 0 | 3 | 235 |
| Hourly Total | 12 | 446 | 7 | 0 | 0 | 465 | 25 | 1 | 8 | 0 | 0 | 34 | 1 | 509 | 43 | 0 | 0 | 553 | 1 | 2 | 8 | 0 | 0 | 11 | 1063 |
| 9:00 PM | 2 | 77 | 1 | 0 | 0 | 80 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 106 | 10 | 0 | 0 | 116 | 0 | 0 | 2 | 0 | 0 | 2 | 199 |
| 9:15 PM | 1 | 88 | 2 | 0 | 0 | 91 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 110 | 7 | 0 | 0 | 117 | 0 | 0 | 3 | 0 | 0 | 3 | 215 |
| 9:30 PM | 2 | 87 | 3 | 0 | 0 | 92 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 123 | 7 | 0 | 0 | 130 | 0 | 0 | 3 | 0 | 0 | 3 | 228 |
| 9:45 PM | 3 | 70 | 1 | 0 | 0 | 74 | 1 | 1 | 1 | 0 | 0 | 3 | 0 | 70 | 8 | 0 | 0 | 78 | 2 | 1 | 3 | 0 | 0 | 6 | 161 |
| Hourly Total | 8 | 322 | 7 | 0 | 0 | 337 | 6 | 1 | 4 | 0 | 0 | 11 | 0 | 409 | 32 | 0 | 0 | 441 | 2 | 1 | 11 | 0 | 0 | 14 | 803 |
| 10:00 PM | 2 | 83 | 0 | 0 | 0 | 85 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 77 | 5 | 0 | 0 | 82 | 0 | 1 | 12 | 0 | 0 | 13 | 182 |
| 10:15 PM | 1 | 63 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 3 | 0 | 0 | 76 | 0 | 0 | 3 | 0 | 0 | 3 | 143 |
| 10:30 PM | 0 | 64 | 0 | 0 | 0 | 64 | 1 | 0 | 2 | 0 | 0 | 3 | 1 | 77 | 4 | 0 | 0 | 82 | 2 | 0 | 1 | 0 | 0 | 3 | 152 |
| 10:45 PM | 2 | 39 | 0 | 0 | 0 | 41 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 56 | 2 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 103 |
| Hourly Total | 5 | 249 | 0 | 0 | 0 | 254 | 6 | 0 | 3 | 0 | 0 | 9 | 1 | 283 | 14 | 0 | 0 | 298 | 2 | 1 | 16 | 0 | 0 | 19 | 580 |
| 11:00 PM | 4 | 53 | 0 | 0 | 0 | 57 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 38 | 3 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 102 |
| 11:15 PM | 1 | 44 | 0 | 0 | 0 | 45 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 46 | 3 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 97 |
| 11:30 PM | 0 | 43 | 0 | 0 | 0 | 43 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 34 | 2 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 84 |
| 11:45 PM | 1 | 26 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| Hourly Total | 6 | 166 | 0 | 0 | 0 | 172 | 8 | 0 | 4 | 0 | 0 | 12 | 0 | 153 | 8 | 0 | 0 | 161 | 0 | 0 | 0 | 0 | 0 | 0 | 345 |
| Grand Total | 269 | 15934 | 131 | 11 | 0 | 16345 | 863 | 22 | 313 | 0 | 1 | 1198 | 15 | 15342 | 1060 | 0 | 1 | 16417 | 45 | 30 | 194 | 0 | 4 | 269 | 34229 |
| Approach % | 1.6 | 97.5 | 0.8 | 0.1 | - | - | 72.0 | 1.8 | 26.1 | 0.0 | - | - | 0.1 | 93.5 | 6.5 | 0.0 | - | - | 16.7 | 11.2 | 72.1 | 0.0 | - | - | - |
| Total % | 0.8 | 46.6 | 0.4 | 0.0 | - | 47.8 | 2.5 | 0.1 | 0.9 | 0.0 | - | 3.5 | 0.0 | 44.8 | 3.1 | 0.0 | - | 48.0 | 0.1 | 0.1 | 0.6 | 0.0 | - | 0.8 | - |
| Motorcycles | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 3 | 0 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 5 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 261 | 15070 | 129 | 11 | - | 15471 | 855 | 18 | 299 | 0 | - | 1172 | 14 | 14500 | 1042 | 0 | - | 15556 | 44 | 28 | 192 | 0 | - | 264 | 32463 |
| % Cars & Light Goods | 97.0 | 94.6 | 98.5 | 100.0 | - | 94.7 | 99.1 | 81.8 | 95.5 | - | - | 97.8 | 93.3 | 94.5 | 98.3 | - | - | 94.8 | 97.8 | 93.3 | 99.0 | - | - | 98.1 | 94.8 |
| Buses | 1 | 5 | 0 | 0 | - | 6 | 0 | 0 | 1 | 0 | - | 1 | 0 | 11 | 0 | 0 | - | 11 | 0 | 0 | 0 | 0 | - | 0 | 18 |
| % Buses | 0.4 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.3 | - | - | 0.1 | 0.0 | 0.1 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 |
| Single-Unit Trucks | 7 | 594 | 1 | 0 | - | 602 | 7 | 4 | 12 | 0 | - | 23 | 1 | 576 | 17 | 0 | - | 594 | 1 | 2 | 2 | 0 | - | 5 | 1224 |
| % Single-Unit Trucks | 2.6 | 3.7 | 0.8 | 0.0 | - | 3.7 | 0.8 | 18.2 | 3.8 | - | - | 1.9 | 6.7 | 3.8 | 1.6 | - | - | 3.6 | 2.2 | 6.7 | 1.0 | - | - | 1.9 | 3.6 |
| Articulated Trucks | 0 | 263 | 1 | 0 | - | 264 | 1 | 0 | 1 | 0 | - | 2 | 0 | 252 | 1 | 0 | - | 253 | 0 | 0 | 0 | 0 | - | 0 | 519 |
| % Articulated Trucks | 0.0 | 1.7 | 0.8 | 0.0 | - | 1.6 | 0.1 | 0.0 | 0.3 | - | - | 0.2 | 0.0 | 1.6 | 0.1 | - | - | 1.5 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 1.5 |

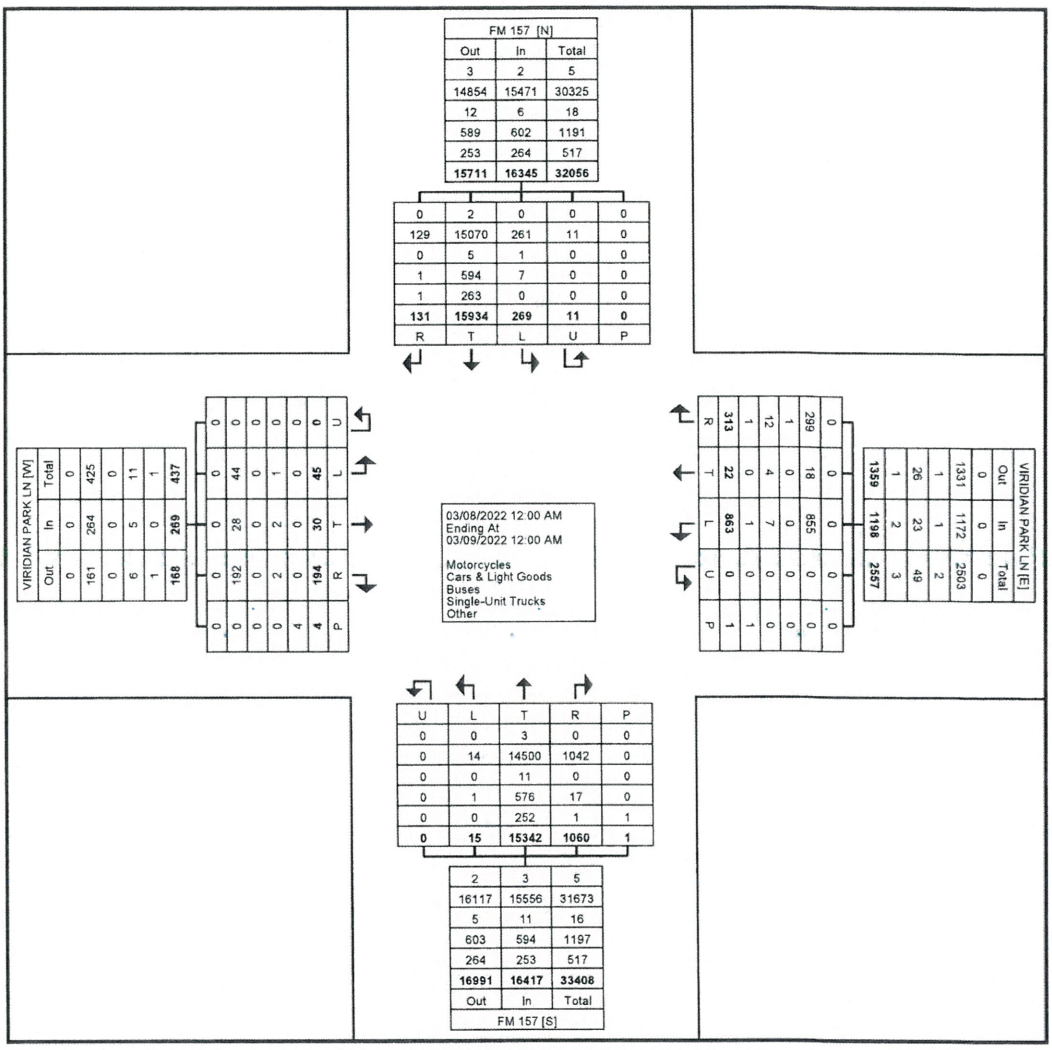
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 3 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 75.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 25.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022
Page No: 5

## Turning Movement Peak Hour Data (7:15 AM)

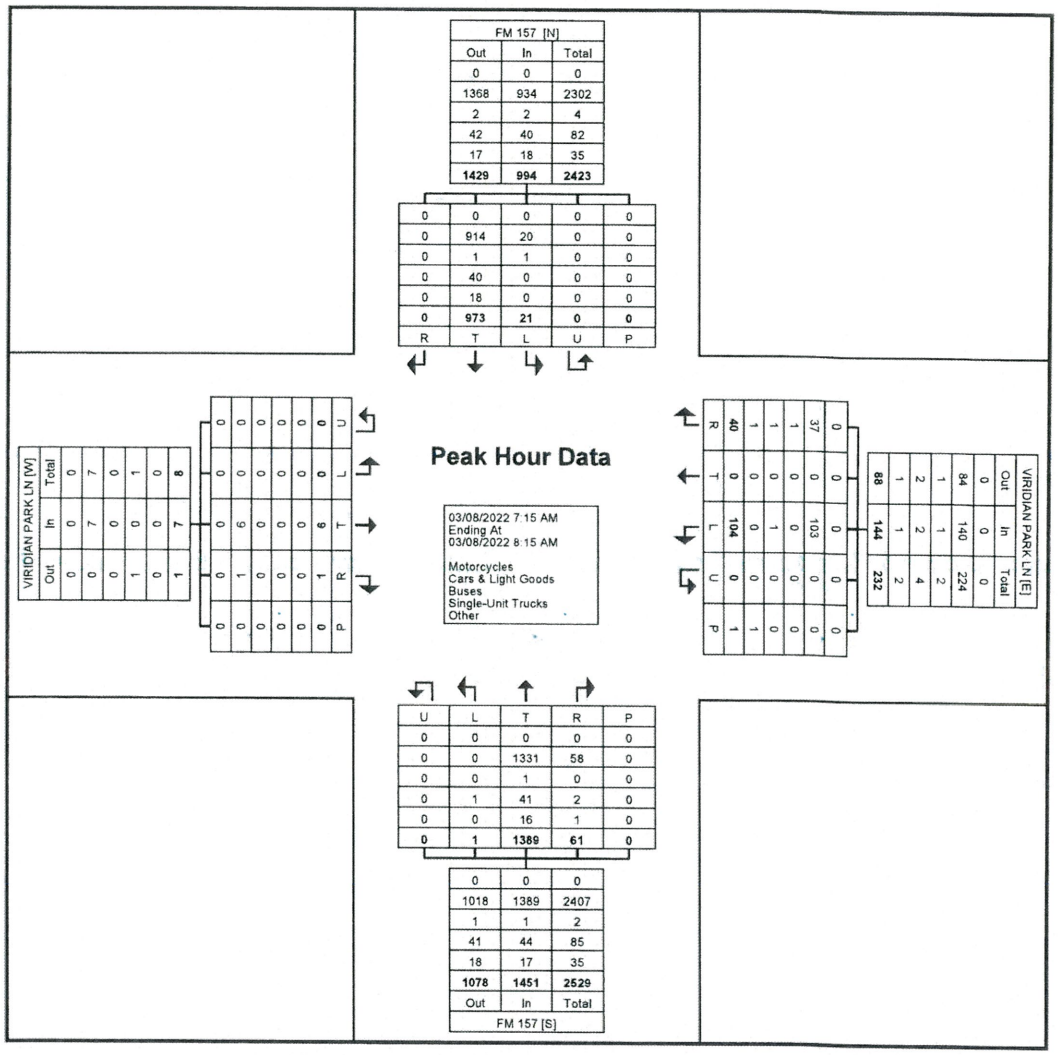
| Start Time | FM 157 Southbound | | | | | | VIRIDIAN PARK LN Westbound | | | | | | FM 157 Northbound | | | | | | VIRIDIAN PARK LN Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 2 | 219 | 0 | 0 | 0 | 221 | 22 | 0 | 12 | 0 | 0 | 34 | 0 | 351 | 15 | 0 | 0 | 366 | 0 | 6 | 1 | 0 | 0 | 7 | 628 |
| 7:30 AM | 2 | 251 | 0 | 0 | 0 | 253 | 27 | 0 | 7 | 0 | 1 | 34 | 1 | 345 | 16 | 0 | 0 | 362 | 0 | 0 | 0 | 0 | 0 | 0 | 649 |
| 7:45 AM | 9 | 256 | 0 | 0 | 0 | 265 | 33 | 0 | 16 | 0 | 0 | 49 | 0 | 380 | 11 | 0 | 0 | 391 | 0 | 0 | 0 | 0 | 0 | 0 | 705 |
| 8:00 AM | 8 | 247 | 0 | 0 | 0 | 255 | 22 | 0 | 5 | 0 | 0 | 27 | 0 | 313 | 19 | 0 | 0 | 332 | 0 | 0 | 0 | 0 | 0 | 0 | 614 |
| Total | 21 | 973 | 0 | 0 | 0 | 994 | 104 | 0 | 40 | 0 | 1 | 144 | 1 | 1389 | 61 | 0 | 0 | 1451 | 0 | 6 | 1 | 0 | 0 | 7 | 2596 |
| Approach % | 2.1 | 97.9 | 0.0 | 0.0 | - | - | 72.2 | 0.0 | 27.8 | 0.0 | - | - | 0.1 | 95.7 | 4.2 | 0.0 | - | - | 0.0 | 85.7 | 14.3 | 0.0 | - | - | - |
| Total % | 0.8 | 37.5 | 0.0 | 0.0 | - | 38.3 | 4.0 | 0.0 | 1.5 | 0.0 | - | 5.5 | 0.0 | 53.5 | 2.3 | 0.0 | - | 55.9 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.3 | - |
| PHF | 0.583 | 0.950 | 0.000 | 0.000 | - | 0.938 | 0.788 | 0.000 | 0.625 | 0.000 | - | 0.735 | 0.250 | 0.914 | 0.803 | 0.000 | - | 0.928 | 0.000 | 0.250 | 0.250 | 0.000 | - | 0.250 | 0.921 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 20 | 914 | 0 | 0 | - | 934 | 103 | 0 | 37 | 0 | - | 140 | 0 | 1331 | 58 | 0 | - | 1389 | 0 | 6 | 1 | 0 | - | 7 | 2470 |
| % Cars & Light Goods | 95.2 | 93.9 | - | - | - | 94.0 | 99.0 | - | 92.5 | - | - | 97.2 | 0.0 | 95.8 | 95.1 | - | - | 95.7 | - | 100.0 | 100.0 | - | - | 100.0 | 95.1 |
| Buses | 1 | 1 | 0 | 0 | - | 2 | 0 | 0 | 1 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 4 |
| % Buses | 4.8 | 0.1 | - | - | - | 0.2 | 0.0 | - | 2.5 | - | - | 0.7 | 0.0 | 0.1 | 0.0 | - | - | 0.1 | - | 0.0 | 0.0 | - | - | 0.0 | 0.2 |
| Single-Unit Trucks | 0 | 40 | 0 | 0 | - | 40 | 1 | 0 | 1 | 0 | - | 2 | 1 | 41 | 2 | 0 | - | 44 | 0 | 0 | 0 | 0 | - | 0 | 86 |
| % Single-Unit Trucks | 0.0 | 4.1 | - | - | - | 4.0 | 1.0 | - | 2.5 | - | - | 1.4 | 100.0 | 3.0 | 3.3 | - | - | 3.0 | - | 0.0 | 0.0 | - | - | 0.0 | 3.3 |
| Articulated Trucks | 0 | 18 | 0 | 0 | - | 18 | 0 | 0 | 1 | 0 | - | 1 | 0 | 16 | 1 | 0 | - | 17 | 0 | 0 | 0 | 0 | - | 0 | 36 |
| % Articulated Trucks | 0.0 | 1.8 | - | - | - | 1.8 | 0.0 | - | 2.5 | - | - | 0.7 | 0.0 | 1.2 | 1.6 | - | - | 1.2 | - | 0.0 | 0.0 | - | - | 0.0 | 1.4 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022


Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022


## Turning Movement Peak Hour Data (4:45 PM)

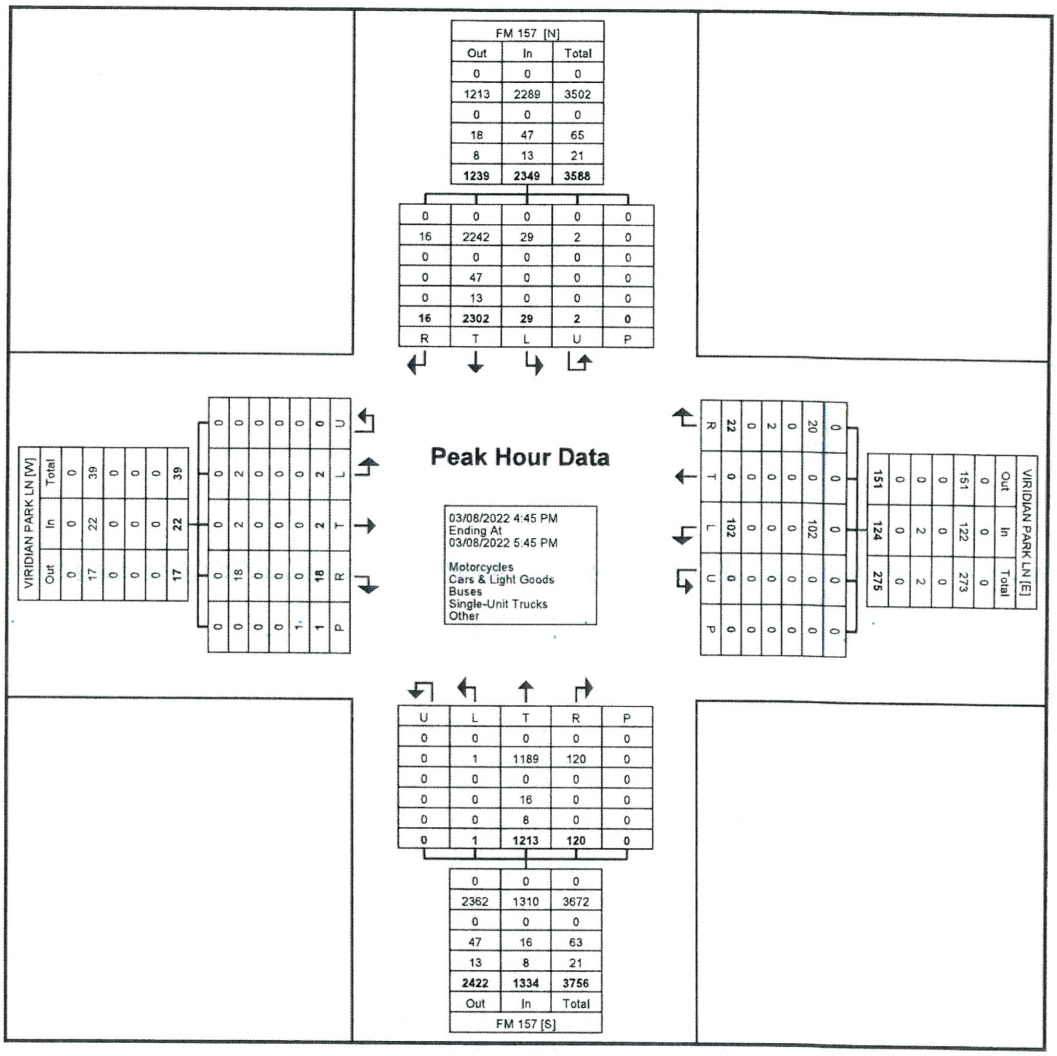
| Start Time | FM 157 Southbound | | | | | | VIRIDIAN PARK LN Westbound | | | | | | FM 157 Northbound | | | | | | VIRIDIAN PARK LN Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:45 PM | 5 | 540 | 5 | 0 | 0 | 550 | 28 | 0 | 7 | 0 | 0 | 35 | 0 | 286 | 30 | 0 | 0 | 316 | 0 | 1 | 6 | 0 | 0 | 7 | 908 |
| 5:00 PM | 6 | 536 | 5 | 1 | 0 | 548 | 22 | 0 | 4 | 0 | 0 | 26 | 1 | 312 | 26 | 0 | 0 | 339 | 0 | 0 | 6 | 0 | 0 | 6 | 919 |
| 5:15 PM | 12 | 641 | 2 | 0 | 0 | 655 | 26 | 0 | 5 | 0 | 0 | 31 | 0 | 293 | 28 | 0 | 0 | 321 | 1 | 1 | 2 | 0 | 0 | 4 | 1011 |
| 5:30 PM | 6 | 585 | 4 | 1 | 0 | 596 | 26 | 0 | 6 | 0 | 0 | 32 | 0 | 322 | 36 | 0 | 0 | 358 | 1 | 0 | 4 | 0 | 1 | 5 | 991 |
| Total | 29 | 2302 | 16 | 2 | 0 | 2349 | 102 | 0 | 22 | 0 | 0 | 124 | 1 | 1213 | 120 | 0 | 0 | 1334 | 2 | 2 | 18 | 0 | 1 | 22 | 3829 |
| Approach % | 1.2 | 98.0 | 0.7 | 0.1 | - | - | 82.3 | 0.0 | 17.7 | 0.0 | - | - | 0.1 | 90.9 | 9.0 | 0.0 | - | - | 9.1 | 9.1 | 81.8 | 0.0 | - | - | - |
| Total % | 0.8 | 60.1 | 0.4 | 0.1 | - | 61.3 | 2.7 | 0.0 | 0.6 | 0.0 | - | 3.2 | 0.0 | 31.7 | 3.1 | 0.0 | - | 34.8 | 0.1 | 0.1 | 0.5 | 0.0 | - | 0.6 | - |
| PHF | 0.604 | 0.898 | 0.800 | 0.500 | - | 0.897 | 0.911 | 0.000 | 0.786 | 0.000 | - | 0.886 | 0.250 | 0.942 | 0.833 | 0.000 | - | 0.932 | 0.500 | 0.500 | 0.750 | 0.000 | - | 0.786 | 0.947 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 29 | 2242 | 16 | 2 | - | 2289 | 102 | 0 | 20 | 0 | - | 122 | 1 | 1189 | 120 | 0 | - | 1310 | 2 | 2 | 18 | 0 | - | 22 | 3743 |
| % Cars & Light Goods | 100.0 | 97.4 | 100.0 | 100.0 | - | 97.4 | 100.0 | - | 90.9 | - | - | 98.4 | 100.0 | 98.0 | 100.0 | - | - | 98.2 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 97.8 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 47 | 0 | 0 | - | 47 | 0 | 0 | 2 | 0 | - | 2 | 0 | 16 | 0 | 0 | - | 16 | 0 | 0 | 0 | 0 | - | 0 | 65 |
| % Single-Unit Trucks | 0.0 | 2.0 | 0.0 | 0.0 | - | 2.0 | 0.0 | - | 9.1 | - | - | 1.6 | 0.0 | 1.3 | 0.0 | - | - | 1.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 1.7 |
| Articulated Trucks | 0 | 13 | 0 | 0 | - | 13 | 0 | 0 | 0 | 0 | - | 0 | 0 | 8 | 0 | 0 | - | 8 | 0 | 0 | 0 | 0 | - | 0 | 21 |
| % Articulated Trucks | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.6 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.7 | 0.0 | - | - | 0.6 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ VIRIDIAN PARK LN
Site Code:
Start Date: 03/08/2022
Page No: 8




Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | FM 157 Southbound | | | | | | GREEN OAKS BLVD Westbound | | | | | | FM 157 Northbound | | | | | | GREEN OAKS BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 0 | 12 | 14 | 0 | 0 | 26 | 5 | 13 | 4 | 0 | 0 | 22 | 2 | 24 | 11 | 0 | 0 | 37 | 7 | 4 | 2 | 0 | 0 | 13 | 98 |
| 12:15 AM | 4 | 15 | 11 | 0 | 0 | 30 | 6 | 7 | 4 | 0 | 0 | 17 | 5 | 10 | 5 | 0 | 0 | 20 | 10 | 5 | 5 | 0 | 0 | 20 | 87 |
| 12:30 AM | 4 | 10 | 4 | 0 | 0 | 18 | 5 | 8 | 4 | 0 | 0 | 17 | 3 | 13 | 3 | 0 | 0 | 19 | 5 | 3 | 2 | 0 | 0 | 10 | 64 |
| 12:45 AM | 4 | 7 | 7 | 0 | 0 | 18 | 7 | 6 | 1 | 0 | 0 | 14 | 4 | 12 | 3 | 0 | 0 | 19 | 7 | 1 | 2 | 0 | 0 | 10 | 61 |
| Hourly Total | 12 | 44 | 36 | 0 | 0 | 92 | 23 | 34 | 13 | 0 | 0 | 70 | 14 | 59 | 22 | 0 | 0 | 95 | 29 | 13 | 11 | 0 | 0 | 53 | 310 |
| 1:00 AM | 2 | 10 | 4 | 0 | 0 | 16 | 3 | 10 | 2 | 2 | 0 | 17 | 2 | 10 | 0 | 0 | 0 | 12 | 3 | 2 | 0 | 0 | 0 | 5 | 50 |
| 1:15 AM | 1 | 12 | 4 | 0 | 0 | 17 | 3 | 4 | 1 | 0 | 0 | 8 | 0 | 11 | 4 | 0 | 0 | 15 | 1 | 4 | 6 | 0 | 0 | 11 | 51 |
| 1:30 AM | 4 | 12 | 3 | 0 | 0 | 19 | 6 | 4 | 2 | 0 | 0 | 12 | 2 | 12 | 4 | 0 | 0 | 18 | 4 | 1 | 2 | 0 | 0 | 7 | 56 |
| 1:45 AM | 2 | 12 | 4 | 0 | 0 | 18 | 2 | 6 | 6 | 2 | 0 | 16 | 1 | 11 | 6 | 0 | 0 | 18 | 4 | 0 | 0 | 0 | 0 | 4 | 56 |
| Hourly Total | 9 | 46 | 15 | 0 | 0 | 70 | 14 | 24 | 11 | 4 | 0 | 53 | 5 | 44 | 14 | 0 | 0 | 63 | 12 | 7 | 8 | 0 | 0 | 27 | 213 |
| 2:00 AM | 1 | 11 | 8 | 0 | 0 | 20 | 5 | 2 | 4 | 0 | 0 | 11 | 2 | 10 | 2 | 0 | 0 | 14 | 6 | 6 | 3 | 0 | 0 | 15 | 60 |
| 2:15 AM | 4 | 17 | 4 | 0 | 0 | 25 | 4 | 9 | 3 | 0 | 0 | 16 | 1 | 12 | 2 | 0 | 0 | 15 | 3 | 2 | 4 | 0 | 0 | 9 | 65 |
| 2:30 AM | 2 | 16 | 1 | 0 | 0 | 19 | 6 | 1 | 3 | 0 | 0 | 10 | 5 | 13 | 2 | 0 | 0 | 20 | 1 | 3 | 1 | 0 | 0 | 5 | 54 |
| 2:45 AM | 0 | 11 | 4 | 0 | 0 | 15 | 3 | 10 | 5 | 0 | 0 | 18 | 2 | 7 | 3 | 0 | 0 | 12 | 4 | 4 | 1 | 0 | 0 | 9 | 54 |
| Hourly Total | 7 | 55 | 17 | 0 | 0 | 79 | 18 | 22 | 15 | 0 | 0 | 55 | 10 | 42 | 9 | 0 | 0 | 61 | 14 | 15 | 9 | 0 | 0 | 38 | 233 |
| 3:00 AM | 0 | 7 | 6 | 0 | 0 | 13 | 3 | 4 | 3 | 0 | 0 | 10 | 2 | 16 | 4 | 0 | 0 | 22 | 4 | 1 | 3 | 0 | 0 | 8 | 53 |
| 3:15 AM | 2 | 6 | 5 | 0 | 0 | 13 | 6 | 4 | 3 | 1 | 0 | 14 | 0 | 17 | 4 | 0 | 0 | 21 | 4 | 1 | 3 | 0 | 0 | 8 | 56 |
| 3:30 AM | 0 | 8 | 1 | 0 | 0 | 9 | 3 | 6 | 2 | 0 | 0 | 11 | 0 | 14 | 2 | 0 | 0 | 16 | 8 | 6 | 2 | 0 | 0 | 16 | 52 |
| 3:45 AM | 1 | 9 | 1 | 0 | 0 | 11 | 1 | 4 | 7 | 1 | 0 | 13 | 0 | 13 | 4 | 0 | 0 | 17 | 6 | 12 | 4 | 0 | 0 | 22 | 63 |
| Hourly Total | 3 | 30 | 13 | 0 | 0 | 46 | 13 | 18 | 15 | 2 | 0 | 48 | 2 | 60 | 14 | 0 | 0 | 76 | 22 | 20 | 12 | 0 | 0 | 54 | 224 |
| 4:00 AM | 0 | 12 | 1 | 0 | 0 | 13 | 2 | 1 | 2 | 0 | 0 | 5 | 1 | 18 | 2 | 0 | 0 | 21 | 11 | 6 | 3 | 0 | 0 | 20 | 59 |
| 4:15 AM | 5 | 15 | 3 | 0 | 0 | 23 | 2 | 6 | 5 | 0 | 0 | 13 | 3 | 18 | 3 | 0 | 0 | 24 | 8 | 14 | 1 | 0 | 0 | 23 | 83 |
| 4:30 AM | 4 | 12 | 7 | 0 | 0 | 23 | 2 | 4 | 7 | 0 | 0 | 13 | 3 | 27 | 6 | 0 | 0 | 36 | 18 | 15 | 6 | 0 | 0 | 39 | 111 |
| 4:45 AM | 2 | 18 | 10 | 0 | 0 | 30 | 3 | 8 | 10 | 0 | 0 | 21 | 0 | 27 | 6 | 0 | 0 | 33 | 17 | 15 | 3 | 0 | 0 | 35 | 119 |
| Hourly Total | 11 | 57 | 21 | 0 | 0 | 89 | 9 | 19 | 24 | 0 | 0 | 52 | 7 | 90 | 17 | 0 | 0 | 114 | 54 | 50 | 13 | 0 | 0 | 117 | 372 |
| 5:00 AM | 3 | 23 | 8 | 0 | 0 | 34 | 3 | 9 | 8 | 1 | 0 | 21 | 1 | 42 | 7 | 0 | 0 | 50 | 24 | 25 | 2 | 0 | 0 | 51 | 156 |
| 5:15 AM | 6 | 24 | 13 | 0 | 0 | 43 | 2 | 8 | 10 | 0 | 0 | 20 | 2 | 64 | 16 | 0 | 0 | 82 | 30 | 21 | 2 | 0 | 0 | 53 | 198 |
| 5:30 AM | 10 | 35 | 12 | 0 | 0 | 57 | 5 | 7 | 16 | 0 | 0 | 28 | 2 | 70 | 10 | 0 | 0 | 82 | 48 | 34 | 12 | 0 | 0 | 94 | 261 |
| 5:45 AM | 7 | 38 | 23 | 0 | 0 | 68 | 6 | 17 | 18 | 0 | 0 | 41 | 6 | 71 | 20 | 0 | 0 | 97 | 62 | 39 | 4 | 0 | 0 | 105 | 311 |
| Hourly Total | 26 | 120 | 56 | 0 | 0 | 202 | 16 | 41 | 52 | 1 | 0 | 110 | 11 | 247 | 53 | 0 | 0 | 311 | 164 | 119 | 20 | 0 | 0 | 303 | 926 |
| 6:00 AM | 12 | 43 | 16 | 0 | 0 | 71 | 6 | 15 | 18 | 0 | 0 | 39 | 4 | 91 | 10 | 0 | 0 | 105 | 73 | 40 | 11 | 0 | 0 | 124 | 339 |
| 6:15 AM | 10 | 43 | 20 | 0 | 0 | 73 | 7 | 25 | 29 | 0 | 0 | 61 | 7 | 120 | 15 | 0 | 0 | 142 | 81 | 58 | 7 | 0 | 0 | 146 | 422 |
| 6:30 AM | 21 | 56 | 38 | 0 | 1 | 115 | 12 | 32 | 30 | 0 | 0 | 74 | 9 | 167 | 20 | 0 | 0 | 196 | 126 | 79 | 13 | 0 | 0 | 218 | 603 |
| 6:45 AM | 23 | 75 | 27 | 0 | 0 | 125 | 18 | 36 | 38 | 0 | 0 | 92 | 4 | 179 | 22 | 0 | 0 | 205 | 129 | 98 | 13 | 0 | 0 | 240 | 662 |
| Hourly Total | 66 | 217 | 101 | 0 | 1 | 384 | 43 | 108 | 115 | 0 | 0 | 266 | 24 | 557 | 67 | 0 | 0 | 648 | 409 | 275 | 44 | 0 | 0 | 728 | 2026 |
| 7:00 AM | 23 | 73 | 52 | 0 | 0 | 148 | 6 | 70 | 34 | 0 | 1 | 110 | 8 | 137 | 16 | 0 | 0 | 161 | 132 | 123 | 24 | 0 | 0 | 279 | 698 |
| 7:15 AM | 35 | 118 | 70 | 0 | 0 | 223 | 12 | 68 | 46 | 0 | 1 | 126 | 19 | 179 | 16 | 0 | 0 | 214 | 146 | 163 | 26 | 0 | 0 | 335 | 898 |
| 7:30 AM | 50 | 133 | 90 | 0 | 0 | 273 | 19 | 59 | 58 | 0 | 0 | 136 | 13 | 154 | 31 | 0 | 0 | 198 | 156 | 214 | 31 | 0 | 0 | 401 | 1008 |
| 7:45 AM | 50 | 147 | 93 | 0 | 0 | 290 | 21 | 60 | 52 | 0 | 0 | 133 | 13 | 200 | 32 | 0 | 0 | 245 | 130 | 196 | 39 | 0 | 0 | 365 | 1033 |
| Hourly Total | 158 | 471 | 305 | 0 | 0 | 934 | 58 | 257 | 190 | 0 | 2 | 505 | 53 | 670 | 95 | 0 | 0 | 818 | 564 | 696 | 120 | 0 | 0 | 1380 | 3637 |
| 8:00 AM | 41 | 143 | 79 | 0 | 0 | 263 | 20 | 66 | 46 | 0 | 0 | 132 | 25 | 133 | 33 | 0 | 1 | 191 | 134 | 213 | 36 | 0 | 0 | 383 | 969 |
| 8:15 AM | 44 | 118 | 73 | 0 | 2 | 235 | 25 | 65 | 54 | 0 | 0 | 144 | 25 | 147 | 22 | 0 | 0 | 194 | 119 | 121 | 32 | 0 | 0 | 272 | 845 |
| 8:30 AM | 30 | 109 | 43 | 0 | 0 | 182 | 17 | 50 | 53 | 0 | 0 | 120 | 15 | 118 | 26 | 0 | 0 | 159 | 107 | 106 | 18 | 0 | 0 | 231 | 692 |
| 8:45 AM | 43 | 122 | 63 | 0 | 0 | 228 | 29 | 46 | 42 | 0 | 0 | 117 | 11 | 145 | 25 | 0 | 0 | 181 | 85 | 93 | 26 | 0 | 0 | 204 | 730 |
| Hourly Total | 158 | 492 | 258 | 0 | 2 | 908 | 91 | 227 | 195 | 0 | 0 | 513 | 76 | 543 | 106 | 0 | 1 | 725 | 445 | 533 | 112 | 0 | 0 | 1090 | 3236 |
| 9:00 AM | 29 | 88 | 74 | 0 | 0 | 191 | 14 | 49 | 27 | 2 | 0 | 92 | 18 | 96 | 22 | 0 | 0 | 136 | 87 | 64 | 26 | 0 | 0 | 177 | 596 |
| 9:15 AM | 27 | 110 | 54 | 0 | 0 | 191 | 21 | 30 | 31 | 0 | 0 | 82 | 11 | 107 | 38 | 0 | 0 | 156 | 72 | 50 | 17 | 0 | 0 | 139 | 568 |
| 9:30 AM | 31 | 83 | 57 | 0 | 0 | 171 | 18 | 32 | 36 | 0 | 0 | 86 | 10 | 91 | 23 | 0 | 0 | 124 | 78 | 51 | 18 | 0 | 0 | 147 | 528 |
| 9:45 AM | 23 | 117 | 42 | 0 | 0 | 182 | 22 | 32 | 33 | 1 | 0 | 88 | 14 | 114 | 23 | 0 | 0 | 151 | 58 | 62 | 19 | 0 | 0 | 139 | 560 |
| Hourly Total | 110 | 398 | 227 | 0 | 0 | 735 | 75 | 143 | 127 | 3 | 0 | 348 | 53 | 408 | 106 | 0 | 0 | 567 | 295 | 227 | 80 | 0 | 0 | 602 | 2252 |
| 10:00 AM | 28 | 93 | 48 | 0 | 0 | 169 | 19 | 28 | 31 | 0 | 0 | 78 | 8 | 83 | 31 | 0 | 0 | 122 | 59 | 36 | 17 | 0 | 0 | 112 | 481 |
| 10:15 AM | 20 | 100 | 52 | 0 | 0 | 172 | 22 | 46 | 33 | 0 | 0 | 101 | 16 | 98 | 20 | 0 | 1 | 134 | 49 | 53 | 20 | 0 | 0 | 122 | 529 |
| 10:30 AM | 29 | 68 | 66 | 0 | 1 | 163 | 25 | 49 | 38 | 0 | 0 | 112 | 14 | 107 | 27 | 0 | 1 | 148 | 67 | 43 | 22 | 0 | 1 | 132 | 555 |
| 10:45 AM | 32 | 117 | 43 | 0 | 0 | 192 | 21 | 41 | 41 | 0 | 0 | 103 | 20 | 109 | 25 | 0 | 0 | 154 | 54 | 47 | 15 | 0 | 0 | 116 | 565 |
| Hourly Total | 109 | 378 | 209 | 0 | 1 | 696 | 87 | 164 | 143 | 0 | 0 | 394 | 58 | 397 | 103 | 0 | 2 | 558 | 229 | 179 | 74 | 0 | 1 | 482 | 2130 |
| 11:00 AM | 28 | 114 | 39 | 0 | 0 | 181 | 21 | 48 | 47 | 0 | 0 | 116 | 16 | 97 | 27 | 0 | 0 | 140 | 42 | 36 | 19 | 0 | 0 | 97 | 534 |
| 11:15 AM | 39 | 114 | 49 | 0 | 0 | 202 | 32 | 35 | 35 | 0 | 0 | 102 | 11 | 116 | 20 | 0 | 0 | 147 | 39 | 47 | 15 | 0 | 1 | 101 | 552 |
| 11:30 AM | 32 | 86 | 55 | 0 | 0 | 173 | 34 | 51 | 41 | 0 | 0 | 126 | 24 | 111 | 42 | 0 | 0 | 177 | 62 | 61 | 22 | 0 | 0 | 145 | 621 |
| 11:45 AM | 38 | 122 | 53 | 0 | 0 | 213 | 19 | 60 | 47 | 0 | 0 | 126 | 22 | 119 | 28 | 0 | 0 | 169 | 47 | 46 | 37 | 0 | 0 | 130 | 638 |
| Hourly Total | 137 | 436 | 196 | 0 | 0 | 769 | 106 | 194 | 170 | 0 | 0 | 470 | 73 | 443 | 117 | 0 | 0 | 633 | 190 | 190 | 93 | 0 | 1 | 473 | 2345 |
| 12:00 PM | 26 | 86 | 60 | 0 | 0 | 172 | 40 | 50 | 37 | 0 | 0 | 127 | 27 | 128 | 27 | 0 | 0 | 182 | 73 | 49 | 25 | 0 | 0 | 147 | 628 |
| 12:15 PM | 35 | 104 | 56 | 0 | 1 | 195 | 36 | 51 | 36 | 0 | 1 | 123 | 21 | 135 | 30 | 0 | 0 | 186 | 55 | 45 | 17 | 0 | 0 | 117 | 621 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 25 | 99 | 46 | 0 | 0 | 170 | 30 | 54 | 48 | 0 | 2 | 132 | 29 | 110 | 47 | 0 | 0 | 186 | 53 | 48 | 24 | 0 | 0 | 125 | 613 |
| 12:45 PM | 29 | 115 | 56 | 0 | 0 | 200 | 29 | 43 | 31 | 1 | 0 | 104 | 22 | 140 | 41 | 0 | 0 | 203 | 48 | 49 | 28 | 0 | 0 | 125 | 632 |
| Hourly Total | 115 | 404 | 218 | 0 | 1 | 737 | 135 | 198 | 152 | 1 | 3 | 486 | 99 | 513 | 145 | 0 | 0 | 757 | 229 | 191 | 94 | 0 | 0 | 514 | 2494 |
| 1:00 PM | 26 | 118 | 45 | 0 | 0 | 189 | 45 | 47 | 40 | 0 | 0 | 132 | 25 | 120 | 44 | 0 | 0 | 189 | 59 | 51 | 37 | 0 | 0 | 147 | 657 |
| 1:15 PM | 29 | 119 | 69 | 0 | 0 | 217 | 38 | 48 | 31 | 0 | 0 | 117 | 17 | 144 | 37 | 1 | 0 | 199 | 71 | 60 | 34 | 0 | 0 | 165 | 698 |
| 1:30 PM | 33 | 91 | 56 | 0 | 0 | 180 | 31 | 70 | 49 | 0 | 0 | 150 | 14 | 135 | 49 | 0 | 0 | 198 | 75 | 63 | 23 | 0 | 0 | 161 | 689 |
| 1:45 PM | 36 | 128 | 82 | 0 | 0 | 246 | 31 | 51 | 30 | 0 | 0 | 112 | 31 | 113 | 44 | 0 | 0 | 188 | 70 | 65 | 27 | 0 | 0 | 162 | 708 |
| Hourly Total | 124 | 456 | 252 | 0 | 0 | 832 | 145 | 216 | 150 | 0 | 0 | 511 | 87 | 512 | 174 | 1 | 0 | 774 | 275 | 239 | 121 | 0 | 0 | 635 | 2752 |
| 2:00 PM | 24 | 109 | 68 | 0 | 0 | 201 | 34 | 65 | 34 | 1 | 0 | 134 | 14 | 126 | 33 | 0 | 0 | 173 | 70 | 58 | 21 | 0 | 0 | 149 | 657 |
| 2:15 PM | 40 | 131 | 62 | 0 | 0 | 233 | 39 | 53 | 40 | 0 | 0 | 132 | 31 | 133 | 41 | 0 | 0 | 205 | 61 | 43 | 30 | 0 | 0 | 134 | 704 |
| 2:30 PM | 37 | 117 | 77 | 0 | 1 | 231 | 40 | 91 | 42 | 3 | 0 | 176 | 20 | 133 | 34 | 0 | 0 | 187 | 59 | 69 | 31 | 0 | 0 | 159 | 753 |
| 2:45 PM | 52 | 133 | 106 | 0 | 0 | 291 | 40 | 89 | 43 | 3 | 0 | 175 | 25 | 157 | 37 | 0 | 0 | 219 | 82 | 66 | 24 | 0 | 0 | 172 | 857 |
| Hourly Total | 153 | 490 | 313 | 0 | 1 | 956 | 153 | 298 | 159 | 7 | 0 | 617 | 90 | 549 | 145 | 0 | 0 | 784 | 272 | 236 | 106 | 0 | 0 | 614 | 2971 |
| 3:00 PM | 38 | 172 | 105 | 0 | 0 | 315 | 37 | 91 | 47 | 2 | 0 | 177 | 22 | 107 | 35 | 0 | 0 | 164 | 69 | 77 | 24 | 0 | 0 | 170 | 826 |
| 3:15 PM | 49 | 175 | 102 | 0 | 0 | 326 | 32 | 68 | 46 | 0 | 0 | 146 | 25 | 124 | 36 | 0 | 0 | 185 | 64 | 92 | 21 | 0 | 0 | 177 | 834 |
| 3:30 PM | 58 | 190 | 123 | 0 | 0 | 371 | 37 | 111 | 56 | 0 | 0 | 204 | 35 | 156 | 42 | 0 | 0 | 233 | 71 | 103 | 41 | 0 | 0 | 215 | 1023 |
| 3:45 PM | 69 | 177 | 135 | 0 | 0 | 381 | 69 | 128 | 52 | 1 | 0 | 250 | 39 | 112 | 40 | 0 | 0 | 191 | 94 | 125 | 59 | 0 | 0 | 278 | 1100 |
| Hourly Total | 214 | 714 | 465 | 0 | 0 | 1393 | 175 | 398 | 201 | 3 | 0 | 777 | 121 | 499 | 153 | 0 | 0 | 773 | 298 | 397 | 145 | 0 | 0 | 840 | 3783 |
| 4:00 PM | 79 | 186 | 150 | 0 | 0 | 415 | 35 | 158 | 63 | 1 | 0 | 257 | 43 | 165 | 32 | 0 | 1 | 240 | 63 | 89 | 34 | 0 | 0 | 186 | 1098 |
| 4:15 PM | 78 | 202 | 175 | 0 | 0 | 455 | 53 | 171 | 60 | 1 | 0 | 285 | 39 | 129 | 39 | 0 | 2 | 207 | 89 | 117 | 51 | 3 | 0 | 260 | 1207 |
| 4:30 PM | 83 | 253 | 216 | 0 | 0 | 552 | 51 | 133 | 56 | 2 | 0 | 242 | 32 | 146 | 39 | 0 | 1 | 217 | 84 | 98 | 39 | 1 | 0 | 222 | 1233 |
| 4:45 PM | 71 | 263 | 236 | 0 | 0 | 570 | 40 | 189 | 65 | 1 | 1 | 295 | 47 | 175 | 47 | 0 | 1 | 269 | 85 | 124 | 30 | 0 | 0 | 239 | 1373 |
| Hourly Total | 311 | 904 | 777 | 0 | 0 | 1992 | 179 | 651 | 244 | 5 | 1 | 1079 | 161 | 615 | 157 | 0 | 5 | 933 | 321 | 428 | 154 | 4 | 0 | 907 | 4911 |
| 5:00 PM | 93 | 249 | 215 | 0 | 1 | 557 | 44 | 190 | 84 | 1 | 0 | 319 | 42 | 146 | 34 | 0 | 0 | 222 | 119 | 139 | 35 | 0 | 0 | 293 | 1391 |
| 5:15 PM | 87 | 292 | 264 | 0 | 1 | 643 | 51 | 190 | 63 | 0 | 0 | 304 | 44 | 192 | 45 | 0 | 0 | 281 | 114 | 147 | 48 | 0 | 0 | 309 | 1537 |
| 5:30 PM | 104 | 293 | 272 | 0 | 0 | 669 | 41 | 192 | 73 | 0 | 0 | 306 | 49 | 184 | 61 | 0 | 0 | 294 | 86 | 108 | 38 | 0 | 0 | 232 | 1501 |
| 5:45 PM | 77 | 205 | 257 | 0 | 0 | 539 | 61 | 187 | 68 | 2 | 0 | 318 | 35 | 155 | 42 | 0 | 0 | 232 | 109 | 110 | 28 | 0 | 0 | 247 | 1336 |
| Hourly Total | 361 | 1039 | 1008 | 0 | 2 | 2408 | 197 | 759 | 288 | 3 | 0 | 1247 | 170 | 677 | 182 | 0 | 0 | 1029 | 428 | 504 | 149 | 0 | 0 | 1081 | 5765 |
| 6:00 PM | 65 | 231 | 221 | 0 | 0 | 517 | 35 | 124 | 53 | 0 | 0 | 212 | 38 | 154 | 30 | 0 | 0 | 222 | 70 | 79 | 37 | 0 | 0 | 186 | 1137 |
| 6:15 PM | 62 | 197 | 184 | 0 | 0 | 443 | 48 | 137 | 55 | 0 | 0 | 240 | 52 | 153 | 43 | 0 | 0 | 248 | 91 | 87 | 33 | 1 | 0 | 212 | 1143 |
| 6:30 PM | 54 | 147 | 114 | 0 | 0 | 315 | 54 | 94 | 42 | 0 | 0 | 190 | 27 | 129 | 54 | 0 | 0 | 210 | 65 | 75 | 30 | 0 | 0 | 170 | 885 |
| 6:45 PM | 38 | 154 | 99 | 0 | 0 | 291 | 26 | 64 | 37 | 0 | 0 | 127 | 34 | 133 | 41 | 0 | 0 | 208 | 65 | 75 | 40 | 0 | 0 | 180 | 806 |
| Hourly Total | 219 | 729 | 618 | 0 | 0 | 1566 | 163 | 419 | 187 | 0 | 0 | 769 | 151 | 569 | 168 | 0 | 0 | 888 | 291 | 316 | 140 | 1 | 0 | 748 | 3971 |
| 7:00 PM | 30 | 113 | 67 | 0 | 1 | 210 | 36 | 72 | 38 | 0 | 0 | 146 | 40 | 129 | 36 | 0 | 2 | 205 | 74 | 78 | 41 | 0 | 0 | 193 | 754 |
| 7:15 PM | 41 | 105 | 62 | 0 | 0 | 208 | 32 | 65 | 45 | 0 | 0 | 142 | 28 | 108 | 42 | 0 | 0 | 178 | 79 | 63 | 33 | 0 | 0 | 175 | 703 |
| 7:30 PM | 37 | 97 | 66 | 0 | 0 | 200 | 34 | 53 | 24 | 0 | 0 | 111 | 23 | 86 | 38 | 0 | 0 | 147 | 57 | 56 | 22 | 0 | 0 | 135 | 593 |
| 7:45 PM | 36 | 82 | 59 | 0 | 1 | 177 | 40 | 50 | 30 | 0 | 0 | 120 | 23 | 106 | 41 | 0 | 0 | 170 | 50 | 37 | 31 | 0 | 1 | 118 | 585 |
| Hourly Total | 144 | 397 | 254 | 0 | 2 | 795 | 142 | 240 | 137 | 0 | 0 | 519 | 114 | 429 | 157 | 0 | 2 | 700 | 260 | 234 | 127 | 0 | 1 | 621 | 2635 |
| 8:00 PM | 20 | 65 | 43 | 0 | 0 | 128 | 26 | 43 | 20 | 0 | 0 | 89 | 23 | 75 | 25 | 0 | 0 | 123 | 36 | 42 | 22 | 0 | 0 | 100 | 440 |
| 8:15 PM | 15 | 76 | 41 | 0 | 0 | 132 | 27 | 42 | 22 | 0 | 0 | 91 | 18 | 89 | 24 | 0 | 0 | 131 | 42 | 45 | 23 | 0 | 0 | 110 | 464 |
| 8:30 PM | 16 | 61 | 45 | 0 | 0 | 122 | 28 | 42 | 17 | 0 | 0 | 87 | 20 | 69 | 24 | 0 | 2 | 113 | 54 | 41 | 22 | 0 | 0 | 117 | 439 |
| 8:45 PM | 17 | 60 | 31 | 0 | 0 | 108 | 16 | 44 | 21 | 0 | 0 | 81 | 22 | 83 | 32 | 0 | 0 | 137 | 39 | 42 | 18 | 0 | 0 | 99 | 425 |
| Hourly Total | 68 | 262 | 160 | 0 | 0 | 490 | 97 | 171 | 80 | 0 | 0 | 348 | 83 | 316 | 105 | 0 | 2 | 504 | 171 | 170 | 85 | 0 | 0 | 426 | 1768 |
| 9:00 PM | 9 | 40 | 30 | 0 | 0 | 79 | 27 | 45 | 11 | 0 | 0 | 83 | 26 | 77 | 27 | 0 | 0 | 130 | 31 | 28 | 21 | 0 | 0 | 80 | 372 |
| 9:15 PM | 19 | 44 | 30 | 0 | 0 | 93 | 17 | 27 | 16 | 0 | 0 | 60 | 17 | 69 | 31 | 0 | 0 | 117 | 34 | 43 | 19 | 0 | 0 | 96 | 366 |
| 9:30 PM | 18 | 53 | 31 | 0 | 0 | 102 | 14 | 36 | 18 | 0 | 0 | 68 | 15 | 71 | 17 | 0 | 0 | 103 | 40 | 31 | 10 | 0 | 0 | 81 | 354 |
| 9:45 PM | 10 | 44 | 28 | 0 | 0 | 82 | 11 | 30 | 13 | 0 | 0 | 54 | 15 | 43 | 22 | 0 | 0 | 80 | 31 | 41 | 12 | 0 | 0 | 84 | 300 |
| Hourly Total | 56 | 181 | 119 | 0 | 0 | 356 | 69 | 138 | 58 | 0 | 0 | 265 | 73 | 260 | 97 | 0 | 0 | 430 | 136 | 143 | 62 | 0 | 0 | 341 | 1392 |
| 10:00 PM | 14 | 39 | 33 | 0 | 0 | 86 | 20 | 32 | 12 | 1 | 0 | 65 | 20 | 42 | 13 | 0 | 0 | 75 | 25 | 18 | 15 | 0 | 0 | 58 | 284 |
| 10:15 PM | 11 | 36 | 24 | 0 | 0 | 71 | 15 | 36 | 20 | 0 | 0 | 71 | 15 | 47 | 21 | 0 | 0 | 83 | 14 | 21 | 7 | 0 | 0 | 42 | 267 |
| 10:30 PM | 9 | 39 | 20 | 0 | 0 | 68 | 10 | 24 | 8 | 0 | 0 | 42 | 9 | 52 | 8 | 0 | 0 | 69 | 25 | 22 | 8 | 0 | 0 | 55 | 234 |
| 10:45 PM | 8 | 26 | 17 | 0 | 0 | 51 | 13 | 22 | 8 | 0 | 0 | 43 | 9 | 34 | 14 | 0 | 1 | 57 | 19 | 12 | 10 | 0 | 0 | 41 | 192 |
| Hourly Total | 42 | 140 | 94 | 0 | 0 | 276 | 58 | 114 | 48 | 1 | 0 | 221 | 53 | 175 | 56 | 0 | 1 | 284 | 83 | 73 | 40 | 0 | 0 | 196 | 977 |
| 11:00 PM | 9 | 29 | 19 | 0 | 0 | 57 | 8 | 27 | 5 | 2 | 0 | 42 | 6 | 29 | 6 | 0 | 0 | 41 | 10 | 16 | 8 | 1 | 0 | 35 | 175 |
| 11:15 PM | 8 | 29 | 10 | 0 | 0 | 47 | 11 | 20 | 10 | 0 | 0 | 41 | 8 | 33 | 5 | 0 | 0 | 46 | 13 | 14 | 5 | 1 | 0 | 33 | 167 |
| 11:30 PM | 3 | 31 | 15 | 0 | 0 | 49 | 5 | 15 | 8 | 0 | 0 | 28 | 9 | 18 | 11 | 0 | 0 | 38 | 12 | 11 | 7 | 0 | 0 | 30 | 145 |
| 11:45 PM | 2 | 18 | 9 | 0 | 0 | 29 | 6 | 14 | 5 | 0 | 0 | 25 | 4 | 22 | 6 | 0 | 0 | 32 | 16 | 12 | 4 | 0 | 0 | 32 | 118 |
| Hourly Total | 22 | 107 | 53 | 0 | 0 | 182 | 30 | 76 | 28 | 2 | 0 | 136 | 27 | 102 | 28 | 0 | 0 | 157 | 51 | 53 | 24 | 2 | 0 | 130 | 605 |
| Grand Total | 2635 | 8567 | 5785 | 0 | 10 | 16987 | 2096 | 4929 | 2802 | 32 | 6 | 9859 | 1615 | 8776 | 2290 | 1 | 13 | 12682 | 5242 | 5308 | 1843 | 7 | 3 | 12400 | 51928 |
| Approach % | 15.5 | 50.4 | 34.1 | 0.0 | - | - | 21.3 | 50.0 | 28.4 | 0.3 | - | - | 12.7 | 69.2 | 18.1 | 0.0 | - | - | 42.3 | 42.8 | 14.9 | 0.1 | - | - | - |
| Total % | 5.1 | 16.5 | 11.1 | 0.0 | - | 32.7 | 4.0 | 9.5 | 5.4 | 0.1 | - | 19.0 | 3.1 | 16.9 | 4.4 | 0.0 | - | 24.4 | 10.1 | 10.2 | 3.5 | 0.0 | - | 23.9 | - |
| Motorcycles | 0 | 2 | 0 | 0 | - | 2 | 0 | 2 | 1 | 0 | - | 3 | 0 | 1 | 1 | 0 | - | 2 | 0 | 3 | 2 | 0 | - | 5 | 12 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | - | 0.0 | 0.0 |
| Cars & Light Goods | 2544 | 7891 | 5688 | 0 | - | 16123 | 2071 | 4853 | 2663 | 31 | - | 9618 | 1601 | 8157 | 2254 | 1 | - | 12013 | 5131 | 5232 | 1820 | 7 | - | 12190 | 49944 |
| % Cars & Light Goods | 96.5 | 92.1 | 98.3 | - | - | 94.9 | 98.8 | 98.5 | 95.0 | 96.9 | - | 97.6 | 99.1 | 92.9 | 98.4 | 100.0 | - | 94.7 | 97.9 | 98.6 | 98.8 | 100.0 | - | 98.3 | 96.2 |
| Buses | 1 | 1 | 1 | 0 | - | 3 | 2 | 27 | 3 | 0 | - | 32 | 3 | 7 | 4 | 0 | - | 14 | 2 | 28 | 7 | 0 | - | 37 | 86 |
| % Buses | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 | 0.5 | 0.1 | 0.0 | - | 0.3 | 0.2 | 0.1 | 0.2 | 0.0 | - | 0.1 | 0.0 | 0.5 | 0.4 | 0.0 | - | 0.3 | 0.2 |
| Single-Unit Trucks | 63 | 456 | 80 | 0 | - | 599 | 16 | 43 | 104 | 0 | - | 163 | 11 | 403 | 25 | 0 | - | 439 | 94 | 36 | 11 | 0 | - | 141 | 1342 |
| % Single-Unit Trucks | 2.4 | 5.3 | 1.4 | - | - | 3.5 | 0.8 | 0.9 | 3.7 | 0.0 | - | 1.7 | 0.7 | 4.6 | 1.1 | 0.0 | - | 3.5 | 1.8 | 0.7 | 0.6 | 0.0 | - | 1.1 | 2.6 |
| Articulated Trucks | 27 | 217 | 16 | 0 | - | 260 | 7 | 4 | 31 | 1 | - | 43 | 0 | 208 | 6 | 0 | - | 214 | 15 | 9 | 3 | 0 | - | 27 | 544 |
| % Articulated Trucks | 1.0 | 2.5 | 0.3 | - | - | 1.5 | 0.3 | 0.1 | 1.1 | 3.1 | - | 0.4 | 0.0 | 2.4 | 0.3 | 0.0 | - | 1.7 | 0.3 | 0.2 | 0.2 | 0.0 | - | 0.2 | 1.0 |

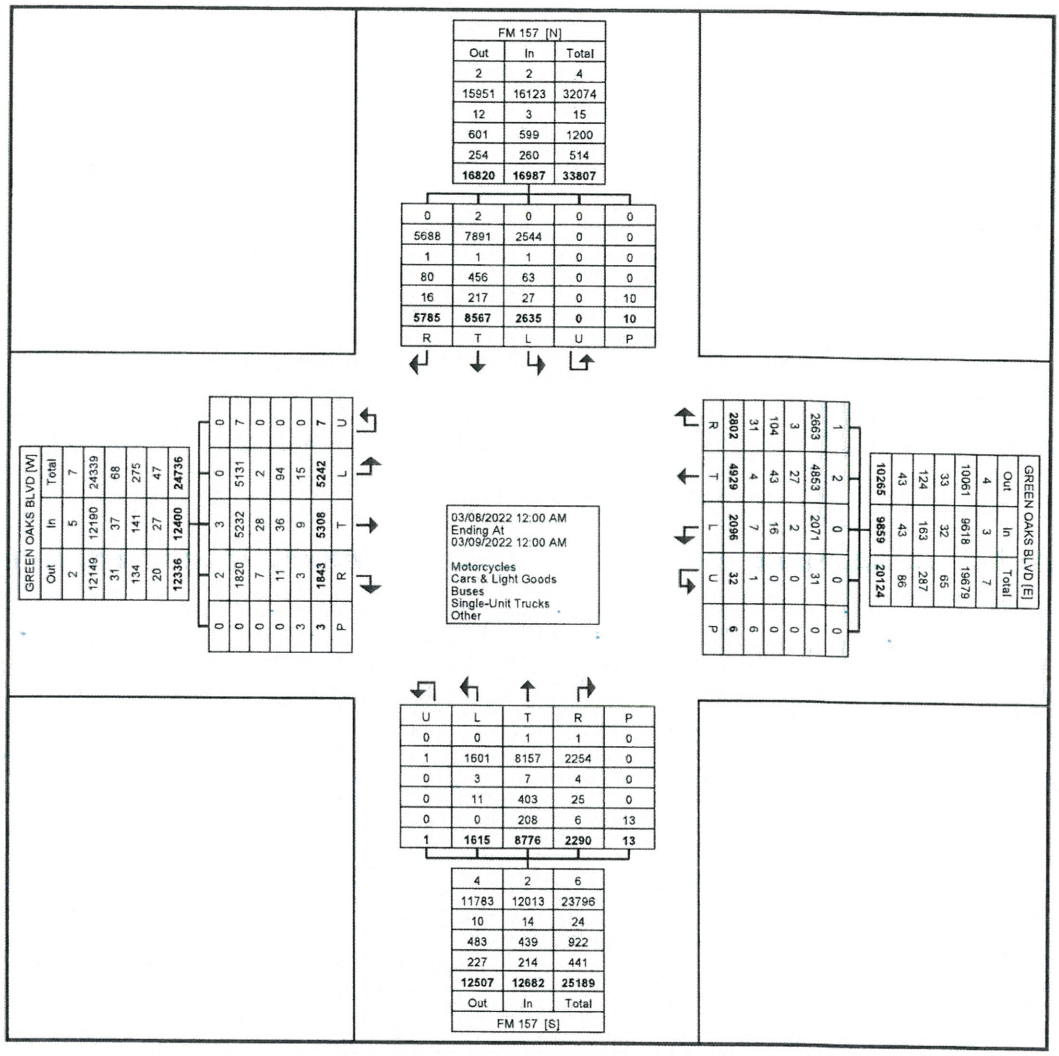
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 1 | - | - | - | - | - | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 10.0 | - | - | - | - | - | 33.3 | - | - | - | - | - | 15.4 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 9 | - | - | - | - | - | 4 | - | - | - | - | - | 11 | - | - | - | - | - | 3 | - | - |
| % Pedestrians | - | - | - | - | 90.0 | - | - | - | - | - | 66.7 | - | - | - | - | - | 84.6 | - | - | - | - | - | 100.0 | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 5

## Turning Movement Peak Hour Data (7:15 AM)

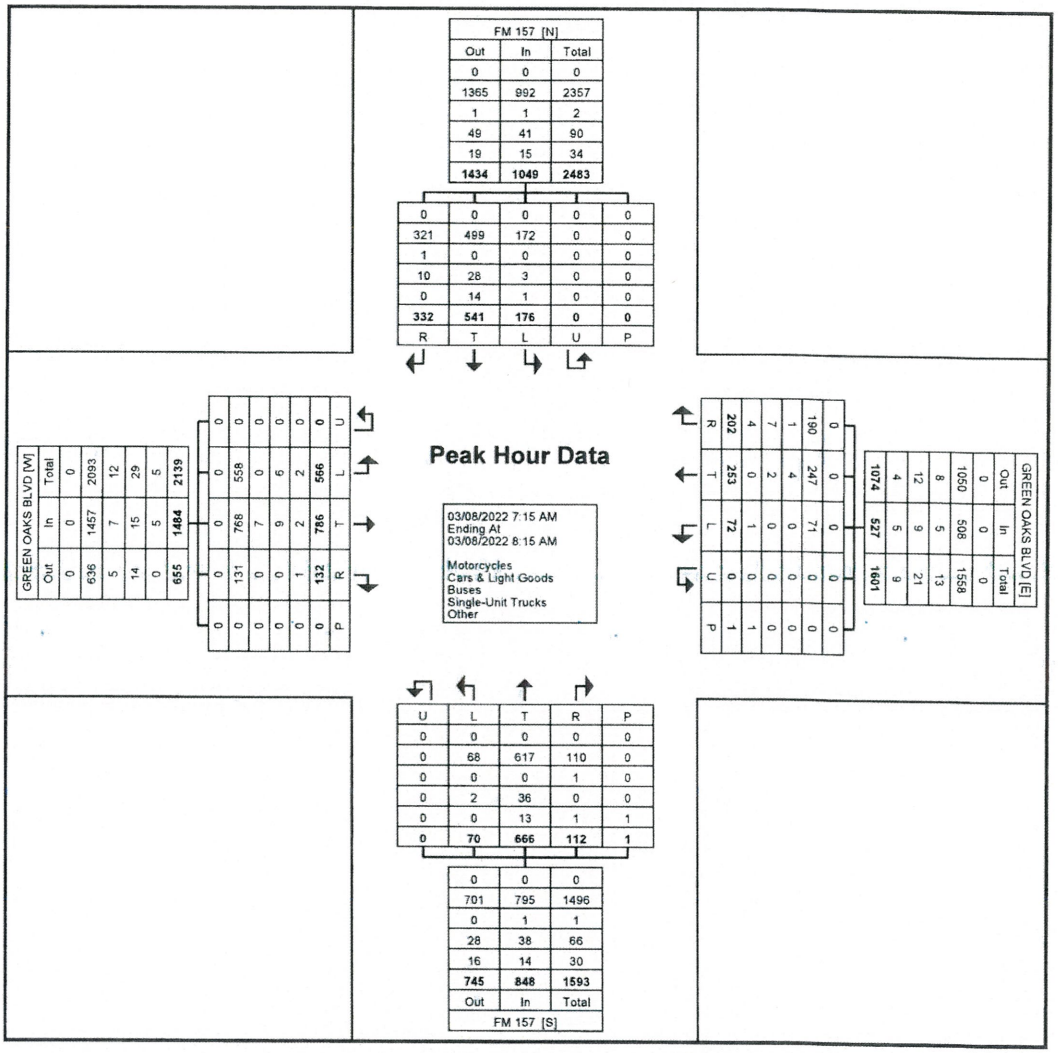
| Start Time | FM 157 Southbound | | | | | | GREEN OAKS BLVD Westbound | | | | | | FM 157 Northbound | | | | | | GREEN OAKS BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 35 | 118 | 70 | 0 | 0 | 223 | 12 | 68 | 46 | 0 | 1 | 126 | 19 | 179 | 16 | 0 | 0 | 214 | 146 | 163 | 26 | 0 | 0 | 335 | 898 |
| 7:30 AM | 50 | 133 | 90 | 0 | 0 | 273 | 19 | 59 | 58 | 0 | 0 | 136 | 13 | 154 | 31 | 0 | 0 | 198 | 156 | 214 | 31 | 0 | 0 | 401 | 1008 |
| 7:45 AM | 50 | 147 | 93 | 0 | 0 | 290 | 21 | 60 | 52 | 0 | 0 | 133 | 13 | 200 | 32 | 0 | 0 | 245 | 130 | 196 | 39 | 0 | 0 | 365 | 1033 |
| 8:00 AM | 41 | 143 | 79 | 0 | 0 | 263 | 20 | 66 | 46 | 0 | 0 | 132 | 25 | 133 | 33 | 0 | 1 | 191 | 134 | 213 | 36 | 0 | 0 | 383 | 969 |
| Total | 176 | 541 | 332 | 0 | 0 | 1049 | 72 | 253 | 202 | 0 | 1 | 527 | 70 | 666 | 112 | 0 | 1 | 848 | 566 | 786 | 132 | 0 | 0 | 1484 | 3908 |
| Approach % | 16.8 | 51.6 | 31.6 | 0.0 | - | - | 13.7 | 48.0 | 38.3 | 0.0 | - | - | 8.3 | 78.5 | 13.2 | 0.0 | - | - | 38.1 | 53.0 | 8.9 | 0.0 | - | - | - |
| Total % | 4.5 | 13.8 | 8.5 | 0.0 | - | 26.8 | 1.8 | 6.5 | 5.2 | 0.0 | - | 13.5 | 1.8 | 17.0 | 2.9 | 0.0 | - | 21.7 | 14.5 | 20.1 | 3.4 | 0.0 | - | 38.0 | - |
| PHF | 0.880 | 0.920 | 0.892 | 0.000 | - | 0.904 | 0.857 | 0.930 | 0.871 | 0.000 | - | 0.969 | 0.700 | 0.833 | 0.848 | 0.000 | - | 0.865 | 0.907 | 0.918 | 0.846 | 0.000 | - | 0.925 | 0.946 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 172 | 499 | 321 | 0 | - | 992 | 71 | 247 | 190 | 0 | - | 508 | 68 | 617 | 110 | 0 | - | 795 | 558 | 768 | 131 | 0 | - | 1457 | 3752 |
| % Cars & Light Goods | 97.7 | 92.2 | 96.7 | - | - | 94.6 | 98.6 | 97.6 | 94.1 | - | - | 96.4 | 97.1 | 92.6 | 98.2 | - | - | 93.8 | 98.6 | 97.7 | 99.2 | - | - | 98.2 | 96.0 |
| Buses | 0 | 0 | 1 | 0 | - | 1 | 0 | 4 | 1 | 0 | - | 5 | 0 | 0 | 1 | 0 | - | 1 | 0 | 7 | 0 | 0 | - | 7 | 14 |
| % Buses | 0.0 | 0.0 | 0.3 | - | - | 0.1 | 0.0 | 1.6 | 0.5 | - | - | 0.9 | 0.0 | 0.0 | 0.9 | - | - | 0.1 | 0.0 | 0.9 | 0.0 | - | - | 0.5 | 0.4 |
| Single-Unit Trucks | 3 | 28 | 10 | 0 | - | 41 | 0 | 2 | 7 | 0 | - | 9 | 2 | 36 | 0 | 0 | - | 38 | 6 | 9 | 0 | 0 | - | 15 | 103 |
| % Single-Unit Trucks | 1.7 | 5.2 | 3.0 | - | - | 3.9 | 0.0 | 0.8 | 3.5 | - | - | 1.7 | 2.9 | 5.4 | 0.0 | - | - | 4.5 | 1.1 | 1.1 | 0.0 | - | - | 1.0 | 2.6 |
| Articulated Trucks | 1 | 14 | 0 | 0 | - | 15 | 1 | 0 | 4 | 0 | - | 5 | 0 | 13 | 1 | 0 | - | 14 | 2 | 2 | 1 | 0 | - | 5 | 39 |
| % Articulated Trucks | 0.6 | 2.6 | 0.0 | - | - | 1.4 | 1.4 | 0.0 | 2.0 | - | - | 0.9 | 0.0 | 2.0 | 0.9 | - | - | 1.7 | 0.4 | 0.3 | 0.8 | - | - | 0.3 | 1.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 6




Turning Movement Peak Hour Data Plot (7:15 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (4:45 PM)

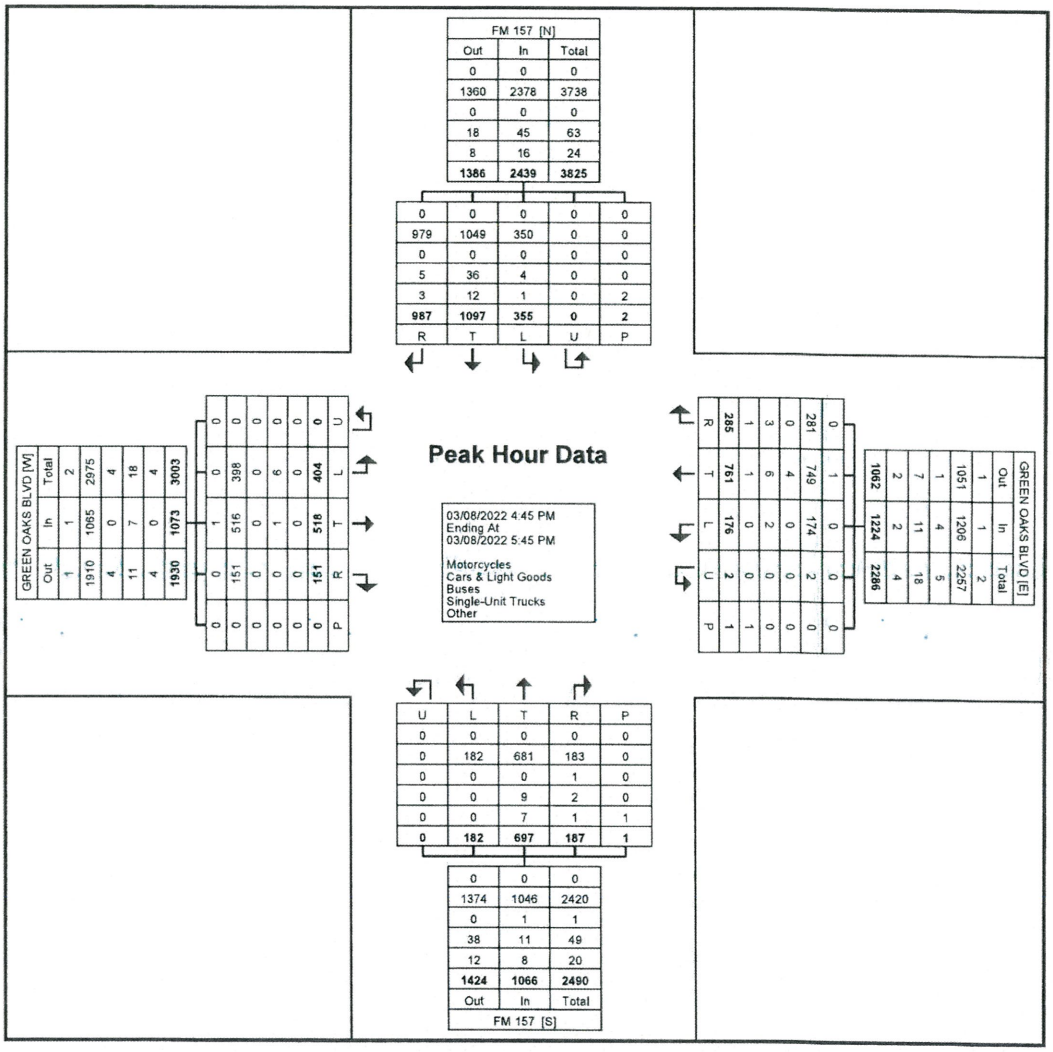
| Start Time | FM 157 Southbound | | | | | | GREEN OAKS BLVD Westbound | | | | | | FM 157 Northbound | | | | | | GREEN OAKS BLVD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:45 PM | 71 | 263 | 236 | 0 | 0 | 570 | 40 | 189 | 65 | 1 | 1 | 295 | 47 | 175 | 47 | 0 | 1 | 269 | 85 | 124 | 30 | 0 | 0 | 239 | 1373 |
| 5:00 PM | 93 | 249 | 215 | 0 | 1 | 557 | 44 | 190 | 84 | 1 | 0 | 319 | 42 | 146 | 34 | 0 | 0 | 222 | 119 | 139 | 35 | 0 | 0 | 293 | 1391 |
| 5:15 PM | 87 | 292 | 264 | 0 | 1 | 643 | 51 | 190 | 63 | 0 | 0 | 304 | 44 | 192 | 45 | 0 | 0 | 281 | 114 | 147 | 48 | 0 | 0 | 309 | 1537 |
| 5:30 PM | 104 | 293 | 272 | 0 | 0 | 669 | 41 | 192 | 73 | 0 | 0 | 306 | 49 | 184 | 61 | 0 | 0 | 294 | 86 | 108 | 38 | 0 | 0 | 232 | 1501 |
| Total | 355 | 1097 | 987 | 0 | 2 | 2439 | 176 | 761 | 285 | 2 | 1 | 1224 | 182 | 697 | 187 | 0 | 1 | 1066 | 404 | 518 | 151 | 0 | 0 | 1073 | 5802 |
| Approach % | 14.6 | 45.0 | 40.5 | 0.0 | - | - | 14.4 | 62.2 | 23.3 | 0.2 | - | - | 17.1 | 65.4 | 17.5 | 0.0 | - | - | 37.7 | 48.3 | 14.1 | 0.0 | - | - | - |
| Total % | 6.1 | 18.9 | 17.0 | 0.0 | - | 42.0 | 3.0 | 13.1 | 4.9 | 0.0 | - | 21.1 | 3.1 | 12.0 | 3.2 | 0.0 | - | 18.4 | 7.0 | 8.9 | 2.6 | 0.0 | - | 18.5 | - |
| PHF | 0.853 | 0.936 | 0.907 | 0.000 | - | 0.911 | 0.863 | 0.991 | 0.848 | 0.500 | - | 0.959 | 0.929 | 0.908 | 0.766 | 0.000 | - | 0.906 | 0.849 | 0.881 | 0.786 | 0.000 | - | 0.868 | 0.944 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 2 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.2 | 0.0 | - | - | 0.1 | 0.0 |
| Cars & Light Goods | 350 | 1049 | 979 | 0 | - | 2378 | 174 | 749 | 281 | 2 | - | 1206 | 182 | 681 | 183 | 0 | - | 1046 | 398 | 516 | 151 | 0 | - | 1065 | 5695 |
| % Cars & Light Goods | 98.6 | 95.6 | 99.2 | - | - | 97.5 | 98.9 | 98.4 | 98.6 | 100.0 | - | 98.5 | 100.0 | 97.7 | 97.9 | - | - | 98.1 | 98.5 | 99.6 | 100.0 | - | - | 99.3 | 98.2 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 4 | 0 | 0 | - | 4 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 5 |
| % Buses | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | - | 0.3 | 0.0 | 0.0 | 0.5 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 |
| Single-Unit Trucks | 4 | 36 | 5 | 0 | - | 45 | 2 | 6 | 3 | 0 | - | 11 | 0 | 9 | 2 | 0 | - | 11 | 6 | 1 | 0 | 0 | - | 7 | 74 |
| % Single-Unit Trucks | 1.1 | 3.3 | 0.5 | - | - | 1.8 | 1.1 | 0.8 | 1.1 | 0.0 | - | 0.9 | 0.0 | 1.3 | 1.1 | - | - | 1.0 | 1.5 | 0.2 | 0.0 | - | - | 0.7 | 1.3 |
| Articulated Trucks | 1 | 12 | 3 | 0 | - | 16 | 0 | 1 | 1 | 0 | - | 2 | 0 | 7 | 1 | 0 | - | 8 | 0 | 0 | 0 | 0 | - | 0 | 26 |
| % Articulated Trucks | 0.3 | 1.1 | 0.3 | - | - | 0.7 | 0.0 | 0.1 | 0.4 | 0.0 | - | 0.2 | 0.0 | 1.0 | 0.5 | - | - | 0.8 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 2 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: FM 157 @ GREEN OAKS BLVD
Site Code:
Start Date: 03/08/2022
Page No: 8




Turning Movement Peak Hour Data Plot (4:45 PM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: MOSIER VALLEY RD @ ALLAN SAXE PKWY
Site Code:
Start Date: 03/08/2022
Page No: 1

## Turning Movement Data

| Start Time | Southbound St. Southbound | | | | | | MOSIER VALLEY RD Westbound | | | | | | ALLAN SAXE PKWY Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 2 |
| 3:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 3:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 5 |
| 4:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 4:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 4 |
| 4:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 2 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 13 |
| 5:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 2 | 0 | 0 | 0 | 10 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 5:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 15 |
| 5:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 5:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 2 | 0 | 0 | 0 | 16 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 1 | 21 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 6 | 0 | 0 | 0 | 41 | 0 | 0 | 20 | 0 | 0 | 20 | 0 | 1 | 1 | 0 | 0 | 2 | 63 |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 6 | 0 | 0 | 0 | 17 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 4 | 1 | 0 | 0 | 5 | 30 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 4 | 0 | 0 | 0 | 25 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 8 | 0 | 0 | 0 | 21 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 2 | 1 | 0 | 0 | 3 | 36 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 8 | 0 | 0 | 0 | 25 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 1 | 1 | 0 | 0 | 2 | 37 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 26 | 0 | 0 | 0 | 88 | 0 | 0 | 37 | 0 | 0 | 37 | 0 | 7 | 3 | 0 | 0 | 10 | 135 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 4 | 0 | 1 | 0 | 26 | 1 | 0 | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 4 | 0 | 0 | 0 | 17 | 1 | 0 | 12 | 0 | 0 | 13 | 0 | 5 | 1 | 0 | 0 | 6 | 36 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 4 | 0 | 0 | 0 | 29 | 0 | 0 | 16 | 0 | 0 | 16 | 0 | 7 | 1 | 0 | 0 | 8 | 53 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 8 | 0 | 0 | 0 | 30 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 5 | 2 | 0 | 0 | 7 | 52 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 20 | 0 | 1 | 0 | 102 | 2 | 0 | 54 | 0 | 0 | 56 | 0 | 17 | 4 | 0 | 0 | 21 | 179 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 4 | 0 | 0 | 0 | 31 | 1 | 0 | 22 | 0 | 0 | 23 | 0 | 15 | 1 | 0 | 0 | 16 | 70 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 9 | 0 | 0 | 0 | 23 | 0 | 0 | 14 | 0 | 0 | 14 | 0 | 2 | 2 | 0 | 0 | 4 | 41 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 7 | 0 | 0 | 0 | 20 | 0 | 0 | 16 | 0 | 0 | 16 | 0 | 12 | 0 | 0 | 0 | 12 | 48 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 8 | 0 | 0 | 0 | 28 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 4 | 1 | 0 | 0 | 5 | 46 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 28 | 0 | 0 | 0 | 102 | 1 | 0 | 65 | 0 | 0 | 66 | 0 | 33 | 4 | 0 | 0 | 37 | 205 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 13 | 0 | 0 | 0 | 30 | 0 | 0 | 11 | 0 | 0 | 11 | 0 | 9 | 1 | 0 | 0 | 10 | 51 |
| 9:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 4 | 0 | 0 | 0 | 21 | 1 | 0 | 23 | 0 | 0 | 24 | 0 | 13 | 0 | 0 | 0 | 13 | 58 |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 11 | 0 | 0 | 0 | 26 | 0 | 0 | 18 | 0 | 0 | 18 | 0 | 6 | 0 | 0 | 0 | 6 | 50 |
| 9:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 10 | 0 | 0 | 0 | 27 | 0 | 0 | 17 | 0 | 0 | 17 | 0 | 10 | 0 | 0 | 0 | 10 | 54 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 38 | 0 | 0 | 0 | 104 | 1 | 0 | 69 | 0 | 0 | 70 | 0 | 38 | 1 | 0 | 0 | 39 | 213 |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 4 | 0 | 0 | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 22 | 0 | 4 | 0 | 0 | 0 | 4 | 48 |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 11 | 0 | 0 | 0 | 30 | 2 | 0 | 13 | 0 | 0 | 15 | 0 | 4 | 1 | 0 | 0 | 5 | 50 |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 13 | 0 | 0 | 0 | 35 | 0 | 0 | 24 | 3 | 0 | 27 | 0 | 9 | 2 | 0 | 0 | 11 | 73 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 0 | 0 | 0 | 27 | 1 | 0 | 18 | 0 | 0 | 19 | 0 | 11 | 1 | 0 | 0 | 12 | 58 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 35 | 0 | 0 | 0 | 114 | 3 | 0 | 77 | 3 | 0 | 83 | 0 | 28 | 4 | 0 | 0 | 32 | 229 |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 2 | 0 | 0 | 0 | 26 | 1 | 0 | 16 | 1 | 0 | 18 | 0 | 9 | 0 | 0 | 0 | 9 | 53 |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 5 | 0 | 0 | 0 | 22 | 1 | 0 | 27 | 0 | 0 | 28 | 0 | 3 | 0 | 0 | 0 | 3 | 53 |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 11 | 0 | 0 | 0 | 31 | 1 | 0 | 17 | 0 | 0 | 18 | 0 | 3 | 0 | 0 | 0 | 3 | 52 |
| 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 8 | 0 | 0 | 0 | 34 | 0 | 0 | 18 | 0 | 0 | 18 | 0 | 10 | 3 | 0 | 0 | 13 | 65 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 87 | 26 | 0 | 0 | 0 | 113 | 3 | 0 | 78 | 1 | 0 | 82 | 0 | 25 | 3 | 0 | 0 | 28 | 223 |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 10 | 0 | 0 | 0 | 28 | 2 | 0 | 24 | 1 | 0 | 27 | 0 | 11 | 0 | 0 | 0 | 11 | 66 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 6 | 0 | 0 | 0 | 26 | 0 | 0 | 16 | 0 | 0 | 16 | 0 | 9 | 0 | 0 | 0 | 9 | 51 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 4 | 0 | 0 | 0 | 32 | 1 | 0 | 23 | 0 | 0 | 24 | 0 | 2 | 0 | 0 | 0 | 2 | 58 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 3 | 0 | 0 | 0 | 27 | 0 | 0 | 16 | 2 | 0 | 18 | 0 | 8 | 0 | 0 | 0 | 8 | 53 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 90 | 23 | 0 | 0 | 0 | 113 | 3 | 0 | 79 | 3 | 0 | 85 | 0 | 30 | 0 | 0 | 0 | 30 | 228 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 0 | 0 | 0 | 27 | 1 | 0 | 31 | 0 | 0 | 32 | 0 | 8 | 1 | 0 | 0 | 9 | 68 |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 10 | 0 | 0 | 0 | 33 | 2 | 0 | 25 | 0 | 0 | 27 | 0 | 5 | 1 | 0 | 0 | 6 | 66 |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 8 | 0 | 0 | 0 | 24 | 0 | 0 | 14 | 0 | 0 | 14 | 0 | 8 | 0 | 0 | 0 | 8 | 46 |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 8 | 0 | 1 | 0 | 29 | 1 | 0 | 24 | 0 | 0 | 25 | 0 | 9 | 0 | 0 | 0 | 9 | 63 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 33 | 0 | 1 | 0 | 113 | 4 | 0 | 94 | 0 | 0 | 98 | 0 | 30 | 2 | 0 | 0 | 32 | 243 |
| 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 5 | 0 | 0 | 0 | 20 | 1 | 0 | 19 | 0 | 0 | 20 | 0 | 7 | 0 | 0 | 0 | 7 | 47 |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 6 | 0 | 0 | 0 | 32 | 0 | 0 | 20 | 0 | 0 | 20 | 0 | 6 | 0 | 0 | 0 | 6 | 58 |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 10 | 0 | 0 | 0 | 22 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 6 | 1 | 0 | 0 | 7 | 44 |
| 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 10 | 0 | 0 | 0 | 36 | 1 | 0 | 21 | 0 | 0 | 22 | 0 | 8 | 0 | 0 | 0 | 8 | 66 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 31 | 0 | 0 | 0 | 110 | 2 | 0 | 75 | 0 | 0 | 77 | 0 | 27 | 1 | 0 | 0 | 28 | 215 |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 7 | 0 | 0 | 0 | 25 | 1 | 0 | 15 | 0 | 0 | 16 | 0 | 10 | 0 | 0 | 0 | 10 | 51 |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 4 | 0 | 0 | 0 | 17 | 1 | 0 | 16 | 0 | 0 | 17 | 0 | 7 | 0 | 0 | 0 | 7 | 41 |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 7 | 0 | 0 | 0 | 32 | 4 | 0 | 24 | 0 | 0 | 28 | 0 | 6 | 0 | 0 | 0 | 6 | 66 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 7 | 0 | 0 | 0 | 22 | 1 | 0 | 18 | 0 | 0 | 19 | 0 | 5 | 1 | 0 | 0 | 6 | 47 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 71 | 25 | 0 | 0 | 0 | 96 | 7 | 0 | 73 | 0 | 0 | 80 | 0 | 28 | 1 | 0 | 0 | 29 | 205 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 9 | 0 | 0 | 0 | 22 | 1 | 0 | 22 | 0 | 0 | 23 | 0 | 7 | 1 | 0 | 0 | 8 | 53 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 4 | 0 | 0 | 0 | 14 | 4 | 0 | 22 | 0 | 0 | 26 | 0 | 11 | 0 | 0 | 0 | 11 | 51 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 5 | 0 | 0 | 0 | 13 | 1 | 0 | 20 | 0 | 0 | 21 | 0 | 6 | 0 | 0 | 0 | 6 | 40 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 0 | 10 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 5 | 1 | 0 | 0 | 6 | 28 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 25 | 0 | 0 | 0 | 59 | 6 | 0 | 76 | 0 | 0 | 82 | 0 | 29 | 2 | 0 | 0 | 31 | 172 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 5 | 2 | 0 | 4 | 0 | 0 | 6 | 0 | 8 | 1 | 0 | 0 | 9 | 20 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 6 | 20 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 8 | 1 | 0 | 6 | 0 | 0 | 7 | 0 | 4 | 0 | 0 | 0 | 4 | 19 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 7 | 1 | 0 | 4 | 0 | 0 | 5 | 0 | 8 | 0 | 0 | 0 | 8 | 20 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 12 | 0 | 0 | 0 | 28 | 4 | 0 | 20 | 0 | 0 | 24 | 0 | 26 | 1 | 0 | 0 | 27 | 79 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 8 | 0 | 0 | 10 | 0 | 6 | 0 | 0 | 0 | 6 | 17 |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 3 | 10 |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 4 | 7 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 8 | 2 | 0 | 15 | 0 | 0 | 17 | 0 | 13 | 0 | 0 | 0 | 13 | 38 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 4 |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 4 |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 3 | 6 |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 0 | 7 | 0 | 0 | 8 | 0 | 2 | 0 | 0 | 0 | 2 | 13 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 11 | 27 |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 3 |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 3 |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 4 | 10 |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 3 |
| 10:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 10:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 11:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 0 | 865 | 350 | 0 | 4 | 0 | 1219 | 39 | 0 | 843 | 7 | 0 | 889 | 0 | 353 | 31 | 0 | 0 | 384 | 2492 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 71.0 | 28.7 | 0.0 | 0.3 | - | - | 4.4 | 0.0 | 94.8 | 0.8 | - | - | 0.0 | 91.9 | 8.1 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 34.7 | 14.0 | 0.0 | 0.2 | - | 48.9 | 1.6 | 0.0 | 33.8 | 0.3 | - | 35.7 | 0.0 | 14.2 | 1.2 | 0.0 | - | 15.4 | - |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 0 | 0 | 0 | - | 0 | 251 | 135 | 0 | 2 | - | 388 | 18 | 0 | 243 | 1 | - | 262 | 0 | 134 | 21 | 0 | - | 155 | 805 |
| % Cars & Light Goods | - | - | - | - | - | - | 29.0 | 38.6 | - | 50.0 | - | 31.8 | 46.2 | - | 28.8 | 14.3 | - | 29.5 | - | 38.0 | 67.7 | - | - | 40.4 | 32.3 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 585 | 67 | 0 | 2 | - | 654 | 21 | 0 | 571 | 6 | - | 598 | 0 | 77 | 10 | 0 | - | 87 | 1339 |
| % Single-Unit Trucks | - | - | - | - | - | - | 67.6 | 19.1 | - | 50.0 | - | 53.7 | 53.8 | - | 67.7 | 85.7 | - | 67.3 | - | 21.8 | 32.3 | - | - | 22.7 | 53.7 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 29 | 148 | 0 | 0 | - | 177 | 0 | 0 | 29 | 0 | - | 29 | 0 | 142 | 0 | 0 | - | 142 | 348 |
| % Articulated Trucks | - | - | - | - | - | - | 3.4 | 42.3 | - | 0.0 | - | 14.5 | 0.0 | - | 3.4 | 0.0 | - | 3.3 | - | 40.2 | 0.0 | - | - | 37.0 | 14.0 |

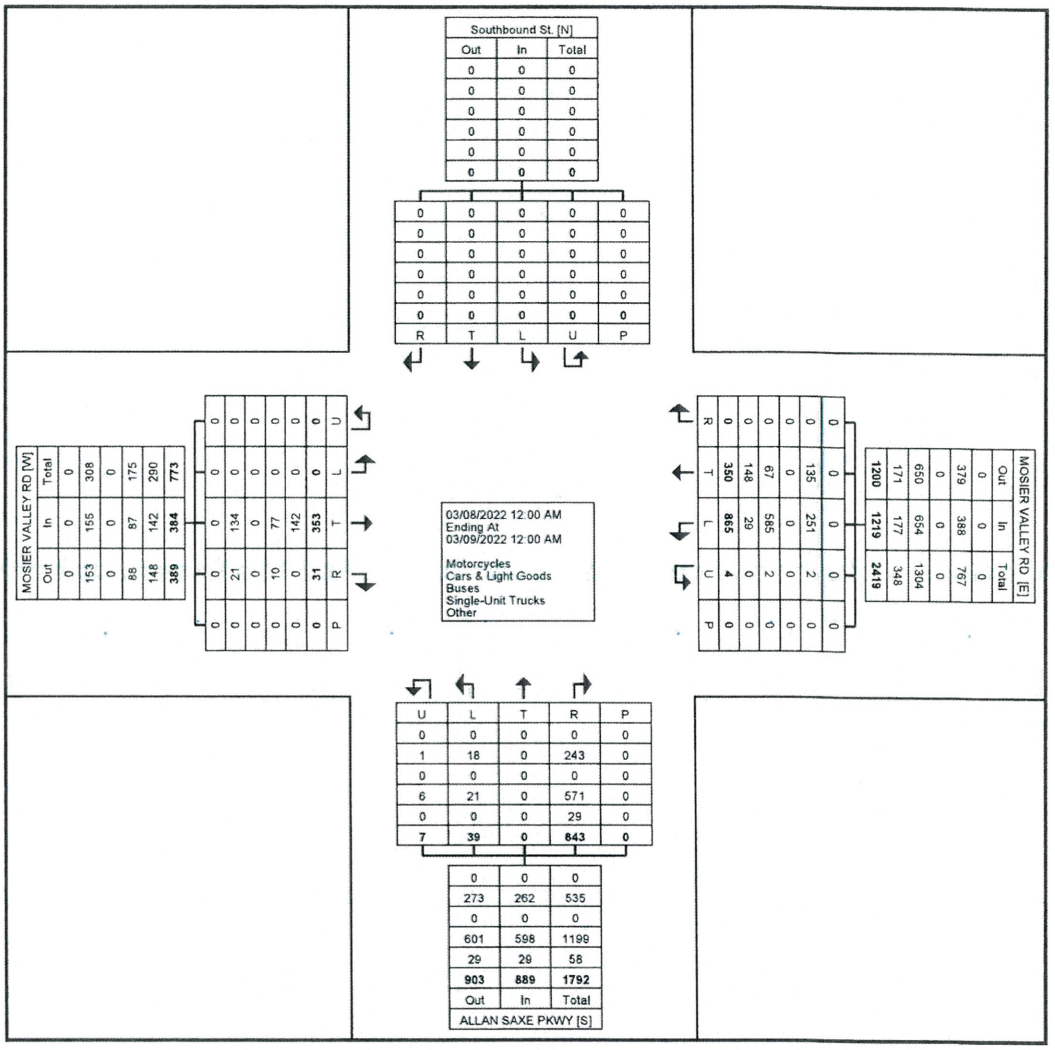
| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: MOSIER VALLEY RD @ ALLAN SAXE PKWY
Site Code:
Start Date: 03/08/2022
Page No: 4




Turning Movement Data Plot

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: MOSIER VALLEY RD @ ALLAN SAXE PKWY
Site Code:
Start Date: 03/08/2022


## Turning Movement Peak Hour Data (10:30 AM)

| Start Time | Southbound St. Southbound | | | | | | MOSIER VALLEY RD Westbound | | | | | | ALLAN SAXE PKWY Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 13 | 0 | 0 | 0 | 35 | 0 | 0 | 24 | 3 | 0 | 27 | 0 | 9 | 2 | 0 | 0 | 11 | 73 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 0 | 0 | 0 | 27 | 1 | 0 | 18 | 0 | 0 | 19 | 0 | 11 | 1 | 0 | 0 | 12 | 58 |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 2 | 0 | 0 | 0 | 26 | 1 | 0 | 16 | 1 | 0 | 18 | 0 | 9 | 0 | 0 | 0 | 9 | 53 |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 5 | 0 | 0 | 0 | 22 | 1 | 0 | 27 | 0 | 0 | 28 | 0 | 3 | 0 | 0 | 0 | 3 | 53 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 27 | 0 | 0 | 0 | 110 | 3 | 0 | 85 | 4 | 0 | 92 | 0 | 32 | 3 | 0 | 0 | 35 | 237 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 75.5 | 24.5 | 0.0 | 0.0 | - | - | 3.3 | 0.0 | 92.4 | 4.3 | - | - | 0.0 | 91.4 | 8.6 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 35.0 | 11.4 | 0.0 | 0.0 | - | 46.4 | 1.3 | 0.0 | 35.9 | 1.7 | - | 38.8 | 0.0 | 13.5 | 1.3 | 0.0 | - | 14.8 | - |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.865 | 0.519 | 0.000 | 0.000 | - | 0.786 | 0.750 | 0.000 | 0.787 | 0.333 | - | 0.821 | 0.000 | 0.727 | 0.375 | 0.000 | - | 0.729 | 0.812 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 0 | 0 | 0 | - | 0 | 23 | 3 | 0 | 0 | - | 26 | 2 | 0 | 22 | 0 | - | 24 | 0 | 3 | 2 | 0 | - | 5 | 55 |
| % Cars & Light Goods | - | - | - | - | - | - | 27.7 | 11.1 | - | - | - | 23.6 | 66.7 | - | 25.9 | 0.0 | - | 26.1 | - | 9.4 | 66.7 | - | - | 14.3 | 23.2 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 56 | 8 | 0 | 0 | - | 64 | 1 | 0 | 62 | 4 | - | 67 | 0 | 14 | 1 | 0 | - | 15 | 146 |
| % Single-Unit Trucks | - | - | - | - | - | - | 67.5 | 29.6 | - | - | - | 58.2 | 33.3 | - | 72.9 | 100.0 | - | 72.8 | - | 43.8 | 33.3 | - | - | 42.9 | 61.6 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 4 | 16 | 0 | 0 | - | 20 | 0 | 0 | 1 | 0 | - | 1 | 0 | 15 | 0 | 0 | - | 15 | 36 |
| % Articulated Trucks | - | - | - | - | - | - | 4.8 | 59.3 | - | - | - | 18.2 | 0.0 | - | 1.2 | 0.0 | - | 1.1 | - | 46.9 | 0.0 | - | - | 42.9 | 15.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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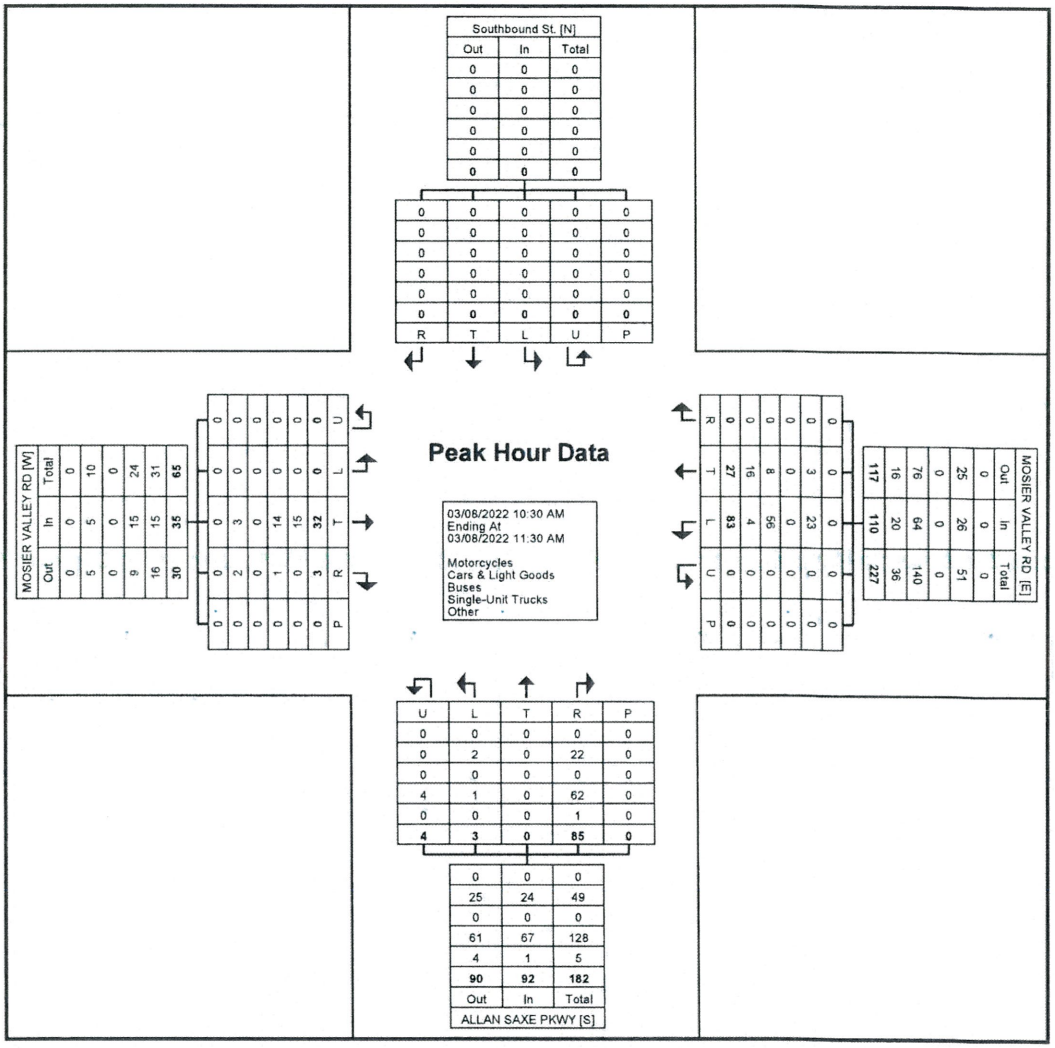
Count Name: MOSIER VALLEY RD @ ALLAN SAXE PKWY
Site Code:
Start Date: 03/08/2022
Page No: 6




Turning Movement Peak Hour Data Plot (10:30 AM)

# GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968


Count Name: MOSIER VALLEY RD @ ALLAN SAXE PKWY
Site Code:
Start Date: 03/08/2022
Page No: 7

## Turning Movement Peak Hour Data (12:30 PM)

| Start Time | Southbound St. Southbound | | | | | | MOSIER VALLEY RD Westbound | | | | | | ALLAN SAXE PKWY Northbound | | | | | | MOSIER VALLEY RD Eastbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 4 | 0 | 0 | 0 | 32 | 1 | 0 | 23 | 0 | 0 | 24 | 0 | 2 | 0 | 0 | 0 | 2 | 58 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 3 | 0 | 0 | 0 | 27 | 0 | 0 | 16 | 2 | 0 | 18 | 0 | 8 | 0 | 0 | 0 | 8 | 53 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 0 | 0 | 0 | 27 | 1 | 0 | 31 | 0 | 0 | 32 | 0 | 8 | 1 | 0 | 0 | 9 | 68 |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 10 | 0 | 0 | 0 | 33 | 2 | 0 | 25 | 0 | 0 | 27 | 0 | 5 | 1 | 0 | 0 | 6 | 66 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 24 | 0 | 0 | 0 | 119 | 4 | 0 | 95 | 2 | 0 | 101 | 0 | 23 | 2 | 0 | 0 | 25 | 245 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 79.8 | 20.2 | 0.0 | 0.0 | - | - | 4.0 | 0.0 | 94.1 | 2.0 | - | - | 0.0 | 92.0 | 8.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 38.8 | 9.8 | 0.0 | 0.0 | - | 48.6 | 1.6 | 0.0 | 38.8 | 0.8 | - | 41.2 | 0.0 | 9.4 | 0.8 | 0.0 | - | 10.2 | - |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.848 | 0.600 | 0.000 | 0.000 | - | 0.902 | 0.500 | 0.000 | 0.766 | 0.250 | - | 0.789 | 0.000 | 0.719 | 0.500 | 0.000 | - | 0.694 | 0.901 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 0 | 0 | 0 | - | 0 | 22 | 5 | 0 | 0 | - | 27 | 0 | 0 | 19 | 0 | - | 19 | 0 | 6 | 2 | 0 | - | 8 | 54 |
| % Cars & Light Goods | - | - | - | - | - | - | 23.2 | 20.8 | - | - | - | 22.7 | 0.0 | - | 20.0 | 0.0 | - | 18.8 | - | 26.1 | 100.0 | - | - | 32.0 | 22.0 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 70 | 6 | 0 | 0 | - | 76 | 4 | 0 | 72 | 2 | - | 78 | 0 | 4 | 0 | 0 | - | 4 | 158 |
| % Single-Unit Trucks | - | - | - | - | - | - | 73.7 | 25.0 | - | - | - | 63.9 | 100.0 | - | 75.8 | 100.0 | - | 77.2 | - | 17.4 | 0.0 | - | - | 16.0 | 64.5 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 3 | 13 | 0 | 0 | - | 16 | 0 | 0 | 4 | 0 | - | 4 | 0 | 13 | 0 | 0 | - | 13 | 33 |
| % Articulated Trucks | - | - | - | - | - | - | 3.2 | 54.2 | - | - | - | 13.4 | 0.0 | - | 4.2 | 0.0 | - | 4.0 | - | 56.5 | 0.0 | - | - | 52.0 | 13.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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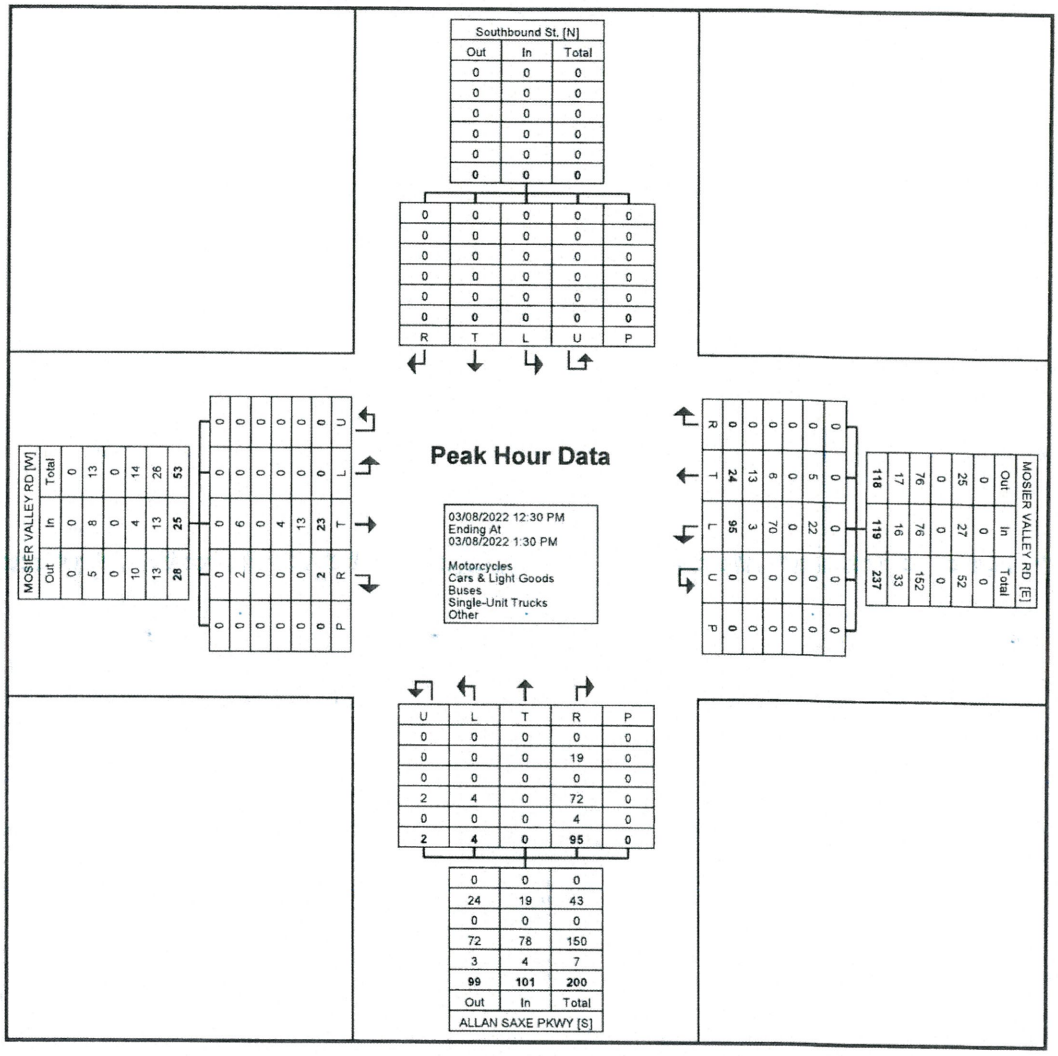


Turning Movement Peak Hour Data Plot (12:30 PM)

# Appendix B:
# Site Life Calculations

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT

## PART III – SITE DEVELOPMENT PLAN
## APPENDIX IIIM
## SITE LIFE CALCULATIONS

Prepared for

City of Arlington (Owner)
and
Republic Waste Services of Texas, Ltd. (Operator)

November 2021

DRAFT

Prepared by

**Weaver Consultants Group, LLC**
TPBE Registration No. F-3727
6420 Southwest Blvd., Suite 206
Fort Worth, TX 76109
817-735-9770

WCG Project No. 0023-404-11-96

This document is intended for permitting purposes only.

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| **1** | **SITE LIFE** | **IIIM-1** |
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| | 1.2 Population Equivalent | IIIM-2 |
| | 1.3 Landfill Capacity | IIIM-3 |
| | 1.4 Site Life Calculations | IIIM-3 |

# 1 SITE LIFE

## 1.1 Solid Waste Generation

The following estimate has been developed to provide an assessment of the solid waste generation rate for the City of Arlington Landfill. It is important to note that the included estimate is based on numerous assumptions and may vary as market conditions change.

Over the last few years the waste inflow rate at City of Arlington Landfill has varied from 3,184 tons per day to 3,488 tons per day as listed below.

| Fiscal Year | Actual Waste Inflow[1] | Typical Daily Waste Inflow Rate Based on a 286-Day Operating Schedule |
|---|---|---|
| 2017 | 997,520 tons per year | 3,488 tons per day |
| 2018 | 990,495 tons per year | 3,463 tons per day |
| 2019 | 910,524 tons per year | 3,184 tons per day |
| 2020 | 993,193 tons per year | 3,473 tons per day |

[1] Information obtained from the TCEQ MSW Annual Reports filed by the City of Arlington Landfill.

City of Arlington Landfill estimates that the waste inflow will increase to 1,043,900 tons per year (3,650 tons per day based on a 286-day operating schedule) in 2021. After 2021, the waste inflow rate is assumed to increase consistent with the projected growth rate for the facility's general service area which for this analysis is assumed to be Dallas, Denton, Johnson, and Tarrant counties.

Using this methodology, the expected maximum annual waste acceptance rate is 1,537,173 tons per year (5,375 tons per day based on a 286-day operating schedule). The above projections are based on current market conditions and may vary as market conditions change. Over the life of the facility, the expected average daily volume of incoming waste is projected to be approximately 4,541 tons per day (1,298,726 tons per year based on a 286-day operating schedule).

Site life calculations based on the City of Arlington Landfill projections are shown on pages IIIM-3 through IIIM-5.

## 1.2 Population Equivalent

Using the average waste inflow rate of 1,298,726 tons per year discussed in Section 1.1 (an average daily volume of 4,541 tons per day based on a 286-day operating schedule) and assuming 5 pounds of waste is generated per capita per day, the population equivalent is:

$$\frac{(1{,}298{,}726 \text{ tons/year}) \times (2{,}000 \text{ pounds/ton})}{(5 \text{ pounds/person/day}) \times (365 \text{ days/year})} = 1{,}423{,}261 \text{ persons}$$

## 1.3 Landfill Capacity

The estimated total capacity of waste (defined as waste and daily cover) ever on site over the active life of the facility is approximately 95.668 million cubic yards. The total volume available for solid waste and daily cover after November 16, 2020 (date of topographic information) is estimated to be 61,583,000 cubic yards. This airspace estimate includes the remaining available volume in the existing permitted area. The current volume of waste (defined as waste and daily cover) in-place as of November 16, 2020 is approximately 34.085 million cubic yards.

## 1.4 Site Life Calculations

The site life calculations are presented on pages IIIM-3 through IIIM-5. In summary, the site life is projected to be approximately 33.4 years, which would result in the site's closure during the year 2054.

Prep by: KRB
Date: 11/24/2021

CITY OF ARLINGTON LANDFILL
0023-404-11-96
APPENDIX IIIM
SITE LIFE CALCULATIONS

Chkd by: CRA
Date: 11/24/2021

**Required:** Determine approximate site life (years) for the site based on City of Arlington Landfill. waste inflow projections. The site will typically operate 286 days per year. The waste inflow rate is expected to increase to 3,650 tons per day in 2021.

**Solution:** Determine available landfill tonnage and initial annual waste inflow rate:

Remaining airspace (includes existing permitted site and expansion)= 61,583,000 cy (as of November 16, 2020)
Percent daily cover = 12 %
In-place density of waste/cover soils[1] = 1,700 lb/cy

[1] Refer to page IIIM-7 for additional information regarding the average in-place density of waste.

Estimate the total remaining airspace (tons).

-Estimate density of waste only

$(\gamma_{soil})(12\% \text{ of } 61{,}583{,}000 \text{ cy}) + (\gamma_{waste})(88\% \text{ of } 61{,}583{,}000 \text{ cy}) = (\gamma_{soil/waste})(61{,}583{,}000 \text{ cy})$

$(2{,}430 \text{ lb/cy})(7{,}389{,}960 \text{ cy}) + (\gamma_{waste})(54{,}193{,}040 \text{ cy}) = (1{,}700 \text{ lb/cy})(61{,}583{,}000 \text{ cy})$

$\gamma_{waste} =$ 1,600 lb/cy

Remaining permitted available airspace = (88% of 61,583,000 cy)*(1,600 lb/cy*1/2000 tons/lb)

Remaining permitted available airspace = 43,366,749 tons

| Total remaining capacity (includes existing permitted site and expansion) = | 43,366,749 tons |
|---|---|

Initial waste stream estimate = 3,650 tons/day
Days of operation per year = 286 days

| Initial waste inflow rate = | 1,043,900 tons/year |
|---|---|

Assumed growth rates (based on population growth rates):

| | | | |
|---|---|---|---|
| Growth rate (years 2021-2030)= | 14.30% | or annualized growth rate of: | 1.35% |
| Growth rate (years 2031-2040)= | 13.18% | or annualized growth rate of: | 1.25% |
| Growth rate (years 2041-2050)= | 10.29% | or annualized growth rate of: | 0.98% |
| Growth rate (years 2051-2060)= | 8.68% | or annualized growth rate of: | 0.84% |
| Growth rate (years 2061-close)= | 6.91% | or annualized growth rate of: | 0.67% |

The growth rate estimates were obtained from the Texas Water Development Board (County Population Projections from 2020-2070 from the 2021 Regional and 2022 State Water Plan). The initial waste stream estimate was provided by the landfill operator.

The following table calculates the waste stream growth (assuming the growth rates described above) and the projected cumulative airspace consumed.

Prep by: KRB
Date: 11/24/2021

CITY OF ARLINGTON LANDFILL
0023-404-11-96
APPENDIX IIIM
SITE LIFE CALCULATIONS

Chkd by: CRA
Date: 11/24/2021

| Year | Waste Inflow (tons/year) | Tonnage Consumed (tons) |
|---|---|---|
| 2020 | 1,043,900 | 128,700 |
| 2021 | 1,057,946 | 1,186,646 |
| 2022 | 1,072,181 | 2,258,826 |
| 2023 | 1,086,607 | 3,345,433 |
| 2024 | 1,101,227 | 4,446,660 |
| 2025 | 1,116,044 | 5,562,704 |
| 2026 | 1,131,061 | 6,693,765 |
| 2027 | 1,146,279 | 7,840,044 |
| 2028 | 1,161,703 | 9,001,747 |
| 2029 | 1,177,333 | 10,179,080 |
| 2030 | 1,193,174 | 11,372,255 |
| 2031 | 1,208,036 | 12,580,290 |
| 2032 | 1,223,082 | 13,803,373 |
| 2033 | 1,238,316 | 15,041,689 |
| 2034 | 1,253,740 | 16,295,429 |
| 2035 | 1,269,356 | 17,564,785 |
| 2036 | 1,285,166 | 18,849,951 |
| 2037 | 1,301,173 | 20,151,124 |
| 2038 | 1,317,380 | 21,468,504 |
| 2039 | 1,333,788 | 22,802,293 |
| 2040 | 1,350,401 | 24,152,694 |
| 2041 | 1,363,687 | 25,516,381 |
| 2042 | 1,377,104 | 26,893,485 |
| 2043 | 1,390,653 | 28,284,138 |
| 2044 | 1,404,335 | 29,688,472 |
| 2045 | 1,418,152 | 31,106,624 |
| 2046 | 1,432,104 | 32,538,728 |
| 2047 | 1,446,194 | 33,984,922 |
| 2048 | 1,460,423 | 35,445,345 |
| 2049 | 1,474,791 | 36,920,136 |
| 2050 | 1,489,301 | 38,409,437 |
| 2051 | 1,501,744 | 39,911,181 |
| 2052 | 1,514,291 | 41,425,472 |
| 2053 | 1,526,943 | 42,952,415 |
| 2054 | 414,334 | 43,366,749 |

16-Nov

45 days

98 days

| | | |
|---|---|---|
| Available tonnage is consumed during year | 2054 | |
| Site life is projected to be approximately | 33.4 | years |

| Initial inflow = | 3,650 tons/day |
|---|---|

Summary of waste tonnage information:

$$\text{Maximum inflow} = \frac{\text{Tonnage accepted during final year of operation (1,537,173 tons)}^{1}}{\text{286 days of operation per year}}$$

[1] 1,537,173 tons represents the calculated total tonnage for the final year of 2055, the year in which the maximum waste inflow occurs.

Projected maximum waste inflow rate:

| Maximum inflow = | 5,375 tons/day |
|---|---|

$$\text{Average inflow} = \frac{\text{Maximum waste accepted}}{\text{Site life}}$$

Projected average waste inflow rate:

$$\frac{43{,}366{,}749 \text{ tons}}{33.4 \text{ years} * 286 \text{ days/year}}$$

| Average inflow = | 4,541 tons/day |
|---|---|

# Appendix C:
# Capacity Analysis Results

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 278 | 622 | 95 | 170 | 189 | 200 | 111 | 1036 | 487 | 124 | 661 | 134 |
| Future Volume (veh/h) | 278 | 622 | 95 | 170 | 189 | 200 | 111 | 1036 | 487 | 124 | 661 | 134 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1826 | 1678 | 1767 | 1811 | 1707 | 1826 | 1781 | 1811 | 1752 | 1781 | 1841 |
| Adj Flow Rate, veh/h | 305 | 684 | 0 | 187 | 208 | 0 | 122 | 1138 | 0 | 136 | 726 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 5 | 15 | 9 | 6 | 13 | 5 | 8 | 6 | 10 | 8 | 4 |
| Cap, veh/h | 335 | 942 | | 271 | 289 | | 147 | 1250 | | 424 | 2074 | |
| Arrive On Green | 0.19 | 0.19 | 0.00 | 0.08 | 0.08 | 0.00 | 0.08 | 0.26 | 0.00 | 0.25 | 0.43 | 0.00 |
| Sat Flow, veh/h | 1781 | 5149 | 0 | 3264 | 3441 | 1447 | 1739 | 4863 | 1535 | 1668 | 4863 | 1560 |
| Grp Volume(v), veh/h | 305 | 684 | 0 | 187 | 208 | 0 | 122 | 1138 | 0 | 136 | 726 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1662 | 0 | 1632 | 1721 | 1447 | 1739 | 1621 | 1535 | 1668 | 1621 | 1560 |
| Q Serve(g_s), s | 20.1 | 15.5 | 0.0 | 6.7 | 7.1 | 0.0 | 8.3 | 27.2 | 0.0 | 7.9 | 12.1 | 0.0 |
| Cycle Q Clear(g_c), s | 20.1 | 15.5 | 0.0 | 6.7 | 7.1 | 0.0 | 8.3 | 27.2 | 0.0 | 7.9 | 12.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 335 | 942 | | 271 | 289 | | 147 | 1250 | | 424 | 2074 | |
| V/C Ratio(X) | 0.91 | 0.73 | | 0.69 | 0.72 | | 0.83 | 0.91 | | 0.32 | 0.35 | |
| Avail Cap(c_a), veh/h | 453 | 1267 | | 422 | 444 | | 210 | 1277 | | 424 | 2074 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.86 | 0.86 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 47.7 | 45.7 | 0.0 | 53.5 | 53.6 | 0.0 | 54.0 | 43.2 | 0.0 | 36.3 | 23.2 | 0.0 |
| Incr Delay (d2), s/veh | 17.3 | 1.4 | 0.0 | 2.3 | 3.3 | 0.0 | 12.8 | 10.1 | 0.0 | 0.3 | 0.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.3 | 6.4 | 0.0 | 2.8 | 3.1 | 0.0 | 4.0 | 11.6 | 0.0 | 3.2 | 4.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 65.1 | 47.1 | 0.0 | 55.8 | 56.9 | 0.0 | 66.8 | 53.4 | 0.0 | 36.6 | 23.7 | 0.0 |
| LnGrp LOS | E | D | | E | E | | E | D | | D | C | |
| Approach Vol, veh/h | | 989 | A | | 395 | A | | 1260 | A | | 862 | A |
| Approach Delay, s/veh | | 52.7 | | | 56.4 | | | 54.7 | | | 25.7 | |
| Approach LOS | | D | | | E | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 37.0 | 37.3 | 16.5 | 29.2 | 16.7 | 57.7 | 29.1 | 16.6 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 16.5 | 31.5 | 15.5 | 30.5 | 14.5 | 33.5 | 30.5 | 15.5 |
| Max Q Clear Time (g_c+I1), s | 9.9 | 29.2 | 8.7 | 17.5 | 10.3 | 14.1 | 22.1 | 9.1 |
| Green Ext Time (p_c), s | 0.1 | 1.6 | 0.2 | 3.6 | 0.1 | 5.1 | 0.4 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 47.2 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 9 | 0 | 59 | 1 | 1487 | 22 | 41 | 867 | 1 |
| Future Volume (veh/h) | 1 | 0 | 0 | 9 | 0 | 59 | 1 | 1487 | 22 | 41 | 867 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1085 | 1870 | 788 | 1870 | 1841 | 1292 | 1026 | 1796 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 10 | 0 | 68 | 1 | 1709 | 25 | 47 | 997 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 55 | 2 | 75 | 2 | 4 | 41 | 59 | 7 | 2 |
| Cap, veh/h | 137 | 0 | 0 | 42 | 5 | 86 | 385 | 3537 | 770 | 65 | 2783 | 3 |
| Arrive On Green | 0.06 | 0.00 | 0.00 | 0.06 | 0.00 | 0.06 | 0.22 | 0.70 | 0.70 | 0.09 | 0.73 | 0.73 |
| Sat Flow, veh/h | 1230 | 0 | 0 | 123 | 79 | 1374 | 1781 | 5025 | 1094 | 977 | 5059 | 5 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 78 | 0 | 0 | 1 | 1709 | 25 | 47 | 644 | 354 |
| Grp Sat Flow(s),veh/h/ln | 1230 | 0 | 0 | 1576 | 0 | 0 | 1781 | 1675 | 1094 | 977 | 1635 | 1795 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 0.1 | 18.3 | 0.8 | 5.6 | 8.6 | 8.6 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.1 | 18.3 | 0.8 | 5.6 | 8.6 | 8.6 |
| Prop In Lane | 1.00 | | 0.00 | 0.13 | | 0.87 | 1.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 137 | 0 | 0 | 133 | 0 | 0 | 385 | 3537 | 770 | 65 | 1798 | 987 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | 0.48 | 0.03 | 0.72 | 0.36 | 0.36 |
| Avail Cap(c_a), veh/h | 259 | 0 | 0 | 275 | 0 | 0 | 385 | 3537 | 770 | 151 | 1798 | 987 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.88 | 0.88 | 0.88 | 0.89 | 0.89 | 0.89 |
| Uniform Delay (d), s/veh | 52.7 | 0.0 | 0.0 | 55.4 | 0.0 | 0.0 | 36.9 | 8.0 | 5.4 | 53.6 | 8.4 | 8.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 0.0 | 0.4 | 0.1 | 17.3 | 0.5 | 0.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 | 0.0 | 5.4 | 0.2 | 1.6 | 2.6 | 2.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 52.8 | 0.0 | 0.0 | 61.1 | 0.0 | 0.0 | 36.9 | 8.4 | 5.5 | 70.9 | 8.9 | 9.3 |
| LnGrp LOS | D | A | A | E | A | A | D | A | A | E | A | A |
| Approach Vol, veh/h | | 1 | | | 78 | | | 1735 | | | 1045 | |
| Approach Delay, s/veh | | 52.8 | | | 61.1 | | | 8.4 | | | 11.8 | |
| Approach LOS | | D | | | E | | | A | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.5 | 91.5 | | 14.0 | 33.0 | 73.0 | | 14.0 | | | | |
| Change Period (Y+Rc), s | 6.5 | 7.0 | | 6.5 | 7.0 | * 7 | | 6.5 | | | | |
| Max Green Setting (Gmax), s | 8.5 | 63.0 | | 18.5 | 15.5 | * 66 | | 18.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.6 | 20.3 | | 2.1 | 2.1 | 10.6 | | 7.8 | | | | |
| Green Ext Time (p_c), s | 0.1 | 23.9 | | 0.0 | 0.0 | 10.9 | | 0.3 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 11.1 |
| HCM 6th LOS | B |

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 51 | 47 | 51 | 1418 | 0 | 898 | 53 |
| Future Volume (veh/h) | 51 | 47 | 51 | 1418 | 0 | 898 | 53 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1086 | 1188 | 1310 | 1863 | | 1827 | 1159 |
| Adj Flow Rate, veh/h | 58 | 0 | 58 | 1611 | | 1020 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | | 0.88 | 0.88 |
| Percent Heavy Veh, % | 75 | 60 | 45 | 2 | | 4 | 64 |
| Cap, veh/h | 72 | 70 | 266 | 3234 | | 2262 | 447 |
| Arrive On Green | 0.07 | 0.00 | 0.06 | 0.64 | | 0.45 | 0.00 |
| Sat Flow, veh/h | 1034 | 1009 | 1248 | 5253 | | 5152 | 985 |
| Grp Volume(v), veh/h | 58 | 0 | 58 | 1611 | | 1020 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1034 | 1009 | 1248 | 1695 | | 1663 | 985 |
| Q Serve(g_s), s | 2.4 | 0.0 | 0.7 | 7.4 | | 6.2 | 0.0 |
| Cycle Q Clear(g_c), s | 2.4 | 0.0 | 0.7 | 7.4 | | 6.2 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 72 | 70 | 266 | 3234 | | 2262 | 447 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.22 | 0.50 | | 0.45 | 0.00 |
| Avail Cap(c_a), veh/h | 469 | 458 | 477 | 3460 | | 3393 | 670 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.2 | 0.0 | 10.1 | 4.3 | | 8.3 | 0.0 |
| Incr Delay (d2), s/veh | 19.0 | 0.0 | 0.2 | 0.1 | | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 0.5 | 3.5 | | 2.9 | 0.0 |
| LnGrp Delay(d),s/veh | 39.3 | 0.0 | 10.3 | 4.4 | | 8.4 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 58 | | | 1669 | | 1020 | |
| Approach Delay, s/veh | 39.3 | | | 4.6 | | 8.4 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.5 | | 9.6 | 8.0 | 26.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 4.4 | 2.7 | 8.2 | | |
| Green Ext Time (p_c), s | | 10.9 | | 0.1 | 0.0 | 6.6 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.7 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 32 | 5 | 87 | 20 | 2 | 65 |
| Future Vol, veh/h | 32 | 5 | 87 | 20 | 2 | 65 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 72 | 20 | 57 | 45 | 100 | 66 |
| Mvmt Flow | 43 | 7 | 116 | 27 | 3 | 87 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 50 | 0 | 306 | 47 |
| Stage 1 | - | - | - | - | 47 | - |
| Stage 2 | - | - | - | - | 259 | - |
| Critical Hdwy | - | - | 4.67 | - | 7.4 | 6.86 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.713 | - | 4.4 | 3.894 |
| Pot Cap-1 Maneuver | - | - | 1267 | - | 523 | 867 |
| Stage 1 | - | - | - | - | 774 | - |
| Stage 2 | - | - | - | - | 602 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1267 | - | 474 | 867 |
| Mov Cap-2 Maneuver | - | - | - | - | 474 | - |
| Stage 1 | - | - | - | - | 774 | - |
| Stage 2 | - | - | - | - | 546 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.6 | 9.8 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 846 | - | - | 1267 | - |
| HCM Lane V/C Ratio | 0.106 | - | - | 0.092 | - |
| HCM Control Delay (s) | 9.8 | - | - | 8.1 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.4 | - | - | 0.3 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 3 | 1 | 0 | 142 | 0 | 151 | 16 | 47 | 1369 | 77 | 92 | 771 |
| Future Volume (veh/h) | 3 | 1 | 0 | 142 | 0 | 151 | 16 | 47 | 1369 | 77 | 92 | 771 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1826 | 1870 | 1841 | | 1870 | 1856 | 1796 | 1752 | 1811 |
| Adj Flow Rate, veh/h | 3 | 1 | 0 | 156 | 0 | 0 | | 52 | 1504 | 0 | 101 | 847 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 5 | 2 | 4 | | 2 | 3 | 7 | 10 | 6 |
| Cap, veh/h | 188 | 12 | 0 | 232 | 135 | | | 67 | 2715 | | 127 | 2859 |
| Arrive On Green | 0.00 | 0.01 | 0.00 | 0.07 | 0.00 | 0.00 | | 0.04 | 0.54 | 0.00 | 0.08 | 0.57 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3374 | 1870 | 0 | | 1781 | 5066 | 1522 | 1668 | 4976 |
| Grp Volume(v), veh/h | 3 | 1 | 0 | 156 | 0 | 0 | | 52 | 1504 | 0 | 101 | 561 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1687 | 1870 | 0 | | 1781 | 1689 | 1522 | 1668 | 1648 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | | 2.6 | 17.5 | 0.0 | 5.3 | 7.8 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | | 2.6 | 17.5 | 0.0 | 5.3 | 7.8 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 188 | 12 | 0 | 232 | 135 | | | 67 | 2715 | | 127 | 1894 |
| V/C Ratio(X) | 0.02 | 0.08 | 0.00 | 0.67 | 0.00 | | | 0.78 | 0.55 | | 0.79 | 0.30 |
| Avail Cap(c_a), veh/h | 679 | 522 | 0 | 942 | 522 | | | 497 | 3960 | | 466 | 2577 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.4 | 44.2 | 0.0 | 40.7 | 0.0 | 0.0 | | 42.7 | 13.7 | 0.0 | 40.7 | 9.8 |
| Incr Delay (d2), s/veh | 0.0 | 1.1 | 0.0 | 1.3 | 0.0 | 0.0 | | 7.1 | 0.4 | 0.0 | 4.2 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | | 1.2 | 5.6 | 0.0 | 2.2 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 38.4 | 45.3 | 0.0 | 42.0 | 0.0 | 0.0 | | 49.8 | 14.1 | 0.0 | 44.9 | 9.9 |
| LnGrp LOS | D | D | A | D | A | | | D | B | | D | A |
| Approach Vol, veh/h | | 4 | | | 156 | A | | | 1556 | A | | 967 |
| Approach Delay, s/veh | | 40.1 | | | 42.0 | | | | 15.3 | | | 13.6 |
| Approach LOS | | D | | | D | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 55.0 | 13.2 | 7.6 | 10.4 | 58.4 | 7.3 | 13.4 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 19.5 | 6.0 | 2.0 | 4.6 | 9.8 | 2.1 | 0.0 |
| Green Ext Time (p_c), s | 0.1 | 28.4 | 0.2 | 0.0 | 0.0 | 13.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 16.3 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 17 |
| Future Volume (veh/h) | 17 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 19 |
| Peak Hour Factor | 0.91 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 64 |
| Arrive On Green | 0.57 |
| Sat Flow, veh/h | 111 |
| Grp Volume(v), veh/h | 305 |
| Grp Sat Flow(s),veh/h/ln | 1791 |
| Q Serve(g_s), s | 7.8 |
| Cycle Q Clear(g_c), s | 7.8 |
| Prop In Lane | 0.06 |
| Lane Grp Cap(c), veh/h | 1029 |
| V/C Ratio(X) | 0.30 |
| Avail Cap(c_a), veh/h | 1400 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 9.8 |
| Incr Delay (d2), s/veh | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 10.1 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 20 | 32 | 172 | 17 | 169 | 29 | 1301 | 73 | 3 | 85 | 790 | 20 |
| Future Volume (veh/h) | 29 | 20 | 32 | 172 | 17 | 169 | 29 | 1301 | 73 | 3 | 85 | 790 | 20 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1826 | 1530 | 1870 | 1811 | 1870 | 1441 | 1841 | 1870 | | 1870 | 1811 | 1604 |
| Adj Flow Rate, veh/h | 32 | 22 | 0 | 187 | 18 | 0 | 32 | 1414 | 0 | | 92 | 859 | 22 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 14 | 5 | 25 | 2 | 6 | 2 | 31 | 4 | 2 | | 2 | 6 | 20 |
| Cap, veh/h | 38 | 98 | | 221 | 279 | | 35 | 2411 | | | 118 | 2505 | 64 |
| Arrive On Green | 0.02 | 0.05 | 0.00 | 0.12 | 0.15 | 0.00 | 0.03 | 0.48 | 0.00 | | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 5025 | 1585 | | 1781 | 4957 | 127 |
| Grp Volume(v), veh/h | 32 | 22 | 0 | 187 | 18 | 0 | 32 | 1414 | 0 | | 92 | 571 | 310 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 1675 | 1585 | | 1781 | 1648 | 1788 |
| Q Serve(g_s), s | 2.0 | 1.1 | 0.0 | 10.2 | 0.8 | 0.0 | 2.3 | 20.3 | 0.0 | | 5.1 | 10.3 | 10.3 |
| Cycle Q Clear(g_c), s | 2.0 | 1.1 | 0.0 | 10.2 | 0.8 | 0.0 | 2.3 | 20.3 | 0.0 | | 5.1 | 10.3 | 10.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 38 | 98 | | 221 | 279 | | 35 | 2411 | | | 118 | 1666 | 904 |
| V/C Ratio(X) | 0.84 | 0.22 | | 0.85 | 0.06 | | 0.91 | 0.59 | | | 0.78 | 0.34 | 0.34 |
| Avail Cap(c_a), veh/h | 259 | 294 | | 394 | 291 | | 483 | 3535 | | | 537 | 2319 | 1258 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.4 | 45.1 | 0.0 | 42.7 | 36.0 | 0.0 | 48.4 | 18.7 | 0.0 | | 45.7 | 14.7 | 14.7 |
| Incr Delay (d2), s/veh | 16.4 | 0.4 | 0.0 | 3.5 | 0.0 | 0.0 | 25.5 | 0.5 | 0.0 | | 4.2 | 0.3 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.5 | 0.0 | 4.7 | 0.4 | 0.0 | 1.0 | 7.1 | 0.0 | | 2.3 | 3.5 | 3.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 64.7 | 45.5 | 0.0 | 46.1 | 36.0 | 0.0 | 73.9 | 19.2 | 0.0 | | 49.9 | 15.0 | 15.2 |
| LnGrp LOS | E | D | | D | D | | E | B | | | D | B | B |
| Approach Vol, veh/h | | 54 | A | | 205 | A | | 1446 | A | | | 973 | |
| Approach Delay, s/veh | | 56.9 | | | 45.2 | | | 20.4 | | | | 18.4 | |
| Approach LOS | | E | | | D | | | C | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.1 | 54.7 | 19.3 | 12.3 | 10.5 | 57.3 | 9.3 | 22.3 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.6 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 17.1 | 22.3 | 12.2 | 3.1 | 4.3 | 12.3 | 4.0 | 2.8 |
| Green Ext Time (p_c), s | 0.1 | 25.5 | 0.2 | 0.0 | 0.0 | 13.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 22.3 |
| HCM 6th LOS | C |

**Notes**

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 6 | 1 | 104 | 0 | 40 | 0 | 1389 | 61 | 21 | 973 | 0 |
| Future Volume (veh/h) | 0 | 6 | 1 | 104 | 0 | 40 | 0 | 1389 | 61 | 21 | 973 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1796 | 0 | 1841 | 1826 | 1826 | 1811 | 1870 |
| Adj Flow Rate, veh/h | 0 | 7 | 1 | 113 | 0 | 0 | 0 | 1510 | 0 | 23 | 1058 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 7 | 0 | 4 | 5 | 5 | 6 | 2 |
| Cap, veh/h | 390 | 25 | 4 | 334 | 385 | | 0 | 2493 | | 53 | 3067 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.10 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 | 0.03 | 0.62 | 0.00 |
| Sat Flow, veh/h | 1781 | 1601 | 229 | 3456 | 1870 | 1522 | 0 | 5191 | 1547 | 1739 | 4944 | 1585 |
| Grp Volume(v), veh/h | 0 | 0 | 8 | 113 | 0 | 0 | 0 | 1510 | 0 | 23 | 1058 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1829 | 1728 | 1870 | 1522 | 0 | 1675 | 1547 | 1739 | 1648 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.3 | 2.3 | 0.0 | 0.0 | 0.0 | 16.2 | 0.0 | 1.0 | 7.7 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.3 | 2.3 | 0.0 | 0.0 | 0.0 | 16.2 | 0.0 | 1.0 | 7.7 | 0.0 |
| Prop In Lane | 1.00 | | 0.13 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 390 | 0 | 28 | 334 | 385 | | 0 | 2493 | | 53 | 3067 | |
| V/C Ratio(X) | 0.00 | 0.00 | 0.28 | 0.34 | 0.00 | | 0.00 | 0.61 | | 0.43 | 0.34 | |
| Avail Cap(c_a), veh/h | 722 | 0 | 563 | 1156 | 500 | | 0 | 3025 | | 372 | 3067 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.4 | 31.5 | 0.0 | 0.0 | 0.0 | 13.6 | 0.0 | 35.6 | 6.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 2.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 2.1 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.2 | 0.9 | 0.0 | 0.0 | 0.0 | 4.9 | 0.0 | 0.4 | 1.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 38.4 | 31.7 | 0.0 | 0.0 | 0.0 | 14.1 | 0.0 | 37.7 | 7.0 | 0.0 |
| LnGrp LOS | A | A | D | C | A | | A | B | | D | A | |
| Approach Vol, veh/h | | 8 | | | 113 | A | | 1510 | A | | 1081 | A |
| Approach Delay, s/veh | | 38.4 | | | 31.7 | | | 14.1 | | | 7.7 | |
| Approach LOS | | D | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.3 | 43.6 | 14.2 | 7.7 | | 52.9 | 0.0 | 21.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 13.0 | 18.2 | 4.3 | 2.3 | | 9.7 | 0.0 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 18.9 | 0.2 | 0.0 | | 15.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 12.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 566 | 786 | 132 | 72 | 253 | 202 | 70 | 666 | 112 | 176 | 541 | 332 |
| Future Volume (veh/h) | 566 | 786 | 132 | 72 | 253 | 202 | 70 | 666 | 112 | 176 | 541 | 332 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1856 | 1811 | 1856 | 1796 | 1870 | 1870 | 1781 | 1856 |
| Adj Flow Rate, veh/h | 596 | 827 | 0 | 76 | 266 | 0 | 74 | 701 | 0 | 185 | 569 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 7 | 2 | 2 | 8 | 3 |
| Cap, veh/h | 667 | 1190 | | 133 | 397 | | 561 | 2147 | | 242 | 659 | |
| Arrive On Green | 0.19 | 0.23 | 0.00 | 0.04 | 0.08 | 0.00 | 0.32 | 0.44 | 0.00 | 0.07 | 0.19 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | 3456 | 5066 | 1535 | 1767 | 4904 | 1585 | 3456 | 3385 | 1572 |
| Grp Volume(v), veh/h | 596 | 827 | 0 | 76 | 266 | 0 | 74 | 701 | 0 | 185 | 569 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | 1728 | 1689 | 1535 | 1767 | 1635 | 1585 | 1728 | 1692 | 1572 |
| Q Serve(g_s), s | 20.2 | 17.8 | 0.0 | 2.6 | 6.1 | 0.0 | 3.6 | 11.3 | 0.0 | 6.3 | 19.5 | 0.0 |
| Cycle Q Clear(g_c), s | 20.2 | 17.8 | 0.0 | 2.6 | 6.1 | 0.0 | 3.6 | 11.3 | 0.0 | 6.3 | 19.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 667 | 1190 | | 133 | 397 | | 561 | 2147 | | 242 | 659 | |
| V/C Ratio(X) | 0.89 | 0.70 | | 0.57 | 0.67 | | 0.13 | 0.33 | | 0.76 | 0.86 | |
| Avail Cap(c_a), veh/h | 994 | 1808 | | 331 | 823 | | 561 | 2147 | | 346 | 917 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 47.2 | 42.1 | 0.0 | 56.7 | 53.8 | 0.0 | 29.2 | 22.1 | 0.0 | 54.8 | 46.8 | 0.0 |
| Incr Delay (d2), s/veh | 5.4 | 0.3 | 0.0 | 1.5 | 0.7 | 0.0 | 0.0 | 0.4 | 0.0 | 3.4 | 14.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.9 | 7.3 | 0.0 | 1.1 | 2.6 | 0.0 | 1.5 | 4.2 | 0.0 | 2.8 | 9.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 52.6 | 42.4 | 0.0 | 58.2 | 54.5 | 0.0 | 29.2 | 22.5 | 0.0 | 58.2 | 60.9 | 0.0 |
| LnGrp LOS | D | D | | E | D | | C | C | | E | E | |
| Approach Vol, veh/h | | 1423 | A | | 342 | A | | 775 | A | | 754 | A |
| Approach Delay, s/veh | | 46.7 | | | 55.3 | | | 23.2 | | | 60.2 | |
| Approach LOS | | D | | | E | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.4 | 59.0 | 11.1 | 34.5 | 44.6 | 29.8 | 29.7 | 15.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 12.6 | 27.5 | 11.5 | 42.5 | 7.5 | 32.5 | 34.5 | 19.5 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 13.3 | 4.6 | 19.8 | 5.6 | 21.5 | 22.2 | 8.1 |
| Green Ext Time (p_c), s | 0.1 | 1.4 | 0.0 | 3.5 | 0.0 | 1.7 | 1.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 45.2 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 87 | 146 | 49 | 142 | 152 | 123 | 59 | 585 | 148 | 95 | 547 | 83 |
| Future Volume (veh/h) | 87 | 146 | 49 | 142 | 152 | 123 | 59 | 585 | 148 | 95 | 547 | 83 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1752 | 1811 | 1678 | 1826 | 1737 | 1426 | 1693 | 1737 | 1767 | 1648 | 1722 |
| Adj Flow Rate, veh/h | 92 | 154 | 0 | 149 | 160 | 0 | 62 | 616 | 0 | 100 | 576 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 14 | 10 | 6 | 15 | 5 | 11 | 32 | 14 | 11 | 9 | 17 | 12 |
| Cap, veh/h | 185 | 605 | | 454 | 549 | | 85 | 1096 | | 132 | 1137 | |
| Arrive On Green | 0.11 | 0.13 | 0.00 | 0.15 | 0.16 | 0.00 | 0.06 | 0.24 | 0.00 | 0.08 | 0.25 | 0.00 |
| Sat Flow, veh/h | 1612 | 4940 | 0 | 3100 | 3469 | 1472 | 1358 | 4621 | 1472 | 1682 | 4499 | 1459 |
| Grp Volume(v), veh/h | 92 | 154 | 0 | 149 | 160 | 0 | 62 | 616 | 0 | 100 | 576 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1594 | 0 | 1550 | 1735 | 1472 | 1358 | 1540 | 1472 | 1682 | 1500 | 1459 |
| Q Serve(g_s), s | 3.4 | 1.8 | 0.0 | 2.7 | 2.6 | 0.0 | 2.8 | 7.4 | 0.0 | 3.7 | 6.9 | 0.0 |
| Cycle Q Clear(g_c), s | 3.4 | 1.8 | 0.0 | 2.7 | 2.6 | 0.0 | 2.8 | 7.4 | 0.0 | 3.7 | 6.9 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 185 | 605 | | 454 | 549 | | 85 | 1096 | | 132 | 1137 | |
| V/C Ratio(X) | 0.50 | 0.25 | | 0.33 | 0.29 | | 0.73 | 0.56 | | 0.76 | 0.51 | |
| Avail Cap(c_a), veh/h | 765 | 2269 | | 1961 | 2195 | | 430 | 3289 | | 532 | 2135 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 26.3 | 24.9 | 0.0 | 24.2 | 23.5 | 0.0 | 29.1 | 21.2 | 0.0 | 28.5 | 20.2 | 0.0 |
| Incr Delay (d2), s/veh | 1.5 | 0.2 | 0.0 | 0.3 | 0.3 | 0.0 | 8.3 | 0.5 | 0.0 | 6.4 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.6 | 0.0 | 0.9 | 1.0 | 0.0 | 1.0 | 2.3 | 0.0 | 1.6 | 2.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 27.8 | 25.1 | 0.0 | 24.5 | 23.8 | 0.0 | 37.4 | 21.8 | 0.0 | 35.0 | 20.7 | 0.0 |
| LnGrp LOS | C | C | | C | C | | D | C | | C | C | |
| Approach Vol, veh/h | | 246 | A | | 309 | A | | 678 | A | | 676 | A |
| Approach Delay, s/veh | | 26.1 | | | 24.1 | | | 23.2 | | | 22.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.5 | 21.5 | 15.8 | 14.5 | 10.5 | 22.5 | 13.8 | 16.5 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 20.0 | 45.0 | 40.0 | 30.0 | 20.0 | 30.0 | 30.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 9.4 | 4.7 | 3.8 | 4.8 | 8.9 | 5.4 | 4.6 |
| Green Ext Time (p_c), s | 0.1 | 5.0 | 0.4 | 0.9 | 0.1 | 4.1 | 0.2 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 23.6 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 24 | 0 | 60 | 1 | 750 | 30 | 6 | 65 | 654 | 0 |
| Future Volume (veh/h) | 1 | 0 | 0 | 24 | 0 | 60 | 1 | 750 | 30 | 6 | 65 | 654 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1218 | 1870 | 833 | 1870 | 1737 | 863 | | 892 | 1737 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 26 | 0 | 66 | 1 | 824 | 33 | | 71 | 719 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 46 | 2 | 72 | 2 | 11 | 70 | | 68 | 11 | 2 |
| Cap, veh/h | 177 | 0 | 0 | 73 | 9 | 88 | 186 | 2906 | 448 | | 89 | 2906 | 0 |
| Arrive On Green | 0.08 | 0.00 | 0.00 | 0.08 | 0.00 | 0.08 | 0.10 | 0.61 | 0.61 | | 0.10 | 0.61 | 0.00 |
| Sat Flow, veh/h | 1317 | 0 | 0 | 329 | 112 | 1121 | 1781 | 4742 | 731 | | 850 | 4898 | 0 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 92 | 0 | 0 | 1 | 824 | 33 | | 71 | 719 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1317 | 0 | 0 | 1563 | 0 | 0 | 1781 | 1581 | 731 | | 850 | 1581 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 8.0 | 1.8 | | 8.0 | 6.8 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 5.6 | 0.0 | 0.0 | 0.0 | 8.0 | 1.8 | | 8.0 | 6.8 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 0.28 | | 0.72 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 177 | 0 | 0 | 170 | 0 | 0 | 186 | 2906 | 448 | | 89 | 2906 | 0 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.01 | 0.28 | 0.07 | | 0.80 | 0.25 | 0.00 |
| Avail Cap(c_a), veh/h | 618 | 0 | 0 | 676 | 0 | 0 | 546 | 2906 | 448 | | 260 | 2906 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 41.6 | 0.0 | 0.0 | 44.1 | 0.0 | 0.0 | 39.3 | 8.9 | 7.7 | | 42.8 | 8.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 0.2 | 0.3 | | 20.4 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 2.3 | 0.3 | | 2.1 | 2.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 41.6 | 0.0 | 0.0 | 47.9 | 0.0 | 0.0 | 39.3 | 9.1 | 8.0 | | 63.2 | 8.8 | 0.0 |
| LnGrp LOS | D | A | A | D | A | A | D | A | A | | E | A | A |
| Approach Vol, veh/h | | 1 | | | 92 | | | 858 | | | | 790 | |
| Approach Delay, s/veh | | 41.6 | | | 47.9 | | | 9.1 | | | | 13.7 | |
| Approach LOS | | D | | | D | | | A | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.7 | 67.0 | 14.2 | 16.7 | 67.0 | 14.2 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 6.5 | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 30.0 | 60.0 | 40.0 | 30.0 | 60.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 10.0 | 2.1 | 2.0 | 8.8 | 7.6 |
| Green Ext Time (p_c), s | 0.2 | 9.2 | 0.0 | 0.0 | 7.5 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 13.3 |
| HCM 6th LOS | B |

Notes

User approved ignoring U-Turning movement.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 66 | 51 | 50 | 701 | 2 | 616 | 68 |
| Future Volume (veh/h) | 66 | 51 | 50 | 701 | 2 | 616 | 68 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1056 | 1080 | 1145 | 1776 | | 1827 | 1027 |
| Adj Flow Rate, veh/h | 71 | 0 | 54 | 754 | | 662 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | | 0.93 | 0.93 |
| Percent Heavy Veh, % | 80 | 76 | 66 | 7 | | 4 | 85 |
| Cap, veh/h | 79 | 72 | 258 | 3047 | | 2245 | 393 |
| Arrive On Green | 0.08 | 0.00 | 0.05 | 0.63 | | 0.45 | 0.00 |
| Sat Flow, veh/h | 1005 | 918 | 1090 | 5007 | | 5152 | 873 |
| Grp Volume(v), veh/h | 71 | 0 | 54 | 754 | | 662 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1005 | 918 | 1090 | 1616 | | 1663 | 873 |
| Q Serve(g_s), s | 3.1 | 0.0 | 0.7 | 3.0 | | 3.7 | 0.0 |
| Cycle Q Clear(g_c), s | 3.1 | 0.0 | 0.7 | 3.0 | | 3.7 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 79 | 72 | 258 | 3047 | | 2245 | 393 |
| V/C Ratio(X) | 0.90 | 0.00 | 0.21 | 0.25 | | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 452 | 413 | 444 | 3273 | | 3367 | 589 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.3 | 0.0 | 10.0 | 3.6 | | 7.7 | 0.0 |
| Incr Delay (d2), s/veh | 26.9 | 0.0 | 0.1 | 0.0 | | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 0.4 | 1.3 | | 1.7 | 0.0 |
| LnGrp Delay(d),s/veh | 47.2 | 0.0 | 10.1 | 3.7 | | 7.8 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 71 | | | 808 | | 662 | |
| Approach Delay, s/veh | 47.2 | | | 4.1 | | 7.8 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.4 | | 10.0 | 7.9 | 26.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 5.0 | | 5.1 | 2.7 | 5.7 | | |
| Green Ext Time (p_c), s | | 4.8 | | 0.1 | 0.0 | 4.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.7 |
| HCM 2010 LOS | A |

Notes

| Intersection | | | | | | |
|---|---|---|---|---|---|---|
| Int Delay, s/veh | 7.3 | | | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 23 | 2 | 95 | 24 | 4 | 95 |
| Future Vol, veh/h | 23 | 2 | 95 | 24 | 4 | 95 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 74 | 2 | 77 | 79 | 100 | 80 |
| Mvmt Flow | 26 | 2 | 106 | 27 | 4 | 106 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 28 | 0 | 266 | 27 |
| Stage 1 | - | - | - | - | 27 | - |
| Stage 2 | - | - | - | - | 239 | - |
| Critical Hdwy | - | - | 4.87 | - | 7.4 | 7 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.893 | - | 4.4 | 4.02 |
| Pot Cap-1 Maneuver | - | - | 1212 | - | 555 | 863 |
| Stage 1 | - | - | - | - | 793 | - |
| Stage 2 | - | - | - | - | 617 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1212 | - | 506 | 863 |
| Mov Cap-2 Maneuver | - | - | - | - | 506 | - |
| Stage 1 | - | - | - | - | 793 | - |
| Stage 2 | - | - | - | - | 562 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.6 | 9.9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 839 | - | - | 1212 | - |
| HCM Lane V/C Ratio | 0.131 | - | - | 0.087 | - |
| HCM Control Delay (s) | 9.9 | - | - | 8.3 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.5 | - | - | 0.3 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 0 | 2 | 97 | 6 | 60 | 8 | 18 | 704 | 83 | 53 | 608 |
| Future Volume (veh/h) | 9 | 0 | 2 | 97 | 6 | 60 | 8 | 18 | 704 | 83 | 53 | 608 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1841 | 1870 | 1856 | | 1870 | 1737 | 1841 | 1811 | 1752 |
| Adj Flow Rate, veh/h | 10 | 0 | 2 | 103 | 6 | 0 | | 19 | 749 | 0 | 56 | 647 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 4 | 2 | 3 | | 2 | 11 | 4 | 6 | 10 |
| Cap, veh/h | 267 | 0 | 66 | 194 | 165 | | | 33 | 1705 | | 72 | 1874 |
| Arrive On Green | 0.01 | 0.00 | 0.04 | 0.06 | 0.09 | 0.00 | | 0.02 | 0.36 | 0.00 | 0.04 | 0.38 |
| Sat Flow, veh/h | 1781 | 0 | 1585 | 3401 | 1870 | 0 | | 1781 | 4742 | 1560 | 1725 | 4895 |
| Grp Volume(v), veh/h | 10 | 0 | 2 | 103 | 6 | 0 | | 19 | 749 | 0 | 56 | 421 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | 1700 | 1870 | 0 | | 1781 | 1581 | 1560 | 1725 | 1594 |
| Q Serve(g_s), s | 0.3 | 0.0 | 0.1 | 1.6 | 0.2 | 0.0 | | 0.6 | 6.7 | 0.0 | 1.8 | 5.3 |
| Cycle Q Clear(g_c), s | 0.3 | 0.0 | 0.1 | 1.6 | 0.2 | 0.0 | | 0.6 | 6.7 | 0.0 | 1.8 | 5.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 267 | 0 | 66 | 194 | 165 | | | 33 | 1705 | | 72 | 1221 |
| V/C Ratio(X) | 0.04 | 0.00 | 0.03 | 0.53 | 0.04 | | | 0.58 | 0.44 | | 0.78 | 0.35 |
| Avail Cap(c_a), veh/h | 1045 | 0 | 708 | 1520 | 836 | | | 796 | 5933 | | 771 | 3989 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.9 | 0.0 | 25.7 | 25.7 | 23.3 | 0.0 | | 27.3 | 13.6 | 0.0 | 26.6 | 12.3 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.1 | 0.8 | 0.0 | 0.0 | | 6.0 | 0.4 | 0.0 | 6.7 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 0.6 | 0.1 | 0.0 | | 0.3 | 1.9 | 0.0 | 0.8 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 22.9 | 0.0 | 25.8 | 26.5 | 23.4 | 0.0 | | 33.3 | 14.0 | 0.0 | 33.3 | 12.6 |
| LnGrp LOS | C | A | C | C | C | | | C | B | | C | B |
| Approach Vol, veh/h | | 12 | | | 109 | A | | | 768 | A | | 708 |
| Approach Delay, s/veh | | 23.4 | | | 26.3 | | | | 14.5 | | | 14.4 |
| Approach LOS | | C | | | C | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.3 | 27.1 | 10.2 | 9.3 | 8.0 | 28.4 | 7.6 | 11.9 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 8.7 | 3.6 | 2.1 | 2.6 | 7.3 | 2.3 | 2.2 |
| Green Ext Time (p_c), s | 0.0 | 11.4 | 0.2 | 0.0 | 0.0 | 8.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 5 |
| Future Volume (veh/h) | 5 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 5 |
| Peak Hour Factor | 0.94 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 14 |
| Arrive On Green | 0.38 |
| Sat Flow, veh/h | 38 |
| Grp Volume(v), veh/h | 231 |
| Grp Sat Flow(s),veh/h/ln | 1745 |
| Q Serve(g_s), s | 5.3 |
| Cycle Q Clear(g_c), s | 5.3 |
| Prop In Lane | 0.02 |
| Lane Grp Cap(c), veh/h | 668 |
| V/C Ratio(X) | 0.35 |
| Avail Cap(c_a), veh/h | 2183 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 12.3 |
| Incr Delay (d2), s/veh | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 12.9 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 15 | 40 | 76 | 21 | 48 | 3 | 43 | 710 | 69 | 10 | 33 | 650 | 17 |
| Future Volume (veh/h) | 42 | 15 | 40 | 76 | 21 | 48 | 3 | 43 | 710 | 69 | 10 | 33 | 650 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1589 | 1796 | 1337 | 1856 | 1870 | 1841 | | 1352 | 1752 | 1870 | | 1811 | 1781 | 1470 |
| Adj Flow Rate, veh/h | 44 | 16 | 0 | 79 | 22 | 0 | | 45 | 740 | 0 | | 34 | 677 | 18 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 21 | 7 | 38 | 3 | 2 | 4 | | 37 | 10 | 2 | | 6 | 8 | 29 |
| Cap, veh/h | 53 | 135 | | 102 | 183 | | | 47 | 1779 | | | 50 | 1652 | 44 |
| Arrive On Green | 0.03 | 0.08 | 0.00 | 0.06 | 0.10 | 0.00 | | 0.04 | 0.37 | 0.00 | | 0.03 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 4782 | 1585 | | 1725 | 4871 | 129 |
| Grp Volume(v), veh/h | 44 | 16 | 0 | 79 | 22 | 0 | | 45 | 740 | 0 | | 34 | 450 | 245 |
| Grp Sat Flow(s),veh/h/ln | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 1594 | 1585 | | 1725 | 1621 | 1758 |
| Q Serve(g_s), s | 1.7 | 0.5 | 0.0 | 2.6 | 0.6 | 0.0 | | 2.1 | 6.8 | 0.0 | | 1.2 | 6.3 | 6.3 |
| Cycle Q Clear(g_c), s | 1.7 | 0.5 | 0.0 | 2.6 | 0.6 | 0.0 | | 2.1 | 6.8 | 0.0 | | 1.2 | 6.3 | 6.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 53 | 135 | | 102 | 183 | | | 47 | 1779 | | | 50 | 1100 | 596 |
| V/C Ratio(X) | 0.83 | 0.12 | | 0.78 | 0.12 | | | 0.96 | 0.42 | | | 0.68 | 0.41 | 0.41 |
| Avail Cap(c_a), veh/h | 411 | 487 | | 659 | 507 | | | 764 | 5677 | | | 878 | 3849 | 2087 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.3 | 25.4 | 0.0 | 27.4 | 24.3 | 0.0 | | 28.4 | 13.8 | 0.0 | | 28.4 | 15.0 | 15.0 |
| Incr Delay (d2), s/veh | 11.9 | 0.1 | 0.0 | 4.7 | 0.1 | 0.0 | | 29.3 | 0.3 | 0.0 | | 5.9 | 0.5 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.2 | 0.0 | 1.2 | 0.3 | 0.0 | | 0.9 | 2.0 | 0.0 | | 0.5 | 1.9 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 40.2 | 25.6 | 0.0 | 32.1 | 24.4 | 0.0 | | 57.6 | 14.1 | 0.0 | | 34.3 | 15.5 | 15.9 |
| LnGrp LOS | D | C | | C | C | | | E | B | | | C | B | B |
| Approach Vol, veh/h | | 60 | A | | 101 | A | | | 785 | A | | | 729 | |
| Approach Delay, s/veh | | 36.3 | | | 30.4 | | | | 16.6 | | | | 16.5 | |
| Approach LOS | | D | | | C | | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 28.9 | 10.4 | 11.4 | 10.1 | 27.0 | 9.1 | 12.8 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 13.2 | 8.8 | 4.6 | 2.5 | 4.1 | 8.3 | 3.7 | 2.6 |
| Green Ext Time (p_c), s | 0.0 | 11.2 | 0.1 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 18.1 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 16 | 0 | 812 | 70 | 11 | 741 | 6 |
| Future Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 16 | 0 | 812 | 70 | 11 | 741 | 6 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1811 | 1870 | 1707 | 0 | 1752 | 1856 | 1767 | 1752 | 1870 |
| Adj Flow Rate, veh/h | 2 | 1 | 9 | 39 | 1 | 0 | 0 | 873 | 0 | 12 | 797 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 6 | 2 | 13 | 0 | 10 | 3 | 9 | 10 | 2 |
| Cap, veh/h | 254 | 3 | 29 | 219 | 153 | | 0 | 1902 | | 31 | 2608 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.07 | 0.08 | 0.00 | 0.00 | 0.40 | 0.00 | 0.02 | 0.55 | 0.00 |
| Sat Flow, veh/h | 1781 | 161 | 1449 | 3346 | 1870 | 1447 | 0 | 4940 | 1572 | 1682 | 4782 | 1585 |
| Grp Volume(v), veh/h | 2 | 0 | 10 | 39 | 1 | 0 | 0 | 873 | 0 | 12 | 797 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1610 | 1673 | 1870 | 1447 | 0 | 1594 | 1572 | 1682 | 1594 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 7.3 | 0.0 | 0.4 | 4.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 7.3 | 0.0 | 0.4 | 4.9 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 254 | 0 | 32 | 219 | 153 | | 0 | 1902 | | 31 | 2608 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.32 | 0.18 | 0.01 | | 0.00 | 0.46 | | 0.39 | 0.31 | |
| Avail Cap(c_a), veh/h | 709 | 0 | 684 | 1545 | 691 | | 0 | 3976 | | 497 | 3976 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 22.7 | 0.0 | 26.2 | 23.9 | 22.8 | 0.0 | 0.0 | 12.0 | 0.0 | 26.3 | 6.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 2.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 3.0 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 1.9 | 0.0 | 0.2 | 1.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 22.7 | 0.0 | 28.3 | 24.1 | 22.8 | 0.0 | 0.0 | 12.4 | 0.0 | 29.2 | 6.9 | 0.0 |
| LnGrp LOS | C | A | C | C | C | | A | B | | C | A | |
| Approach Vol, veh/h | | 12 | | | 40 | A | | 873 | A | | 809 | A |
| Approach Delay, s/veh | | 27.3 | | | 24.0 | | | 12.4 | | | 7.2 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.0 | 28.0 | 10.5 | 7.6 | | 36.0 | 7.2 | 10.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 9.3 | 2.6 | 2.3 | | 6.9 | 2.1 | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 12.2 | 0.0 | 0.0 | | 11.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 10.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 231 | 208 | 123 | 142 | 192 | 150 | 93 | 514 | 169 | 109 | 451 | 216 |
| Future Volume (veh/h) | 231 | 208 | 123 | 142 | 192 | 150 | 93 | 514 | 169 | 109 | 451 | 216 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1811 | 1870 | 1870 | 1870 | 1826 | 1767 | 1870 | 1737 | 1870 | 1767 | 1752 | 1841 |
| Adj Flow Rate, veh/h | 248 | 224 | 0 | 153 | 206 | 0 | 100 | 553 | 0 | 117 | 485 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 6 | 2 | 2 | 2 | 5 | 9 | 2 | 11 | 2 | 9 | 10 | 4 |
| Cap, veh/h | 303 | 364 | | 307 | 347 | | 124 | 2692 | | 167 | 1843 | |
| Arrive On Green | 0.09 | 0.07 | 0.00 | 0.09 | 0.07 | 0.00 | 0.07 | 0.57 | 0.00 | 0.05 | 0.55 | 0.00 |
| Sat Flow, veh/h | 3346 | 5106 | 1585 | 3456 | 4985 | 1497 | 1781 | 4742 | 1585 | 3264 | 3328 | 1560 |
| Grp Volume(v), veh/h | 248 | 224 | 0 | 153 | 206 | 0 | 100 | 553 | 0 | 117 | 485 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1702 | 1585 | 1728 | 1662 | 1497 | 1781 | 1581 | 1585 | 1632 | 1664 | 1560 |
| Q Serve(g_s), s | 8.7 | 5.1 | 0.0 | 5.1 | 4.8 | 0.0 | 6.6 | 6.8 | 0.0 | 4.2 | 9.1 | 0.0 |
| Cycle Q Clear(g_c), s | 8.7 | 5.1 | 0.0 | 5.1 | 4.8 | 0.0 | 6.6 | 6.8 | 0.0 | 4.2 | 9.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 303 | 364 | | 307 | 347 | | 124 | 2692 | | 167 | 1843 | |
| V/C Ratio(X) | 0.82 | 0.62 | | 0.50 | 0.59 | | 0.81 | 0.21 | | 0.70 | 0.26 | |
| Avail Cap(c_a), veh/h | 376 | 1340 | | 389 | 1308 | | 141 | 2692 | | 245 | 1843 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 53.6 | 54.1 | 0.0 | 52.1 | 54.2 | 0.0 | 55.0 | 12.7 | 0.0 | 56.0 | 14.0 | 0.0 |
| Incr Delay (d2), s/veh | 9.0 | 0.6 | 0.0 | 0.5 | 0.6 | 0.0 | 22.5 | 0.2 | 0.0 | 2.0 | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.0 | 2.2 | 0.0 | 2.2 | 2.0 | 0.0 | 3.7 | 2.3 | 0.0 | 1.7 | 3.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.6 | 54.8 | 0.0 | 52.6 | 54.8 | 0.0 | 77.6 | 12.9 | 0.0 | 58.0 | 14.3 | 0.0 |
| LnGrp LOS | E | D | | D | D | | E | B | | E | B | |
| Approach Vol, veh/h | | 472 | A | | 359 | A | | 653 | A | | 602 | A |
| Approach Delay, s/veh | | 58.9 | | | 53.8 | | | 22.8 | | | 22.8 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.1 | 74.6 | 17.2 | 15.0 | 14.8 | 72.9 | 17.4 | 14.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 9.0 | 39.5 | 13.5 | 31.5 | 9.5 | 39.5 | 13.5 | 31.5 |
| Max Q Clear Time (g_c+I1), s | 10.2 | 8.8 | 7.1 | 7.1 | 8.6 | 11.1 | 10.7 | 6.8 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.1 | 0.8 | 0.0 | 1.8 | 0.1 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 36.3 |
| HCM 6th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 133 | 218 | 162 | 891 | 689 | 219 | 106 | 901 | 234 | 143 | 1141 | 211 |
| Future Volume (veh/h) | 133 | 218 | 162 | 891 | 689 | 219 | 106 | 901 | 234 | 143 | 1141 | 211 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1841 | 1767 | 1870 | 1870 | 1856 | 1767 | 1870 | 1796 | 1841 | 1870 | 1826 |
| Adj Flow Rate, veh/h | 143 | 234 | 0 | 958 | 741 | 0 | 114 | 969 | 0 | 154 | 1227 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 4 | 9 | 2 | 2 | 3 | 9 | 2 | 7 | 4 | 2 | 5 |
| Cap, veh/h | 158 | 323 | | 1005 | 948 | | 294 | 1095 | | 404 | 1378 | |
| Arrive On Green | 0.09 | 0.06 | 0.00 | 0.29 | 0.27 | 0.00 | 0.35 | 0.43 | 0.00 | 0.23 | 0.27 | 0.00 |
| Sat Flow, veh/h | 1781 | 5191 | 0 | 3456 | 3554 | 1572 | 1682 | 5106 | 1522 | 1753 | 5106 | 1547 |
| Grp Volume(v), veh/h | 143 | 234 | 0 | 958 | 741 | 0 | 114 | 969 | 0 | 154 | 1227 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1675 | 0 | 1728 | 1777 | 1572 | 1682 | 1702 | 1522 | 1753 | 1702 | 1547 |
| Q Serve(g_s), s | 10.3 | 5.9 | 0.0 | 35.4 | 25.1 | 0.0 | 6.6 | 22.7 | 0.0 | 9.6 | 30.0 | 0.0 |
| Cycle Q Clear(g_c), s | 10.3 | 5.9 | 0.0 | 35.4 | 25.1 | 0.0 | 6.6 | 22.7 | 0.0 | 9.6 | 30.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 158 | 323 | | 1005 | 948 | | 294 | 1095 | | 404 | 1378 | |
| V/C Ratio(X) | 0.91 | 0.72 | | 0.95 | 0.78 | | 0.39 | 0.89 | | 0.38 | 0.89 | |
| Avail Cap(c_a), veh/h | 158 | 445 | | 1023 | 1052 | | 294 | 1198 | | 404 | 1434 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.91 | 0.91 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 58.7 | 59.7 | 0.0 | 45.2 | 44.2 | 0.0 | 37.0 | 35.7 | 0.0 | 42.2 | 45.6 | 0.0 |
| Incr Delay (d2), s/veh | 45.3 | 3.7 | 0.0 | 17.7 | 3.5 | 0.0 | 0.6 | 9.7 | 0.0 | 0.4 | 9.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.6 | 2.6 | 0.0 | 17.2 | 11.3 | 0.0 | 2.5 | 7.8 | 0.0 | 4.1 | 13.3 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 104.0 | 63.4 | 0.0 | 62.9 | 47.7 | 0.0 | 37.6 | 45.3 | 0.0 | 42.6 | 54.6 | 0.0 |
| LnGrp LOS | F | E | | E | D | | D | D | | D | D | |
| Approach Vol, veh/h | | 377 | A | | 1699 | A | | 1083 | A | | 1381 | A |
| Approach Delay, s/veh | | 78.8 | | | 56.3 | | | 44.5 | | | 53.3 | |
| Approach LOS | | E | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 36.5 | 34.4 | 44.3 | 14.9 | 29.3 | 41.6 | 18.0 | 41.2 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 23.5 | 30.5 | 38.5 | 11.5 | 17.5 | 36.5 | 11.5 | 38.5 |
| Max Q Clear Time (g_c+I1), s | 11.6 | 24.7 | 37.4 | 7.9 | 8.6 | 32.0 | 12.3 | 27.1 |
| Green Ext Time (p_c), s | 0.2 | 3.2 | 0.4 | 0.4 | 0.1 | 3.1 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 54.4 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 56 | 0 | 51 | 0 | 1168 | 22 | 2 | 29 | 2227 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 56 | 0 | 51 | 0 | 1168 | 22 | 2 | 29 | 2227 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1633 | 1870 | 1381 | 1870 | 1870 | 1426 | | 1233 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 60 | 0 | 54 | 0 | 1243 | 23 | | 31 | 2369 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 18 | 2 | 35 | 2 | 2 | 32 | | 45 | 2 | 2 |
| Cap, veh/h | 0 | 170 | 0 | 108 | 6 | 65 | 1 | 2592 | 613 | | 286 | 4112 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.09 | 0.00 | 0.51 | 0.51 | | 0.49 | 1.00 | 0.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 723 | 70 | 714 | 1781 | 5106 | 1207 | | 1174 | 5274 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 114 | 0 | 0 | 0 | 1243 | 23 | | 31 | 2369 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1508 | 0 | 0 | 1781 | 1702 | 1207 | | 1174 | 1702 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 8.7 | 0.0 | 0.0 | 0.0 | 20.6 | 1.2 | | 1.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 9.6 | 0.0 | 0.0 | 0.0 | 20.6 | 1.2 | | 1.9 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 0.53 | | 0.47 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 170 | 0 | 179 | 0 | 0 | 1 | 2592 | 613 | | 286 | 4112 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.64 | 0.00 | 0.00 | 0.00 | 0.48 | 0.04 | | 0.11 | 0.58 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 266 | 0 | 256 | 0 | 0 | 226 | 2592 | 613 | | 286 | 4112 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.96 | 0.96 | | 0.40 | 0.40 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 58.1 | 0.0 | 0.0 | 0.0 | 20.8 | 16.1 | | 25.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 5.3 | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 | | 0.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | 0.0 | 7.8 | 0.3 | | 0.5 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 0.0 | 63.3 | 0.0 | 0.0 | 0.0 | 21.4 | 16.2 | | 25.7 | 0.2 | 0.0 |
| LnGrp LOS | A | A | A | E | A | A | A | C | B | | C | A | A |
| Approach Vol, veh/h | | 0 | | | 114 | | | 1266 | | | | 2400 | |
| Approach Delay, s/veh | | 0.0 | | | 63.3 | | | 21.3 | | | | 0.6 | |
| Approach LOS | | | | | E | | | C | | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 38.7 | 73.0 | | 18.3 | 0.0 | 111.7 | | 18.3 |
| Change Period (Y+Rc), s | 7.0 | * 7 | | 6.5 | 6.5 | 7.0 | | 6.5 |
| Max Green Setting (Gmax), s | 25.5 | * 66 | | 18.5 | 16.5 | 75.0 | | 18.5 |
| Max Q Clear Time (g_c+I1), s | 13.9 | 22.6 | | 0.0 | 0.0 | 2.0 | | 11.6 |
| Green Ext Time (p_c), s | 0.1 | 15.4 | | 0.0 | 0.0 | 51.9 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 9.4 |
| HCM 6th LOS | A |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 12 | 48 | 22 | 1156 | 0 | 2301 | 9 |
| Future Volume (veh/h) | 12 | 48 | 22 | 1156 | 0 | 2301 | 9 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1203 | 1319 | 1267 | 1863 | | 1863 | 1067 |
| Adj Flow Rate, veh/h | 12 | 0 | 23 | 1204 | | 2397 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 |
| Percent Heavy Veh, % | 58 | 44 | 50 | 2 | | 2 | 78 |
| Cap, veh/h | 21 | 21 | 183 | 3659 | | 2955 | 527 |
| Arrive On Green | 0.02 | 0.00 | 0.03 | 0.72 | | 0.58 | 0.00 |
| Sat Flow, veh/h | 1145 | 1122 | 1206 | 5253 | | 5253 | 907 |
| Grp Volume(v), veh/h | 12 | 0 | 23 | 1204 | | 2397 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1145 | 1122 | 1206 | 1695 | | 1695 | 907 |
| Q Serve(g_s), s | 0.5 | 0.0 | 0.2 | 4.3 | | 18.5 | 0.0 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.2 | 4.3 | | 18.5 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 21 | 21 | 183 | 3659 | | 2955 | 527 |
| V/C Ratio(X) | 0.57 | 0.00 | 0.13 | 0.33 | | 0.81 | 0.00 |
| Avail Cap(c_a), veh/h | 462 | 452 | 393 | 3659 | | 3076 | 549 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 24.1 | 0.0 | 14.2 | 2.6 | | 8.2 | 0.0 |
| Incr Delay (d2), s/veh | 21.8 | 0.0 | 0.1 | 0.1 | | 1.7 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.2 | 2.0 | | 8.9 | 0.0 |
| LnGrp Delay(d),s/veh | 46.0 | 0.0 | 14.3 | 2.6 | | 9.9 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 12 | | | 1227 | | 2397 | |
| Approach Delay, s/veh | 46.0 | | | 2.8 | | 9.9 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 42.2 | | 7.4 | 6.9 | 35.3 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.3 | | 2.5 | 2.2 | 20.5 | | |
| Green Ext Time (p_c), s | | 8.3 | | 0.0 | 0.0 | 8.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.6 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 23 | 2 | 14 | 17 | 3 | 28 |
| Future Vol, veh/h | 23 | 2 | 14 | 17 | 3 | 28 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 22 | 50 | 86 | 35 | 33 | 68 |
| Mvmt Flow | 29 | 3 | 18 | 22 | 4 | 36 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 32 | 0 | 89 | 31 |
| Stage 1 | - | - | - | - | 31 | - |
| Stage 2 | - | - | - | - | 58 | - |
| Critical Hdwy | - | - | 4.96 | - | 6.73 | 6.88 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.73 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.73 | - |
| Follow-up Hdwy | - | - | 2.974 | - | 3.797 | 3.912 |
| Pot Cap-1 Maneuver | - | - | 1174 | - | 841 | 882 |
| Stage 1 | - | - | - | - | 917 | - |
| Stage 2 | - | - | - | - | 891 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1174 | - | 828 | 882 |
| Mov Cap-2 Maneuver | - | - | - | - | 828 | - |
| Stage 1 | - | - | - | - | 917 | - |
| Stage 2 | - | - | - | - | 877 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 3.7 | 9.3 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 876 | - | - | 1174 | - |
| HCM Lane V/C Ratio | 0.045 | - | - | 0.015 | - |
| HCM Control Delay (s) | 9.3 | - | - | 8.1 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 4 | 4 | 103 | 2 | 108 | 10 | 3 | 1111 | 126 | 107 | 2167 |
| Future Volume (veh/h) | 20 | 4 | 4 | 103 | 2 | 108 | 10 | 3 | 1111 | 126 | 107 | 2167 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 | | 1870 | 1856 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 21 | 4 | 4 | 107 | 2 | 0 | | 3 | 1157 | 0 | 111 | 2257 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 3 | | 2 | 3 | 2 | 2 | 3 |
| Cap, veh/h | 194 | 29 | 29 | 169 | 123 | | | 6 | 2854 | | 140 | 3336 |
| Arrive On Green | 0.02 | 0.03 | 0.03 | 0.05 | 0.07 | 0.00 | | 0.00 | 0.56 | 0.00 | 0.08 | 0.64 |
| Sat Flow, veh/h | 1781 | 853 | 853 | 3456 | 1870 | 0 | | 1781 | 5066 | 1585 | 1781 | 5224 |
| Grp Volume(v), veh/h | 21 | 0 | 8 | 107 | 2 | 0 | | 3 | 1157 | 0 | 111 | 1459 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1706 | 1728 | 1870 | 0 | | 1781 | 1689 | 1585 | 1781 | 1689 |
| Q Serve(g_s), s | 1.1 | 0.0 | 0.5 | 3.1 | 0.1 | 0.0 | | 0.2 | 13.2 | 0.0 | 6.2 | 28.0 |
| Cycle Q Clear(g_c), s | 1.1 | 0.0 | 0.5 | 3.1 | 0.1 | 0.0 | | 0.2 | 13.2 | 0.0 | 6.2 | 28.0 |
| Prop In Lane | 1.00 | | 0.50 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 194 | 0 | 59 | 169 | 123 | | | 6 | 2854 | | 140 | 2156 |
| V/C Ratio(X) | 0.11 | 0.00 | 0.14 | 0.63 | 0.02 | | | 0.53 | 0.41 | | 0.80 | 0.68 |
| Avail Cap(c_a), veh/h | 600 | 0 | 419 | 848 | 459 | | | 437 | 3480 | | 437 | 2320 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.3 | 0.0 | 47.7 | 47.5 | 44.5 | 0.0 | | 50.7 | 12.6 | 0.0 | 46.1 | 11.7 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.4 | 1.4 | 0.0 | 0.0 | | 25.3 | 0.2 | 0.0 | 3.9 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.2 | 1.4 | 0.0 | 0.0 | | 0.1 | 4.3 | 0.0 | 2.8 | 8.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 43.4 | 0.0 | 48.1 | 49.0 | 44.5 | 0.0 | | 76.0 | 12.8 | 0.0 | 50.0 | 12.8 |
| LnGrp LOS | D | A | D | D | D | | | E | B | | D | B |
| Approach Vol, veh/h | | 29 | | | 109 | A | | | 1160 | A | | 2371 |
| Approach Delay, s/veh | | 44.7 | | | 48.9 | | | | 12.9 | | | 14.8 |
| Approach LOS | | D | | | D | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 64.4 | 12.0 | 10.5 | 7.3 | 72.1 | 8.8 | 13.7 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 15.2 | 5.1 | 2.5 | 2.2 | 30.0 | 3.1 | 2.1 |
| Green Ext Time (p_c), s | 0.1 | 20.4 | 0.2 | 0.0 | 0.0 | 35.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.5 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 3 |
| Future Volume (veh/h) | 3 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 3 |
| Peak Hour Factor | 0.96 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 4 |
| Arrive On Green | 0.64 |
| Sat Flow, veh/h | 7 |
| Grp Volume(v), veh/h | 801 |
| Grp Sat Flow(s),veh/h/ln | 1854 |
| Q Serve(g_s), s | 28.0 |
| Cycle Q Clear(g_c), s | 28.0 |
| Prop In Lane | 0.00 |
| Lane Grp Cap(c), veh/h | 1184 |
| V/C Ratio(X) | 0.68 |
| Avail Cap(c_a), veh/h | 1274 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 11.7 |
| Incr Delay (d2), s/veh | 1.9 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.7 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 13.6 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 46 | 21 | 83 | 106 | 14 | 81 | 4 | 28 | 1207 | 150 | 7 | 93 | 2158 | 23 |
| Future Volume (veh/h) | 46 | 21 | 83 | 106 | 14 | 81 | 4 | 28 | 1207 | 150 | 7 | 93 | 2158 | 23 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1737 | 1870 | 1811 | 1870 | 1796 | 1870 | | 1796 | 1870 | 1870 | | 1870 | 1856 | 1841 |
| Adj Flow Rate, veh/h | 52 | 24 | 0 | 119 | 16 | 0 | | 31 | 1356 | 0 | | 104 | 2425 | 26 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 11 | 2 | 6 | 2 | 7 | 2 | | 7 | 2 | 2 | | 2 | 3 | 4 |
| Cap, veh/h | 65 | 92 | | 146 | 165 | | | 38 | 2842 | | | 130 | 3070 | 33 |
| Arrive On Green | 0.04 | 0.05 | 0.00 | 0.08 | 0.09 | 0.00 | | 0.02 | 0.56 | 0.00 | | 0.07 | 0.59 | 0.59 |
| Sat Flow, veh/h | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 5106 | 1585 | | 1781 | 5167 | 55 |
| Grp Volume(v), veh/h | 52 | 24 | 0 | 119 | 16 | 0 | | 31 | 1356 | 0 | | 104 | 1583 | 868 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 1702 | 1585 | | 1781 | 1689 | 1846 |
| Q Serve(g_s), s | 3.6 | 1.4 | 0.0 | 7.6 | 0.9 | 0.0 | | 2.1 | 18.5 | 0.0 | | 6.6 | 41.2 | 41.4 |
| Cycle Q Clear(g_c), s | 3.6 | 1.4 | 0.0 | 7.6 | 0.9 | 0.0 | | 2.1 | 18.5 | 0.0 | | 6.6 | 41.2 | 41.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 65 | 92 | | 146 | 165 | | | 38 | 2842 | | | 130 | 2007 | 1097 |
| V/C Ratio(X) | 0.79 | 0.26 | | 0.81 | 0.10 | | | 0.81 | 0.48 | | | 0.80 | 0.79 | 0.79 |
| Avail Cap(c_a), veh/h | 230 | 260 | | 340 | 250 | | | 520 | 3105 | | | 464 | 2053 | 1122 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.8 | 52.7 | 0.0 | 52.0 | 47.9 | 0.0 | | 56.0 | 15.4 | 0.0 | | 52.5 | 17.9 | 17.9 |
| Incr Delay (d2), s/veh | 7.9 | 0.5 | 0.0 | 4.1 | 0.1 | 0.0 | | 13.7 | 0.3 | 0.0 | | 4.2 | 2.5 | 4.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.7 | 0.0 | 3.5 | 0.4 | 0.0 | | 1.0 | 6.5 | 0.0 | | 3.0 | 14.4 | 16.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.7 | 53.2 | 0.0 | 56.1 | 48.0 | 0.0 | | 69.8 | 15.7 | 0.0 | | 56.8 | 20.3 | 22.4 |
| LnGrp LOS | E | D | | E | D | | | E | B | | | E | C | C |
| Approach Vol, veh/h | | 76 | A | | 135 | A | | | 1387 | A | | | 2555 | |
| Approach Delay, s/veh | | 59.7 | | | 55.1 | | | | 16.9 | | | | 22.5 | |
| Approach LOS | | E | | | E | | | | B | | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.9 | 71.1 | 16.5 | 12.7 | 10.6 | 75.4 | 11.6 | 17.6 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 18.6 | 20.5 | 9.6 | 3.4 | 4.1 | 43.4 | 5.6 | 2.9 |
| Green Ext Time (p_c), s | 0.1 | 24.5 | 0.1 | 0.0 | 0.0 | 25.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 22.4 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 18 | 102 | 0 | 22 | 0 | 1213 | 120 | 2 | 29 | 2302 | 16 |
| Future Volume (veh/h) | 2 | 2 | 18 | 102 | 0 | 22 | 0 | 1213 | 120 | 2 | 29 | 2302 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1767 | 0 | 1870 | 1870 | | 1870 | 1856 | 1870 |
| Adj Flow Rate, veh/h | 2 | 2 | 19 | 107 | 0 | 0 | 0 | 1277 | 0 | | 31 | 2423 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 9 | 0 | 2 | 2 | | 2 | 3 | 2 |
| Cap, veh/h | 282 | 5 | 49 | 332 | 236 | | 0 | 2386 | | | 68 | 3040 | |
| Arrive On Green | 0.00 | 0.03 | 0.03 | 0.10 | 0.00 | 0.00 | 0.00 | 0.47 | 0.00 | | 0.04 | 0.60 | 0.00 |
| Sat Flow, veh/h | 1781 | 153 | 1450 | 3456 | 1870 | 1497 | 0 | 5274 | 1585 | | 1781 | 5066 | 1585 |
| Grp Volume(v), veh/h | 2 | 0 | 21 | 107 | 0 | 0 | 0 | 1277 | 0 | | 31 | 2423 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1603 | 1728 | 1870 | 1497 | 0 | 1702 | 1585 | | 1781 | 1689 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.9 | 2.1 | 0.0 | 0.0 | 0.0 | 13.1 | 0.0 | | 1.3 | 27.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.9 | 2.1 | 0.0 | 0.0 | 0.0 | 13.1 | 0.0 | | 1.3 | 27.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 282 | 0 | 54 | 332 | 236 | | 0 | 2386 | | | 68 | 3040 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.39 | 0.32 | 0.00 | | 0.00 | 0.54 | | | 0.46 | 0.80 | |
| Avail Cap(c_a), veh/h | 614 | 0 | 498 | 1168 | 506 | | 0 | 3106 | | | 385 | 3081 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.1 | 0.0 | 35.0 | 31.2 | 0.0 | 0.0 | 0.0 | 14.0 | 0.0 | | 34.8 | 11.3 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | | 1.8 | 1.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.4 | 0.9 | 0.0 | 0.0 | 0.0 | 4.2 | 0.0 | | 0.5 | 7.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 28.1 | 0.0 | 36.7 | 31.4 | 0.0 | 0.0 | 0.0 | 14.4 | 0.0 | | 36.6 | 13.1 | 0.0 |
| LnGrp LOS | C | A | D | C | A | | A | B | | | D | B | |
| Approach Vol, veh/h | | 23 | | | 107 | A | | 1277 | A | | | 2454 | A |
| Approach Delay, s/veh | | 36.0 | | | 31.4 | | | 14.4 | | | | 13.4 | |
| Approach LOS | | D | | | C | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.8 | 41.1 | 14.1 | 9.0 | | 50.9 | 7.2 | 15.8 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 15.1 | 4.1 | 2.9 | | 29.1 | 2.1 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 17.3 | 0.2 | 0.0 | | 15.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.4 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 404 | 518 | 151 | 2 | 176 | 761 | 285 | 182 | 697 | 187 | 355 | 1097 | 987 |
| Future Volume (veh/h) | 404 | 518 | 151 | 2 | 176 | 761 | 285 | 182 | 697 | 187 | 355 | 1097 | 987 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1870 |
| Adj Flow Rate, veh/h | 430 | 551 | 0 | | 187 | 810 | 0 | 194 | 741 | 0 | 378 | 1167 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 |
| Cap, veh/h | 443 | 1234 | | | 232 | 923 | | 161 | 843 | | 1246 | 1521 | |
| Arrive On Green | 0.13 | 0.24 | 0.00 | | 0.07 | 0.18 | 0.00 | 0.09 | 0.17 | 0.00 | 0.36 | 0.43 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | | 3456 | 5106 | 1585 | 1781 | 5106 | 1585 | 3456 | 3497 | 1585 |
| Grp Volume(v), veh/h | 430 | 551 | 0 | | 187 | 810 | 0 | 194 | 741 | 0 | 378 | 1167 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | | 1728 | 1702 | 1585 | 1781 | 1702 | 1585 | 1728 | 1749 | 1585 |
| Q Serve(g_s), s | 19.8 | 14.7 | 0.0 | | 8.5 | 24.7 | 0.0 | 14.5 | 22.7 | 0.0 | 12.6 | 45.3 | 0.0 |
| Cycle Q Clear(g_c), s | 19.8 | 14.7 | 0.0 | | 8.5 | 24.7 | 0.0 | 14.5 | 22.7 | 0.0 | 12.6 | 45.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 443 | 1234 | | | 232 | 923 | | 161 | 843 | | 1246 | 1521 | |
| V/C Ratio(X) | 0.97 | 0.45 | | | 0.81 | 0.88 | | 1.20 | 0.88 | | 0.30 | 0.77 | |
| Avail Cap(c_a), veh/h | 443 | 1234 | | | 443 | 1069 | | 161 | 1292 | | 1246 | 1521 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 69.5 | 51.6 | 0.0 | | 73.6 | 63.8 | 0.0 | 72.8 | 65.2 | 0.0 | 36.7 | 38.3 | 0.0 |
| Incr Delay (d2), s/veh | 35.0 | 0.1 | 0.0 | | 2.5 | 6.9 | 0.0 | 135.3 | 12.6 | 0.0 | 0.1 | 3.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.8 | 6.2 | 0.0 | | 3.8 | 11.1 | 0.0 | 12.6 | 10.6 | 0.0 | 5.2 | 19.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 104.5 | 51.7 | 0.0 | | 76.1 | 70.7 | 0.0 | 208.1 | 77.9 | 0.0 | 36.8 | 42.1 | 0.0 |
| LnGrp LOS | F | D | | | E | E | | F | E | | D | D | |
| Approach Vol, veh/h | | 981 | A | | | 997 | A | | 935 | A | | 1545 | A |
| Approach Delay, s/veh | | 74.8 | | | | 71.7 | | | 104.9 | | | 40.8 | |
| Approach LOS | | E | | | | E | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 64.7 | 32.9 | 17.2 | 45.2 | 21.0 | 76.6 | 27.0 | 35.4 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | * 7 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 39.6 | 40.5 | 20.5 | 33.5 | 14.5 | * 66 | 20.5 | 33.5 |
| Max Q Clear Time (g_c+I1), s | 14.6 | 24.7 | 10.5 | 16.7 | 16.5 | 47.3 | 21.8 | 26.7 |
| Green Ext Time (p_c), s | 0.6 | 1.5 | 0.2 | 2.1 | 0.0 | 4.8 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 68.6 |
| HCM 6th LOS | E |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 286 | 639 | 98 | 175 | 194 | 205 | 114 | 1064 | 500 | 127 | 679 | 138 |
| Future Volume (veh/h) | 286 | 639 | 98 | 175 | 194 | 205 | 114 | 1064 | 500 | 127 | 679 | 138 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1826 | 1678 | 1767 | 1811 | 1707 | 1826 | 1781 | 1811 | 1752 | 1781 | 1841 |
| Adj Flow Rate, veh/h | 314 | 702 | 0 | 192 | 213 | 0 | 125 | 1169 | 0 | 140 | 746 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 5 | 15 | 9 | 6 | 13 | 5 | 8 | 6 | 10 | 8 | 4 |
| Cap, veh/h | 344 | 966 | | 272 | 289 | | 151 | 1262 | | 412 | 2041 | |
| Arrive On Green | 0.19 | 0.19 | 0.00 | 0.08 | 0.08 | 0.00 | 0.09 | 0.26 | 0.00 | 0.25 | 0.42 | 0.00 |
| Sat Flow, veh/h | 1781 | 5149 | 0 | 3264 | 3441 | 1447 | 1739 | 4863 | 1535 | 1668 | 4863 | 1560 |
| Grp Volume(v), veh/h | 314 | 702 | 0 | 192 | 213 | 0 | 125 | 1169 | 0 | 140 | 746 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1662 | 0 | 1632 | 1721 | 1447 | 1739 | 1621 | 1535 | 1668 | 1621 | 1560 |
| Q Serve(g_s), s | 20.7 | 15.9 | 0.0 | 6.9 | 7.3 | 0.0 | 8.5 | 28.1 | 0.0 | 8.3 | 12.6 | 0.0 |
| Cycle Q Clear(g_c), s | 20.7 | 15.9 | 0.0 | 6.9 | 7.3 | 0.0 | 8.5 | 28.1 | 0.0 | 8.3 | 12.6 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 344 | 966 | | 272 | 289 | | 151 | 1262 | | 412 | 2041 | |
| V/C Ratio(X) | 0.91 | 0.73 | | 0.71 | 0.74 | | 0.83 | 0.93 | | 0.34 | 0.37 | |
| Avail Cap(c_a), veh/h | 453 | 1267 | | 422 | 444 | | 210 | 1277 | | 412 | 2041 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.85 | 0.85 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 47.4 | 45.4 | 0.0 | 53.6 | 53.7 | 0.0 | 53.9 | 43.3 | 0.0 | 37.2 | 23.9 | 0.0 |
| Incr Delay (d2), s/veh | 18.3 | 1.5 | 0.0 | 2.5 | 3.6 | 0.0 | 13.5 | 11.4 | 0.0 | 0.4 | 0.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.7 | 6.5 | 0.0 | 2.9 | 3.2 | 0.0 | 4.2 | 12.1 | 0.0 | 3.3 | 4.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 65.7 | 46.9 | 0.0 | 56.1 | 57.3 | 0.0 | 67.4 | 54.7 | 0.0 | 37.5 | 24.4 | 0.0 |
| LnGrp LOS | E | D | | E | E | | E | D | | D | C | |
| Approach Vol, veh/h | | 1016 | A | | 405 | A | | 1294 | A | | 886 | A |
| Approach Delay, s/veh | | 52.7 | | | 56.7 | | | 55.9 | | | 26.5 | |
| Approach LOS | | D | | | E | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 36.1 | 37.6 | 16.5 | 29.8 | 16.9 | 56.9 | 29.7 | 16.6 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 16.5 | 31.5 | 15.5 | 30.5 | 14.5 | 33.5 | 30.5 | 15.5 |
| Max Q Clear Time (g_c+I1), s | 10.3 | 30.1 | 8.9 | 17.9 | 10.5 | 14.6 | 22.7 | 9.3 |
| Green Ext Time (p_c), s | 0.1 | 1.0 | 0.2 | 3.7 | 0.1 | 5.2 | 0.4 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 47.8 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 9 | 0 | 61 | 1 | 1527 | 23 | 42 | 891 | 1 |
| Future Volume (veh/h) | 1 | 0 | 0 | 9 | 0 | 61 | 1 | 1527 | 23 | 42 | 891 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1085 | 1870 | 788 | 1870 | 1841 | 1292 | 1026 | 1796 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 10 | 0 | 70 | 1 | 1755 | 26 | 48 | 1024 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 55 | 2 | 75 | 2 | 4 | 41 | 59 | 7 | 2 |
| Cap, veh/h | 138 | 0 | 0 | 41 | 5 | 89 | 383 | 3529 | 769 | 65 | 2783 | 3 |
| Arrive On Green | 0.06 | 0.00 | 0.00 | 0.06 | 0.00 | 0.06 | 0.21 | 0.70 | 0.70 | 0.09 | 0.73 | 0.73 |
| Sat Flow, veh/h | 1208 | 0 | 0 | 118 | 79 | 1380 | 1781 | 5025 | 1094 | 977 | 5060 | 5 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 80 | 0 | 0 | 1 | 1755 | 26 | 48 | 662 | 363 |
| Grp Sat Flow(s),veh/h/ln | 1208 | 0 | 0 | 1577 | 0 | 0 | 1781 | 1675 | 1094 | 977 | 1635 | 1795 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.1 | 19.2 | 0.9 | 5.7 | 8.9 | 8.9 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 0.1 | 19.2 | 0.9 | 5.7 | 8.9 | 8.9 |
| Prop In Lane | 1.00 | | 0.00 | 0.12 | | 0.87 | 1.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 138 | 0 | 0 | 135 | 0 | 0 | 383 | 3529 | 769 | 65 | 1798 | 987 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | 0.50 | 0.03 | 0.74 | 0.37 | 0.37 |
| Avail Cap(c_a), veh/h | 257 | 0 | 0 | 275 | 0 | 0 | 383 | 3529 | 769 | 151 | 1798 | 987 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.87 | 0.87 | 0.87 | 0.88 | 0.88 | 0.88 |
| Uniform Delay (d), s/veh | 52.6 | 0.0 | 0.0 | 55.3 | 0.0 | 0.0 | 37.0 | 8.2 | 5.4 | 53.7 | 8.4 | 8.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 0.0 | 0.4 | 0.1 | 18.2 | 0.5 | 0.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 0.0 | 5.7 | 0.2 | 1.7 | 2.6 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 52.6 | 0.0 | 0.0 | 61.0 | 0.0 | 0.0 | 37.0 | 8.6 | 5.5 | 71.9 | 9.0 | 9.4 |
| LnGrp LOS | D | A | A | E | A | A | D | A | A | E | A | A |
| Approach Vol, veh/h | | 1 | | | 80 | | | 1782 | | | 1073 | |
| Approach Delay, s/veh | | 52.6 | | | 61.0 | | | 8.6 | | | 11.9 | |
| Approach LOS | | D | | | E | | | A | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.5 | 91.3 | | 14.2 | 32.8 | 73.0 | | 14.2 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | | 6.5 | 7.0 | * 7 | | 6.5 |
| Max Green Setting (Gmax), s | 8.5 | 63.0 | | 18.5 | 15.5 | * 66 | | 18.5 |
| Max Q Clear Time (g_c+I1), s | 7.7 | 21.2 | | 2.1 | 2.1 | 10.9 | | 8.0 |
| Green Ext Time (p_c), s | 0.1 | 24.5 | | 0.0 | 0.0 | 11.3 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 11.2 |
| HCM 6th LOS | B |

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 52 | 48 | 52 | 1457 | 0 | 922 | 54 |
| Future Volume (veh/h) | 52 | 48 | 52 | 1457 | 0 | 922 | 54 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1086 | 1188 | 1310 | 1863 | | 1827 | 1159 |
| Adj Flow Rate, veh/h | 59 | 0 | 59 | 1656 | | 1048 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | | 0.88 | 0.88 |
| Percent Heavy Veh, % | 75 | 60 | 45 | 2 | | 4 | 64 |
| Cap, veh/h | 72 | 71 | 266 | 3233 | | 2259 | 446 |
| Arrive On Green | 0.07 | 0.00 | 0.06 | 0.64 | | 0.45 | 0.00 |
| Sat Flow, veh/h | 1034 | 1009 | 1248 | 5253 | | 5152 | 985 |
| Grp Volume(v), veh/h | 59 | 0 | 59 | 1656 | | 1048 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1034 | 1009 | 1248 | 1695 | | 1663 | 985 |
| Q Serve(g_s), s | 2.5 | 0.0 | 0.7 | 7.8 | | 6.4 | 0.0 |
| Cycle Q Clear(g_c), s | 2.5 | 0.0 | 0.7 | 7.8 | | 6.4 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 72 | 71 | 266 | 3233 | | 2259 | 446 |
| V/C Ratio(X) | 0.82 | 0.00 | 0.22 | 0.51 | | 0.46 | 0.00 |
| Avail Cap(c_a), veh/h | 468 | 457 | 476 | 3454 | | 3388 | 669 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.3 | 0.0 | 10.2 | 4.3 | | 8.4 | 0.0 |
| Incr Delay (d2), s/veh | 19.3 | 0.0 | 0.2 | 0.1 | | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 0.5 | 3.6 | | 2.9 | 0.0 |
| LnGrp Delay(d),s/veh | 39.5 | 0.0 | 10.3 | 4.5 | | 8.5 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 59 | | | 1715 | | 1048 | |
| Approach Delay, s/veh | 39.5 | | | 4.7 | | 8.5 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.6 | | 9.6 | 8.1 | 26.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.8 | | 4.5 | 2.7 | 8.4 | | |
| Green Ext Time (p_c), s | | 11.2 | | 0.1 | 0.0 | 6.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.8 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 33 | 5 | 89 | 21 | 2 | 67 |
| Future Vol, veh/h | 33 | 5 | 89 | 21 | 2 | 67 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 72 | 20 | 57 | 45 | 100 | 66 |
| Mvmt Flow | 44 | 7 | 119 | 28 | 3 | 89 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 51 | 0 | 314 | 48 |
| Stage 1 | - | - | - | - | 48 | - |
| Stage 2 | - | - | - | - | 266 | - |
| Critical Hdwy | - | - | 4.67 | - | 7.4 | 6.86 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.713 | - | 4.4 | 3.894 |
| Pot Cap-1 Maneuver | - | - | 1266 | - | 517 | 866 |
| Stage 1 | - | - | - | - | 774 | - |
| Stage 2 | - | - | - | - | 597 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1266 | - | 468 | 866 |
| Mov Cap-2 Maneuver | - | - | - | - | 468 | - |
| Stage 1 | - | - | - | - | 774 | - |
| Stage 2 | - | - | - | - | 540 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.6 | 9.8 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 845 | - | - | 1266 | - |
| HCM Lane V/C Ratio | 0.109 | - | - | 0.094 | - |
| HCM Control Delay (s) | 9.8 | - | - | 8.1 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.4 | - | - | 0.3 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 3 | 1 | 0 | 146 | 0 | 155 | 16 | 48 | 1406 | 79 | 95 | 792 |
| Future Volume (veh/h) | 3 | 1 | 0 | 146 | 0 | 155 | 16 | 48 | 1406 | 79 | 95 | 792 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1826 | 1870 | 1841 | | 1870 | 1856 | 1796 | 1752 | 1811 |
| Adj Flow Rate, veh/h | 3 | 1 | 0 | 160 | 0 | 0 | | 53 | 1545 | 0 | 104 | 870 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 5 | 2 | 4 | | 2 | 3 | 7 | 10 | 6 |
| Cap, veh/h | 187 | 12 | 0 | 235 | 136 | | | 68 | 2739 | | 130 | 2891 |
| Arrive On Green | 0.00 | 0.01 | 0.00 | 0.07 | 0.00 | 0.00 | | 0.04 | 0.54 | 0.00 | 0.08 | 0.58 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3374 | 1870 | 0 | | 1781 | 5066 | 1522 | 1668 | 4979 |
| Grp Volume(v), veh/h | 3 | 1 | 0 | 160 | 0 | 0 | | 53 | 1545 | 0 | 104 | 576 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1687 | 1870 | 0 | | 1781 | 1689 | 1522 | 1668 | 1648 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.0 | 4.3 | 0.0 | 0.0 | | 2.7 | 18.5 | 0.0 | 5.6 | 8.1 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 4.3 | 0.0 | 0.0 | | 2.7 | 18.5 | 0.0 | 5.6 | 8.1 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 187 | 12 | 0 | 235 | 136 | | | 68 | 2739 | | 130 | 1914 |
| V/C Ratio(X) | 0.02 | 0.08 | 0.00 | 0.68 | 0.00 | | | 0.78 | 0.56 | | 0.80 | 0.30 |
| Avail Cap(c_a), veh/h | 666 | 509 | 0 | 919 | 509 | | | 485 | 3863 | | 454 | 2514 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 45.3 | 0.0 | 41.7 | 0.0 | 0.0 | | 43.7 | 13.9 | 0.0 | 41.6 | 9.8 |
| Incr Delay (d2), s/veh | 0.0 | 1.1 | 0.0 | 1.3 | 0.0 | 0.0 | | 6.9 | 0.4 | 0.0 | 4.2 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | | 1.3 | 6.0 | 0.0 | 2.3 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 39.3 | 46.5 | 0.0 | 43.0 | 0.0 | 0.0 | | 50.6 | 14.3 | 0.0 | 45.7 | 10.0 |
| LnGrp LOS | D | D | A | D | A | | | D | B | | D | A |
| Approach Vol, veh/h | | 4 | | | 160 | A | | | 1598 | A | | 993 |
| Approach Delay, s/veh | | 41.1 | | | 43.0 | | | | 15.5 | | | 13.8 |
| Approach LOS | | D | | | D | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.2 | 56.6 | 13.4 | 7.6 | 10.5 | 60.3 | 7.3 | 13.7 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 7.6 | 20.5 | 6.3 | 2.0 | 4.7 | 10.2 | 2.1 | 0.0 |
| Green Ext Time (p_c), s | 0.1 | 29.1 | 0.3 | 0.0 | 0.0 | 13.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 16.5 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 17 |
| Future Volume (veh/h) | 17 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 19 |
| Peak Hour Factor | 0.91 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 63 |
| Arrive On Green | 0.58 |
| Sat Flow, veh/h | 109 |
| Grp Volume(v), veh/h | 313 |
| Grp Sat Flow(s),veh/h/ln | 1791 |
| Q Serve(g_s), s | 8.2 |
| Cycle Q Clear(g_c), s | 8.2 |
| Prop In Lane | 0.06 |
| Lane Grp Cap(c), veh/h | 1040 |
| V/C Ratio(X) | 0.30 |
| Avail Cap(c_a), veh/h | 1366 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 9.8 |
| Incr Delay (d2), s/veh | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 10.1 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 30 | 21 | 33 | 177 | 17 | 174 | 30 | 1336 | 75 | 3 | 87 | 811 | 21 |
| Future Volume (veh/h) | 30 | 21 | 33 | 177 | 17 | 174 | 30 | 1336 | 75 | 3 | 87 | 811 | 21 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1826 | 1530 | 1870 | 1811 | 1870 | 1441 | 1841 | 1870 | | 1870 | 1811 | 1604 |
| Adj Flow Rate, veh/h | 33 | 23 | 0 | 192 | 18 | 0 | 33 | 1452 | 0 | | 95 | 882 | 23 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 14 | 5 | 25 | 2 | 6 | 2 | 31 | 4 | 2 | | 2 | 6 | 20 |
| Cap, veh/h | 39 | 97 | | 225 | 281 | | 37 | 2431 | | | 121 | 2529 | 66 |
| Arrive On Green | 0.02 | 0.05 | 0.00 | 0.13 | 0.15 | 0.00 | 0.03 | 0.48 | 0.00 | | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 5025 | 1585 | | 1781 | 4955 | 129 |
| Grp Volume(v), veh/h | 33 | 23 | 0 | 192 | 18 | 0 | 33 | 1452 | 0 | | 95 | 586 | 319 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 1675 | 1585 | | 1781 | 1648 | 1788 |
| Q Serve(g_s), s | 2.1 | 1.2 | 0.0 | 10.8 | 0.9 | 0.0 | 2.5 | 21.5 | 0.0 | | 5.4 | 10.8 | 10.9 |
| Cycle Q Clear(g_c), s | 2.1 | 1.2 | 0.0 | 10.8 | 0.9 | 0.0 | 2.5 | 21.5 | 0.0 | | 5.4 | 10.8 | 10.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 39 | 97 | | 225 | 281 | | 37 | 2431 | | | 121 | 1683 | 913 |
| V/C Ratio(X) | 0.84 | 0.24 | | 0.85 | 0.06 | | 0.90 | 0.60 | | | 0.78 | 0.35 | 0.35 |
| Avail Cap(c_a), veh/h | 252 | 286 | | 383 | 283 | | 470 | 3440 | | | 523 | 2256 | 1224 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.7 | 46.4 | 0.0 | 43.7 | 36.9 | 0.0 | 49.6 | 19.2 | 0.0 | | 46.9 | 14.9 | 14.9 |
| Incr Delay (d2), s/veh | 15.7 | 0.5 | 0.0 | 3.6 | 0.0 | 0.0 | 23.7 | 0.5 | 0.0 | | 4.1 | 0.3 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.6 | 0.0 | 4.9 | 0.4 | 0.0 | 1.0 | 7.5 | 0.0 | | 2.4 | 3.7 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 65.4 | 46.9 | 0.0 | 47.4 | 36.9 | 0.0 | 73.3 | 19.7 | 0.0 | | 51.0 | 15.2 | 15.4 |
| LnGrp LOS | E | D | | D | D | | E | B | | | D | B | B |
| Approach Vol, veh/h | | 56 | A | | 210 | A | | 1485 | A | | | 1000 | |
| Approach Delay, s/veh | | 57.8 | | | 46.5 | | | 20.9 | | | | 18.7 | |
| Approach LOS | | E | | | D | | | C | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.5 | 56.5 | 19.9 | 12.4 | 10.7 | 59.2 | 9.5 | 22.8 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 17.4 | 23.5 | 12.8 | 3.2 | 4.5 | 12.9 | 4.1 | 2.9 |
| Green Ext Time (p_c), s | 0.1 | 26.0 | 0.2 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 22.8 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 6 | 1 | 107 | 0 | 41 | 0 | 1427 | 63 | 22 | 999 | 0 |
| Future Volume (veh/h) | 0 | 6 | 1 | 107 | 0 | 41 | 0 | 1427 | 63 | 22 | 999 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1796 | 0 | 1841 | 1826 | 1826 | 1811 | 1870 |
| Adj Flow Rate, veh/h | 0 | 7 | 1 | 116 | 0 | 0 | 0 | 1551 | 0 | 24 | 1086 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 7 | 0 | 4 | 5 | 5 | 6 | 2 |
| Cap, veh/h | 387 | 25 | 4 | 333 | 382 | | 0 | 2513 | | 55 | 3085 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.10 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 | 0.03 | 0.62 | 0.00 |
| Sat Flow, veh/h | 1781 | 1601 | 229 | 3456 | 1870 | 1522 | 0 | 5191 | 1547 | 1739 | 4944 | 1585 |
| Grp Volume(v), veh/h | 0 | 0 | 8 | 116 | 0 | 0 | 0 | 1551 | 0 | 24 | 1086 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1829 | 1728 | 1870 | 1522 | 0 | 1675 | 1547 | 1739 | 1648 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.3 | 2.4 | 0.0 | 0.0 | 0.0 | 16.9 | 0.0 | 1.0 | 8.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.3 | 2.4 | 0.0 | 0.0 | 0.0 | 16.9 | 0.0 | 1.0 | 8.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.13 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 387 | 0 | 28 | 333 | 382 | | 0 | 2513 | | 55 | 3085 | |
| V/C Ratio(X) | 0.00 | 0.00 | 0.28 | 0.35 | 0.00 | | 0.00 | 0.62 | | 0.44 | 0.35 | |
| Avail Cap(c_a), veh/h | 714 | 0 | 556 | 1141 | 494 | | 0 | 2987 | | 368 | 3085 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.9 | 32.0 | 0.0 | 0.0 | 0.0 | 13.7 | 0.0 | 36.0 | 6.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 2.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 2.1 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.2 | 1.0 | 0.0 | 0.0 | 0.0 | 5.2 | 0.0 | 0.4 | 1.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 38.9 | 32.2 | 0.0 | 0.0 | 0.0 | 14.2 | 0.0 | 38.1 | 7.0 | 0.0 |
| LnGrp LOS | A | A | D | C | A | | A | B | | D | A | |
| Approach Vol, veh/h | | 8 | | | 116 | A | | 1551 | A | | 1110 | A |
| Approach Delay, s/veh | | 38.9 | | | 32.2 | | | 14.2 | | | 7.7 | |
| Approach LOS | | D | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.4 | 44.4 | 14.3 | 7.7 | | 53.7 | 0.0 | 22.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 13.0 | 18.9 | 4.4 | 2.3 | | 10.0 | 0.0 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 19.0 | 0.2 | 0.0 | | 15.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 12.4 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 581 | 807 | 136 | 74 | 260 | 207 | 72 | 684 | 115 | 181 | 556 | 341 |
| Future Volume (veh/h) | 581 | 807 | 136 | 74 | 260 | 207 | 72 | 684 | 115 | 181 | 556 | 341 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1856 | 1811 | 1856 | 1796 | 1870 | 1870 | 1781 | 1856 |
| Adj Flow Rate, veh/h | 612 | 849 | 0 | 78 | 274 | 0 | 76 | 720 | 0 | 191 | 585 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 7 | 2 | 2 | 8 | 3 |
| Cap, veh/h | 683 | 1221 | | 133 | 406 | | 542 | 2108 | | 248 | 674 | |
| Arrive On Green | 0.20 | 0.24 | 0.00 | 0.04 | 0.08 | 0.00 | 0.31 | 0.43 | 0.00 | 0.07 | 0.20 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | 3456 | 5066 | 1535 | 1767 | 4904 | 1585 | 3456 | 3385 | 1572 |
| Grp Volume(v), veh/h | 612 | 849 | 0 | 78 | 274 | 0 | 76 | 720 | 0 | 191 | 585 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | 1728 | 1689 | 1535 | 1767 | 1635 | 1585 | 1728 | 1692 | 1572 |
| Q Serve(g_s), s | 20.7 | 18.2 | 0.0 | 2.7 | 6.3 | 0.0 | 3.7 | 11.8 | 0.0 | 6.5 | 20.1 | 0.0 |
| Cycle Q Clear(g_c), s | 20.7 | 18.2 | 0.0 | 2.7 | 6.3 | 0.0 | 3.7 | 11.8 | 0.0 | 6.5 | 20.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 683 | 1221 | | 133 | 406 | | 542 | 2108 | | 248 | 674 | |
| V/C Ratio(X) | 0.90 | 0.70 | | 0.59 | 0.68 | | 0.14 | 0.34 | | 0.77 | 0.87 | |
| Avail Cap(c_a), veh/h | 994 | 1808 | | 331 | 823 | | 542 | 2108 | | 346 | 917 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 46.9 | 41.7 | 0.0 | 56.7 | 53.7 | 0.0 | 30.2 | 22.9 | 0.0 | 54.7 | 46.5 | 0.0 |
| Incr Delay (d2), s/veh | 5.9 | 0.3 | 0.0 | 1.5 | 0.7 | 0.0 | 0.0 | 0.4 | 0.0 | 4.2 | 14.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.2 | 7.4 | 0.0 | 1.2 | 2.6 | 0.0 | 1.5 | 4.4 | 0.0 | 2.9 | 9.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 52.9 | 41.9 | 0.0 | 58.3 | 54.4 | 0.0 | 30.2 | 23.3 | 0.0 | 58.9 | 60.7 | 0.0 |
| LnGrp LOS | D | D | | E | D | | C | C | | E | E | |
| Approach Vol, veh/h | | 1461 | A | | 352 | A | | 796 | A | | 776 | A |
| Approach Delay, s/veh | | 46.5 | | | 55.3 | | | 24.0 | | | 60.2 | |
| Approach LOS | | D | | | E | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.6 | 58.1 | 11.1 | 35.2 | 43.3 | 30.4 | 30.2 | 16.1 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 12.0 | 27.5 | 11.5 | 42.5 | 7.5 | 32.5 | 34.5 | 19.5 |
| Max Q Clear Time (g_c+I1), s | 8.5 | 13.8 | 4.7 | 20.2 | 5.7 | 22.1 | 22.7 | 8.3 |
| Green Ext Time (p_c), s | 0.1 | 1.4 | 0.0 | 3.6 | 0.0 | 1.7 | 1.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 45.3 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 89 | 150 | 50 | 146 | 156 | 126 | 61 | 601 | 152 | 98 | 562 | 85 |
| Future Volume (veh/h) | 89 | 150 | 50 | 146 | 156 | 126 | 61 | 601 | 152 | 98 | 562 | 85 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1752 | 1811 | 1678 | 1826 | 1737 | 1426 | 1693 | 1737 | 1767 | 1648 | 1722 |
| Adj Flow Rate, veh/h | 94 | 158 | 0 | 154 | 164 | 0 | 64 | 633 | 0 | 103 | 592 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 14 | 10 | 6 | 15 | 5 | 11 | 32 | 14 | 11 | 9 | 17 | 12 |
| Cap, veh/h | 187 | 604 | | 457 | 548 | | 87 | 1094 | | 133 | 1134 | |
| Arrive On Green | 0.12 | 0.13 | 0.00 | 0.15 | 0.16 | 0.00 | 0.06 | 0.24 | 0.00 | 0.08 | 0.25 | 0.00 |
| Sat Flow, veh/h | 1612 | 4940 | 0 | 3100 | 3469 | 1472 | 1358 | 4621 | 1472 | 1682 | 4499 | 1459 |
| Grp Volume(v), veh/h | 94 | 158 | 0 | 154 | 164 | 0 | 64 | 633 | 0 | 103 | 592 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1594 | 0 | 1550 | 1735 | 1472 | 1358 | 1540 | 1472 | 1682 | 1500 | 1459 |
| Q Serve(g_s), s | 3.5 | 1.9 | 0.0 | 2.8 | 2.6 | 0.0 | 2.9 | 7.7 | 0.0 | 3.8 | 7.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.5 | 1.9 | 0.0 | 2.8 | 2.6 | 0.0 | 2.9 | 7.7 | 0.0 | 3.8 | 7.2 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 187 | 604 | | 457 | 548 | | 87 | 1094 | | 133 | 1134 | |
| V/C Ratio(X) | 0.50 | 0.26 | | 0.34 | 0.30 | | 0.74 | 0.58 | | 0.77 | 0.52 | |
| Avail Cap(c_a), veh/h | 763 | 2265 | | 1957 | 2191 | | 429 | 3282 | | 531 | 2131 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 26.3 | 25.0 | 0.0 | 24.2 | 23.6 | 0.0 | 29.1 | 21.4 | 0.0 | 28.6 | 20.4 | 0.0 |
| Incr Delay (d2), s/veh | 1.6 | 0.2 | 0.0 | 0.3 | 0.3 | 0.0 | 8.6 | 0.6 | 0.0 | 6.9 | 0.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.7 | 0.0 | 1.0 | 1.0 | 0.0 | 1.1 | 2.4 | 0.0 | 1.6 | 2.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 27.9 | 25.2 | 0.0 | 24.6 | 23.9 | 0.0 | 37.8 | 22.0 | 0.0 | 35.5 | 20.9 | 0.0 |
| LnGrp LOS | C | C | | C | C | | D | C | | D | C | |
| Approach Vol, veh/h | | 252 | A | | 318 | A | | 697 | A | | 695 | A |
| Approach Delay, s/veh | | 26.2 | | | 24.2 | | | 23.4 | | | 23.0 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.5 | 21.5 | 15.8 | 14.5 | 10.6 | 22.5 | 13.8 | 16.5 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 20.0 | 45.0 | 40.0 | 30.0 | 20.0 | 30.0 | 30.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 5.8 | 9.7 | 4.8 | 3.9 | 4.9 | 9.2 | 5.5 | 4.6 |
| Green Ext Time (p_c), s | 0.1 | 5.2 | 0.4 | 0.9 | 0.1 | 4.2 | 0.2 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 23.8 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 25 | 0 | 62 | 1 | 770 | 31 | 6 | 67 | 672 | 0 |
| Future Volume (veh/h) | 1 | 0 | 0 | 25 | 0 | 62 | 1 | 770 | 31 | 6 | 67 | 672 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1218 | 1870 | 833 | 1870 | 1737 | 863 | | 892 | 1737 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 27 | 0 | 68 | 1 | 846 | 34 | | 74 | 738 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 46 | 2 | 72 | 2 | 11 | 70 | | 68 | 11 | 2 |
| Cap, veh/h | 177 | 0 | 0 | 74 | 9 | 90 | 192 | 2886 | 445 | | 92 | 2886 | 0 |
| Arrive On Green | 0.08 | 0.00 | 0.00 | 0.08 | 0.00 | 0.08 | 0.11 | 0.61 | 0.61 | | 0.11 | 0.61 | 0.00 |
| Sat Flow, veh/h | 1289 | 0 | 0 | 331 | 113 | 1119 | 1781 | 4742 | 731 | | 850 | 4898 | 0 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 95 | 0 | 0 | 1 | 846 | 34 | | 74 | 738 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1289 | 0 | 0 | 1563 | 0 | 0 | 1781 | 1581 | 731 | | 850 | 1581 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 3.9 | 0.0 | 0.0 | 0.0 | 8.4 | 1.9 | | 8.4 | 7.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.0 | 8.4 | 1.9 | | 8.4 | 7.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 0.28 | | 0.72 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 177 | 0 | 0 | 173 | 0 | 0 | 192 | 2886 | 445 | | 92 | 2886 | 0 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 | 0.01 | 0.29 | 0.08 | | 0.81 | 0.26 | 0.00 |
| Avail Cap(c_a), veh/h | 610 | 0 | 0 | 671 | 0 | 0 | 542 | 2886 | 445 | | 259 | 2886 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 41.7 | 0.0 | 0.0 | 44.3 | 0.0 | 0.0 | 39.3 | 9.2 | 7.9 | | 43.0 | 8.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | | 20.5 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 | 2.4 | 0.3 | | 2.2 | 2.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 41.7 | 0.0 | 0.0 | 48.1 | 0.0 | 0.0 | 39.3 | 9.5 | 8.3 | | 63.5 | 9.2 | 0.0 |
| LnGrp LOS | D | A | A | D | A | A | D | A | A | | E | A | A |
| Approach Vol, veh/h | | 1 | | | 95 | | | 881 | | | | 812 | |
| Approach Delay, s/veh | | 41.7 | | | 48.1 | | | 9.4 | | | | 14.1 | |
| Approach LOS | | D | | | D | | | A | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 87.1 | 67.0 | | 14.5 | 17.1 | 67.0 | | 14.5 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | | 6.5 | 6.5 | 7.0 | | 6.5 |
| Max Green Setting (Gmax), s | 30.6 | 60.0 | | 40.0 | 30.0 | 60.0 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 10.4 | | 2.1 | 2.0 | 9.1 | | 7.8 |
| Green Ext Time (p_c), s | 0.2 | 9.5 | | 0.0 | 0.0 | 7.8 | | 0.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 13.6 |
| HCM 6th LOS | | B |

Notes

User approved ignoring U-Turning movement.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 68 | 52 | 51 | 720 | 2 | 633 | 70 |
| Future Volume (veh/h) | 68 | 52 | 51 | 720 | 2 | 633 | 70 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1056 | 1080 | 1145 | 1776 | | 1827 | 1027 |
| Adj Flow Rate, veh/h | 73 | 0 | 55 | 774 | | 681 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | | 0.93 | 0.93 |
| Percent Heavy Veh, % | 80 | 76 | 66 | 7 | | 4 | 85 |
| Cap, veh/h | 81 | 74 | 258 | 3044 | | 2240 | 392 |
| Arrive On Green | 0.08 | 0.00 | 0.06 | 0.63 | | 0.45 | 0.00 |
| Sat Flow, veh/h | 1005 | 918 | 1090 | 5007 | | 5152 | 873 |
| Grp Volume(v), veh/h | 73 | 0 | 55 | 774 | | 681 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1005 | 918 | 1090 | 1616 | | 1663 | 873 |
| Q Serve(g_s), s | 3.2 | 0.0 | 0.7 | 3.1 | | 3.9 | 0.0 |
| Cycle Q Clear(g_c), s | 3.2 | 0.0 | 0.7 | 3.1 | | 3.9 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 81 | 74 | 258 | 3044 | | 2240 | 392 |
| V/C Ratio(X) | 0.91 | 0.00 | 0.21 | 0.25 | | 0.30 | 0.00 |
| Avail Cap(c_a), veh/h | 451 | 412 | 443 | 3265 | | 3360 | 588 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.3 | 0.0 | 10.0 | 3.7 | | 7.8 | 0.0 |
| Incr Delay (d2), s/veh | 28.1 | 0.0 | 0.2 | 0.0 | | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 0.0 | 0.4 | 1.4 | | 1.8 | 0.0 |
| LnGrp Delay(d),s/veh | 48.4 | 0.0 | 10.1 | 3.7 | | 7.9 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 73 | | | 829 | | 681 | |
| Approach Delay, s/veh | 48.4 | | | 4.1 | | 7.9 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.5 | | 10.1 | 8.0 | 26.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 5.1 | | 5.2 | 2.7 | 5.9 | | |
| Green Ext Time (p_c), s | | 5.0 | | 0.1 | 0.0 | 4.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.8 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 2 | 98 | 25 | 4 | 98 |
| Future Vol, veh/h | 24 | 2 | 98 | 25 | 4 | 98 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 74 | 2 | 77 | 79 | 100 | 80 |
| Mvmt Flow | 27 | 2 | 109 | 28 | 4 | 109 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 29 | 0 | 274 | 28 |
| Stage 1 | - | - | - | - | 28 | - |
| Stage 2 | - | - | - | - | 246 | - |
| Critical Hdwy | - | - | 4.87 | - | 7.4 | 7 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.893 | - | 4.4 | 4.02 |
| Pot Cap-1 Maneuver | - | - | 1211 | - | 548 | 861 |
| Stage 1 | - | - | - | - | 792 | - |
| Stage 2 | - | - | - | - | 612 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1211 | - | 498 | 861 |
| Mov Cap-2 Maneuver | - | - | - | - | 498 | - |
| Stage 1 | - | - | - | - | 792 | - |
| Stage 2 | - | - | - | - | 556 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.6 | 10 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 837 | - | - | 1211 | - |
| HCM Lane V/C Ratio | 0.135 | - | - | 0.09 | - |
| HCM Control Delay (s) | 10 | - | - | 8.3 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.5 | - | - | 0.3 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 0 | 2 | 100 | 6 | 62 | 8 | 18 | 723 | 85 | 54 | 625 |
| Future Volume (veh/h) | 9 | 0 | 2 | 100 | 6 | 62 | 8 | 18 | 723 | 85 | 54 | 625 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1841 | 1870 | 1856 | | 1870 | 1737 | 1841 | 1811 | 1752 |
| Adj Flow Rate, veh/h | 10 | 0 | 2 | 106 | 6 | 0 | | 19 | 769 | 0 | 57 | 665 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 4 | 2 | 3 | | 2 | 11 | 4 | 6 | 10 |
| Cap, veh/h | 266 | 0 | 65 | 195 | 165 | | | 32 | 1736 | | 72 | 1908 |
| Arrive On Green | 0.01 | 0.00 | 0.04 | 0.06 | 0.09 | 0.00 | | 0.02 | 0.37 | 0.00 | 0.04 | 0.39 |
| Sat Flow, veh/h | 1781 | 0 | 1585 | 3401 | 1870 | 0 | | 1781 | 4742 | 1560 | 1725 | 4897 |
| Grp Volume(v), veh/h | 10 | 0 | 2 | 106 | 6 | 0 | | 19 | 769 | 0 | 57 | 433 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | 1700 | 1870 | 0 | | 1781 | 1581 | 1560 | 1725 | 1594 |
| Q Serve(g_s), s | 0.3 | 0.0 | 0.1 | 1.7 | 0.2 | 0.0 | | 0.6 | 7.0 | 0.0 | 1.9 | 5.4 |
| Cycle Q Clear(g_c), s | 0.3 | 0.0 | 0.1 | 1.7 | 0.2 | 0.0 | | 0.6 | 7.0 | 0.0 | 1.9 | 5.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 266 | 0 | 65 | 195 | 165 | | | 32 | 1736 | | 72 | 1242 |
| V/C Ratio(X) | 0.04 | 0.00 | 0.03 | 0.54 | 0.04 | | | 0.58 | 0.44 | | 0.79 | 0.35 |
| Avail Cap(c_a), veh/h | 1032 | 0 | 699 | 1499 | 824 | | | 785 | 5853 | | 760 | 3935 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.2 | 0.0 | 26.1 | 26.0 | 23.7 | 0.0 | | 27.6 | 13.6 | 0.0 | 26.9 | 12.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.1 | 0.9 | 0.0 | 0.0 | | 6.1 | 0.4 | 0.0 | 7.0 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 0.7 | 0.1 | 0.0 | | 0.3 | 2.0 | 0.0 | 0.8 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 23.2 | 0.0 | 26.2 | 26.9 | 23.7 | 0.0 | | 33.7 | 14.0 | 0.0 | 34.0 | 12.6 |
| LnGrp LOS | C | A | C | C | C | | | C | B | | C | B |
| Approach Vol, veh/h | | 12 | | | 112 | A | | | 788 | A | | 727 |
| Approach Delay, s/veh | | 23.7 | | | 26.7 | | | | 14.5 | | | 14.4 |
| Approach LOS | | C | | | C | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.4 | 27.8 | 10.2 | 9.3 | 8.0 | 29.1 | 7.6 | 12.0 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 3.9 | 9.0 | 3.7 | 2.1 | 2.6 | 7.4 | 2.3 | 2.2 |
| Green Ext Time (p_c), s | 0.0 | 11.8 | 0.2 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 5 |
| Future Volume (veh/h) | 5 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 5 |
| Peak Hour Factor | 0.94 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 14 |
| Arrive On Green | 0.39 |
| Sat Flow, veh/h | 37 |
| Grp Volume(v), veh/h | 237 |
| Grp Sat Flow(s),veh/h/ln | 1745 |
| Q Serve(g_s), s | 5.4 |
| Cycle Q Clear(g_c), s | 5.4 |
| Prop In Lane | 0.02 |
| Lane Grp Cap(c), veh/h | 680 |
| V/C Ratio(X) | 0.35 |
| Avail Cap(c_a), veh/h | 2154 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 12.2 |
| Incr Delay (d2), s/veh | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 12.9 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 43 | 15 | 41 | 78 | 22 | 49 | 3 | 44 | 729 | 71 | 10 | 34 | 668 | 17 |
| Future Volume (veh/h) | 43 | 15 | 41 | 78 | 22 | 49 | 3 | 44 | 729 | 71 | 10 | 34 | 668 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1589 | 1796 | 1337 | 1856 | 1870 | 1841 | | 1352 | 1752 | 1870 | | 1811 | 1781 | 1470 |
| Adj Flow Rate, veh/h | 45 | 16 | 0 | 81 | 23 | 0 | | 46 | 759 | 0 | | 35 | 696 | 18 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 21 | 7 | 38 | 3 | 2 | 4 | | 37 | 10 | 2 | | 6 | 8 | 29 |
| Cap, veh/h | 53 | 136 | | 104 | 186 | | | 48 | 1774 | | | 51 | 1647 | 43 |
| Arrive On Green | 0.04 | 0.08 | 0.00 | 0.06 | 0.10 | 0.00 | | 0.04 | 0.37 | 0.00 | | 0.03 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 4782 | 1585 | | 1725 | 4875 | 126 |
| Grp Volume(v), veh/h | 45 | 16 | 0 | 81 | 23 | 0 | | 46 | 759 | 0 | | 35 | 462 | 252 |
| Grp Sat Flow(s),veh/h/ln | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 1594 | 1585 | | 1725 | 1621 | 1759 |
| Q Serve(g_s), s | 1.8 | 0.5 | 0.0 | 2.7 | 0.7 | 0.0 | | 2.1 | 7.0 | 0.0 | | 1.2 | 6.5 | 6.5 |
| Cycle Q Clear(g_c), s | 1.8 | 0.5 | 0.0 | 2.7 | 0.7 | 0.0 | | 2.1 | 7.0 | 0.0 | | 1.2 | 6.5 | 6.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 53 | 136 | | 104 | 186 | | | 48 | 1774 | | | 51 | 1095 | 594 |
| V/C Ratio(X) | 0.84 | 0.12 | | 0.78 | 0.12 | | | 0.96 | 0.43 | | | 0.69 | 0.42 | 0.42 |
| Avail Cap(c_a), veh/h | 409 | 485 | | 657 | 506 | | | 761 | 5655 | | | 874 | 3834 | 2080 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.4 | 25.5 | 0.0 | 27.5 | 24.3 | 0.0 | | 28.4 | 13.9 | 0.0 | | 28.5 | 15.1 | 15.1 |
| Incr Delay (d2), s/veh | 12.3 | 0.1 | 0.0 | 4.6 | 0.1 | 0.0 | | 27.9 | 0.4 | 0.0 | | 5.9 | 0.6 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.2 | 0.0 | 1.2 | 0.3 | 0.0 | | 0.9 | 2.0 | 0.0 | | 0.5 | 2.0 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 40.6 | 25.6 | 0.0 | 32.0 | 24.4 | 0.0 | | 56.4 | 14.3 | 0.0 | | 34.4 | 15.7 | 16.2 |
| LnGrp LOS | D | C | | C | C | | | E | B | | | C | B | B |
| Approach Vol, veh/h | | 61 | A | | 104 | A | | | 805 | A | | | 749 | |
| Approach Delay, s/veh | | 36.7 | | | 30.3 | | | | 16.7 | | | | 16.7 | |
| Approach LOS | | D | | | C | | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.3 | 29.0 | 10.5 | 11.5 | 10.2 | 27.0 | 9.1 | 12.9 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 13.2 | 9.0 | 4.7 | 2.5 | 4.1 | 8.5 | 3.8 | 2.7 |
| Green Ext Time (p_c), s | 0.0 | 11.6 | 0.1 | 0.0 | 0.0 | 10.1 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 18.2 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 37 | 1 | 16 | 0 | 834 | 72 | 11 | 761 | 6 |
| Future Volume (veh/h) | 2 | 1 | 8 | 37 | 1 | 16 | 0 | 834 | 72 | 11 | 761 | 6 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1811 | 1870 | 1707 | 0 | 1752 | 1856 | 1767 | 1752 | 1870 |
| Adj Flow Rate, veh/h | 2 | 1 | 9 | 40 | 1 | 0 | 0 | 897 | 0 | 12 | 818 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 6 | 2 | 13 | 0 | 10 | 3 | 9 | 10 | 2 |
| Cap, veh/h | 254 | 3 | 28 | 223 | 155 | | 0 | 1931 | | 31 | 2628 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.07 | 0.08 | 0.00 | 0.00 | 0.40 | 0.00 | 0.02 | 0.55 | 0.00 |
| Sat Flow, veh/h | 1781 | 161 | 1449 | 3346 | 1870 | 1447 | 0 | 4940 | 1572 | 1682 | 4782 | 1585 |
| Grp Volume(v), veh/h | 2 | 0 | 10 | 40 | 1 | 0 | 0 | 897 | 0 | 12 | 818 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1610 | 1673 | 1870 | 1447 | 0 | 1594 | 1572 | 1682 | 1594 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 7.6 | 0.0 | 0.4 | 5.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 7.6 | 0.0 | 0.4 | 5.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 254 | 0 | 32 | 223 | 155 | | 0 | 1931 | | 31 | 2628 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.32 | 0.18 | 0.01 | | 0.00 | 0.46 | | 0.39 | 0.31 | |
| Avail Cap(c_a), veh/h | 702 | 0 | 674 | 1524 | 681 | | 0 | 3919 | | 490 | 3919 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 23.0 | 0.0 | 26.6 | 24.2 | 23.1 | 0.0 | 0.0 | 12.0 | 0.0 | 26.6 | 6.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 2.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 3.0 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.2 | 1.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 23.0 | 0.0 | 28.6 | 24.4 | 23.1 | 0.0 | 0.0 | 12.4 | 0.0 | 29.6 | 6.9 | 0.0 |
| LnGrp LOS | C | A | C | C | C | | A | B | | C | A | |
| Approach Vol, veh/h | | 12 | | | 41 | A | | 897 | A | | 830 | A |
| Approach Delay, s/veh | | 27.7 | | | 24.3 | | | 12.4 | | | 7.2 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.0 | 28.7 | 10.7 | 7.6 | | 36.7 | 7.2 | 11.1 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 9.6 | 2.6 | 2.3 | | 7.1 | 2.1 | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 12.6 | 0.0 | 0.0 | | 11.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 10.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 237 | 214 | 126 | 146 | 197 | 154 | 96 | 528 | 174 | 112 | 463 | 222 |
| Future Volume (veh/h) | 237 | 214 | 126 | 146 | 197 | 154 | 96 | 528 | 174 | 112 | 463 | 222 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1811 | 1870 | 1870 | 1870 | 1826 | 1767 | 1870 | 1737 | 1870 | 1767 | 1752 | 1841 |
| Adj Flow Rate, veh/h | 255 | 230 | 0 | 157 | 212 | 0 | 103 | 568 | 0 | 120 | 498 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 6 | 2 | 2 | 2 | 5 | 9 | 2 | 11 | 2 | 9 | 10 | 4 |
| Cap, veh/h | 310 | 370 | | 314 | 354 | | 127 | 2672 | | 170 | 1826 | |
| Arrive On Green | 0.09 | 0.07 | 0.00 | 0.09 | 0.07 | 0.00 | 0.07 | 0.56 | 0.00 | 0.05 | 0.55 | 0.00 |
| Sat Flow, veh/h | 3346 | 5106 | 1585 | 3456 | 4985 | 1497 | 1781 | 4742 | 1585 | 3264 | 3328 | 1560 |
| Grp Volume(v), veh/h | 255 | 230 | 0 | 157 | 212 | 0 | 103 | 568 | 0 | 120 | 498 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1702 | 1585 | 1728 | 1662 | 1497 | 1781 | 1581 | 1585 | 1632 | 1664 | 1560 |
| Q Serve(g_s), s | 9.0 | 5.2 | 0.0 | 5.2 | 5.0 | 0.0 | 6.8 | 7.1 | 0.0 | 4.3 | 9.5 | 0.0 |
| Cycle Q Clear(g_c), s | 9.0 | 5.2 | 0.0 | 5.2 | 5.0 | 0.0 | 6.8 | 7.1 | 0.0 | 4.3 | 9.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 310 | 370 | | 314 | 354 | | 127 | 2672 | | 170 | 1826 | |
| V/C Ratio(X) | 0.82 | 0.62 | | 0.50 | 0.60 | | 0.81 | 0.21 | | 0.70 | 0.27 | |
| Avail Cap(c_a), veh/h | 376 | 1340 | | 389 | 1308 | | 141 | 2672 | | 245 | 1826 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 53.5 | 54.0 | 0.0 | 51.9 | 54.1 | 0.0 | 54.9 | 13.0 | 0.0 | 56.0 | 14.4 | 0.0 |
| Incr Delay (d2), s/veh | 9.8 | 0.6 | 0.0 | 0.5 | 0.6 | 0.0 | 23.9 | 0.2 | 0.0 | 2.0 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.1 | 2.2 | 0.0 | 2.2 | 2.0 | 0.0 | 3.8 | 2.4 | 0.0 | 1.8 | 3.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 63.3 | 54.7 | 0.0 | 52.4 | 54.7 | 0.0 | 78.8 | 13.2 | 0.0 | 57.9 | 14.8 | 0.0 |
| LnGrp LOS | E | D | | D | D | | E | B | | E | B | |
| Approach Vol, veh/h | | 485 | A | | 369 | A | | 671 | A | | 618 | A |
| Approach Delay, s/veh | | 59.2 | | | 53.7 | | | 23.2 | | | 23.1 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.3 | 74.1 | 17.4 | 15.2 | 15.1 | 72.3 | 17.6 | 15.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 9.3 | 39.5 | 13.5 | 31.5 | 9.5 | 39.5 | 13.5 | 31.5 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 9.1 | 7.2 | 7.2 | 8.8 | 11.5 | 11.0 | 7.0 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.1 | 0.9 | 0.0 | 1.9 | 0.1 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 36.6 |
| HCM 6th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 137 | 224 | 166 | 915 | 708 | 225 | 109 | 925 | 240 | 147 | 1172 | 217 |
| Future Volume (veh/h) | 137 | 224 | 166 | 915 | 708 | 225 | 109 | 925 | 240 | 147 | 1172 | 217 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1841 | 1767 | 1870 | 1870 | 1856 | 1767 | 1870 | 1796 | 1841 | 1870 | 1826 |
| Adj Flow Rate, veh/h | 147 | 241 | 0 | 984 | 761 | 0 | 117 | 995 | 0 | 158 | 1260 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 4 | 9 | 2 | 2 | 3 | 9 | 2 | 7 | 4 | 2 | 5 |
| Cap, veh/h | 158 | 330 | | 1023 | 970 | | 278 | 1113 | | 387 | 1394 | |
| Arrive On Green | 0.09 | 0.07 | 0.00 | 0.30 | 0.27 | 0.00 | 0.33 | 0.44 | 0.00 | 0.22 | 0.27 | 0.00 |
| Sat Flow, veh/h | 1781 | 5191 | 0 | 3456 | 3554 | 1572 | 1682 | 5106 | 1522 | 1753 | 5106 | 1547 |
| Grp Volume(v), veh/h | 147 | 241 | 0 | 984 | 761 | 0 | 117 | 995 | 0 | 158 | 1260 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1675 | 0 | 1728 | 1777 | 1572 | 1682 | 1702 | 1522 | 1753 | 1702 | 1547 |
| Q Serve(g_s), s | 10.7 | 6.1 | 0.0 | 36.4 | 25.8 | 0.0 | 7.0 | 23.4 | 0.0 | 10.0 | 31.0 | 0.0 |
| Cycle Q Clear(g_c), s | 10.7 | 6.1 | 0.0 | 36.4 | 25.8 | 0.0 | 7.0 | 23.4 | 0.0 | 10.0 | 31.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 158 | 330 | | 1023 | 970 | | 278 | 1113 | | 387 | 1394 | |
| V/C Ratio(X) | 0.93 | 0.73 | | 0.96 | 0.78 | | 0.42 | 0.89 | | 0.41 | 0.90 | |
| Avail Cap(c_a), veh/h | 158 | 445 | | 1023 | 1052 | | 278 | 1198 | | 387 | 1434 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.90 | 0.90 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 58.9 | 59.6 | 0.0 | 45.1 | 43.7 | 0.0 | 38.6 | 35.3 | 0.0 | 43.4 | 45.6 | 0.0 |
| Incr Delay (d2), s/veh | 51.9 | 4.0 | 0.0 | 19.5 | 3.7 | 0.0 | 0.7 | 10.2 | 0.0 | 0.5 | 9.9 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.0 | 2.7 | 0.0 | 18.0 | 11.6 | 0.0 | 2.7 | 8.0 | 0.0 | 4.3 | 13.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 110.7 | 63.7 | 0.0 | 64.6 | 47.4 | 0.0 | 39.3 | 45.4 | 0.0 | 43.9 | 55.5 | 0.0 |
| LnGrp LOS | F | E | | E | D | | D | D | | D | E | |
| Approach Vol, veh/h | | 388 | A | | 1745 | A | | 1112 | A | | 1418 | A |
| Approach Delay, s/veh | | 81.5 | | | 57.1 | | | 44.8 | | | 54.2 | |
| Approach LOS | | F | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 35.2 | 34.8 | 45.0 | 15.0 | 28.0 | 42.0 | 18.0 | 42.0 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 23.5 | 30.5 | 38.5 | 11.5 | 17.5 | 36.5 | 11.5 | 38.5 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 25.4 | 38.4 | 8.1 | 9.0 | 33.0 | 12.7 | 27.8 |
| Green Ext Time (p_c), s | 0.2 | 2.9 | 0.0 | 0.4 | 0.1 | 2.5 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 55.3 |
| HCM 6th LOS | E |

**Notes**

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 58 | 0 | 52 | 0 | 1200 | 23 | 2 | 30 | 2288 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 58 | 0 | 52 | 0 | 1200 | 23 | 2 | 30 | 2288 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1633 | 1870 | 1381 | 1870 | 1870 | 1426 | | 1233 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 62 | 0 | 55 | 0 | 1277 | 24 | | 32 | 2434 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 18 | 2 | 35 | 2 | 2 | 32 | | 45 | 2 | 2 |
| Cap, veh/h | 0 | 174 | 0 | 110 | 6 | 66 | 1 | 2592 | 613 | | 284 | 4101 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.09 | 0.00 | 0.51 | 0.51 | | 0.48 | 1.00 | 0.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 730 | 68 | 708 | 1781 | 5106 | 1207 | | 1174 | 5274 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 117 | 0 | 0 | 0 | 1277 | 24 | | 32 | 2434 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1506 | 0 | 0 | 1781 | 1702 | 1207 | | 1174 | 1702 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 0.0 | 21.3 | 1.3 | | 1.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 | 0.0 | 21.3 | 1.3 | | 1.9 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 0.53 | | 0.47 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 174 | 0 | 182 | 0 | 0 | 1 | 2592 | 613 | | 284 | 4101 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.64 | 0.00 | 0.00 | 0.00 | 0.49 | 0.04 | | 0.11 | 0.59 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 266 | 0 | 256 | 0 | 0 | 226 | 2592 | 613 | | 284 | 4101 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.96 | 0.96 | | 0.35 | 0.35 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 57.9 | 0.0 | 0.0 | 0.0 | 21.0 | 16.1 | | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 5.3 | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 | | 0.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 | 0.0 | 8.1 | 0.4 | | 0.5 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 0.0 | 63.2 | 0.0 | 0.0 | 0.0 | 21.7 | 16.2 | | 26.0 | 0.2 | 0.0 |
| LnGrp LOS | A | A | A | E | A | A | A | C | B | | C | A | A |
| Approach Vol, veh/h | | 0 | | | 117 | | | 1301 | | | | 2466 | |
| Approach Delay, s/veh | | 0.0 | | | 63.2 | | | 21.6 | | | | 0.6 | |
| Approach LOS | | | | | E | | | C | | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 38.4 | 73.0 | | 18.6 | 0.0 | 111.4 | | 18.6 |
| Change Period (Y+Rc), s | 7.0 | * 7 | | 6.5 | 6.5 | 7.0 | | 6.5 |
| Max Green Setting (Gmax), s | 25.5 | * 66 | | 18.5 | 16.5 | 75.0 | | 18.5 |
| Max Q Clear Time (g_c+I1), s | 13.9 | 23.3 | | 0.0 | 0.0 | 2.0 | | 11.9 |
| Green Ext Time (p_c), s | 0.1 | 15.9 | | 0.0 | 0.0 | 53.8 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 9.5 |
| HCM 6th LOS | A |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 12 | 49 | 23 | 1187 | 0 | 2364 | 9 |
| Future Volume (veh/h) | 12 | 49 | 23 | 1187 | 0 | 2364 | 9 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1203 | 1319 | 1267 | 1863 | | 1863 | 1067 |
| Adj Flow Rate, veh/h | 12 | 0 | 24 | 1236 | | 2462 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 |
| Percent Heavy Veh, % | 58 | 44 | 50 | 2 | | 2 | 78 |
| Cap, veh/h | 21 | 21 | 183 | 3668 | | 2964 | 529 |
| Arrive On Green | 0.02 | 0.00 | 0.03 | 0.72 | | 0.58 | 0.00 |
| Sat Flow, veh/h | 1145 | 1122 | 1206 | 5253 | | 5253 | 907 |
| Grp Volume(v), veh/h | 12 | 0 | 24 | 1236 | | 2462 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1145 | 1122 | 1206 | 1695 | | 1695 | 907 |
| Q Serve(g_s), s | 0.5 | 0.0 | 0.3 | 4.5 | | 19.6 | 0.0 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.3 | 4.5 | | 19.6 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 21 | 21 | 183 | 3668 | | 2964 | 529 |
| V/C Ratio(X) | 0.57 | 0.00 | 0.13 | 0.34 | | 0.83 | 0.00 |
| Avail Cap(c_a), veh/h | 459 | 449 | 390 | 3668 | | 3054 | 545 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 24.3 | 0.0 | 14.4 | 2.6 | | 8.4 | 0.0 |
| Incr Delay (d2), s/veh | 21.8 | 0.0 | 0.1 | 0.1 | | 2.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.2 | 2.1 | | 9.4 | 0.0 |
| LnGrp Delay(d),s/veh | 46.2 | 0.0 | 14.5 | 2.6 | | 10.4 | 0.0 |
| LnGrp LOS | D | | B | A | | B | |
| Approach Vol, veh/h | 12 | | | 1260 | | 2462 | |
| Approach Delay, s/veh | 46.2 | | | 2.8 | | 10.4 | |
| Approach LOS | D | | | A | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 42.5 | | 7.4 | 6.9 | 35.6 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.5 | | 2.5 | 2.3 | 21.6 | | |
| Green Ext Time (p_c), s | | 8.5 | | 0.0 | 0.0 | 7.6 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.0 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 2 | 14 | 17 | 3 | 29 |
| Future Vol, veh/h | 24 | 2 | 14 | 17 | 3 | 29 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 22 | 50 | 86 | 35 | 33 | 68 |
| Mvmt Flow | 31 | 3 | 18 | 22 | 4 | 37 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 34 | 0 | 91 | 33 |
| Stage 1 | - | - | - | - | 33 | - |
| Stage 2 | - | - | - | - | 58 | - |
| Critical Hdwy | - | - | 4.96 | - | 6.73 | 6.88 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.73 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.73 | - |
| Follow-up Hdwy | - | - | 2.974 | - | 3.797 | 3.912 |
| Pot Cap-1 Maneuver | - | - | 1171 | - | 839 | 880 |
| Stage 1 | - | - | - | - | 915 | - |
| Stage 2 | - | - | - | - | 891 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1171 | - | 826 | 880 |
| Mov Cap-2 Maneuver | - | - | - | - | 826 | - |
| Stage 1 | - | - | - | - | 915 | - |
| Stage 2 | - | - | - | - | 877 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 3.7 | 9.3 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 875 | - | - | 1171 | - |
| HCM Lane V/C Ratio | 0.047 | - | - | 0.015 | - |
| HCM Control Delay (s) | 9.3 | - | - | 8.1 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 21 | 4 | 4 | 106 | 2 | 111 | 10 | 3 | 1141 | 129 | 110 | 2226 |
| Future Volume (veh/h) | 21 | 4 | 4 | 106 | 2 | 111 | 10 | 3 | 1141 | 129 | 110 | 2226 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 | | 1870 | 1856 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 22 | 4 | 4 | 110 | 2 | 0 | | 3 | 1189 | 0 | 115 | 2319 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 3 | | 2 | 3 | 2 | 2 | 3 |
| Cap, veh/h | 195 | 30 | 30 | 173 | 125 | | | 6 | 2849 | | 144 | 3344 |
| Arrive On Green | 0.02 | 0.03 | 0.03 | 0.05 | 0.07 | 0.00 | | 0.00 | 0.56 | 0.00 | 0.08 | 0.64 |
| Sat Flow, veh/h | 1781 | 853 | 853 | 3456 | 1870 | 0 | | 1781 | 5066 | 1585 | 1781 | 5225 |
| Grp Volume(v), veh/h | 22 | 0 | 8 | 110 | 2 | 0 | | 3 | 1189 | 0 | 115 | 1499 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1706 | 1728 | 1870 | 0 | | 1781 | 1689 | 1585 | 1781 | 1689 |
| Q Serve(g_s), s | 1.2 | 0.0 | 0.5 | 3.2 | 0.1 | 0.0 | | 0.2 | 13.8 | 0.0 | 6.5 | 29.6 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 0.5 | 3.2 | 0.1 | 0.0 | | 0.2 | 13.8 | 0.0 | 6.5 | 29.6 |
| Prop In Lane | 1.00 | | 0.50 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 195 | 0 | 60 | 173 | 125 | | | 6 | 2849 | | 144 | 2162 |
| V/C Ratio(X) | 0.11 | 0.00 | 0.13 | 0.64 | 0.02 | | | 0.53 | 0.42 | | 0.80 | 0.69 |
| Avail Cap(c_a), veh/h | 595 | 0 | 414 | 839 | 454 | | | 432 | 3443 | | 432 | 2295 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.7 | 0.0 | 48.2 | 48.0 | 44.9 | 0.0 | | 51.3 | 12.9 | 0.0 | 46.5 | 12.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.4 | 1.5 | 0.0 | 0.0 | | 25.3 | 0.2 | 0.0 | 3.8 | 1.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.2 | 1.4 | 0.0 | 0.0 | | 0.1 | 4.6 | 0.0 | 2.9 | 9.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 43.8 | 0.0 | 48.6 | 49.5 | 44.9 | 0.0 | | 76.6 | 13.1 | 0.0 | 50.4 | 13.2 |
| LnGrp LOS | D | A | D | D | D | | | E | B | | D | B |
| Approach Vol, veh/h | | 30 | | | 112 | A | | | 1192 | A | | 2437 |
| Approach Delay, s/veh | | 45.0 | | | 49.4 | | | | 13.3 | | | 15.2 |
| Approach LOS | | D | | | D | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 64.9 | 12.1 | 10.6 | 7.3 | 72.9 | 8.9 | 13.9 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 8.5 | 15.8 | 5.2 | 2.5 | 2.2 | 31.6 | 3.2 | 2.1 |
| Green Ext Time (p_c), s | 0.1 | 21.1 | 0.2 | 0.0 | 0.0 | 34.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.9 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 3 |
| Future Volume (veh/h) | 3 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 3 |
| Peak Hour Factor | 0.96 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 4 |
| Arrive On Green | 0.64 |
| Sat Flow, veh/h | 7 |
| Grp Volume(v), veh/h | 823 |
| Grp Sat Flow(s),veh/h/ln | 1854 |
| Q Serve(g_s), s | 29.6 |
| Cycle Q Clear(g_c), s | 29.6 |
| Prop In Lane | 0.00 |
| Lane Grp Cap(c), veh/h | 1187 |
| V/C Ratio(X) | 0.69 |
| Avail Cap(c_a), veh/h | 1260 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 12.0 |
| Incr Delay (d2), s/veh | 2.1 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.3 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 14.1 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 47 | 22 | 85 | 109 | 14 | 83 | 4 | 29 | 1240 | 154 | 7 | 96 | 2217 | 24 |
| Future Volume (veh/h) | 47 | 22 | 85 | 109 | 14 | 83 | 4 | 29 | 1240 | 154 | 7 | 96 | 2217 | 24 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1737 | 1870 | 1811 | 1870 | 1796 | 1870 | | 1796 | 1870 | 1870 | | 1870 | 1856 | 1841 |
| Adj Flow Rate, veh/h | 53 | 25 | 0 | 122 | 16 | 0 | | 33 | 1393 | 0 | | 108 | 2491 | 27 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 11 | 2 | 6 | 2 | 7 | 2 | | 7 | 2 | 2 | | 2 | 3 | 4 |
| Cap, veh/h | 67 | 92 | | 149 | 167 | | | 41 | 2832 | | | 134 | 3065 | 33 |
| Arrive On Green | 0.04 | 0.05 | 0.00 | 0.08 | 0.09 | 0.00 | | 0.02 | 0.55 | 0.00 | | 0.08 | 0.59 | 0.59 |
| Sat Flow, veh/h | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 5106 | 1585 | | 1781 | 5167 | 56 |
| Grp Volume(v), veh/h | 53 | 25 | 0 | 122 | 16 | 0 | | 33 | 1393 | 0 | | 108 | 1627 | 891 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 1702 | 1585 | | 1781 | 1689 | 1845 |
| Q Serve(g_s), s | 3.7 | 1.5 | 0.0 | 7.8 | 0.9 | 0.0 | | 2.2 | 19.4 | 0.0 | | 6.9 | 43.9 | 44.1 |
| Cycle Q Clear(g_c), s | 3.7 | 1.5 | 0.0 | 7.8 | 0.9 | 0.0 | | 2.2 | 19.4 | 0.0 | | 6.9 | 43.9 | 44.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 67 | 92 | | 149 | 167 | | | 41 | 2832 | | | 134 | 2003 | 1095 |
| V/C Ratio(X) | 0.79 | 0.27 | | 0.82 | 0.10 | | | 0.80 | 0.49 | | | 0.80 | 0.81 | 0.81 |
| Avail Cap(c_a), veh/h | 228 | 258 | | 338 | 248 | | | 516 | 3079 | | | 460 | 2036 | 1113 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.2 | 53.2 | 0.0 | 52.3 | 48.2 | 0.0 | | 56.4 | 15.8 | 0.0 | | 52.8 | 18.5 | 18.6 |
| Incr Delay (d2), s/veh | 7.7 | 0.6 | 0.0 | 4.1 | 0.1 | 0.0 | | 12.6 | 0.3 | 0.0 | | 4.2 | 2.9 | 5.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 | 0.7 | 0.0 | 3.7 | 0.4 | 0.0 | | 1.1 | 6.8 | 0.0 | | 3.1 | 15.5 | 17.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.9 | 53.8 | 0.0 | 56.4 | 48.3 | 0.0 | | 69.0 | 16.1 | 0.0 | | 57.0 | 21.5 | 23.9 |
| LnGrp LOS | E | D | | E | D | | | E | B | | | E | C | C |
| Approach Vol, veh/h | | 78 | A | | 138 | A | | | 1426 | A | | | 2626 | |
| Approach Delay, s/veh | | 60.0 | | | 55.5 | | | | 17.3 | | | | 23.8 | |
| Approach LOS | | E | | | E | | | | B | | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 71.4 | 16.7 | 12.7 | 10.8 | 75.9 | 11.7 | 17.8 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 18.9 | 21.4 | 9.8 | 3.5 | 4.2 | 46.1 | 5.7 | 2.9 |
| Green Ext Time (p_c), s | 0.1 | 25.2 | 0.1 | 0.0 | 0.0 | 22.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 23.3 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 18 | 105 | 0 | 23 | 0 | 1246 | 123 | 2 | 30 | 2365 | 16 |
| Future Volume (veh/h) | 2 | 2 | 18 | 105 | 0 | 23 | 0 | 1246 | 123 | 2 | 30 | 2365 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1767 | 0 | 1870 | 1870 | | 1870 | 1856 | 1870 |
| Adj Flow Rate, veh/h | 2 | 2 | 19 | 111 | 0 | 0 | 0 | 1312 | 0 | | 32 | 2489 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 9 | 0 | 2 | 2 | | 2 | 3 | 2 |
| Cap, veh/h | 283 | 5 | 49 | 335 | 238 | | 0 | 2384 | | | 70 | 3041 | |
| Arrive On Green | 0.00 | 0.03 | 0.03 | 0.10 | 0.00 | 0.00 | 0.00 | 0.47 | 0.00 | | 0.04 | 0.60 | 0.00 |
| Sat Flow, veh/h | 1781 | 153 | 1450 | 3456 | 1870 | 1497 | 0 | 5274 | 1585 | | 1781 | 5066 | 1585 |
| Grp Volume(v), veh/h | 2 | 0 | 21 | 111 | 0 | 0 | 0 | 1312 | 0 | | 32 | 2489 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1603 | 1728 | 1870 | 1497 | 0 | 1702 | 1585 | | 1781 | 1689 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 1.0 | 2.2 | 0.0 | 0.0 | 0.0 | 13.7 | 0.0 | | 1.3 | 28.7 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 1.0 | 2.2 | 0.0 | 0.0 | 0.0 | 13.7 | 0.0 | | 1.3 | 28.7 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 283 | 0 | 54 | 335 | 238 | | 0 | 2384 | | | 70 | 3041 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.39 | 0.33 | 0.00 | | 0.00 | 0.55 | | | 0.46 | 0.82 | |
| Avail Cap(c_a), veh/h | 613 | 0 | 497 | 1164 | 504 | | 0 | 3095 | | | 384 | 3071 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.1 | 0.0 | 35.1 | 31.3 | 0.0 | 0.0 | 0.0 | 14.2 | 0.0 | | 34.9 | 11.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | | 1.8 | 2.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.4 | 0.9 | 0.0 | 0.0 | 0.0 | 4.3 | 0.0 | | 0.6 | 7.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 28.1 | 0.0 | 36.9 | 31.5 | 0.0 | 0.0 | 0.0 | 14.6 | 0.0 | | 36.7 | 13.7 | 0.0 |
| LnGrp LOS | C | A | D | C | A | | A | B | | | D | B | |
| Approach Vol, veh/h | | 23 | | | 111 | A | | 1312 | A | | | 2521 | A |
| Approach Delay, s/veh | | 36.1 | | | 31.5 | | | 14.6 | | | | 14.0 | |
| Approach LOS | | D | | | C | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 41.2 | 14.2 | 9.0 | | 51.1 | 7.2 | 15.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 15.7 | 4.2 | 3.0 | | 30.7 | 2.1 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 17.6 | 0.2 | 0.0 | | 13.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.8 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 415 | 532 | 155 | 2 | 181 | 782 | 293 | 187 | 716 | 192 | 365 | 1127 | 1014 |
| Future Volume (veh/h) | 415 | 532 | 155 | 2 | 181 | 782 | 293 | 187 | 716 | 192 | 365 | 1127 | 1014 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1870 |
| Adj Flow Rate, veh/h | 441 | 566 | 0 | | 193 | 832 | 0 | 199 | 762 | 0 | 388 | 1199 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 |
| Cap, veh/h | 443 | 1243 | | | 238 | 941 | | 161 | 863 | | 1220 | 1509 | |
| Arrive On Green | 0.13 | 0.24 | 0.00 | | 0.07 | 0.18 | 0.00 | 0.09 | 0.17 | 0.00 | 0.35 | 0.43 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | | 3456 | 5106 | 1585 | 1781 | 5106 | 1585 | 3456 | 3497 | 1585 |
| Grp Volume(v), veh/h | 441 | 566 | 0 | | 193 | 832 | 0 | 199 | 762 | 0 | 388 | 1199 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | | 1728 | 1702 | 1585 | 1781 | 1702 | 1585 | 1728 | 1749 | 1585 |
| Q Serve(g_s), s | 20.4 | 15.1 | 0.0 | | 8.8 | 25.4 | 0.0 | 14.5 | 23.3 | 0.0 | 13.1 | 47.5 | 0.0 |
| Cycle Q Clear(g_c), s | 20.4 | 15.1 | 0.0 | | 8.8 | 25.4 | 0.0 | 14.5 | 23.3 | 0.0 | 13.1 | 47.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 443 | 1243 | | | 238 | 941 | | 161 | 863 | | 1220 | 1509 | |
| V/C Ratio(X) | 1.00 | 0.46 | | | 0.81 | 0.88 | | 1.23 | 0.88 | | 0.32 | 0.79 | |
| Avail Cap(c_a), veh/h | 443 | 1243 | | | 443 | 1069 | | 161 | 1292 | | 1220 | 1509 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 69.7 | 51.5 | 0.0 | | 73.5 | 63.6 | 0.0 | 72.8 | 64.9 | 0.0 | 37.7 | 39.4 | 0.0 |
| Incr Delay (d2), s/veh | 41.6 | 0.1 | 0.0 | | 2.5 | 7.6 | 0.0 | 146.9 | 12.6 | 0.0 | 0.1 | 4.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.5 | 6.4 | 0.0 | | 3.9 | 11.5 | 0.0 | 13.1 | 10.9 | 0.0 | 5.5 | 20.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 111.4 | 51.6 | 0.0 | | 76.0 | 71.2 | 0.0 | 219.6 | 77.6 | 0.0 | 37.8 | 43.8 | 0.0 |
| LnGrp LOS | F | D | | | E | E | | F | E | | D | D | |
| Approach Vol, veh/h | | 1007 | A | | | 1025 | A | | 961 | A | | 1587 | A |
| Approach Delay, s/veh | | 77.8 | | | | 72.1 | | | 107.0 | | | 42.3 | |
| Approach LOS | | E | | | | E | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 63.5 | 33.6 | 17.5 | 45.4 | 21.0 | 76.0 | 27.0 | 36.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | * 7 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 39.0 | 40.5 | 20.5 | 33.5 | 14.5 | * 66 | 20.5 | 33.5 |
| Max Q Clear Time (g_c+I1), s | 15.1 | 25.3 | 10.8 | 17.1 | 16.5 | 49.5 | 22.4 | 27.4 |
| Green Ext Time (p_c), s | 0.7 | 1.6 | 0.2 | 2.1 | 0.0 | 4.8 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 70.3 |
| HCM 6th LOS | E |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 399 | 894 | 137 | 244 | 272 | 287 | 159 | 1489 | 700 | 178 | 950 | 193 |
| Future Volume (veh/h) | 399 | 894 | 137 | 244 | 272 | 287 | 159 | 1489 | 700 | 178 | 950 | 193 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1826 | 1678 | 1767 | 1811 | 1707 | 1826 | 1781 | 1811 | 1752 | 1781 | 1841 |
| Adj Flow Rate, veh/h | 438 | 982 | 0 | 268 | 299 | 0 | 175 | 1636 | 0 | 196 | 1044 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 5 | 15 | 9 | 6 | 13 | 5 | 8 | 6 | 10 | 8 | 4 |
| Cap, veh/h | 453 | 1302 | | 324 | 366 | | 200 | 1277 | | 267 | 1497 | |
| Arrive On Green | 0.25 | 0.26 | 0.00 | 0.10 | 0.11 | 0.00 | 0.15 | 0.35 | 0.00 | 0.16 | 0.31 | 0.00 |
| Sat Flow, veh/h | 1781 | 5149 | 0 | 3264 | 3441 | 1447 | 1739 | 4863 | 1535 | 1668 | 4863 | 1560 |
| Grp Volume(v), veh/h | 438 | 982 | 0 | 268 | 299 | 0 | 175 | 1636 | 0 | 196 | 1044 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1662 | 0 | 1632 | 1721 | 1447 | 1739 | 1621 | 1535 | 1668 | 1621 | 1560 |
| Q Serve(g_s), s | 29.2 | 21.7 | 0.0 | 9.7 | 10.2 | 0.0 | 11.8 | 31.5 | 0.0 | 13.4 | 22.7 | 0.0 |
| Cycle Q Clear(g_c), s | 29.2 | 21.7 | 0.0 | 9.7 | 10.2 | 0.0 | 11.8 | 31.5 | 0.0 | 13.4 | 22.7 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 453 | 1302 | | 324 | 366 | | 200 | 1277 | | 267 | 1497 | |
| V/C Ratio(X) | 0.97 | 0.75 | | 0.83 | 0.82 | | 0.88 | 1.28 | | 0.73 | 0.70 | |
| Avail Cap(c_a), veh/h | 453 | 1302 | | 422 | 444 | | 210 | 1277 | | 267 | 1497 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.57 | 0.57 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 44.3 | 40.8 | 0.0 | 53.0 | 52.5 | 0.0 | 50.0 | 39.1 | 0.0 | 47.9 | 36.6 | 0.0 |
| Incr Delay (d2), s/veh | 33.8 | 2.5 | 0.0 | 9.2 | 9.5 | 0.0 | 19.3 | 130.2 | 0.0 | 9.5 | 2.7 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 16.7 | 9.0 | 0.0 | 4.3 | 4.8 | 0.0 | 5.8 | 26.3 | 0.0 | 6.1 | 8.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 78.0 | 43.3 | 0.0 | 62.2 | 62.0 | 0.0 | 69.3 | 169.3 | 0.0 | 57.4 | 39.3 | 0.0 |
| LnGrp LOS | E | D | | E | E | | E | F | | E | D | |
| Approach Vol, veh/h | | 1420 | A | | 567 | A | | 1811 | A | | 1240 | A |
| Approach Delay, s/veh | | 54.0 | | | 62.1 | | | 159.6 | | | 42.2 | |
| Approach LOS | | D | | | E | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.7 | 38.0 | 18.4 | 37.8 | 20.3 | 43.4 | 37.0 | 19.3 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 16.5 | 31.5 | 15.5 | 30.5 | 14.5 | 33.5 | 30.5 | 15.5 |
| Max Q Clear Time (g_c+I1), s | 15.4 | 33.5 | 11.7 | 23.7 | 13.8 | 24.7 | 31.2 | 12.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.3 | 3.4 | 0.0 | 4.7 | 0.0 | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 90.0 |
| HCM 6th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 13 | 0 | 85 | 1 | 2137 | 32 | 59 | 1246 | 1 |
| Future Volume (veh/h) | 1 | 0 | 0 | 13 | 0 | 85 | 1 | 2137 | 32 | 59 | 1246 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1085 | 1870 | 788 | 1870 | 1841 | 1292 | 1026 | 1796 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 15 | 0 | 98 | 1 | 2456 | 37 | 68 | 1432 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 55 | 2 | 75 | 2 | 4 | 41 | 59 | 7 | 2 |
| Cap, veh/h | 145 | 0 | 0 | 45 | 7 | 121 | 340 | 3312 | 721 | 84 | 2784 | 2 |
| Arrive On Green | 0.09 | 0.00 | 0.00 | 0.09 | 0.00 | 0.09 | 0.19 | 0.66 | 0.66 | 0.09 | 0.55 | 0.55 |
| Sat Flow, veh/h | 962 | 0 | 0 | 127 | 82 | 1368 | 1781 | 5025 | 1094 | 977 | 5061 | 4 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 113 | 0 | 0 | 1 | 2456 | 37 | 68 | 925 | 508 |
| Grp Sat Flow(s),veh/h/ln | 962 | 0 | 0 | 1578 | 0 | 0 | 1781 | 1675 | 1094 | 977 | 1635 | 1796 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 4.3 | 0.0 | 0.0 | 0.1 | 39.1 | 1.4 | 8.2 | 21.3 | 21.3 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 0.1 | 39.1 | 1.4 | 8.2 | 21.3 | 21.3 |
| Prop In Lane | 1.00 | | 0.00 | 0.13 | | 0.87 | 1.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 145 | 0 | 0 | 173 | 0 | 0 | 340 | 3312 | 721 | 84 | 1798 | 988 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.74 | 0.05 | 0.81 | 0.51 | 0.51 |
| Avail Cap(c_a), veh/h | 230 | 0 | 0 | 276 | 0 | 0 | 340 | 3312 | 721 | 151 | 1798 | 988 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.72 | 0.72 | 0.72 | 0.58 | 0.58 | 0.58 |
| Uniform Delay (d), s/veh | 49.9 | 0.0 | 0.0 | 53.7 | 0.0 | 0.0 | 39.3 | 13.6 | 7.2 | 53.9 | 16.9 | 16.9 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.0 | 1.1 | 0.1 | 14.0 | 0.6 | 1.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 0.0 | 12.5 | 0.3 | 2.3 | 7.4 | 8.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 50.0 | 0.0 | 0.0 | 59.5 | 0.0 | 0.0 | 39.3 | 14.7 | 7.3 | 67.8 | 17.6 | 18.1 |
| LnGrp LOS | D | A | A | E | A | A | D | B | A | E | B | B |
| Approach Vol, veh/h | | 1 | | | 113 | | | 2494 | | | 1501 | |
| Approach Delay, s/veh | | 50.0 | | | 59.5 | | | 14.6 | | | 20.0 | |
| Approach LOS | | D | | | E | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 86.8 | 86.1 | | 17.1 | 29.9 | 73.0 | | 17.1 | | | | |
| Change Period (Y+Rc), s | 6.5 | 7.0 | | 6.5 | 7.0 | * 7 | | 6.5 | | | | |
| Max Green Setting (Gmax), s | 18.5 | 63.0 | | 18.5 | 15.5 | * 66 | | 18.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 10.2 | 41.1 | | 2.1 | 2.1 | 23.3 | | 10.4 | | | | |
| Green Ext Time (p_c), s | 0.1 | 19.8 | | 0.0 | 0.0 | 17.6 | | 0.4 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.8 |
| HCM 6th LOS | B |

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 73 | 68 | 73 | 2038 | 0 | 1290 | 76 |
| Future Volume (veh/h) | 73 | 68 | 73 | 2038 | 0 | 1290 | 76 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1086 | 1188 | 1310 | 1863 | | 1827 | 1159 |
| Adj Flow Rate, veh/h | 83 | 0 | 83 | 2316 | | 1466 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | | 0.88 | 0.88 |
| Percent Heavy Veh, % | 75 | 60 | 45 | 2 | | 4 | 64 |
| Cap, veh/h | 87 | 85 | 262 | 3265 | | 2275 | 449 |
| Arrive On Green | 0.08 | 0.00 | 0.07 | 0.64 | | 0.46 | 0.00 |
| Sat Flow, veh/h | 1034 | 1009 | 1248 | 5253 | | 5152 | 985 |
| Grp Volume(v), veh/h | 83 | 0 | 83 | 2316 | | 1466 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1034 | 1009 | 1248 | 1695 | | 1663 | 985 |
| Q Serve(g_s), s | 3.8 | 0.0 | 1.0 | 14.2 | | 10.7 | 0.0 |
| Cycle Q Clear(g_c), s | 3.8 | 0.0 | 1.0 | 14.2 | | 10.7 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 87 | 85 | 262 | 3265 | | 2275 | 449 |
| V/C Ratio(X) | 0.95 | 0.00 | 0.32 | 0.71 | | 0.64 | 0.00 |
| Avail Cap(c_a), veh/h | 436 | 425 | 438 | 3265 | | 3151 | 622 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 21.7 | 0.0 | 11.3 | 5.6 | | 9.9 | 0.0 |
| Incr Delay (d2), s/veh | 34.8 | 0.0 | 0.3 | 0.7 | | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 0.7 | 6.7 | | 5.0 | 0.0 |
| LnGrp Delay(d),s/veh | 56.5 | 0.0 | 11.5 | 6.3 | | 10.3 | 0.0 |
| LnGrp LOS | E | | B | A | | B | |
| Approach Vol, veh/h | 83 | | | 2399 | | 1466 | |
| Approach Delay, s/veh | 56.5 | | | 6.5 | | 10.3 | |
| Approach LOS | E | | | A | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 37.0 | | 10.5 | 8.8 | 28.2 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 16.2 | | 5.8 | 3.0 | 12.7 | | |
| Green Ext Time (p_c), s | | 11.4 | | 0.2 | 0.0 | 8.9 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.9 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.7 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 46 | 7 | 125 | 29 | 3 | 93 |
| Future Vol, veh/h | 46 | 7 | 125 | 29 | 3 | 93 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 72 | 20 | 57 | 45 | 100 | 66 |
| Mvmt Flow | 61 | 9 | 167 | 39 | 4 | 124 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 70 | 0 | 439 | 66 |
| Stage 1 | - | - | - | - | 66 | - |
| Stage 2 | - | - | - | - | 373 | - |
| Critical Hdwy | - | - | 4.67 | - | 7.4 | 6.86 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.713 | - | 4.4 | 3.894 |
| Pot Cap-1 Maneuver | - | - | 1244 | - | 429 | 845 |
| Stage 1 | - | - | - | - | 757 | - |
| Stage 2 | - | - | - | - | 525 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1244 | - | 370 | 845 |
| Mov Cap-2 Maneuver | - | - | - | - | 370 | - |
| Stage 1 | - | - | - | - | 757 | - |
| Stage 2 | - | - | - | - | 453 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.8 | 10.3 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 812 | - | - | 1244 | - |
| HCM Lane V/C Ratio | 0.158 | - | - | 0.134 | - |
| HCM Control Delay (s) | 10.3 | - | - | 8.3 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.6 | - | - | 0.5 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 4 | 1 | 0 | 204 | 0 | 217 | 23 | 68 | 1967 | 111 | 132 | 1108 |
| Future Volume (veh/h) | 4 | 1 | 0 | 204 | 0 | 217 | 23 | 68 | 1967 | 111 | 132 | 1108 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1826 | 1870 | 1841 | | 1870 | 1856 | 1796 | 1752 | 1811 |
| Adj Flow Rate, veh/h | 4 | 1 | 0 | 224 | 0 | 0 | | 75 | 2162 | 0 | 145 | 1218 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 5 | 2 | 4 | | 2 | 3 | 7 | 10 | 6 |
| Cap, veh/h | 194 | 14 | 0 | 287 | 166 | | | 96 | 2871 | | 171 | 3066 |
| Arrive On Green | 0.00 | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 | | 0.05 | 0.57 | 0.00 | 0.10 | 0.62 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3374 | 1870 | 0 | | 1781 | 5066 | 1522 | 1668 | 4982 |
| Grp Volume(v), veh/h | 4 | 1 | 0 | 224 | 0 | 0 | | 75 | 2162 | 0 | 145 | 806 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1687 | 1870 | 0 | | 1781 | 1689 | 1522 | 1668 | 1648 |
| Q Serve(g_s), s | 0.2 | 0.1 | 0.0 | 7.7 | 0.0 | 0.0 | | 4.9 | 38.0 | 0.0 | 10.1 | 14.6 |
| Cycle Q Clear(g_c), s | 0.2 | 0.1 | 0.0 | 7.7 | 0.0 | 0.0 | | 4.9 | 38.0 | 0.0 | 10.1 | 14.6 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 194 | 14 | 0 | 287 | 166 | | | 96 | 2871 | | 171 | 2029 |
| V/C Ratio(X) | 0.02 | 0.07 | 0.00 | 0.78 | 0.00 | | | 0.78 | 0.75 | | 0.85 | 0.40 |
| Avail Cap(c_a), veh/h | 565 | 397 | 0 | 716 | 397 | | | 378 | 3012 | | 354 | 2029 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.6 | 58.0 | 0.0 | 52.8 | 0.0 | 0.0 | | 55.0 | 19.3 | 0.0 | 51.9 | 11.5 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.0 | 1.8 | 0.0 | 0.0 | | 5.0 | 1.3 | 0.0 | 4.4 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 3.3 | 0.0 | 0.0 | | 2.3 | 13.4 | 0.0 | 4.3 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 48.6 | 58.7 | 0.0 | 54.5 | 0.0 | 0.0 | | 60.0 | 20.6 | 0.0 | 56.3 | 11.8 |
| LnGrp LOS | D | E | A | D | A | | | E | C | | E | B |
| Approach Vol, veh/h | | 5 | | | 224 | A | | | 2237 | A | | 1389 |
| Approach Delay, s/veh | | 50.6 | | | 54.5 | | | | 21.9 | | | 16.5 |
| Approach LOS | | D | | | D | | | | C | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.1 | 73.7 | 17.0 | 7.9 | 13.4 | 79.4 | 7.5 | 17.4 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 40.0 | 9.7 | 2.1 | 6.9 | 16.7 | 2.2 | 0.0 |
| Green Ext Time (p_c), s | 0.1 | 26.8 | 0.4 | 0.0 | 0.1 | 21.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 21.9 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 24 |
| Future Volume (veh/h) | 24 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 26 |
| Peak Hour Factor | 0.91 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 65 |
| Arrive On Green | 0.62 |
| Sat Flow, veh/h | 106 |
| Grp Volume(v), veh/h | 438 |
| Grp Sat Flow(s),veh/h/ln | 1792 |
| Q Serve(g_s), s | 14.7 |
| Cycle Q Clear(g_c), s | 14.7 |
| Prop In Lane | 0.06 |
| Lane Grp Cap(c), veh/h | 1103 |
| V/C Ratio(X) | 0.40 |
| Avail Cap(c_a), veh/h | 1103 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 11.5 |
| Incr Delay (d2), s/veh | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.2 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 12.0 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 29 | 46 | 247 | 24 | 243 | 42 | 1869 | 105 | 4 | 122 | 1135 | 29 |
| Future Volume (veh/h) | 42 | 29 | 46 | 247 | 24 | 243 | 42 | 1869 | 105 | 4 | 122 | 1135 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1826 | 1530 | 1870 | 1811 | 1870 | 1441 | 1841 | 1870 | | 1870 | 1811 | 1604 |
| Adj Flow Rate, veh/h | 46 | 32 | 0 | 268 | 26 | 0 | 46 | 2032 | 0 | | 133 | 1234 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 14 | 5 | 25 | 2 | 6 | 2 | 31 | 4 | 2 | | 2 | 6 | 20 |
| Cap, veh/h | 57 | 82 | | 290 | 312 | | 55 | 2513 | | | 158 | 2665 | 69 |
| Arrive On Green | 0.04 | 0.04 | 0.00 | 0.16 | 0.17 | 0.00 | 0.04 | 0.50 | 0.00 | | 0.09 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 5025 | 1585 | | 1781 | 4955 | 128 |
| Grp Volume(v), veh/h | 46 | 32 | 0 | 268 | 26 | 0 | 46 | 2032 | 0 | | 133 | 821 | 445 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 1675 | 1585 | | 1781 | 1648 | 1788 |
| Q Serve(g_s), s | 3.8 | 2.3 | 0.0 | 20.0 | 1.6 | 0.0 | 4.5 | 45.9 | 0.0 | | 9.9 | 20.7 | 20.7 |
| Cycle Q Clear(g_c), s | 3.8 | 2.3 | 0.0 | 20.0 | 1.6 | 0.0 | 4.5 | 45.9 | 0.0 | | 9.9 | 20.7 | 20.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 57 | 82 | | 290 | 312 | | 55 | 2513 | | | 158 | 1773 | 961 |
| V/C Ratio(X) | 0.80 | 0.39 | | 0.92 | 0.08 | | 0.84 | 0.81 | | | 0.84 | 0.46 | 0.46 |
| Avail Cap(c_a), veh/h | 191 | 216 | | 290 | 312 | | 355 | 2603 | | | 395 | 1773 | 961 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 64.7 | 62.7 | 0.0 | 55.7 | 47.0 | 0.0 | 64.4 | 28.4 | 0.0 | | 60.6 | 19.2 | 19.2 |
| Incr Delay (d2), s/veh | 9.2 | 1.1 | 0.0 | 33.0 | 0.0 | 0.0 | 12.0 | 2.3 | 0.0 | | 4.6 | 0.4 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 | 1.1 | 0.0 | 11.7 | 0.7 | 0.0 | 1.7 | 17.6 | 0.0 | | 4.6 | 7.5 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 73.9 | 63.8 | 0.0 | 88.8 | 47.0 | 0.0 | 76.5 | 30.6 | 0.0 | | 65.2 | 19.6 | 20.0 |
| LnGrp LOS | E | E | | F | D | | E | C | | | E | B | B |
| Approach Vol, veh/h | | 78 | A | | 294 | A | | 2078 | A | | | 1399 | |
| Approach Delay, s/veh | | 69.8 | | | 85.1 | | | 31.6 | | | | 24.1 | |
| Approach LOS | | E | | | F | | | C | | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.5 | 74.6 | 29.0 | 13.1 | 13.4 | 79.7 | 11.8 | 30.3 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 20.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 11.9 | 47.9 | 22.0 | 4.3 | 6.5 | 22.7 | 5.8 | 3.6 |
| Green Ext Time (p_c), s | 0.1 | 19.7 | 0.0 | 0.0 | 0.0 | 21.1 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 33.7 |
| HCM 6th LOS | C |

**Notes**

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 9 | 1 | 149 | 0 | 57 | 0 | 1996 | 88 | 30 | 1398 | 0 |
| Future Volume (veh/h) | 0 | 9 | 1 | 149 | 0 | 57 | 0 | 1996 | 88 | 30 | 1398 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1796 | 0 | 1841 | 1826 | 1826 | 1811 | 1870 |
| Adj Flow Rate, veh/h | 0 | 10 | 1 | 162 | 0 | 0 | 0 | 2170 | 0 | 33 | 1520 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 7 | 0 | 4 | 5 | 5 | 6 | 2 |
| Cap, veh/h | 365 | 32 | 3 | 322 | 366 | | 0 | 2651 | | 67 | 3210 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.09 | 0.00 | 0.00 | 0.00 | 0.53 | 0.00 | 0.04 | 0.65 | 0.00 |
| Sat Flow, veh/h | 1781 | 1673 | 167 | 3456 | 1870 | 1522 | 0 | 5191 | 1547 | 1739 | 4944 | 1585 |
| Grp Volume(v), veh/h | 0 | 0 | 11 | 162 | 0 | 0 | 0 | 2170 | 0 | 33 | 1520 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1840 | 1728 | 1870 | 1522 | 0 | 1675 | 1547 | 1739 | 1648 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.5 | 3.7 | 0.0 | 0.0 | 0.0 | 30.1 | 0.0 | 1.6 | 13.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.5 | 3.7 | 0.0 | 0.0 | 0.0 | 30.1 | 0.0 | 1.6 | 13.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 365 | 0 | 35 | 322 | 366 | | 0 | 2651 | | 67 | 3210 | |
| V/C Ratio(X) | 0.00 | 0.00 | 0.31 | 0.50 | 0.00 | | 0.00 | 0.82 | | 0.49 | 0.47 | |
| Avail Cap(c_a), veh/h | 660 | 0 | 504 | 1029 | 446 | | 0 | 2695 | | 332 | 3210 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 40.6 | 36.2 | 0.0 | 0.0 | 0.0 | 16.5 | 0.0 | 39.6 | 7.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.8 | 0.5 | 0.0 | 0.0 | 0.0 | 2.4 | 0.0 | 2.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.2 | 1.6 | 0.0 | 0.0 | 0.0 | 9.8 | 0.0 | 0.7 | 3.3 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 42.4 | 36.7 | 0.0 | 0.0 | 0.0 | 18.8 | 0.0 | 41.7 | 7.7 | 0.0 |
| LnGrp LOS | A | A | D | D | A | | A | B | | D | A | |
| Approach Vol, veh/h | | 11 | | | 162 | A | | 2170 | A | | 1553 | A |
| Approach Delay, s/veh | | 42.4 | | | 36.7 | | | 18.8 | | | 8.4 | |
| Approach LOS | | D | | | D | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 80.2 | 50.8 | 14.8 | 8.1 | | 61.0 | 0.0 | 22.9 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.8 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 13.6 | 32.1 | 5.7 | 2.5 | | 15.1 | 0.0 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 12.1 | 0.3 | 0.0 | | 20.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.5 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 813 | 1129 | 190 | 103 | 364 | 290 | 101 | 957 | 161 | 253 | 777 | 477 |
| Future Volume (veh/h) | 813 | 1129 | 190 | 103 | 364 | 290 | 101 | 957 | 161 | 253 | 777 | 477 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1856 | 1811 | 1856 | 1796 | 1870 | 1870 | 1781 | 1856 |
| Adj Flow Rate, veh/h | 856 | 1188 | 0 | 108 | 383 | 0 | 106 | 1007 | 0 | 266 | 818 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 7 | 2 | 2 | 8 | 3 |
| Cap, veh/h | 916 | 1635 | | 161 | 515 | | 277 | 1567 | | 320 | 879 | |
| Arrive On Green | 0.27 | 0.32 | 0.00 | 0.05 | 0.10 | 0.00 | 0.16 | 0.32 | 0.00 | 0.09 | 0.26 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | 3456 | 5066 | 1535 | 1767 | 4904 | 1585 | 3456 | 3385 | 1572 |
| Grp Volume(v), veh/h | 856 | 1188 | 0 | 108 | 383 | 0 | 106 | 1007 | 0 | 266 | 818 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | 1728 | 1689 | 1535 | 1767 | 1635 | 1585 | 1728 | 1692 | 1572 |
| Q Serve(g_s), s | 29.0 | 24.7 | 0.0 | 3.7 | 8.8 | 0.0 | 6.5 | 21.1 | 0.0 | 9.1 | 28.3 | 0.0 |
| Cycle Q Clear(g_c), s | 29.0 | 24.7 | 0.0 | 3.7 | 8.8 | 0.0 | 6.5 | 21.1 | 0.0 | 9.1 | 28.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 916 | 1635 | | 161 | 515 | | 277 | 1567 | | 320 | 879 | |
| V/C Ratio(X) | 0.93 | 0.73 | | 0.67 | 0.74 | | 0.38 | 0.64 | | 0.83 | 0.93 | |
| Avail Cap(c_a), veh/h | 994 | 1808 | | 331 | 823 | | 277 | 1567 | | 346 | 917 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.1 | 36.1 | 0.0 | 56.3 | 52.4 | 0.0 | 45.4 | 35.0 | 0.0 | 53.5 | 43.4 | 0.0 |
| Incr Delay (d2), s/veh | 14.1 | 1.1 | 0.0 | 1.8 | 0.8 | 0.0 | 0.3 | 2.0 | 0.0 | 13.4 | 17.6 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 18.7 | 10.0 | 0.0 | 1.6 | 3.7 | 0.0 | 2.8 | 8.3 | 0.0 | 4.4 | 13.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 57.2 | 37.2 | 0.0 | 58.1 | 53.2 | 0.0 | 45.7 | 37.0 | 0.0 | 66.9 | 61.0 | 0.0 |
| LnGrp LOS | E | D | | E | D | | D | D | | E | E | |
| Approach Vol, veh/h | | 2044 | A | | 491 | A | | 1113 | A | | 1084 | A |
| Approach Delay, s/veh | | 45.6 | | | 54.3 | | | 37.8 | | | 62.5 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.1 | 44.8 | 12.1 | 44.9 | 25.3 | 37.6 | 38.3 | 18.7 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 12.0 | 27.5 | 11.5 | 42.5 | 7.5 | 32.5 | 34.5 | 19.5 |
| Max Q Clear Time (g_c+I1), s | 11.1 | 23.1 | 5.7 | 26.7 | 8.5 | 30.3 | 31.0 | 10.8 |
| Green Ext Time (p_c), s | 0.1 | 1.2 | 0.1 | 4.8 | 0.0 | 0.8 | 0.8 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 48.5 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 125 | 210 | 70 | 204 | 218 | 177 | 85 | 841 | 213 | 137 | 786 | 119 |
| Future Volume (veh/h) | 125 | 210 | 70 | 204 | 218 | 177 | 85 | 841 | 213 | 137 | 786 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1693 | 1752 | 1811 | 1678 | 1826 | 1737 | 1426 | 1693 | 1737 | 1767 | 1648 | 1722 |
| Adj Flow Rate, veh/h | 132 | 221 | 0 | 215 | 229 | 0 | 89 | 885 | 0 | 144 | 827 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 14 | 10 | 6 | 15 | 5 | 11 | 32 | 14 | 11 | 9 | 17 | 12 |
| Cap, veh/h | 173 | 520 | | 416 | 472 | | 106 | 1368 | | 181 | 1463 | |
| Arrive On Green | 0.11 | 0.11 | 0.00 | 0.13 | 0.14 | 0.00 | 0.08 | 0.30 | 0.00 | 0.11 | 0.33 | 0.00 |
| Sat Flow, veh/h | 1612 | 4940 | 0 | 3100 | 3469 | 1472 | 1358 | 4621 | 1472 | 1682 | 4499 | 1459 |
| Grp Volume(v), veh/h | 132 | 221 | 0 | 215 | 229 | 0 | 89 | 885 | 0 | 144 | 827 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1594 | 0 | 1550 | 1735 | 1472 | 1358 | 1540 | 1472 | 1682 | 1500 | 1459 |
| Q Serve(g_s), s | 5.9 | 3.2 | 0.0 | 4.7 | 4.5 | 0.0 | 4.8 | 12.3 | 0.0 | 6.1 | 11.2 | 0.0 |
| Cycle Q Clear(g_c), s | 5.9 | 3.2 | 0.0 | 4.7 | 4.5 | 0.0 | 4.8 | 12.3 | 0.0 | 6.1 | 11.2 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 173 | 520 | | 416 | 472 | | 106 | 1368 | | 181 | 1463 | |
| V/C Ratio(X) | 0.76 | 0.42 | | 0.52 | 0.49 | | 0.84 | 0.65 | | 0.80 | 0.57 | |
| Avail Cap(c_a), veh/h | 658 | 1951 | | 1686 | 1887 | | 369 | 2828 | | 458 | 1836 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 31.9 | 30.6 | 0.0 | 29.6 | 29.4 | 0.0 | 33.4 | 22.5 | 0.0 | 32.0 | 20.5 | 0.0 |
| Incr Delay (d2), s/veh | 5.2 | 0.6 | 0.0 | 0.7 | 0.8 | 0.0 | 12.1 | 0.6 | 0.0 | 5.9 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 1.2 | 0.0 | 1.7 | 1.8 | 0.0 | 1.8 | 3.9 | 0.0 | 2.6 | 3.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.1 | 31.2 | 0.0 | 30.3 | 30.2 | 0.0 | 45.5 | 23.2 | 0.0 | 38.0 | 20.9 | 0.0 |
| LnGrp LOS | D | C | | C | C | | D | C | | D | C | |
| Approach Vol, veh/h | | 353 | A | | 444 | A | | 974 | A | | 971 | A |
| Approach Delay, s/veh | | 33.4 | | | 30.3 | | | 25.2 | | | 23.5 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 28.3 | 16.4 | 14.5 | 12.2 | 30.4 | 14.4 | 16.5 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 20.0 | 45.0 | 40.0 | 30.0 | 20.0 | 30.0 | 30.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 14.3 | 6.7 | 5.2 | 6.8 | 13.2 | 7.9 | 6.5 |
| Green Ext Time (p_c), s | 0.2 | 7.5 | 0.5 | 1.3 | 0.1 | 5.6 | 0.2 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 26.5 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 34 | 0 | 86 | 1 | 1078 | 43 | 9 | 93 | 940 | 0 |
| Future Volume (veh/h) | 1 | 0 | 0 | 34 | 0 | 86 | 1 | 1078 | 43 | 9 | 93 | 940 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1218 | 1870 | 833 | 1870 | 1737 | 863 | | 892 | 1737 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 37 | 0 | 95 | 1 | 1185 | 47 | | 102 | 1033 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 46 | 2 | 72 | 2 | 11 | 70 | | 68 | 11 | 2 |
| Cap, veh/h | 181 | 0 | 0 | 79 | 12 | 122 | 248 | 2675 | 412 | | 118 | 2675 | 0 |
| Arrive On Green | 0.11 | 0.00 | 0.00 | 0.11 | 0.00 | 0.11 | 0.14 | 0.56 | 0.56 | | 0.14 | 0.56 | 0.00 |
| Sat Flow, veh/h | 1042 | 0 | 0 | 331 | 107 | 1124 | 1781 | 4742 | 731 | | 850 | 4898 | 0 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 132 | 0 | 0 | 1 | 1185 | 47 | | 102 | 1033 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1042 | 0 | 0 | 1562 | 0 | 0 | 1781 | 1581 | 731 | | 850 | 1581 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 0.1 | 15.4 | 3.2 | | 12.5 | 12.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 8.7 | 0.0 | 0.0 | 0.1 | 15.4 | 3.2 | | 12.5 | 12.9 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 0.28 | | 0.72 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 181 | 0 | 0 | 213 | 0 | 0 | 248 | 2675 | 412 | | 118 | 2675 | 0 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.62 | 0.00 | 0.00 | 0.00 | 0.44 | 0.11 | | 0.86 | 0.39 | 0.00 |
| Avail Cap(c_a), veh/h | 529 | 0 | 0 | 623 | 0 | 0 | 502 | 2675 | 412 | | 240 | 2675 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 42.3 | 0.0 | 0.0 | 46.1 | 0.0 | 0.0 | 39.4 | 13.5 | 10.8 | | 44.8 | 12.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 | 0.0 | 0.5 | 0.6 | | 21.7 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 0.0 | 4.9 | 0.5 | | 3.2 | 4.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 42.3 | 0.0 | 0.0 | 50.2 | 0.0 | 0.0 | 39.4 | 14.0 | 11.4 | | 66.4 | 13.3 | 0.0 |
| LnGrp LOS | D | A | A | D | A | A | D | B | B | | E | B | A |
| Approach Vol, veh/h | | 1 | | | 132 | | | 1233 | | | | 1135 | |
| Approach Delay, s/veh | | 42.3 | | | 50.2 | | | 13.9 | | | | 18.1 | |
| Approach LOS | | D | | | D | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.3 | 67.0 | | 18.1 | 21.3 | 67.0 | | 18.1 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | | 6.5 | 6.5 | 7.0 | | 6.5 |
| Max Green Setting (Gmax), s | 30.0 | 60.0 | | 40.0 | 30.0 | 60.0 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 14.5 | 17.4 | | 2.1 | 2.1 | 14.9 | | 10.7 |
| Green Ext Time (p_c), s | 0.3 | 14.7 | | 0.0 | 0.0 | 11.9 | | 1.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 17.8 |
| HCM 6th LOS | | B |

Notes

User approved ignoring U-Turning movement.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 95 | 73 | 72 | 1007 | 3 | 885 | 98 |
| Future Volume (veh/h) | 95 | 73 | 72 | 1007 | 3 | 885 | 98 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1056 | 1080 | 1145 | 1776 | | 1827 | 1027 |
| Adj Flow Rate, veh/h | 102 | 0 | 77 | 1083 | | 952 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | | 0.93 | 0.93 |
| Percent Heavy Veh, % | 80 | 76 | 66 | 7 | | 4 | 85 |
| Cap, veh/h | 109 | 100 | 260 | 2973 | | 2134 | 374 |
| Arrive On Green | 0.11 | 0.00 | 0.07 | 0.61 | | 0.43 | 0.00 |
| Sat Flow, veh/h | 1005 | 918 | 1090 | 5007 | | 5152 | 873 |
| Grp Volume(v), veh/h | 102 | 0 | 77 | 1083 | | 952 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1005 | 918 | 1090 | 1616 | | 1663 | 873 |
| Q Serve(g_s), s | 4.7 | 0.0 | 1.1 | 5.2 | | 6.3 | 0.0 |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 1.1 | 5.2 | | 6.3 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 109 | 100 | 260 | 2973 | | 2134 | 374 |
| V/C Ratio(X) | 0.93 | 0.00 | 0.30 | 0.36 | | 0.45 | 0.00 |
| Avail Cap(c_a), veh/h | 430 | 393 | 419 | 3112 | | 3202 | 560 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.7 | 0.0 | 10.5 | 4.5 | | 9.5 | 0.0 |
| Incr Delay (d2), s/veh | 26.7 | 0.0 | 0.2 | 0.1 | | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 0.0 | 0.6 | 2.3 | | 2.8 | 0.0 |
| LnGrp Delay(d),s/veh | 47.3 | 0.0 | 10.7 | 4.6 | | 9.6 | 0.0 |
| LnGrp LOS | D | | B | A | | A | |
| Approach Vol, veh/h | 102 | | | 1160 | | 952 | |
| Approach Delay, s/veh | 47.3 | | | 5.0 | | 9.6 | |
| Approach LOS | D | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 35.2 | | 11.6 | 8.7 | 26.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 7.2 | | 6.7 | 3.1 | 8.3 | | |
| Green Ext Time (p_c), s | | 7.2 | | 0.2 | 0.0 | 6.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.9 |
| HCM 2010 LOS | A |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 33 | 3 | 137 | 34 | 6 | 137 |
| Future Vol, veh/h | 33 | 3 | 137 | 34 | 6 | 137 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 74 | 2 | 77 | 79 | 100 | 80 |
| Mvmt Flow | 37 | 3 | 152 | 38 | 7 | 152 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 40 | 0 | 381 | 39 |
| Stage 1 | - | - | - | - | 39 | - |
| Stage 2 | - | - | - | - | 342 | - |
| Critical Hdwy | - | - | 4.87 | - | 7.4 | 7 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.4 | - |
| Follow-up Hdwy | - | - | 2.893 | - | 4.4 | 4.02 |
| Pot Cap-1 Maneuver | - | - | 1198 | - | 468 | 848 |
| Stage 1 | - | - | - | - | 782 | - |
| Stage 2 | - | - | - | - | 545 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1198 | - | 407 | 848 |
| Mov Cap-2 Maneuver | - | - | - | - | 407 | - |
| Stage 1 | - | - | - | - | 782 | - |
| Stage 2 | - | - | - | - | 474 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 6.8 | 10.5 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 811 | - | - | 1198 | - |
| HCM Lane V/C Ratio | 0.196 | - | - | 0.127 | - |
| HCM Control Delay (s) | 10.5 | - | - | 8.4 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.7 | - | - | 0.4 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 13 | 0 | 3 | 139 | 9 | 86 | 11 | 26 | 1012 | 119 | 76 | 874 |
| Future Volume (veh/h) | 13 | 0 | 3 | 139 | 9 | 86 | 11 | 26 | 1012 | 119 | 76 | 874 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1841 | 1870 | 1856 | | 1870 | 1737 | 1841 | 1811 | 1752 |
| Adj Flow Rate, veh/h | 14 | 0 | 3 | 148 | 10 | 0 | | 28 | 1077 | 0 | 81 | 930 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 4 | 2 | 3 | | 2 | 11 | 4 | 6 | 10 |
| Cap, veh/h | 244 | 0 | 55 | 236 | 170 | | | 42 | 2125 | | 104 | 2372 |
| Arrive On Green | 0.01 | 0.00 | 0.03 | 0.07 | 0.09 | 0.00 | | 0.02 | 0.45 | 0.00 | 0.06 | 0.48 |
| Sat Flow, veh/h | 1781 | 0 | 1585 | 3401 | 1870 | 0 | | 1781 | 4742 | 1560 | 1725 | 4897 |
| Grp Volume(v), veh/h | 14 | 0 | 3 | 148 | 10 | 0 | | 28 | 1077 | 0 | 81 | 605 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | 1700 | 1870 | 0 | | 1781 | 1581 | 1560 | 1725 | 1594 |
| Q Serve(g_s), s | 0.5 | 0.0 | 0.1 | 3.1 | 0.4 | 0.0 | | 1.1 | 11.7 | 0.0 | 3.3 | 8.7 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.1 | 3.1 | 0.4 | 0.0 | | 1.1 | 11.7 | 0.0 | 3.3 | 8.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 244 | 0 | 55 | 236 | 170 | | | 42 | 2125 | | 104 | 1545 |
| V/C Ratio(X) | 0.06 | 0.00 | 0.05 | 0.63 | 0.06 | | | 0.66 | 0.51 | | 0.78 | 0.39 |
| Avail Cap(c_a), veh/h | 836 | 0 | 548 | 1177 | 647 | | | 616 | 4593 | | 597 | 3088 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.2 | 0.0 | 33.7 | 32.7 | 30.0 | 0.0 | | 35.0 | 14.2 | 0.0 | 33.5 | 11.9 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.2 | 1.0 | 0.1 | 0.0 | | 6.4 | 0.4 | 0.0 | 4.7 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 1.3 | 0.2 | 0.0 | | 0.5 | 3.5 | 0.0 | 1.4 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 29.3 | 0.0 | 33.9 | 33.7 | 30.1 | 0.0 | | 41.3 | 14.6 | 0.0 | 38.2 | 12.2 |
| LnGrp LOS | C | A | C | C | C | | | D | B | | D | B |
| Approach Vol, veh/h | | 17 | | | 158 | A | | | 1105 | A | | 1018 |
| Approach Delay, s/veh | | 30.1 | | | 33.5 | | | | 15.3 | | | 14.4 |
| Approach LOS | | C | | | C | | | | B | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.4 | 39.4 | 12.0 | 9.5 | 8.7 | 42.0 | 8.0 | 13.6 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 13.7 | 5.1 | 2.1 | 3.1 | 10.7 | 2.5 | 2.4 |
| Green Ext Time (p_c), s | 0.1 | 18.7 | 0.2 | 0.0 | 0.0 | 14.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 16.3 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 7 |
| Future Volume (veh/h) | 7 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 7 |
| Peak Hour Factor | 0.94 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 18 |
| Arrive On Green | 0.48 |
| Sat Flow, veh/h | 37 |
| Grp Volume(v), veh/h | 332 |
| Grp Sat Flow(s),veh/h/ln | 1745 |
| Q Serve(g_s), s | 8.7 |
| Cycle Q Clear(g_c), s | 8.7 |
| Prop In Lane | 0.02 |
| Lane Grp Cap(c), veh/h | 846 |
| V/C Ratio(X) | 0.39 |
| Avail Cap(c_a), veh/h | 1690 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 11.9 |
| Incr Delay (d2), s/veh | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 12.5 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 22 | 57 | 109 | 30 | 69 | 4 | 62 | 1020 | 99 | 14 | 47 | 934 | 24 |
| Future Volume (veh/h) | 60 | 22 | 57 | 109 | 30 | 69 | 4 | 62 | 1020 | 99 | 14 | 47 | 934 | 24 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1589 | 1796 | 1337 | 1856 | 1870 | 1841 | | 1352 | 1752 | 1870 | | 1811 | 1781 | 1470 |
| Adj Flow Rate, veh/h | 62 | 23 | 0 | 114 | 31 | 0 | | 65 | 1062 | 0 | | 49 | 973 | 25 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 21 | 7 | 38 | 3 | 2 | 4 | | 37 | 10 | 2 | | 6 | 8 | 29 |
| Cap, veh/h | 74 | 132 | | 147 | 201 | | | 74 | 2084 | | | 61 | 1917 | 49 |
| Arrive On Green | 0.05 | 0.07 | 0.00 | 0.08 | 0.11 | 0.00 | | 0.06 | 0.44 | 0.00 | | 0.04 | 0.39 | 0.39 |
| Sat Flow, veh/h | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 4782 | 1585 | | 1725 | 4876 | 125 |
| Grp Volume(v), veh/h | 62 | 23 | 0 | 114 | 31 | 0 | | 65 | 1062 | 0 | | 49 | 647 | 351 |
| Grp Sat Flow(s),veh/h/ln | 1513 | 1796 | 1133 | 1767 | 1870 | 1560 | | 1287 | 1594 | 1585 | | 1725 | 1621 | 1759 |
| Q Serve(g_s), s | 3.0 | 0.9 | 0.0 | 4.7 | 1.1 | 0.0 | | 3.7 | 11.9 | 0.0 | | 2.1 | 11.2 | 11.2 |
| Cycle Q Clear(g_c), s | 3.0 | 0.9 | 0.0 | 4.7 | 1.1 | 0.0 | | 3.7 | 11.9 | 0.0 | | 2.1 | 11.2 | 11.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 74 | 132 | | 147 | 201 | | | 74 | 2084 | | | 61 | 1275 | 692 |
| V/C Ratio(X) | 0.83 | 0.17 | | 0.78 | 0.15 | | | 0.88 | 0.51 | | | 0.80 | 0.51 | 0.51 |
| Avail Cap(c_a), veh/h | 328 | 389 | | 526 | 405 | | | 610 | 4531 | | | 700 | 3072 | 1666 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.8 | 32.1 | 0.0 | 33.2 | 29.9 | 0.0 | | 34.6 | 15.1 | 0.0 | | 35.4 | 17.0 | 17.0 |
| Incr Delay (d2), s/veh | 8.7 | 0.2 | 0.0 | 3.3 | 0.1 | 0.0 | | 11.5 | 0.4 | 0.0 | | 8.7 | 0.7 | 1.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.4 | 0.0 | 2.1 | 0.5 | 0.0 | | 1.3 | 3.6 | 0.0 | | 1.0 | 3.6 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 43.6 | 32.3 | 0.0 | 36.5 | 30.0 | 0.0 | | 46.1 | 15.5 | 0.0 | | 44.1 | 17.7 | 18.2 |
| LnGrp LOS | D | C | | D | C | | | D | B | | | D | B | B |
| Approach Vol, veh/h | | 85 | A | | 145 | A | | | 1127 | A | | | 1047 | |
| Approach Delay, s/veh | | 40.5 | | | 35.1 | | | | 17.3 | | | | 19.1 | |
| Approach LOS | | D | | | D | | | | B | | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.1 | 39.2 | 13.1 | 12.4 | 12.3 | 36.1 | 10.6 | 14.9 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 11.1 | 13.9 | 6.7 | 2.9 | 5.7 | 13.2 | 5.0 | 3.1 |
| Green Ext Time (p_c), s | 0.0 | 18.2 | 0.1 | 0.0 | 0.1 | 15.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 20.0 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 3 | 1 | 11 | 52 | 1 | 23 | 0 | 1167 | 101 | 16 | 1065 | 9 |
| Future Volume (veh/h) | 3 | 1 | 11 | 52 | 1 | 23 | 0 | 1167 | 101 | 16 | 1065 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1811 | 1870 | 1707 | 0 | 1752 | 1856 | 1767 | 1752 | 1870 |
| Adj Flow Rate, veh/h | 3 | 1 | 12 | 56 | 1 | 0 | 0 | 1255 | 0 | 17 | 1145 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 6 | 2 | 13 | 0 | 10 | 3 | 9 | 10 | 2 |
| Cap, veh/h | 252 | 3 | 36 | 258 | 181 | | 0 | 2263 | | 41 | 2877 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.08 | 0.10 | 0.00 | 0.00 | 0.47 | 0.00 | 0.02 | 0.60 | 0.00 |
| Sat Flow, veh/h | 1781 | 123 | 1480 | 3346 | 1870 | 1447 | 0 | 4940 | 1572 | 1682 | 4782 | 1585 |
| Grp Volume(v), veh/h | 3 | 0 | 13 | 56 | 1 | 0 | 0 | 1255 | 0 | 17 | 1145 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1604 | 1673 | 1870 | 1447 | 0 | 1594 | 1572 | 1682 | 1594 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 0.5 | 1.1 | 0.0 | 0.0 | 0.0 | 12.6 | 0.0 | 0.7 | 8.4 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.5 | 1.1 | 0.0 | 0.0 | 0.0 | 12.6 | 0.0 | 0.7 | 8.4 | 0.0 |
| Prop In Lane | 1.00 | | 0.92 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 252 | 0 | 39 | 258 | 181 | | 0 | 2263 | | 41 | 2877 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.33 | 0.22 | 0.01 | | 0.00 | 0.55 | | 0.42 | 0.40 | |
| Avail Cap(c_a), veh/h | 613 | 0 | 548 | 1243 | 556 | | 0 | 3197 | | 400 | 3197 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 27.2 | 0.0 | 32.3 | 29.2 | 27.5 | 0.0 | 0.0 | 12.7 | 0.0 | 32.4 | 7.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.8 | 0.2 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 2.5 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.2 | 0.4 | 0.0 | 0.0 | 0.0 | 3.5 | 0.0 | 0.3 | 1.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 27.2 | 0.0 | 34.2 | 29.3 | 27.5 | 0.0 | 0.0 | 13.1 | 0.0 | 34.9 | 7.2 | 0.0 |
| LnGrp LOS | C | A | C | C | C | | A | B | | C | A | |
| Approach Vol, veh/h | | 16 | | | 57 | A | | 1255 | A | | 1162 | A |
| Approach Delay, s/veh | | 32.9 | | | 29.3 | | | 13.1 | | | 7.6 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.6 | 38.4 | 12.2 | 8.1 | | 47.0 | 7.3 | 13.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 12.7 | 14.6 | 3.1 | 2.5 | | 10.4 | 2.1 | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 17.2 | 0.1 | 0.0 | | 16.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 11.1 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 332 | 299 | 177 | 204 | 276 | 216 | 134 | 739 | 243 | 157 | 648 | 310 |
| Future Volume (veh/h) | 332 | 299 | 177 | 204 | 276 | 216 | 134 | 739 | 243 | 157 | 648 | 310 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1811 | 1870 | 1870 | 1870 | 1826 | 1767 | 1870 | 1737 | 1870 | 1767 | 1752 | 1841 |
| Adj Flow Rate, veh/h | 357 | 322 | 0 | 219 | 297 | 0 | 144 | 795 | 0 | 169 | 697 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 6 | 2 | 2 | 2 | 5 | 9 | 2 | 11 | 2 | 9 | 10 | 4 |
| Cap, veh/h | 376 | 471 | | 380 | 446 | | 141 | 2416 | | 220 | 1671 | |
| Arrive On Green | 0.11 | 0.09 | 0.00 | 0.11 | 0.09 | 0.00 | 0.08 | 0.51 | 0.00 | 0.07 | 0.50 | 0.00 |
| Sat Flow, veh/h | 3346 | 5106 | 1585 | 3456 | 4985 | 1497 | 1781 | 4742 | 1585 | 3264 | 3328 | 1560 |
| Grp Volume(v), veh/h | 357 | 322 | 0 | 219 | 297 | 0 | 144 | 795 | 0 | 169 | 697 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1702 | 1585 | 1728 | 1662 | 1497 | 1781 | 1581 | 1585 | 1632 | 1664 | 1560 |
| Q Serve(g_s), s | 12.7 | 7.3 | 0.0 | 7.2 | 6.9 | 0.0 | 9.5 | 11.9 | 0.0 | 6.1 | 15.8 | 0.0 |
| Cycle Q Clear(g_c), s | 12.7 | 7.3 | 0.0 | 7.2 | 6.9 | 0.0 | 9.5 | 11.9 | 0.0 | 6.1 | 15.8 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 376 | 471 | | 380 | 446 | | 141 | 2416 | | 220 | 1671 | |
| V/C Ratio(X) | 0.95 | 0.68 | | 0.58 | 0.67 | | 1.02 | 0.33 | | 0.77 | 0.42 | |
| Avail Cap(c_a), veh/h | 376 | 1340 | | 389 | 1308 | | 141 | 2416 | | 245 | 1671 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 52.9 | 52.8 | 0.0 | 50.8 | 52.9 | 0.0 | 55.3 | 17.3 | 0.0 | 55.0 | 18.8 | 0.0 |
| Incr Delay (d2), s/veh | 32.9 | 0.7 | 0.0 | 1.3 | 0.6 | 0.0 | 81.5 | 0.4 | 0.0 | 10.5 | 0.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.9 | 3.1 | 0.0 | 3.1 | 2.8 | 0.0 | 7.3 | 4.1 | 0.0 | 2.8 | 5.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 85.8 | 53.4 | 0.0 | 52.0 | 53.5 | 0.0 | 136.7 | 17.7 | 0.0 | 65.5 | 19.6 | 0.0 |
| LnGrp LOS | F | D | | D | D | | F | B | | E | B | |
| Approach Vol, veh/h | | 679 | A | | 516 | A | | 939 | A | | 866 | A |
| Approach Delay, s/veh | | 70.5 | | | 52.9 | | | 36.0 | | | 28.5 | |
| Approach LOS | | E | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 67.7 | 19.7 | 17.6 | 16.0 | 66.8 | 20.0 | 17.2 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 9.6 | 39.5 | 13.5 | 31.5 | 9.5 | 39.5 | 13.5 | 31.5 |
| Max Q Clear Time (g_c+I1), s | 11.1 | 13.9 | 9.2 | 9.3 | 11.5 | 17.8 | 14.7 | 8.9 |
| Green Ext Time (p_c), s | 0.0 | 1.8 | 0.2 | 1.2 | 0.0 | 2.7 | 0.0 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 44.5 |
| HCM 6th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 191 | 313 | 233 | 1280 | 990 | 315 | 152 | 1295 | 336 | 205 | 1639 | 303 |
| Future Volume (veh/h) | 191 | 313 | 233 | 1280 | 990 | 315 | 152 | 1295 | 336 | 205 | 1639 | 303 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1841 | 1767 | 1870 | 1870 | 1856 | 1767 | 1870 | 1796 | 1841 | 1870 | 1826 |
| Adj Flow Rate, veh/h | 205 | 337 | 0 | 1376 | 1065 | 0 | 163 | 1392 | 0 | 220 | 1762 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 4 | 9 | 2 | 2 | 3 | 9 | 2 | 7 | 4 | 2 | 5 |
| Cap, veh/h | 158 | 416 | | 1043 | 1052 | | 226 | 1198 | | 317 | 1434 | |
| Arrive On Green | 0.09 | 0.08 | 0.00 | 0.30 | 0.30 | 0.00 | 0.27 | 0.47 | 0.00 | 0.18 | 0.28 | 0.00 |
| Sat Flow, veh/h | 1781 | 5191 | 0 | 3456 | 3554 | 1572 | 1682 | 5106 | 1522 | 1753 | 5106 | 1547 |
| Grp Volume(v), veh/h | 205 | 337 | 0 | 1376 | 1065 | 0 | 163 | 1392 | 0 | 220 | 1762 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1675 | 0 | 1728 | 1777 | 1572 | 1682 | 1702 | 1522 | 1753 | 1702 | 1547 |
| Q Serve(g_s), s | 11.5 | 8.6 | 0.0 | 39.2 | 38.5 | 0.0 | 11.4 | 30.5 | 0.0 | 15.3 | 36.5 | 0.0 |
| Cycle Q Clear(g_c), s | 11.5 | 8.6 | 0.0 | 39.2 | 38.5 | 0.0 | 11.4 | 30.5 | 0.0 | 15.3 | 36.5 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 158 | 416 | | 1043 | 1052 | | 226 | 1198 | | 317 | 1434 | |
| V/C Ratio(X) | 1.30 | 0.81 | | 1.32 | 1.01 | | 0.72 | 1.16 | | 0.69 | 1.23 | |
| Avail Cap(c_a), veh/h | 158 | 445 | | 1043 | 1052 | | 226 | 1198 | | 317 | 1434 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.75 | 0.75 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 59.3 | 58.6 | 0.0 | 45.4 | 45.8 | 0.0 | 45.3 | 34.5 | 0.0 | 49.9 | 46.8 | 0.0 |
| Incr Delay (d2), s/veh | 173.9 | 10.2 | 0.0 | 150.5 | 30.7 | 0.0 | 7.6 | 80.2 | 0.0 | 6.0 | 109.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.7 | 4.0 | 0.0 | 38.1 | 21.0 | 0.0 | 4.6 | 17.6 | 0.0 | 7.0 | 29.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 233.1 | 68.8 | 0.0 | 195.9 | 76.5 | 0.0 | 52.9 | 114.7 | 0.0 | 55.9 | 156.2 | 0.0 |
| LnGrp LOS | F | E | | F | F | | D | F | | E | F | |
| Approach Vol, veh/h | | 542 | A | | 2441 | A | | 1555 | A | | 1982 | A |
| Approach Delay, s/veh | | 131.0 | | | 143.8 | | | 108.3 | | | 145.0 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.0 | 37.0 | 45.7 | 17.3 | 24.0 | 43.0 | 18.0 | 45.0 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 23.5 | 30.5 | 38.5 | 11.5 | 17.5 | 36.5 | 11.5 | 38.5 |
| Max Q Clear Time (g_c+I1), s | 17.3 | 32.5 | 41.2 | 10.6 | 13.4 | 38.5 | 13.5 | 40.5 |
| Green Ext Time (p_c), s | 0.2 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 134.6 |
| HCM 6th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 80 | 0 | 73 | 0 | 1678 | 32 | 3 | 42 | 3200 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 80 | 0 | 73 | 0 | 1678 | 32 | 3 | 42 | 3200 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1633 | 1870 | 1381 | 1870 | 1870 | 1426 | | 1233 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 85 | 0 | 78 | 0 | 1785 | 34 | | 45 | 3404 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 18 | 2 | 35 | 2 | 2 | 32 | | 45 | 2 | 2 |
| Cap, veh/h | 0 | 231 | 0 | 133 | 6 | 89 | 1 | 2592 | 613 | | 248 | 3945 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.12 | 0.00 | 0.51 | 0.51 | | 0.28 | 1.00 | 0.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 738 | 46 | 719 | 1781 | 5106 | 1207 | | 1174 | 5274 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 163 | 0 | 0 | 0 | 1785 | 34 | | 45 | 3404 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1503 | 0 | 0 | 1781 | 1702 | 1207 | | 1174 | 1702 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 13.0 | 0.0 | 0.0 | 0.0 | 34.4 | 1.9 | | 3.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | 0.0 | 34.4 | 1.9 | | 3.8 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 0.52 | | 0.48 | 1.00 | | 1.00 | | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 231 | 0 | 228 | 0 | 0 | 1 | 2592 | 613 | | 248 | 3945 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.72 | 0.00 | 0.00 | 0.00 | 0.69 | 0.06 | | 0.18 | 0.86 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 266 | 0 | 256 | 0 | 0 | 226 | 2592 | 613 | | 248 | 3945 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.33 | 1.33 | 1.33 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.88 | 0.88 | | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 55.9 | 0.0 | 0.0 | 0.0 | 24.2 | 16.2 | | 38.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 0.0 | 1.3 | 0.2 | | 0.0 | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.0 | 13.1 | 0.5 | | 1.1 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 0.0 | 65.2 | 0.0 | 0.0 | 0.0 | 25.6 | 16.4 | | 38.3 | 0.3 | 0.0 |
| LnGrp LOS | A | A | A | E | A | A | A | C | B | | D | A | A |
| Approach Vol, veh/h | | 0 | | | 163 | | | 1819 | | | | 3449 | |
| Approach Delay, s/veh | | 0.0 | | | 65.2 | | | 25.4 | | | | 0.8 | |
| Approach LOS | | | | | E | | | C | | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 34.4 | 73.0 | | 22.6 | 0.0 | 107.4 | | 22.6 |
| Change Period (Y+Rc), s | 7.0 | * 7 | | 6.5 | 6.5 | 7.0 | | 6.5 |
| Max Green Setting (Gmax), s | 25.5 | * 66 | | 18.5 | 16.5 | 75.0 | | 18.5 |
| Max Q Clear Time (g_c+I1), s | 15.8 | 36.4 | | 0.0 | 0.0 | 2.0 | | 15.8 |
| Green Ext Time (p_c), s | 0.1 | 20.0 | | 0.0 | 0.0 | 70.4 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 10.9 |
| HCM 6th LOS | B |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 17 | 69 | 32 | 1661 | 0 | 3306 | 13 |
| Future Volume (veh/h) | 17 | 69 | 32 | 1661 | 0 | 3306 | 13 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1203 | 1319 | 1267 | 1863 | | 1863 | 1067 |
| Adj Flow Rate, veh/h | 18 | 0 | 33 | 1730 | | 3444 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 |
| Percent Heavy Veh, % | 58 | 44 | 50 | 2 | | 2 | 78 |
| Cap, veh/h | 30 | 30 | 183 | 3674 | | 2948 | 526 |
| Arrive On Green | 0.03 | 0.00 | 0.04 | 0.72 | | 0.58 | 0.00 |
| Sat Flow, veh/h | 1145 | 1122 | 1206 | 5253 | | 5253 | 907 |
| Grp Volume(v), veh/h | 18 | 0 | 33 | 1730 | | 3444 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1145 | 1122 | 1206 | 1695 | | 1695 | 907 |
| Q Serve(g_s), s | 0.8 | 0.0 | 0.4 | 7.4 | | 30.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.8 | 0.0 | 0.4 | 7.4 | | 30.0 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 30 | 30 | 183 | 3674 | | 2948 | 526 |
| V/C Ratio(X) | 0.59 | 0.00 | 0.18 | 0.47 | | 1.17 | 0.00 |
| Avail Cap(c_a), veh/h | 443 | 433 | 372 | 3674 | | 2948 | 526 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 24.9 | 0.0 | 15.1 | 3.0 | | 10.9 | 0.0 |
| Incr Delay (d2), s/veh | 17.2 | 0.0 | 0.2 | 0.1 | | 79.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.0 | 0.3 | 3.4 | | 35.4 | 0.0 |
| LnGrp Delay(d),s/veh | 42.1 | 0.0 | 15.2 | 3.1 | | 90.7 | 0.0 |
| LnGrp LOS | D | | B | A | | F | |
| Approach Vol, veh/h | 18 | | | 1763 | | 3444 | |
| Approach Delay, s/veh | 42.1 | | | 3.3 | | 90.7 | |
| Approach LOS | D | | | A | | F | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 43.9 | | 7.9 | 7.4 | 36.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 30.0 | | 20.0 | 10.0 | 30.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 2.8 | 2.4 | 32.0 | | |
| Green Ext Time (p_c), s | | 11.8 | | 0.0 | 0.0 | 0.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 61.0 |
| HCM 2010 LOS | E |

Notes

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.7 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 33 | 3 | 20 | 24 | 4 | 40 |
| Future Vol, veh/h | 33 | 3 | 20 | 24 | 4 | 40 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 22 | 50 | 86 | 35 | 33 | 68 |
| Mvmt Flow | 42 | 4 | 26 | 31 | 5 | 51 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 46 | 0 | 127 | 44 |
| Stage 1 | - | - | - | - | 44 | - |
| Stage 2 | - | - | - | - | 83 | - |
| Critical Hdwy | - | - | 4.96 | - | 6.73 | 6.88 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.73 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.73 | - |
| Follow-up Hdwy | - | - | 2.974 | - | 3.797 | 3.912 |
| Pot Cap-1 Maneuver | - | - | 1158 | - | 799 | 866 |
| Stage 1 | - | - | - | - | 905 | - |
| Stage 2 | - | - | - | - | 868 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1158 | - | 781 | 866 |
| Mov Cap-2 Maneuver | - | - | - | - | 781 | - |
| Stage 1 | - | - | - | - | 905 | - |
| Stage 2 | - | - | - | - | 848 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 3.7 | 9.5 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 858 | - | - | 1158 | - |
| HCM Lane V/C Ratio | 0.066 | - | - | 0.022 | - |
| HCM Control Delay (s) | 9.5 | - | - | 8.2 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 0.1 | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 6 | 6 | 148 | 3 | 155 | 14 | 4 | 1596 | 181 | 154 | 3114 |
| Future Volume (veh/h) | 29 | 6 | 6 | 148 | 3 | 155 | 14 | 4 | 1596 | 181 | 154 | 3114 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 | | 1870 | 1856 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 30 | 6 | 6 | 154 | 3 | 0 | | 4 | 1662 | 0 | 160 | 3244 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 3 | | 2 | 3 | 2 | 2 | 3 |
| Cap, veh/h | 219 | 35 | 35 | 219 | 154 | | | 7 | 2706 | | 190 | 3328 |
| Arrive On Green | 0.02 | 0.04 | 0.04 | 0.06 | 0.08 | 0.00 | | 0.00 | 0.53 | 0.00 | 0.11 | 0.64 |
| Sat Flow, veh/h | 1781 | 853 | 853 | 3456 | 1870 | 0 | | 1781 | 5066 | 1585 | 1781 | 5225 |
| Grp Volume(v), veh/h | 30 | 0 | 12 | 154 | 3 | 0 | | 4 | 1662 | 0 | 160 | 2096 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1706 | 1728 | 1870 | 0 | | 1781 | 1689 | 1585 | 1781 | 1689 |
| Q Serve(g_s), s | 1.7 | 0.0 | 0.7 | 4.8 | 0.2 | 0.0 | | 0.2 | 25.0 | 0.0 | 9.7 | 65.3 |
| Cycle Q Clear(g_c), s | 1.7 | 0.0 | 0.7 | 4.8 | 0.2 | 0.0 | | 0.2 | 25.0 | 0.0 | 9.7 | 65.3 |
| Prop In Lane | 1.00 | | 0.50 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 219 | 0 | 70 | 219 | 154 | | | 7 | 2706 | | 190 | 2151 |
| V/C Ratio(X) | 0.14 | 0.00 | 0.17 | 0.70 | 0.02 | | | 0.54 | 0.61 | | 0.84 | 0.97 |
| Avail Cap(c_a), veh/h | 585 | 0 | 388 | 786 | 425 | | | 405 | 3226 | | 405 | 2151 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.9 | 0.0 | 50.9 | 50.5 | 46.3 | 0.0 | | 54.6 | 17.8 | 0.0 | 48.2 | 19.1 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.4 | 1.5 | 0.0 | 0.0 | | 20.4 | 0.5 | 0.0 | 3.8 | 14.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 0.3 | 2.1 | 0.1 | 0.0 | | 0.1 | 8.7 | 0.0 | 4.3 | 24.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 45.0 | 0.0 | 51.4 | 52.0 | 46.4 | 0.0 | | 75.1 | 18.3 | 0.0 | 52.0 | 33.2 |
| LnGrp LOS | D | A | D | D | D | | | E | B | | D | C |
| Approach Vol, veh/h | | 42 | | | 157 | A | | | 1666 | A | | 3408 |
| Approach Delay, s/veh | | 46.8 | | | 51.9 | | | | 18.4 | | | 36.2 |
| Approach LOS | | D | | | D | | | | B | | | D |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.7 | 65.7 | 14.0 | 11.5 | 7.5 | 77.0 | 9.4 | 16.1 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 25.0 | 70.0 | 25.0 | 25.0 | 25.0 | 70.0 | 25.0 | 25.0 |
| Max Q Clear Time (g_c+I1), s | 11.7 | 27.0 | 6.8 | 2.7 | 2.2 | 67.4 | 3.7 | 2.2 |
| Green Ext Time (p_c), s | 0.2 | 29.0 | 0.2 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 31.2 |
| HCM 6th LOS | C |

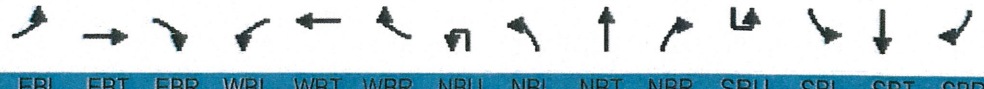
Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 4 |
| Future Volume (veh/h) | 4 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 4 |
| Peak Hour Factor | 0.96 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 4 |
| Arrive On Green | 0.64 |
| Sat Flow, veh/h | 6 |
| Grp Volume(v), veh/h | 1152 |
| Grp Sat Flow(s),veh/h/ln | 1854 |
| Q Serve(g_s), s | 65.4 |
| Cycle Q Clear(g_c), s | 65.4 |
| Prop In Lane | 0.00 |
| Lane Grp Cap(c), veh/h | 1181 |
| V/C Ratio(X) | 0.98 |
| Avail Cap(c_a), veh/h | 1181 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 19.1 |
| Incr Delay (d2), s/veh | 20.6 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 29.0 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 39.7 |
| LnGrp LOS | D |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 66 | 30 | 119 | 152 | 20 | 116 | 6 | 40 | 1734 | 216 | 10 | 134 | 3101 | 33 |
| Future Volume (veh/h) | 66 | 30 | 119 | 152 | 20 | 116 | 6 | 40 | 1734 | 216 | 10 | 134 | 3101 | 33 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1737 | 1870 | 1811 | 1870 | 1796 | 1870 | | 1796 | 1870 | 1870 | | 1870 | 1856 | 1841 |
| Adj Flow Rate, veh/h | 74 | 34 | 0 | 171 | 22 | 0 | | 45 | 1948 | 0 | | 151 | 3484 | 37 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 11 | 2 | 6 | 2 | 7 | 2 | | 7 | 2 | 2 | | 2 | 3 | 4 |
| Cap, veh/h | 93 | 89 | | 198 | 185 | | | 57 | 2657 | | | 178 | 2971 | 31 |
| Arrive On Green | 0.06 | 0.05 | 0.00 | 0.11 | 0.10 | 0.00 | | 0.03 | 0.52 | 0.00 | | 0.10 | 0.57 | 0.57 |
| Sat Flow, veh/h | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 5106 | 1585 | | 1781 | 5168 | 55 |
| Grp Volume(v), veh/h | 74 | 34 | 0 | 171 | 22 | 0 | | 45 | 1948 | 0 | | 151 | 2272 | 1249 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 1702 | 1585 | | 1781 | 1689 | 1846 |
| Q Serve(g_s), s | 5.5 | 2.2 | 0.0 | 11.8 | 1.4 | 0.0 | | 3.3 | 36.9 | 0.0 | | 10.4 | 71.6 | 71.6 |
| Cycle Q Clear(g_c), s | 5.5 | 2.2 | 0.0 | 11.8 | 1.4 | 0.0 | | 3.3 | 36.9 | 0.0 | | 10.4 | 71.6 | 71.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 93 | 89 | | 198 | 185 | | | 57 | 2657 | | | 178 | 1941 | 1061 |
| V/C Ratio(X) | 0.80 | 0.38 | | 0.86 | 0.12 | | | 0.78 | 0.73 | | | 0.85 | 1.17 | 1.18 |
| Avail Cap(c_a), veh/h | 212 | 240 | | 315 | 231 | | | 481 | 2869 | | | 429 | 1941 | 1061 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 58.1 | 57.6 | 0.0 | 54.4 | 50.8 | 0.0 | | 59.8 | 23.2 | 0.0 | | 55.1 | 26.5 | 26.5 |
| Incr Delay (d2), s/veh | 5.9 | 1.0 | 0.0 | 8.1 | 0.1 | 0.0 | | 8.4 | 1.2 | 0.0 | | 4.2 | 82.7 | 89.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 1.1 | 0.0 | 5.7 | 0.6 | 0.0 | | 1.5 | 13.8 | 0.0 | | 4.7 | 47.3 | 53.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 64.0 | 58.6 | 0.0 | 62.5 | 50.9 | 0.0 | | 68.2 | 24.4 | 0.0 | | 59.3 | 109.2 | 116.1 |
| LnGrp LOS | E | E | | E | D | | | E | C | | | E | F | F |
| Approach Vol, veh/h | | 108 | A | | 193 | A | | | 1993 | A | | | 3672 | |
| Approach Delay, s/veh | | 62.3 | | | 61.2 | | | | 25.4 | | | | 109.5 | |
| Approach LOS | | E | | | E | | | | C | | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 71.8 | 20.9 | 12.9 | 12.2 | 78.6 | 14.0 | 19.8 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 30.0 | 70.0 | 22.0 | 16.0 | 35.0 | 70.0 | 16.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 38.9 | 13.8 | 4.2 | 5.3 | 73.6 | 7.5 | 3.4 |
| Green Ext Time (p_c), s | 0.2 | 26.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 79.0 |
| HCM 6th LOS | E |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 3 | 3 | 26 | 147 | 0 | 32 | 0 | 1743 | 172 | 3 | 42 | 3308 | 23 |
| Future Volume (veh/h) | 3 | 3 | 26 | 147 | 0 | 32 | 0 | 1743 | 172 | 3 | 42 | 3308 | 23 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1767 | 0 | 1870 | 1870 | | 1870 | 1856 | 1870 |
| Adj Flow Rate, veh/h | 3 | 3 | 27 | 155 | 0 | 0 | 0 | 1835 | 0 | | 44 | 3482 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 9 | 0 | 2 | 2 | | 2 | 3 | 2 |
| Cap, veh/h | 276 | 7 | 59 | 319 | 241 | | 0 | 2556 | | | 82 | 3188 | |
| Arrive On Green | 0.00 | 0.04 | 0.04 | 0.09 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 | | 0.05 | 0.63 | 0.00 |
| Sat Flow, veh/h | 1781 | 160 | 1443 | 3456 | 1870 | 1497 | 0 | 5274 | 1585 | | 1781 | 5066 | 1585 |
| Grp Volume(v), veh/h | 3 | 0 | 30 | 155 | 0 | 0 | 0 | 1835 | 0 | | 44 | 3482 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1603 | 1728 | 1870 | 1497 | 0 | 1702 | 1585 | | 1781 | 1689 | 1585 |
| Q Serve(g_s), s | 0.1 | 0.0 | 1.5 | 3.6 | 0.0 | 0.0 | 0.0 | 23.6 | 0.0 | | 2.0 | 53.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 1.5 | 3.6 | 0.0 | 0.0 | 0.0 | 23.6 | 0.0 | | 2.0 | 53.1 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 276 | 0 | 66 | 319 | 241 | | 0 | 2556 | | | 82 | 3188 | |
| V/C Ratio(X) | 0.01 | 0.00 | 0.46 | 0.49 | 0.00 | | 0.00 | 0.72 | | | 0.54 | 1.09 | |
| Avail Cap(c_a), veh/h | 563 | 0 | 437 | 1024 | 444 | | 0 | 2725 | | | 338 | 3188 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 31.7 | 0.0 | 39.5 | 36.4 | 0.0 | 0.0 | 0.0 | 16.4 | 0.0 | | 39.4 | 15.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.8 | 0.4 | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | | 2.1 | 47.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.6 | 1.5 | 0.0 | 0.0 | 0.0 | 7.8 | 0.0 | | 0.9 | 28.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 31.7 | 0.0 | 41.3 | 36.8 | 0.0 | 0.0 | 0.0 | 17.6 | 0.0 | | 41.4 | 62.9 | 0.0 |
| LnGrp LOS | C | A | D | D | A | | A | B | | | D | F | |
| Approach Vol, veh/h | | 33 | | | 155 | A | | 1835 | A | | | 3526 | A |
| Approach Delay, s/veh | | 40.5 | | | 36.8 | | | 17.6 | | | | 62.7 | |
| Approach LOS | | D | | | D | | | B | | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.9 | 48.7 | 14.8 | 10.0 | | 59.6 | 7.4 | 17.3 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 16.0 | 45.0 | 25.0 | 23.0 | | 45.0 | 14.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 25.6 | 5.6 | 3.5 | | 55.1 | 2.1 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 16.6 | 0.2 | 0.1 | | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 46.9 |
| HCM 6th LOS | D |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 581 | 744 | 217 | 3 | 253 | 1093 | 410 | 262 | 1001 | 269 | 510 | 1576 | 1418 |
| Future Volume (veh/h) | 581 | 744 | 217 | 3 | 253 | 1093 | 410 | 262 | 1001 | 269 | 510 | 1576 | 1418 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1870 |
| Adj Flow Rate, veh/h | 618 | 791 | 0 | | 269 | 1163 | 0 | 279 | 1065 | 0 | 543 | 1677 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 |
| Cap, veh/h | 443 | 1259 | | | 314 | 1069 | | 161 | 1155 | | 1303 | 1792 | |
| Arrive On Green | 0.13 | 0.25 | 0.00 | | 0.09 | 0.21 | 0.00 | 0.09 | 0.23 | 0.00 | 0.38 | 0.51 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | | 3456 | 5106 | 1585 | 1781 | 5106 | 1585 | 3456 | 3497 | 1585 |
| Grp Volume(v), veh/h | 618 | 791 | 0 | | 269 | 1163 | 0 | 279 | 1065 | 0 | 543 | 1677 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | | 1728 | 1702 | 1585 | 1781 | 1702 | 1585 | 1728 | 1749 | 1585 |
| Q Serve(g_s), s | 20.5 | 22.1 | 0.0 | | 12.3 | 33.5 | 0.0 | 14.5 | 32.6 | 0.0 | 18.6 | 71.9 | 0.0 |
| Cycle Q Clear(g_c), s | 20.5 | 22.1 | 0.0 | | 12.3 | 33.5 | 0.0 | 14.5 | 32.6 | 0.0 | 18.6 | 71.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 443 | 1259 | | | 314 | 1069 | | 161 | 1155 | | 1303 | 1792 | |
| V/C Ratio(X) | 1.40 | 0.63 | | | 0.86 | 1.09 | | 1.73 | 0.92 | | 0.42 | 0.94 | |
| Avail Cap(c_a), veh/h | 443 | 1259 | | | 443 | 1069 | | 161 | 1292 | | 1303 | 1792 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 69.8 | 53.7 | 0.0 | | 71.7 | 63.3 | 0.0 | 72.8 | 60.5 | 0.0 | 36.8 | 36.5 | 0.0 |
| Incr Delay (d2), s/veh | 191.4 | 0.8 | 0.0 | | 8.4 | 54.6 | 0.0 | 352.3 | 13.4 | 0.0 | 0.1 | 10.7 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 20.7 | 9.4 | 0.0 | | 5.7 | 19.6 | 0.0 | 22.3 | 15.2 | 0.0 | 7.7 | 31.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 261.2 | 54.5 | 0.0 | | 80.1 | 117.9 | 0.0 | 425.1 | 73.9 | 0.0 | 36.9 | 47.2 | 0.0 |
| LnGrp LOS | F | D | | | F | F | | F | E | | D | D | |
| Approach Vol, veh/h | | 1409 | A | | | 1432 | A | | 1344 | A | | 2220 | A |
| Approach Delay, s/veh | | 145.1 | | | | 110.8 | | | 146.8 | | | 44.7 | |
| Approach LOS | | F | | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.8 | 42.7 | 21.0 | 46.0 | 21.0 | 89.5 | 27.0 | 40.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | * 7 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 39.8 | 40.5 | 20.5 | 33.5 | 14.5 | * 66 | 20.5 | 33.5 |
| Max Q Clear Time (g_c+I1), s | 20.6 | 34.6 | 14.3 | 24.1 | 16.5 | 73.9 | 22.5 | 35.5 |
| Green Ext Time (p_c), s | 0.9 | 1.6 | 0.3 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 103.0 |
| HCM 6th LOS | F |

**Notes**

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 399 | 894 | 137 | 244 | 272 | 287 | 159 | 1489 | 700 | 178 | 950 | 193 |
| Future Volume (veh/h) | 399 | 894 | 137 | 244 | 272 | 287 | 159 | 1489 | 700 | 178 | 950 | 193 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1826 | 1678 | 1767 | 1811 | 1707 | 1826 | 1781 | 1811 | 1752 | 1781 | 1841 |
| Adj Flow Rate, veh/h | 438 | 982 | 0 | 268 | 299 | 0 | 175 | 1636 | 0 | 196 | 1044 | 0 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 5 | 15 | 9 | 6 | 13 | 5 | 8 | 6 | 10 | 8 | 4 |
| Cap, veh/h | 394 | 1179 | | 310 | 380 | | 194 | 1774 | | 218 | 1865 | |
| Arrive On Green | 0.22 | 0.24 | 0.00 | 0.09 | 0.11 | 0.00 | 0.22 | 0.73 | 0.00 | 0.13 | 0.38 | 0.00 |
| Sat Flow, veh/h | 1781 | 5149 | 0 | 3264 | 3441 | 1447 | 1739 | 4863 | 1535 | 1668 | 4863 | 1560 |
| Grp Volume(v), veh/h | 438 | 982 | 0 | 268 | 299 | 0 | 175 | 1636 | 0 | 196 | 1044 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1662 | 0 | 1632 | 1721 | 1447 | 1739 | 1621 | 1535 | 1668 | 1621 | 1560 |
| Q Serve(g_s), s | 33.1 | 28.1 | 0.0 | 12.1 | 12.7 | 0.0 | 14.7 | 41.7 | 0.0 | 17.4 | 25.3 | 0.0 |
| Cycle Q Clear(g_c), s | 33.1 | 28.1 | 0.0 | 12.1 | 12.7 | 0.0 | 14.7 | 41.7 | 0.0 | 17.4 | 25.3 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 394 | 1179 | | 310 | 380 | | 194 | 1774 | | 218 | 1865 | |
| V/C Ratio(X) | 1.11 | 0.83 | | 0.86 | 0.79 | | 0.90 | 0.92 | | 0.90 | 0.56 | |
| Avail Cap(c_a), veh/h | 394 | 1446 | | 337 | 723 | | 226 | 1774 | | 295 | 1865 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.62 | 0.62 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 58.4 | 54.5 | 0.0 | 66.9 | 65.0 | 0.0 | 57.4 | 18.5 | 0.0 | 64.3 | 36.3 | 0.0 |
| Incr Delay (d2), s/veh | 79.7 | 3.6 | 0.0 | 18.6 | 3.6 | 0.0 | 21.8 | 6.3 | 0.0 | 22.0 | 1.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 23.4 | 12.0 | 0.0 | 5.8 | 5.7 | 0.0 | 6.7 | 7.2 | 0.0 | 8.5 | 9.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 138.1 | 58.1 | 0.0 | 85.5 | 68.6 | 0.0 | 79.3 | 24.8 | 0.0 | 86.2 | 37.5 | 0.0 |
| LnGrp LOS | F | E | | F | E | | E | C | | F | D | |
| Approach Vol, veh/h | | 1420 | A | | 567 | A | | 1811 | A | | 1240 | A |
| Approach Delay, s/veh | | 82.7 | | | 76.6 | | | 30.1 | | | 45.2 | |
| Approach LOS | | F | | | E | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.1 | 61.2 | 20.7 | 42.0 | 23.3 | 64.0 | 39.6 | 23.1 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 26.5 | 38.5 | 15.5 | 43.5 | 19.5 | 45.5 | 27.5 | 31.5 |
| Max Q Clear Time (g_c+I1), s | 19.4 | 43.7 | 14.1 | 30.1 | 16.7 | 27.3 | 35.1 | 14.7 |
| Green Ext Time (p_c), s | 0.2 | 0.0 | 0.1 | 5.4 | 0.1 | 7.4 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 53.9 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 0 | 13 | 0 | 85 | 1 | 2137 | 32 | 59 | 1246 | 1 |
| Future Volume (veh/h) | 1 | 0 | 0 | 13 | 0 | 85 | 1 | 2137 | 32 | 59 | 1246 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1085 | 1870 | 788 | 1870 | 1841 | 1292 | 1026 | 1796 | 1870 |
| Adj Flow Rate, veh/h | 1 | 0 | 0 | 15 | 0 | 98 | 1 | 2456 | 37 | 68 | 1432 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 55 | 2 | 75 | 2 | 4 | 41 | 59 | 7 | 2 |
| Cap, veh/h | 119 | 0 | 0 | 38 | 7 | 117 | 95 | 3049 | 664 | 167 | 3682 | 3 |
| Arrive On Green | 0.09 | 0.00 | 0.00 | 0.09 | 0.00 | 0.09 | 0.11 | 1.00 | 1.00 | 0.34 | 1.00 | 1.00 |
| Sat Flow, veh/h | 829 | 0 | 0 | 130 | 80 | 1368 | 1781 | 5025 | 1094 | 977 | 5061 | 4 |
| Grp Volume(v), veh/h | 1 | 0 | 0 | 113 | 0 | 0 | 1 | 2456 | 37 | 68 | 925 | 508 |
| Grp Sat Flow(s),veh/h/ln | 829 | 0 | 0 | 1577 | 0 | 0 | 1781 | 1675 | 1094 | 977 | 1635 | 1796 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.2 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 0.13 | | 0.87 | 1.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 119 | 0 | 0 | 162 | 0 | 0 | 95 | 3049 | 664 | 167 | 2379 | 1306 |
| V/C Ratio(X) | 0.01 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.01 | 0.81 | 0.06 | 0.41 | 0.39 | 0.39 |
| Avail Cap(c_a), veh/h | 189 | 0 | 0 | 247 | 0 | 0 | 95 | 3049 | 664 | 167 | 2379 | 1306 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.79 | 0.79 | 0.79 | 0.62 | 0.62 | 0.62 |
| Uniform Delay (d), s/veh | 62.8 | 0.0 | 0.0 | 67.5 | 0.0 | 0.0 | 63.5 | 0.0 | 0.0 | 43.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 7.4 | 0.0 | 0.0 | 0.0 | 1.9 | 0.1 | 1.4 | 0.3 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 4.6 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 1.8 | 0.1 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.8 | 0.0 | 0.0 | 74.9 | 0.0 | 0.0 | 63.5 | 1.9 | 0.1 | 45.0 | 0.3 | 0.5 |
| LnGrp LOS | E | A | A | E | A | A | E | A | A | D | A | A |
| Approach Vol, veh/h | | 1 | | | 113 | | | 2494 | | | 1501 | |
| Approach Delay, s/veh | | 62.8 | | | 74.9 | | | 1.9 | | | 2.4 | |
| Approach LOS | | E | | | E | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 32.6 | 98.0 | | 19.4 | 14.5 | 116.1 | | 19.4 | | | | |
| Change Period (Y+Rc), s | 7.0 | * 7 | | 6.5 | 6.5 | 7.0 | | 6.5 | | | | |
| Max Green Setting (Gmax), s | 18.0 | * 91 | | 21.0 | 8.0 | 101.0 | | 21.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 10.0 | 2.0 | | 2.2 | 2.1 | 2.0 | | 12.6 | | | | |
| Green Ext Time (p_c), s | 0.1 | 63.5 | | 0.0 | 0.0 | 21.1 | | 0.4 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 4.1 |
| HCM 6th LOS | A |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 73 | 68 | 73 | 2038 | 0 | 1290 | 76 |
| Future Volume (veh/h) | 73 | 68 | 73 | 2038 | 0 | 1290 | 76 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1086 | 1188 | 1310 | 1863 | | 1827 | 1159 |
| Adj Flow Rate, veh/h | 83 | 0 | 83 | 2316 | | 1466 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | | 0.88 | 0.88 |
| Percent Heavy Veh, % | 75 | 60 | 45 | 2 | | 4 | 64 |
| Cap, veh/h | 94 | 92 | 98 | 4182 | | 3757 | 742 |
| Arrive On Green | 0.09 | 0.00 | 0.03 | 0.82 | | 1.00 | 0.00 |
| Sat Flow, veh/h | 1034 | 1009 | 1248 | 5253 | | 5152 | 985 |
| Grp Volume(v), veh/h | 83 | 0 | 83 | 2316 | | 1466 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1034 | 1009 | 1248 | 1695 | | 1663 | 985 |
| Q Serve(g_s), s | 11.9 | 0.0 | 2.9 | 22.3 | | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.9 | 0.0 | 2.9 | 22.3 | | 0.0 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 94 | 92 | 98 | 4182 | | 3757 | 742 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.85 | 0.55 | | 0.39 | 0.00 |
| Avail Cap(c_a), veh/h | 238 | 232 | 170 | 4182 | | 3757 | 742 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 0.92 | 0.00 |
| Uniform Delay (d), s/veh | 67.4 | 0.0 | 55.1 | 4.3 | | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 21.8 | 0.0 | 7.3 | 0.5 | | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.0 | 0.0 | 3.6 | 10.5 | | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 89.2 | 0.0 | 62.4 | 4.9 | | 0.3 | 0.0 |
| LnGrp LOS | F | | E | A | | A | |
| Approach Vol, veh/h | 83 | | | 2399 | | 1466 | |
| Approach Delay, s/veh | 89.2 | | | 6.9 | | 0.3 | |
| Approach LOS | F | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 129.8 | | 20.2 | 10.3 | 119.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 91.0 | | 34.5 | 13.5 | 83.5 | | |
| Max Q Clear Time (g_c+I1), s | | 24.3 | | 13.9 | 4.9 | 2.0 | | |
| Green Ext Time (p_c), s | | 33.8 | | 0.2 | 0.1 | 14.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.2 |
| HCM 2010 LOS | A |

Notes

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 4 | 1 | 0 | 204 | 0 | 217 | 23 | 68 | 1967 | 111 | 132 | 1108 |
| Future Volume (veh/h) | 4 | 1 | 0 | 204 | 0 | 217 | 23 | 68 | 1967 | 111 | 132 | 1108 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1826 | 1870 | 1841 | | 1870 | 1856 | 1796 | 1752 | 1811 |
| Adj Flow Rate, veh/h | 4 | 1 | 0 | 224 | 0 | 0 | | 75 | 2162 | 0 | 145 | 1218 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 5 | 2 | 4 | | 2 | 3 | 7 | 10 | 6 |
| Cap, veh/h | 173 | 14 | 0 | 269 | 156 | | | 93 | 3175 | | 166 | 3356 |
| Arrive On Green | 0.00 | 0.01 | 0.00 | 0.08 | 0.00 | 0.00 | | 0.10 | 1.00 | 0.00 | 0.10 | 0.67 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3374 | 1870 | 0 | | 1781 | 5066 | 1522 | 1668 | 4982 |
| Grp Volume(v), veh/h | 4 | 1 | 0 | 224 | 0 | 0 | | 75 | 2162 | 0 | 145 | 806 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1687 | 1870 | 0 | | 1781 | 1689 | 1522 | 1668 | 1648 |
| Q Serve(g_s), s | 0.3 | 0.1 | 0.0 | 9.8 | 0.0 | 0.0 | | 6.2 | 0.0 | 0.0 | 12.9 | 15.8 |
| Cycle Q Clear(g_c), s | 0.3 | 0.1 | 0.0 | 9.8 | 0.0 | 0.0 | | 6.2 | 0.0 | 0.0 | 12.9 | 15.8 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 173 | 14 | 0 | 269 | 156 | | | 93 | 3175 | | 166 | 2220 |
| V/C Ratio(X) | 0.02 | 0.07 | 0.00 | 0.83 | 0.00 | | | 0.80 | 0.68 | | 0.88 | 0.36 |
| Avail Cap(c_a), veh/h | 213 | 312 | 0 | 360 | 461 | | | 190 | 3175 | | 211 | 2220 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | | 0.47 | 0.47 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 62.6 | 73.9 | 0.0 | 68.0 | 0.0 | 0.0 | | 66.4 | 0.0 | 0.0 | 66.6 | 10.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.8 | 0.0 | 9.0 | 0.0 | 0.0 | | 2.9 | 0.6 | 0.0 | 22.9 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 4.6 | 0.0 | 0.0 | | 2.7 | 0.2 | 0.0 | 6.4 | 5.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.6 | 74.7 | 0.0 | 77.0 | 0.0 | 0.0 | | 69.3 | 0.6 | 0.0 | 89.6 | 11.0 |
| LnGrp LOS | E | E | A | E | A | | | E | A | | F | B |
| Approach Vol, veh/h | | 5 | | | 224 | A | | | 2237 | A | | 1389 |
| Approach Delay, s/veh | | 65.0 | | | 77.0 | | | | 2.9 | | | 19.4 |
| Approach LOS | | E | | | E | | | | A | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.9 | 101.0 | 19.0 | 8.1 | 14.9 | 108.0 | 7.6 | 19.5 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 19.0 | 62.0 | 16.0 | 25.0 | 16.0 | 65.0 | 4.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 14.9 | 2.0 | 11.8 | 2.1 | 8.2 | 17.8 | 2.3 | 0.0 |
| Green Ext Time (p_c), s | 0.1 | 48.6 | 0.2 | 0.0 | 0.0 | 20.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 13.2 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 24 |
| Future Volume (veh/h) | 24 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 26 |
| Peak Hour Factor | 0.91 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 72 |
| Arrive On Green | 0.67 |
| Sat Flow, veh/h | 106 |
| Grp Volume(v), veh/h | 438 |
| Grp Sat Flow(s),veh/h/ln | 1792 |
| Q Serve(g_s), s | 15.8 |
| Cycle Q Clear(g_c), s | 15.8 |
| Prop In Lane | 0.06 |
| Lane Grp Cap(c), veh/h | 1207 |
| V/C Ratio(X) | 0.36 |
| Avail Cap(c_a), veh/h | 1207 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 10.6 |
| Incr Delay (d2), s/veh | 0.8 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.0 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 11.4 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 29 | 46 | 247 | 24 | 243 | 42 | 1869 | 105 | 4 | 122 | 1135 |
| Future Volume (veh/h) | 42 | 29 | 46 | 247 | 24 | 243 | 42 | 1869 | 105 | 4 | 122 | 1135 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No |
| Adj Sat Flow, veh/h/ln | 1693 | 1826 | 1530 | 1870 | 1811 | 1870 | 1441 | 1841 | 1870 | | 1870 | 1811 |
| Adj Flow Rate, veh/h | 46 | 32 | 0 | 268 | 26 | 0 | 46 | 2032 | 0 | | 133 | 1234 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | | 0.92 | 0.92 |
| Percent Heavy Veh, % | 14 | 5 | 25 | 2 | 6 | 2 | 31 | 4 | 2 | | 2 | 6 |
| Cap, veh/h | 57 | 76 | | 291 | 307 | | 54 | 2689 | | | 137 | 2786 |
| Arrive On Green | 0.04 | 0.04 | 0.00 | 0.16 | 0.17 | 0.00 | 0.08 | 1.00 | 0.00 | | 0.15 | 1.00 |
| Sat Flow, veh/h | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 5025 | 1585 | | 1781 | 4955 |
| Grp Volume(v), veh/h | 46 | 32 | 0 | 268 | 26 | 0 | 46 | 2032 | 0 | | 133 | 821 |
| Grp Sat Flow(s),veh/h/ln | 1612 | 1826 | 1296 | 1781 | 1811 | 1585 | 1372 | 1675 | 1585 | | 1781 | 1648 |
| Q Serve(g_s), s | 4.2 | 2.6 | 0.0 | 22.2 | 1.8 | 0.0 | 5.0 | 0.0 | 0.0 | | 11.1 | 0.0 |
| Cycle Q Clear(g_c), s | 4.2 | 2.6 | 0.0 | 22.2 | 1.8 | 0.0 | 5.0 | 0.0 | 0.0 | | 11.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Lane Grp Cap(c), veh/h | 57 | 76 | | 291 | 307 | | 54 | 2689 | | | 137 | 1853 |
| V/C Ratio(X) | 0.80 | 0.42 | | 0.92 | 0.08 | | 0.85 | 0.76 | | | 0.97 | 0.44 |
| Avail Cap(c_a), veh/h | 107 | 256 | | 392 | 531 | | 101 | 2689 | | | 137 | 1853 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | 2.00 | 2.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.78 | 0.78 | 0.00 | | 0.90 | 0.90 |
| Uniform Delay (d), s/veh | 71.8 | 70.1 | 0.0 | 61.8 | 52.5 | 0.0 | 68.6 | 0.0 | 0.0 | | 63.4 | 0.0 |
| Incr Delay (d2), s/veh | 9.2 | 1.4 | 0.0 | 19.5 | 0.0 | 0.0 | 9.9 | 1.6 | 0.0 | | 64.7 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 1.2 | 0.0 | 11.7 | 0.8 | 0.0 | 1.8 | 0.4 | 0.0 | | 7.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 81.0 | 71.5 | 0.0 | 81.3 | 52.6 | 0.0 | 78.5 | 1.6 | 0.0 | | 128.1 | 0.7 |
| LnGrp LOS | F | E | | F | D | | E | A | | | F | A |
| Approach Vol, veh/h | | 78 | A | | 294 | A | | 2078 | A | | | 1399 |
| Approach Delay, s/veh | | 77.1 | | | 78.8 | | | 3.3 | | | | 13.0 |
| Approach LOS | | E | | | E | | | A | | | | B |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.0 | 87.3 | 31.5 | 13.2 | 13.9 | 91.3 | 12.3 | 32.4 |
| Change Period (Y+Rc), s | 6.5 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 11.5 | 57.0 | 33.0 | 21.0 | 11.0 | 56.0 | 10.0 | 44.0 |
| Max Q Clear Time (g_c+I1), s | 13.1 | 2.0 | 24.2 | 4.6 | 7.0 | 2.0 | 6.2 | 3.8 |
| Green Ext Time (p_c), s | 0.0 | 42.8 | 0.3 | 0.0 | 0.0 | 22.2 | 0.0 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.1 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 29 |
| Future Volume (veh/h) | 29 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1604 |
| Adj Flow Rate, veh/h | 32 |
| Peak Hour Factor | 0.92 |
| Percent Heavy Veh, % | 20 |
| Cap, veh/h | 72 |
| Arrive On Green | 1.00 |
| Sat Flow, veh/h | 128 |
| Grp Volume(v), veh/h | 445 |
| Grp Sat Flow(s),veh/h/ln | 1788 |
| Q Serve(g_s), s | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 |
| Prop In Lane | 0.07 |
| Lane Grp Cap(c), veh/h | 1005 |
| V/C Ratio(X) | 0.44 |
| Avail Cap(c_a), veh/h | 1005 |
| HCM Platoon Ratio | 2.00 |
| Upstream Filter(I) | 0.90 |
| Uniform Delay (d), s/veh | 0.0 |
| Incr Delay (d2), s/veh | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 1.3 |
| LnGrp LOS | A |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 9 | 1 | 149 | 0 | 57 | 0 | 1996 | 88 | 30 | 1398 | 0 |
| Future Volume (veh/h) | 0 | 9 | 1 | 149 | 0 | 57 | 0 | 1996 | 88 | 30 | 1398 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1796 | 0 | 1841 | 1826 | 1826 | 1811 | 1870 |
| Adj Flow Rate, veh/h | 0 | 10 | 1 | 162 | 0 | 0 | 0 | 2170 | 0 | 33 | 1520 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 7 | 0 | 4 | 5 | 5 | 6 | 2 |
| Cap, veh/h | 227 | 31 | 3 | 208 | 234 | | 0 | 3576 | | 52 | 3897 | |
| Arrive On Green | 0.00 | 0.02 | 0.02 | 0.06 | 0.00 | 0.00 | 0.00 | 0.71 | 0.00 | 0.06 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1781 | 1673 | 167 | 3456 | 1870 | 1522 | 0 | 5191 | 1547 | 1739 | 4944 | 1585 |
| Grp Volume(v), veh/h | 0 | 0 | 11 | 162 | 0 | 0 | 0 | 2170 | 0 | 33 | 1520 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1840 | 1728 | 1870 | 1522 | 0 | 1675 | 1547 | 1739 | 1648 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.9 | 6.9 | 0.0 | 0.0 | 0.0 | 32.9 | 0.0 | 2.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.9 | 6.9 | 0.0 | 0.0 | 0.0 | 32.9 | 0.0 | 2.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 1.00 | 0.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 227 | 0 | 34 | 208 | 234 | | 0 | 3576 | | 52 | 3897 | |
| V/C Ratio(X) | 0.00 | 0.00 | 0.33 | 0.78 | 0.00 | | 0.00 | 0.61 | | 0.63 | 0.39 | |
| Avail Cap(c_a), veh/h | 297 | 0 | 337 | 323 | 443 | | 0 | 3576 | | 70 | 3897 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.83 | 0.83 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 72.7 | 69.5 | 0.0 | 0.0 | 0.0 | 11.0 | 0.0 | 69.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 2.1 | 2.5 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 3.9 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.4 | 3.2 | 0.0 | 0.0 | 0.0 | 10.7 | 0.0 | 1.2 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 74.8 | 72.0 | 0.0 | 0.0 | 0.0 | 11.8 | 0.0 | 73.6 | 0.2 | 0.0 |
| LnGrp LOS | A | A | E | E | A | | A | B | | E | A | |
| Approach Vol, veh/h | | 11 | | | 162 | A | | 2170 | A | | 1553 | A |
| Approach Delay, s/veh | | 74.8 | | | 72.0 | | | 11.8 | | | 1.8 | |
| Approach LOS | | E | | | E | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.5 | 113.2 | 16.0 | 9.2 | 124.7 | 0.0 | 25.3 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 6.0 | 75.5 | 14.0 | 27.5 | 88.5 | 6.0 | 35.5 |
| Max Q Clear Time (g_c+I1), s | 4.8 | 34.9 | 8.9 | 2.9 | 2.0 | 0.0 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 35.1 | 0.1 | 0.0 | 37.1 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 10.5 |
| HCM 6th LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 813 | 1129 | 190 | 103 | 364 | 290 | 101 | 957 | 161 | 253 | 777 | 477 |
| Future Volume (veh/h) | 813 | 1129 | 190 | 103 | 364 | 290 | 101 | 957 | 161 | 253 | 777 | 477 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1856 | 1811 | 1856 | 1796 | 1870 | 1870 | 1781 | 1856 |
| Adj Flow Rate, veh/h | 856 | 1188 | 0 | 108 | 383 | 0 | 106 | 1007 | 0 | 266 | 818 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 7 | 2 | 2 | 8 | 3 |
| Cap, veh/h | 912 | 1634 | | 152 | 507 | | 127 | 1814 | | 309 | 1324 | |
| Arrive On Green | 0.26 | 0.32 | 0.00 | 0.04 | 0.10 | 0.00 | 0.07 | 0.37 | 0.00 | 0.09 | 0.39 | 0.00 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | 3456 | 5066 | 1535 | 1767 | 4904 | 1585 | 3456 | 3385 | 1572 |
| Grp Volume(v), veh/h | 856 | 1188 | 0 | 108 | 383 | 0 | 106 | 1007 | 0 | 266 | 818 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | 1728 | 1689 | 1535 | 1767 | 1635 | 1585 | 1728 | 1692 | 1572 |
| Q Serve(g_s), s | 36.4 | 30.9 | 0.0 | 4.6 | 11.0 | 0.0 | 8.9 | 24.4 | 0.0 | 11.4 | 29.1 | 0.0 |
| Cycle Q Clear(g_c), s | 36.4 | 30.9 | 0.0 | 4.6 | 11.0 | 0.0 | 8.9 | 24.4 | 0.0 | 11.4 | 29.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 912 | 1634 | | 152 | 507 | | 127 | 1814 | | 309 | 1324 | |
| V/C Ratio(X) | 0.94 | 0.73 | | 0.71 | 0.76 | | 0.84 | 0.56 | | 0.86 | 0.62 | |
| Avail Cap(c_a), veh/h | 1048 | 2111 | | 219 | 878 | | 135 | 1814 | | 323 | 1324 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 54.0 | 45.2 | 0.0 | 70.8 | 65.7 | 0.0 | 68.7 | 37.5 | 0.0 | 67.4 | 36.7 | 0.0 |
| Incr Delay (d2), s/veh | 13.5 | 0.6 | 0.0 | 2.3 | 0.9 | 0.0 | 30.7 | 1.2 | 0.0 | 18.7 | 2.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.1 | 12.9 | 0.0 | 2.1 | 4.7 | 0.0 | 5.0 | 9.7 | 0.0 | 5.7 | 12.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 67.5 | 45.8 | 0.0 | 73.1 | 66.6 | 0.0 | 99.4 | 38.7 | 0.0 | 86.1 | 38.8 | 0.0 |
| LnGrp LOS | E | D | | E | E | | F | D | | F | D | |
| Approach Vol, veh/h | | 2044 | A | | 491 | A | | 1113 | A | | 1084 | A |
| Approach Delay, s/veh | | 54.9 | | | 68.0 | | | 44.5 | | | 50.4 | |
| Approach LOS | | D | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.4 | 62.0 | 13.1 | 54.5 | 17.3 | 65.2 | 46.1 | 21.5 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 14.0 | 38.0 | 9.5 | 62.0 | 11.5 | 41.0 | 45.5 | 26.0 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 26.4 | 6.6 | 32.9 | 10.9 | 31.1 | 38.4 | 13.0 |
| Green Ext Time (p_c), s | 0.0 | 2.0 | 0.0 | 5.7 | 0.0 | 2.5 | 1.2 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 52.8 |
| HCM 6th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 191 | 313 | 233 | 1280 | 990 | 315 | 152 | 1295 | 336 | 205 | 1639 | 303 |
| Future Volume (veh/h) | 191 | 313 | 233 | 1280 | 990 | 315 | 152 | 1295 | 336 | 205 | 1639 | 303 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1841 | 1767 | 1870 | 1870 | 1856 | 1767 | 1870 | 1796 | 1841 | 1870 | 1826 |
| Adj Flow Rate, veh/h | 205 | 337 | 0 | 1376 | 1065 | 0 | 163 | 1392 | 0 | 220 | 1762 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 4 | 9 | 2 | 2 | 3 | 9 | 2 | 7 | 4 | 2 | 5 |
| Cap, veh/h | 223 | 434 | | 1235 | 1133 | | 165 | 1412 | | 237 | 1603 | |
| Arrive On Green | 0.12 | 0.09 | 0.00 | 0.36 | 0.32 | 0.00 | 0.10 | 0.28 | 0.00 | 0.14 | 0.31 | 0.00 |
| Sat Flow, veh/h | 1781 | 5191 | 0 | 3456 | 3554 | 1572 | 1682 | 5106 | 1522 | 1753 | 5106 | 1547 |
| Grp Volume(v), veh/h | 205 | 337 | 0 | 1376 | 1065 | 0 | 163 | 1392 | 0 | 220 | 1762 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1675 | 0 | 1728 | 1777 | 1572 | 1682 | 1702 | 1522 | 1753 | 1702 | 1547 |
| Q Serve(g_s), s | 20.5 | 11.8 | 0.0 | 64.3 | 52.5 | 0.0 | 17.4 | 48.8 | 0.0 | 22.3 | 56.5 | 0.0 |
| Cycle Q Clear(g_c), s | 20.5 | 11.8 | 0.0 | 64.3 | 52.5 | 0.0 | 17.4 | 48.8 | 0.0 | 22.3 | 56.5 | 0.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 223 | 434 | | 1235 | 1133 | | 165 | 1412 | | 237 | 1603 | |
| V/C Ratio(X) | 0.92 | 0.78 | | 1.11 | 0.94 | | 0.99 | 0.99 | | 0.93 | 1.10 | |
| Avail Cap(c_a), veh/h | 223 | 796 | | 1235 | 1175 | | 165 | 1412 | | 239 | 1603 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.87 | 0.87 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 77.9 | 80.5 | 0.0 | 57.8 | 59.6 | 0.0 | 81.1 | 64.7 | 0.0 | 77.0 | 61.8 | 0.0 |
| Incr Delay (d2), s/veh | 39.0 | 3.0 | 0.0 | 63.1 | 14.0 | 0.0 | 62.0 | 19.2 | 0.0 | 38.7 | 54.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.8 | 5.2 | 0.0 | 38.5 | 25.6 | 0.0 | 10.3 | 23.2 | 0.0 | 12.5 | 31.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 116.9 | 83.5 | 0.0 | 121.0 | 73.6 | 0.0 | 143.1 | 83.9 | 0.0 | 115.7 | 116.6 | 0.0 |
| LnGrp LOS | F | F | | F | E | | F | F | | F | F | |
| Approach Vol, veh/h | | 542 | A | | 2441 | A | | 1555 | A | | 1982 | A |
| Approach Delay, s/veh | | 96.2 | | | 100.3 | | | 90.1 | | | 116.5 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.8 | 56.3 | 70.8 | 22.1 | 24.1 | 63.0 | 29.0 | 63.9 |
| Change Period (Y+Rc), s | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 24.5 | 47.5 | 53.5 | 28.5 | 15.5 | 56.5 | 22.5 | 59.5 |
| Max Q Clear Time (g_c+I1), s | 24.3 | 50.8 | 66.3 | 13.8 | 19.4 | 58.5 | 22.5 | 54.5 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 102.5 |
| HCM 6th LOS | F |

**Notes**

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 80 | 0 | 73 | 0 | 1678 | 32 | 3 | 42 | 3200 |
| Future Volume (veh/h) | 0 | 0 | 0 | 80 | 0 | 73 | 0 | 1678 | 32 | 3 | 42 | 3200 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1633 | 1870 | 1381 | 1870 | 1870 | 1426 | | 1233 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 85 | 0 | 78 | 0 | 1785 | 34 | | 45 | 3404 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 18 | 2 | 35 | 2 | 2 | 32 | | 45 | 2 |
| Cap, veh/h | 0 | 225 | 0 | 121 | 3 | 86 | 1 | 3518 | 832 | | 90 | 4109 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.12 | 0.00 | 1.00 | 1.00 | | 0.15 | 1.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 758 | 23 | 716 | 1781 | 5106 | 1207 | | 1174 | 5274 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 163 | 0 | 0 | 0 | 1785 | 34 | | 45 | 3404 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1497 | 0 | 0 | 1781 | 1702 | 1207 | | 1174 | 1702 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 18.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 6.3 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 19.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 6.3 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 0.52 | | 0.48 | 1.00 | | 1.00 | | 1.00 | |
| Lane Grp Cap(c), veh/h | 0 | 225 | 0 | 210 | 0 | 0 | 1 | 3518 | 832 | | 90 | 4109 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.51 | 0.04 | | 0.50 | 0.83 |
| Avail Cap(c_a), veh/h | 0 | 255 | 0 | 234 | 0 | 0 | 84 | 3518 | 832 | | 90 | 4109 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | 2.00 | 2.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.93 | 0.93 | | 0.09 | 0.09 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 78.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 72.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 14.9 | 0.0 | 0.0 | 0.0 | 0.5 | 0.1 | | 0.5 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | | 1.8 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 0.0 | 0.0 | 93.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.1 | | 73.5 | 0.2 |
| LnGrp LOS | A | A | A | F | A | A | A | A | A | | E | A |
| Approach Vol, veh/h | | 0 | | | 163 | | | 1819 | | | | 3449 |
| Approach Delay, s/veh | | 0.0 | | | 93.0 | | | 0.5 | | | | 1.1 |
| Approach LOS | | | | | F | | | A | | | | A |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.9 | 131.0 | | 28.1 | 0.0 | 151.9 | | 28.1 | | | | |
| Change Period (Y+Rc), s | 7.0 | * 7 | | 6.5 | 6.5 | 7.0 | | 6.5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | * 1.2E2 | | 24.5 | 8.5 | 127.0 | | 24.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 8.3 | 2.0 | | 0.0 | 0.0 | 2.0 | | 21.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 38.1 | | 0.0 | 0.0 | 117.7 | | 0.3 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 3.7 |
| HCM 6th LOS | A |

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 0 |
| Future Volume (veh/h) | 0 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 0 |
| Peak Hour Factor | 0.94 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 0 |
| Arrive On Green | 0.00 |
| Sat Flow, veh/h | 0 |
| Grp Volume(v), veh/h | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 |
| Q Serve(g_s), s | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 |
| Prop In Lane | 0.00 |
| Lane Grp Cap(c), veh/h | 0 |
| V/C Ratio(X) | 0.00 |
| Avail Cap(c_a), veh/h | 0 |
| HCM Platoon Ratio | 2.00 |
| Upstream Filter(I) | 0.00 |
| Uniform Delay (d), s/veh | 0.0 |
| Incr Delay (d2), s/veh | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 0.0 |
| LnGrp LOS | A |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

| Movement | EBL | EBR | NBL | NBT | SBU | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (veh/h) | 17 | 69 | 32 | 1661 | 0 | 3306 | 13 |
| Future Volume (veh/h) | 17 | 69 | 32 | 1661 | 0 | 3306 | 13 |
| Number | 7 | 14 | 5 | 2 | | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1203 | 1319 | 1267 | 1863 | | 1863 | 1067 |
| Adj Flow Rate, veh/h | 18 | 0 | 33 | 1730 | | 3444 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 3 | | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 |
| Percent Heavy Veh, % | 58 | 44 | 50 | 2 | | 2 | 78 |
| Cap, veh/h | 23 | 22 | 68 | 4617 | | 4348 | 776 |
| Arrive On Green | 0.02 | 0.00 | 0.02 | 0.91 | | 1.00 | 0.00 |
| Sat Flow, veh/h | 1145 | 1122 | 1206 | 5253 | | 5253 | 907 |
| Grp Volume(v), veh/h | 18 | 0 | 33 | 1730 | | 3444 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1145 | 1122 | 1206 | 1695 | | 1695 | 907 |
| Q Serve(g_s), s | 2.8 | 0.0 | 0.4 | 8.5 | | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.8 | 0.0 | 0.4 | 8.5 | | 0.0 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | | 1.00 |
| Lane Grp Cap(c), veh/h | 23 | 22 | 68 | 4617 | | 4348 | 776 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.49 | 0.37 | | 0.79 | 0.00 |
| Avail Cap(c_a), veh/h | 207 | 202 | 105 | 4617 | | 4348 | 776 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | | 0.35 | 0.00 |
| Uniform Delay (d), s/veh | 87.9 | 0.0 | 74.6 | 1.2 | | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 44.7 | 0.0 | 2.0 | 0.2 | | 0.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 0.0 | 1.5 | 3.9 | | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 132.6 | 0.0 | 76.6 | 1.4 | | 0.5 | 0.0 |
| LnGrp LOS | F | | E | A | | A | |
| Approach Vol, veh/h | 18 | | | 1763 | | 3444 | |
| Approach Delay, s/veh | 132.6 | | | 2.8 | | 0.5 | |
| Approach LOS | F | | | A | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 169.9 | | 10.1 | 9.5 | 160.4 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 5.5 | 6.5 | | |
| Max Green Setting (Gmax), s | | 123.5 | | 32.5 | 9.5 | 119.5 | | |
| Max Q Clear Time (g_c+I1), s | | 10.5 | | 4.8 | 2.4 | 2.0 | | |
| Green Ext Time (p_c), s | | 19.8 | | 0.0 | 0.0 | 98.7 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 1.8 |
| HCM 2010 LOS | A |

Notes

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 6 | 6 | 148 | 3 | 155 | 14 | 4 | 1596 | 181 | 154 | 3114 |
| Future Volume (veh/h) | 29 | 6 | 6 | 148 | 3 | 155 | 14 | 4 | 1596 | 181 | 154 | 3114 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 | | 1870 | 1856 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 30 | 6 | 6 | 154 | 3 | 0 | | 4 | 1662 | 0 | 160 | 3244 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 3 | | 2 | 3 | 2 | 2 | 3 |
| Cap, veh/h | 166 | 25 | 25 | 192 | 121 | | | 7 | 3336 | | 179 | 3945 |
| Arrive On Green | 0.02 | 0.03 | 0.03 | 0.06 | 0.06 | 0.00 | | 0.01 | 1.00 | 0.00 | 0.10 | 0.76 |
| Sat Flow, veh/h | 1781 | 850 | 850 | 3456 | 1870 | 0 | | 1781 | 5066 | 1585 | 1781 | 5225 |
| Grp Volume(v), veh/h | 30 | 0 | 12 | 154 | 3 | 0 | | 4 | 1662 | 0 | 160 | 2096 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1699 | 1728 | 1870 | 0 | | 1781 | 1689 | 1585 | 1781 | 1689 |
| Q Serve(g_s), s | 2.8 | 0.0 | 1.2 | 7.9 | 0.3 | 0.0 | | 0.4 | 0.0 | 0.0 | 16.0 | 72.2 |
| Cycle Q Clear(g_c), s | 2.8 | 0.0 | 1.2 | 7.9 | 0.3 | 0.0 | | 0.4 | 0.0 | 0.0 | 16.0 | 72.2 |
| Prop In Lane | 1.00 | | 0.50 | 1.00 | | 0.00 | | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 166 | 0 | 51 | 192 | 121 | | | 7 | 3336 | | 179 | 2550 |
| V/C Ratio(X) | 0.18 | 0.00 | 0.24 | 0.80 | 0.02 | | | 0.56 | 0.50 | | 0.89 | 0.82 |
| Avail Cap(c_a), veh/h | 169 | 0 | 264 | 250 | 384 | | | 49 | 3336 | | 267 | 2550 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | | 0.73 | 0.73 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 76.6 | 0.0 | 85.3 | 84.0 | 78.9 | 0.0 | | 89.1 | 0.0 | 0.0 | 80.0 | 14.2 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.9 | 10.1 | 0.0 | 0.0 | | 17.0 | 0.4 | 0.0 | 16.5 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.0 | 0.6 | 3.8 | 0.1 | 0.0 | | 0.2 | 0.1 | 0.0 | 8.1 | 24.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 76.8 | 0.0 | 86.2 | 94.1 | 78.9 | 0.0 | | 106.2 | 0.4 | 0.0 | 96.5 | 17.4 |
| LnGrp LOS | E | A | F | F | E | | | F | A | | F | B |
| Approach Vol, veh/h | | 42 | | | 157 | A | | | 1666 | A | | 3408 |
| Approach Delay, s/veh | | 79.5 | | | 93.8 | | | | 0.6 | | | 21.9 |
| Approach LOS | | E | | | F | | | | A | | | C |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.1 | 125.5 | 17.0 | 12.4 | 7.7 | 142.9 | 10.7 | 18.6 |
| Change Period (Y+Rc), s | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 27.0 | 84.0 | 13.0 | 28.0 | 5.0 | 106.0 | 4.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 18.0 | 2.0 | 9.9 | 3.2 | 2.4 | 74.3 | 4.8 | 2.3 |
| Green Ext Time (p_c), s | 0.1 | 42.2 | 0.1 | 0.0 | 0.0 | 31.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.8 |
| HCM 6th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 4 |
| Future Volume (veh/h) | 4 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 4 |
| Peak Hour Factor | 0.96 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | 5 |
| Arrive On Green | 0.76 |
| Sat Flow, veh/h | 6 |
| Grp Volume(v), veh/h | 1152 |
| Grp Sat Flow(s),veh/h/ln | 1854 |
| Q Serve(g_s), s | 72.3 |
| Cycle Q Clear(g_c), s | 72.3 |
| Prop In Lane | 0.00 |
| Lane Grp Cap(c), veh/h | 1400 |
| V/C Ratio(X) | 0.82 |
| Avail Cap(c_a), veh/h | 1400 |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 1.00 |
| Uniform Delay (d), s/veh | 14.3 |
| Incr Delay (d2), s/veh | 5.6 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 27.9 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 19.8 |
| LnGrp LOS | B |
| Approach Vol, veh/h | |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBU | NBL | NBT | NBR | SBU | SBL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 66 | 30 | 119 | 152 | 20 | 116 | 6 | 40 | 1734 | 216 | 10 | 134 |
| Future Volume (veh/h) | 66 | 30 | 119 | 152 | 20 | 116 | 6 | 40 | 1734 | 216 | 10 | 134 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 |
| Work Zone On Approach | | No | | | No | | | | No | | | |
| Adj Sat Flow, veh/h/ln | 1737 | 1870 | 1811 | 1870 | 1796 | 1870 | | 1796 | 1870 | 1870 | | 1870 |
| Adj Flow Rate, veh/h | 74 | 34 | 0 | 171 | 22 | 0 | | 45 | 1948 | 0 | | 151 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | | 0.89 | 0.89 | 0.89 | | 0.89 |
| Percent Heavy Veh, % | 11 | 2 | 6 | 2 | 7 | 2 | | 7 | 2 | 2 | | 2 |
| Cap, veh/h | 90 | 62 | | 188 | 152 | | | 57 | 2175 | | | 498 |
| Arrive On Green | 0.05 | 0.03 | 0.00 | 0.11 | 0.08 | 0.00 | | 0.07 | 0.85 | 0.00 | | 0.37 |
| Sat Flow, veh/h | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 5106 | 1585 | | 1781 |
| Grp Volume(v), veh/h | 74 | 34 | 0 | 171 | 22 | 0 | | 45 | 1948 | 0 | | 151 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1870 | 1535 | 1781 | 1796 | 1585 | | 1711 | 1702 | 1585 | | 1781 |
| Q Serve(g_s), s | 8.0 | 3.2 | 0.0 | 17.1 | 2.0 | 0.0 | | 4.7 | 42.9 | 0.0 | | 10.8 |
| Cycle Q Clear(g_c), s | 8.0 | 3.2 | 0.0 | 17.1 | 2.0 | 0.0 | | 4.7 | 42.9 | 0.0 | | 10.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 90 | 62 | | 188 | 152 | | | 57 | 2175 | | | 498 |
| V/C Ratio(X) | 0.83 | 0.55 | | 0.91 | 0.14 | | | 0.79 | 0.90 | | | 0.30 |
| Avail Cap(c_a), veh/h | 138 | 312 | | 188 | 339 | | | 57 | 2400 | | | 498 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 | 2.00 | | 1.33 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 0.86 | 0.86 | 0.00 | | 0.45 |
| Uniform Delay (d), s/veh | 84.3 | 85.7 | 0.0 | 79.6 | 76.3 | 0.0 | | 83.4 | 10.8 | 0.0 | | 44.1 |
| Incr Delay (d2), s/veh | 12.2 | 2.8 | 0.0 | 40.3 | 0.2 | 0.0 | | 43.8 | 5.5 | 0.0 | | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 1.6 | 0.0 | 10.0 | 1.0 | 0.0 | | 2.7 | 5.7 | 0.0 | | 4.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 96.4 | 88.4 | 0.0 | 119.9 | 76.5 | 0.0 | | 127.2 | 16.3 | 0.0 | | 44.2 |
| LnGrp LOS | F | F | | F | E | | | F | B | | | D |
| Approach Vol, veh/h | | 108 | A | | 193 | A | | | 1993 | A | | |
| Approach Delay, s/veh | | 93.9 | | | 115.0 | | | | 18.8 | | | |
| Approach LOS | | F | | | F | | | | B | | | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 57.3 | 83.7 | 26.0 | 13.0 | 14.0 | 127.0 | 16.8 | 22.2 |
| Change Period (Y+Rc), s | 7.0 | * 7 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 |
| Max Green Setting (Gmax), s | 18.9 | * 85 | 19.0 | 30.0 | 6.0 | 96.0 | 15.0 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 12.8 | 44.9 | 19.1 | 5.2 | 6.7 | 122.0 | 10.0 | 4.0 |
| Green Ext Time (p_c), s | 0.1 | 31.8 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 28.9 |
| HCM 6th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | SBT | SBR |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (veh/h) | 3101 | 33 |
| Future Volume (veh/h) | 3101 | 33 |
| Initial Q (Qb), veh | 0 | 0 |
| Ped-Bike Adj(A_pbT) | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 |
| Work Zone On Approach | No | |
| Adj Sat Flow, veh/h/ln | 1856 | 1841 |
| Adj Flow Rate, veh/h | 3484 | 37 |
| Peak Hour Factor | 0.89 | 0.89 |
| Percent Heavy Veh, % | 3 | 4 |
| Cap, veh/h | 3447 | 36 |
| Arrive On Green | 0.89 | 0.89 |
| Sat Flow, veh/h | 5168 | 55 |
| Grp Volume(v), veh/h | 2272 | 1249 |
| Grp Sat Flow(s),veh/h/ln | 1689 | 1846 |
| Q Serve(g_s), s | 120.0 | 120.0 |
| Cycle Q Clear(g_c), s | 120.0 | 120.0 |
| Prop In Lane | | 0.03 |
| Lane Grp Cap(c), veh/h | 2252 | 1231 |
| V/C Ratio(X) | 1.01 | 1.01 |
| Avail Cap(c_a), veh/h | 2252 | 1231 |
| HCM Platoon Ratio | 1.33 | 1.33 |
| Upstream Filter(I) | 0.45 | 0.45 |
| Uniform Delay (d), s/veh | 10.2 | 10.2 |
| Incr Delay (d2), s/veh | 15.0 | 20.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.0 | 14.1 |
| Unsig. Movement Delay, s/veh | | |
| LnGrp Delay(d),s/veh | 25.1 | 31.0 |
| LnGrp LOS | F | F |
| Approach Vol, veh/h | 3672 | |
| Approach Delay, s/veh | 27.9 | |
| Approach LOS | C | |
| Timer - Assigned Phs | | |

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 3 | 3 | 26 | 147 | 0 | 32 | 0 | 1743 | 172 | 3 | 42 | 3308 |
| Future Volume (veh/h) | 3 | 3 | 26 | 147 | 0 | 32 | 0 | 1743 | 172 | 3 | 42 | 3308 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1767 | 0 | 1870 | 1870 | | 1870 | 1856 |
| Adj Flow Rate, veh/h | 3 | 3 | 27 | 155 | 0 | 0 | 0 | 1835 | 0 | | 44 | 3482 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 9 | 0 | 2 | 2 | | 2 | 3 |
| Cap, veh/h | 164 | 5 | 44 | 193 | 153 | | 0 | 3737 | | | 56 | 4064 |
| Arrive On Green | 0.00 | 0.03 | 0.03 | 0.06 | 0.00 | 0.00 | 0.00 | 0.73 | 0.00 | | 0.06 | 1.00 |
| Sat Flow, veh/h | 1781 | 160 | 1437 | 3456 | 1870 | 1497 | 0 | 5274 | 1585 | | 1781 | 5066 |
| Grp Volume(v), veh/h | 3 | 0 | 30 | 155 | 0 | 0 | 0 | 1835 | 0 | | 44 | 3482 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1596 | 1728 | 1870 | 1497 | 0 | 1702 | 1585 | | 1781 | 1689 |
| Q Serve(g_s), s | 0.3 | 0.0 | 3.3 | 8.0 | 0.0 | 0.0 | 0.0 | 27.1 | 0.0 | | 4.4 | 0.0 |
| Cycle Q Clear(g_c), s | 0.3 | 0.0 | 3.3 | 8.0 | 0.0 | 0.0 | 0.0 | 27.1 | 0.0 | | 4.4 | 0.0 |
| Prop In Lane | 1.00 | | 0.90 | 1.00 | | 1.00 | 0.00 | | 1.00 | | 1.00 | |
| Lane Grp Cap(c), veh/h | 164 | 0 | 49 | 193 | 153 | | 0 | 3737 | | | 56 | 4064 |
| V/C Ratio(X) | 0.02 | 0.00 | 0.61 | 0.80 | 0.00 | | 0.00 | 0.49 | | | 0.78 | 0.86 |
| Avail Cap(c_a), veh/h | 275 | 0 | 279 | 269 | 348 | | 0 | 3737 | | | 99 | 4064 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 2.00 | 2.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | | 0.09 | 0.09 |
| Uniform Delay (d), s/veh | 75.2 | 0.0 | 86.2 | 84.0 | 0.0 | 0.0 | 0.0 | 10.1 | 0.0 | | 83.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 4.6 | 7.7 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | | 0.8 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 1.5 | 3.8 | 0.0 | 0.0 | 0.0 | 9.3 | 0.0 | | 2.0 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 75.2 | 0.0 | 90.8 | 91.7 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | | 84.5 | 0.2 |
| LnGrp LOS | E | A | F | F | A | | A | B | | | F | A |
| Approach Vol, veh/h | | 33 | | | 155 | A | | 1835 | A | | | 3526 |
| Approach Delay, s/veh | | 89.4 | | | 91.7 | | | 10.6 | | | | 1.3 |
| Approach LOS | | F | | | F | | | B | | | | A |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.7 | 138.2 | 17.1 | 12.0 | | 150.9 | 7.8 | 21.2 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 7.0 | 6.5 | | 6.5 | 7.0 | 6.5 |
| Max Green Setting (Gmax), s | 10.0 | 97.5 | 14.0 | 31.5 | | 114.5 | 12.0 | 33.5 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 29.1 | 10.0 | 5.3 | | 2.0 | 2.3 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 44.4 | 0.1 | 0.1 | | 111.1 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 7.4 |
| HCM 6th LOS | A |

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 23 |
| Future Volume (veh/h) | 23 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 0 |
| Peak Hour Factor | 0.95 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | |
| Arrive On Green | 0.00 |
| Sat Flow, veh/h | 1585 |
| Grp Volume(v), veh/h | 0 |
| Grp Sat Flow(s),veh/h/ln | 1585 |
| Q Serve(g_s), s | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 |
| Prop In Lane | 1.00 |
| Lane Grp Cap(c), veh/h | |
| V/C Ratio(X) | |
| Avail Cap(c_a), veh/h | |
| HCM Platoon Ratio | 2.00 |
| Upstream Filter(I) | 0.00 |
| Uniform Delay (d), s/veh | 0.0 |
| Incr Delay (d2), s/veh | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 0.0 |
| LnGrp LOS | |
| Approach Vol, veh/h | A |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 581 | 744 | 217 | 3 | 253 | 1093 | 410 | 262 | 1001 | 269 | 510 | 1576 |
| Future Volume (veh/h) | 581 | 744 | 217 | 3 | 253 | 1093 | 410 | 262 | 1001 | 269 | 510 | 1576 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | No | | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 |
| Adj Flow Rate, veh/h | 618 | 791 | 0 | | 269 | 1163 | 0 | 279 | 1065 | 0 | 543 | 1677 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| Cap, veh/h | 490 | 1383 | | | 312 | 1121 | | 213 | 1163 | | 1238 | 1632 |
| Arrive On Green | 0.14 | 0.27 | 0.00 | | 0.09 | 0.22 | 0.00 | 0.12 | 0.23 | 0.00 | 0.36 | 0.47 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | | 3456 | 5106 | 1585 | 1781 | 5106 | 1585 | 3456 | 3497 |
| Grp Volume(v), veh/h | 618 | 791 | 0 | | 269 | 1163 | 0 | 279 | 1065 | 0 | 543 | 1677 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | | 1728 | 1702 | 1585 | 1781 | 1702 | 1585 | 1728 | 1749 |
| Q Serve(g_s), s | 25.5 | 24.1 | 0.0 | | 13.8 | 39.5 | 0.0 | 21.5 | 36.6 | 0.0 | 21.5 | 84.0 |
| Cycle Q Clear(g_c), s | 25.5 | 24.1 | 0.0 | | 13.8 | 39.5 | 0.0 | 21.5 | 36.6 | 0.0 | 21.5 | 84.0 |
| Prop In Lane | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 490 | 1383 | | | 312 | 1121 | | 213 | 1163 | | 1238 | 1632 |
| V/C Ratio(X) | 1.26 | 0.57 | | | 0.86 | 1.04 | | 1.31 | 0.92 | | 0.44 | 1.03 |
| Avail Cap(c_a), veh/h | 490 | 1383 | | | 682 | 1121 | | 213 | 1631 | | 1238 | 1632 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 77.3 | 56.6 | 0.0 | | 80.8 | 70.3 | 0.0 | 79.2 | 67.8 | 0.0 | 44.0 | 48.0 |
| Incr Delay (d2), s/veh | 133.7 | 0.4 | 0.0 | | 2.8 | 37.2 | 0.0 | 169.5 | 12.6 | 0.0 | 0.1 | 29.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 20.3 | 10.3 | 0.0 | | 6.2 | 20.8 | 0.0 | 19.7 | 17.0 | 0.0 | 9.1 | 41.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 210.9 | 57.0 | 0.0 | | 83.5 | 107.5 | 0.0 | 248.8 | 80.4 | 0.0 | 44.1 | 77.6 |
| LnGrp LOS | F | E | | | F | F | | F | F | | D | F |
| Approach Vol, veh/h | | 1409 | A | | | 1432 | A | | 1344 | A | | 2220 |
| Approach Delay, s/veh | | 124.5 | | | | 103.0 | | | 115.4 | | | 69.4 |
| Approach LOS | | F | | | | F | | | F | | | E |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 72.0 | 47.5 | 22.8 | 55.2 | 28.0 | 91.5 | 32.0 | 46.0 |
| Change Period (Y+Rc), s | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | * 7 | 6.5 | 6.5 |
| Max Green Setting (Gmax), s | 31.0 | 57.5 | 35.5 | 29.5 | 21.5 | * 68 | 25.5 | 39.5 |
| Max Q Clear Time (g_c+I1), s | 23.5 | 38.6 | 15.8 | 26.1 | 23.5 | 86.0 | 27.5 | 41.5 |
| Green Ext Time (p_c), s | 0.7 | 2.4 | 0.4 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 98.7 |
| HCM 6th LOS | F |

**Notes**

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

| Movement | SBR |
|---|---|
| Lane Configurations | |
| Traffic Volume (veh/h) | 1418 |
| Future Volume (veh/h) | 1418 |
| Initial Q (Qb), veh | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 |
| Parking Bus, Adj | 1.00 |
| Work Zone On Approach | |
| Adj Sat Flow, veh/h/ln | 1870 |
| Adj Flow Rate, veh/h | 0 |
| Peak Hour Factor | 0.94 |
| Percent Heavy Veh, % | 2 |
| Cap, veh/h | |
| Arrive On Green | 0.00 |
| Sat Flow, veh/h | 1585 |
| Grp Volume(v), veh/h | 0 |
| Grp Sat Flow(s),veh/h/ln | 1585 |
| Q Serve(g_s), s | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 |
| Prop In Lane | 1.00 |
| Lane Grp Cap(c), veh/h | |
| V/C Ratio(X) | |
| Avail Cap(c_a), veh/h | |
| HCM Platoon Ratio | 1.00 |
| Upstream Filter(I) | 0.00 |
| Uniform Delay (d), s/veh | 0.0 |
| Incr Delay (d2), s/veh | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 |
| Unsig. Movement Delay, s/veh | |
| LnGrp Delay(d),s/veh | 0.0 |
| LnGrp LOS | |
| Approach Vol, veh/h | A |
| Approach Delay, s/veh | |
| Approach LOS | |
| Timer - Assigned Phs | |

# ATTACHMENT 2

# PROJECT SUMMARY AND SITE LOCATION MAPS

# Project Summary
# City of Arlington Landfill Reconfiguration
# Tarrant County, Texas

## Introduction

The City of Arlington Landfill is in the process of developing a permit amendment application to secure authorization to reconfigure the existing City of Arlington Landfill. The landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties. The permit amendment application will be submitted to the Texas Commission on Environmental Quality (TCEQ) and will undergo a detailed review before the operative Permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed project. 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

City of Arlington Landfill is owned by the City of Arlington and operated by Republic Services of Texas, Ltd. Republic Services of Texas, Ltd. is a subsidiary of Republic Services (Republic). Republic 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 figure shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This figure shows the site location on a USGS topographic map.
- Figure 3 – Aerial Photograph. This figure details both the currently permitted landfill and proposed reconfigured landfill on an aerial photograph.
- Figure 4 – Site Plan. This plan details both the currently permitted landfill and proposed reconfiguration landfill on a detailed topographic map.

- Figure 5 – Existing and Proposed Landfill Completion Plan. This figure provides a comparison between the currently permitted landfill and the proposed reconfigured landfill completion plan.

## Site History

The City of Arlington Landfill is an existing 774.3-acre municipal solid waste facility (TCEQ Permit No. MSW-358B) in Tarrant County. The landfill is currently comprised of two separate disposal areas which are separated by Hurricane Creek. As part of this permit amendment application, Hurricane Creek will be relocated west and the site layout will be reconfigured into one contiguous disposal area.

## Design Summary

The following information presents a summary of the design and operations of the proposed City of Arlington Landfill project.

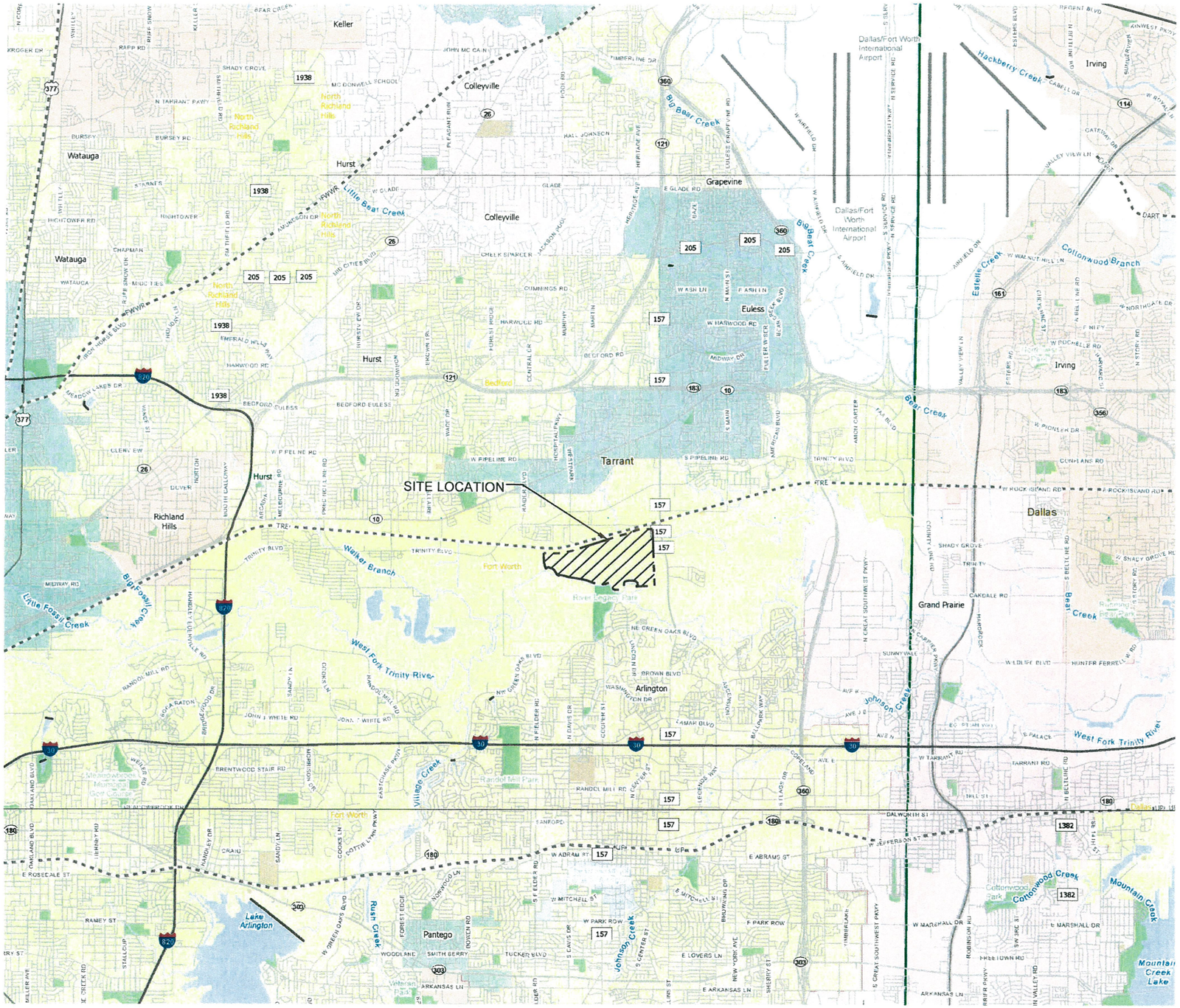
- The City of Arlington Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-358B). The existing landfill currently serves residences and businesses in the communities of Tarrant County and nearby counties.
- With this site reconfiguration, the existing 774.3-acre permit boundary will not be changed. The permitted limit of waste will change by 7.8 acres from approximately 382.7 acres to approximately 390.5 acres.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the City of Arlington Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes.
- 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. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures, which are verified by an independent testing firm. 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 emissions and minimize the potential for subsurface migration, a landfill gas (LFG) collection and control system (GCCS) is currently

installed at the site. The collection system consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is combusted in a flare or processed for beneficial reuse as renewable energy. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control generated LFG. This collection system will be expanded as the landfill is constructed.

- 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 at an off-site laboratory.
  - Gas Monitoring System. The purpose of the landfill gas monitoring system is to verify that landfill gas does not migrate off-site. This is accomplished by sampling monitoring probes located on the perimeter of the landfill.

  These systems are routinely sampled and tested. 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 each evening to prevent potential nuisance conditions such as odors and vectors. The City of Arlington Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.




LEGEND

Texas Department of Transportation

- 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

LANDFILL PROPERTY

NOTES:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS. COUNTIES INCLUDE TARRANT COUNTY AND DALLAS COUNTY.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 1-SITE LOC.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
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| | | |

# SITE LOCATION MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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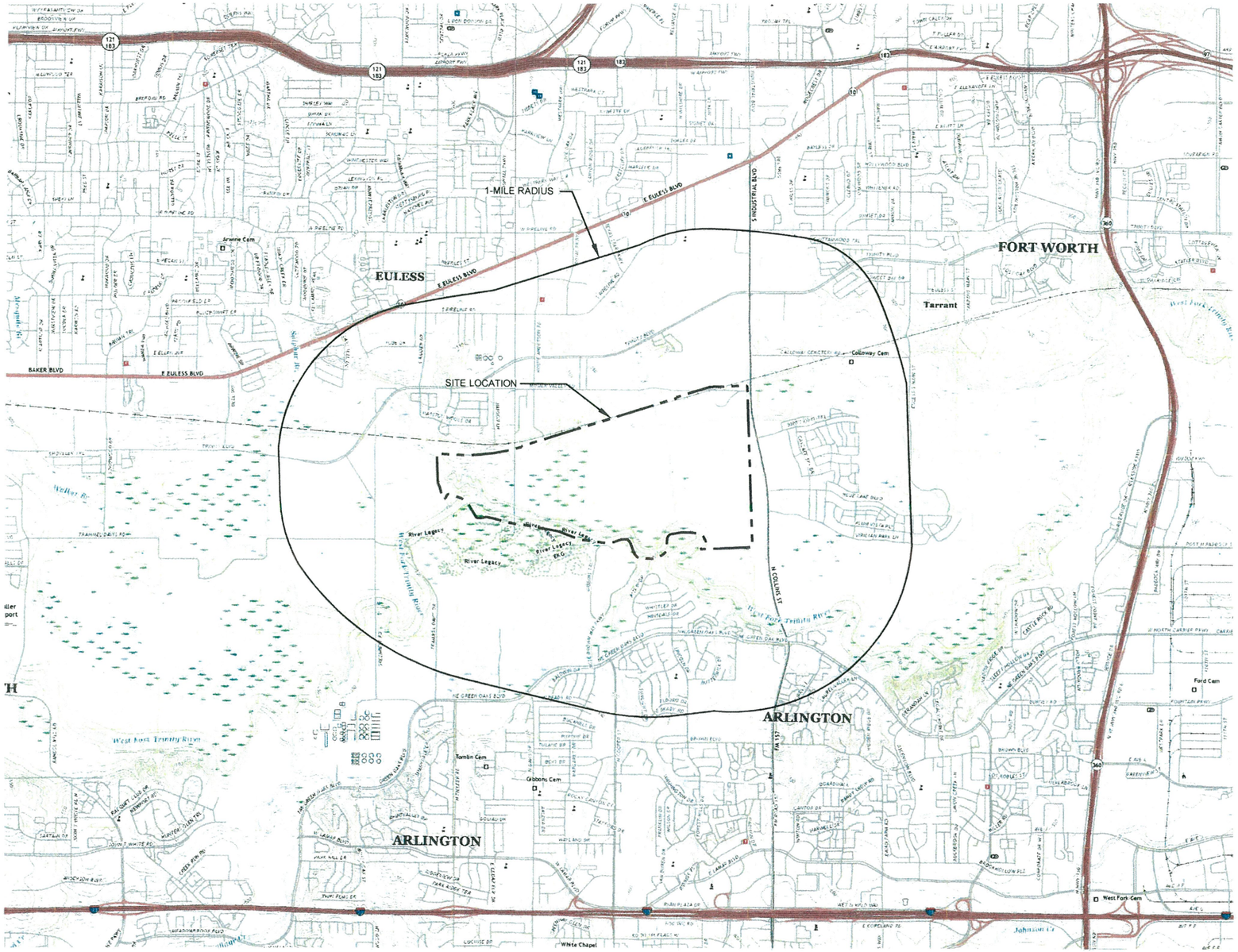
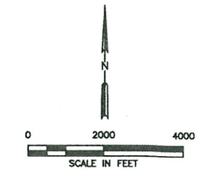
FIGURE 1

O:\0023\404\EXPANSION 2021\PARIS I-II\PROJECT SUMMARY\COORDINATION LETTER\1 - SITE LOCATION.dwg, rspicer, 1:2




LEGEND

ROAD CLASSIFICATION

| | |
|---|---|
| Expressway | Local Connector |
| Secondary Hwy | Local Road |
| Ramp | 4WD |

Interstate Route | US Route | State Route

PERMITTED PERMIT BOUNDARY

EULESS, TX
2019

HURST, TX
2019

NOTES:

1. REPRODUCED FROM 7.5 MINUTE, HURST, TEXAS QUADRANGLE USGS MAP DATED 2019 AND 7.5 MINUTE, EULESS, TEXAS QUADRANGLE USGS MAP DATED 2019.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 2-GENERAL TOPO.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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|---|---|---|
| NO. | DATE | DESCRIPTION |
| | | |
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| | | |

# GENERAL TOPOGRAPHIC MAP

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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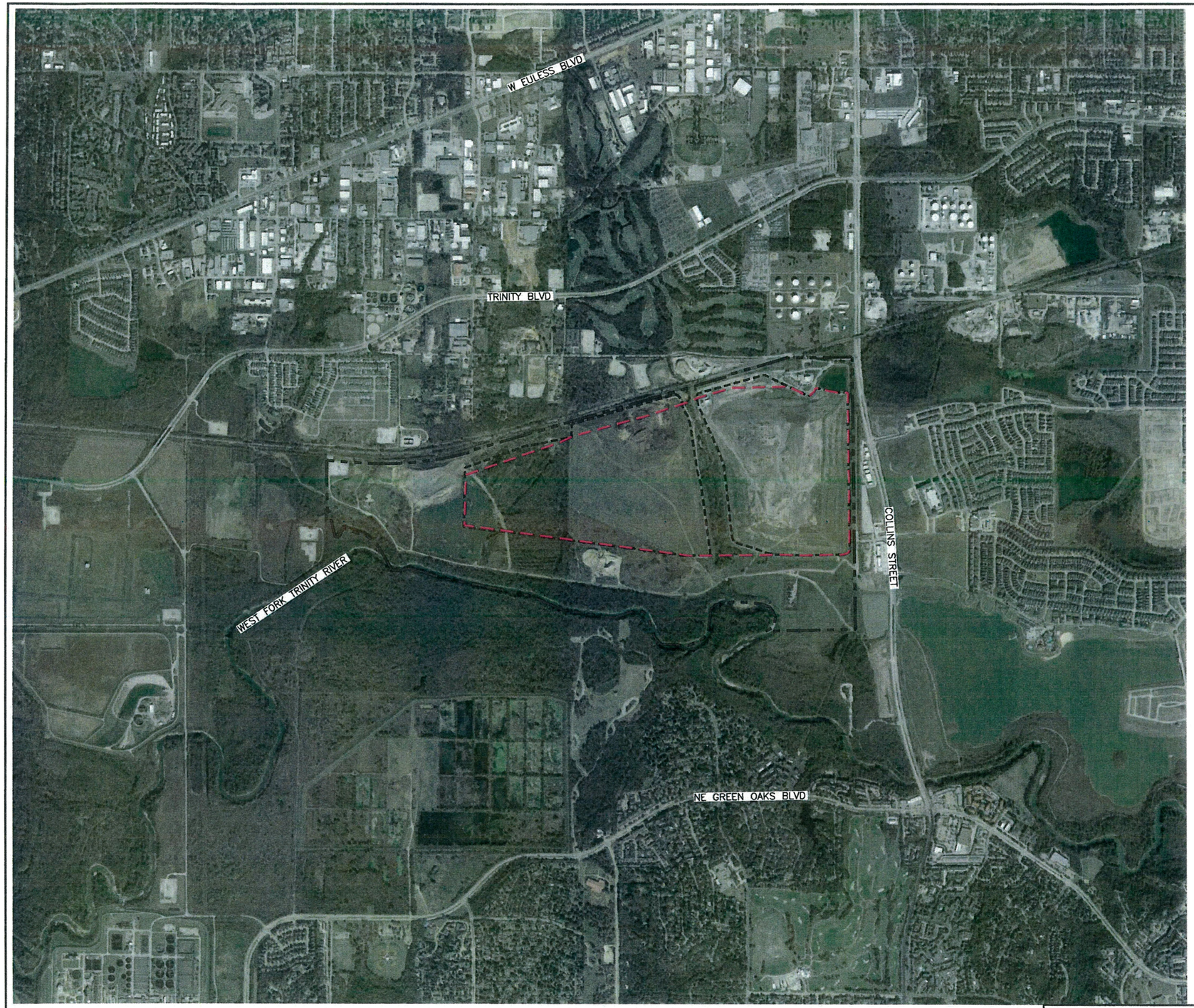
FIGURE 2

S:\Projects\0023-404-11 Arlington Landfill\Permit\Permit Submittal\Permit Submittal Figures\2-GENERAL TOPO.dwg, Topper, 1:2




N

0 1000 2000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)

PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)

NOTE:

1. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH DATED 11-15-2020.

C:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\3-AERIAL PHOTOGRAPH.dwg, rspicer, 1:2

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DATE: 11/2021
FILE: 0023-404-11
CAD: 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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|---|---|---|
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| | | |
| | | |

# AERIAL PHOTOGRAPH

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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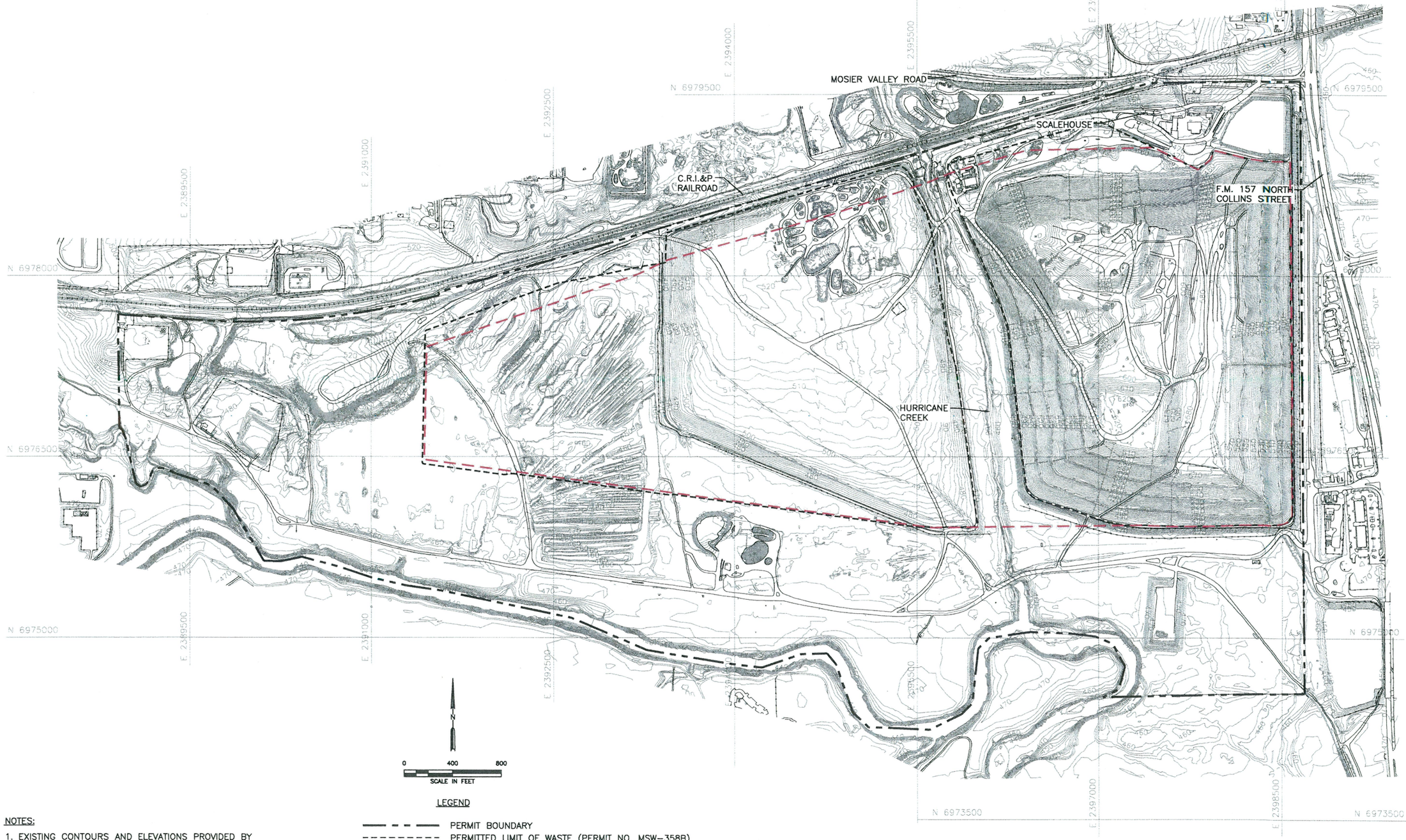
FIGURE 3




LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE (PERMIT NO. MSW-358B)
- PROPOSED LIMIT OF WASTE (PERMIT NO. MSW-358C)
- 500 EXISTING CONTOUR
- N 6975000 STATEPLANE COORDINATE SYSTEM

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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DATE: 11/2021
FILE: 0023-404-11
CAD: 4-SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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AND
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|---|---|---|
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| | | |
| | | |
| | | |

# SITE PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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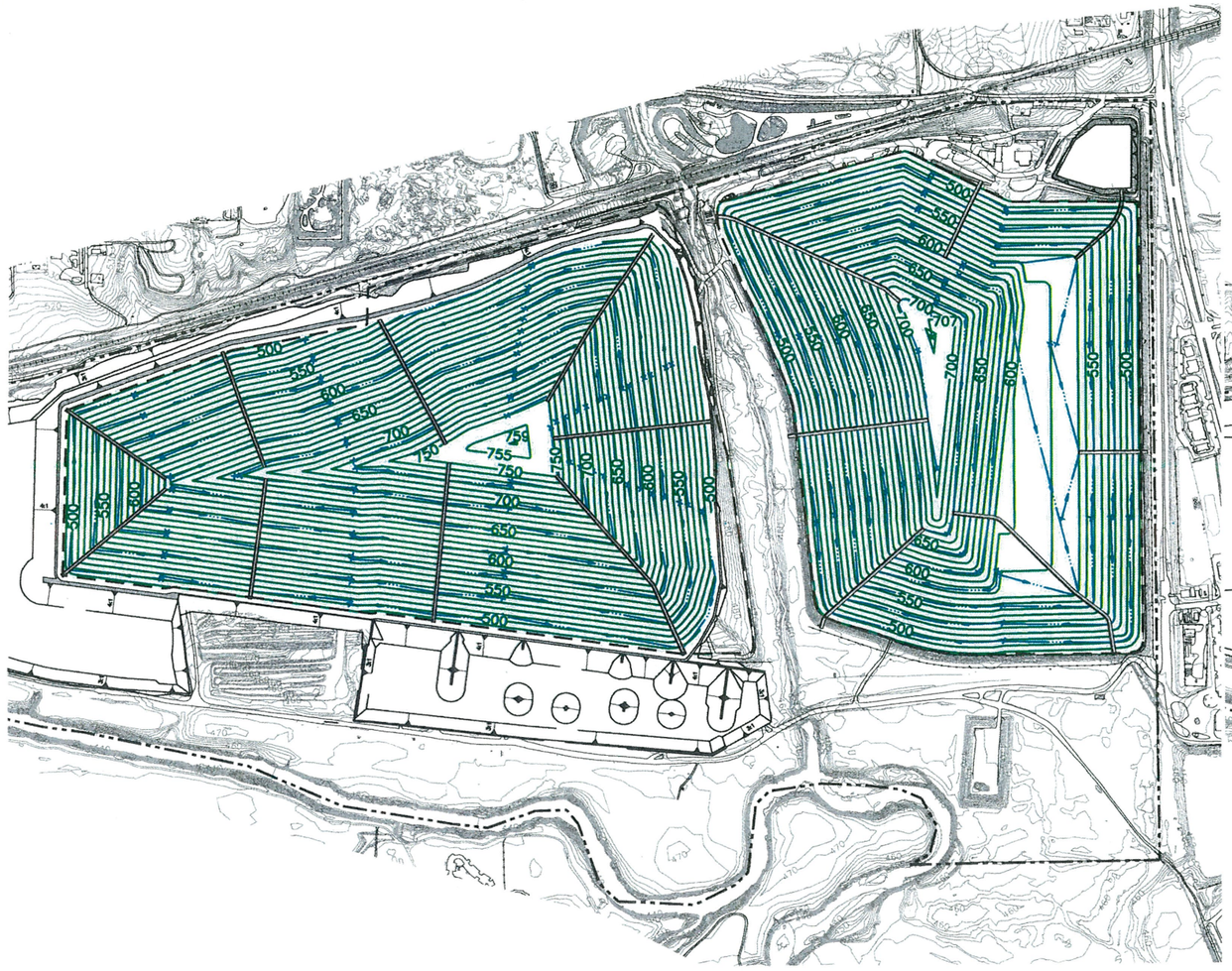
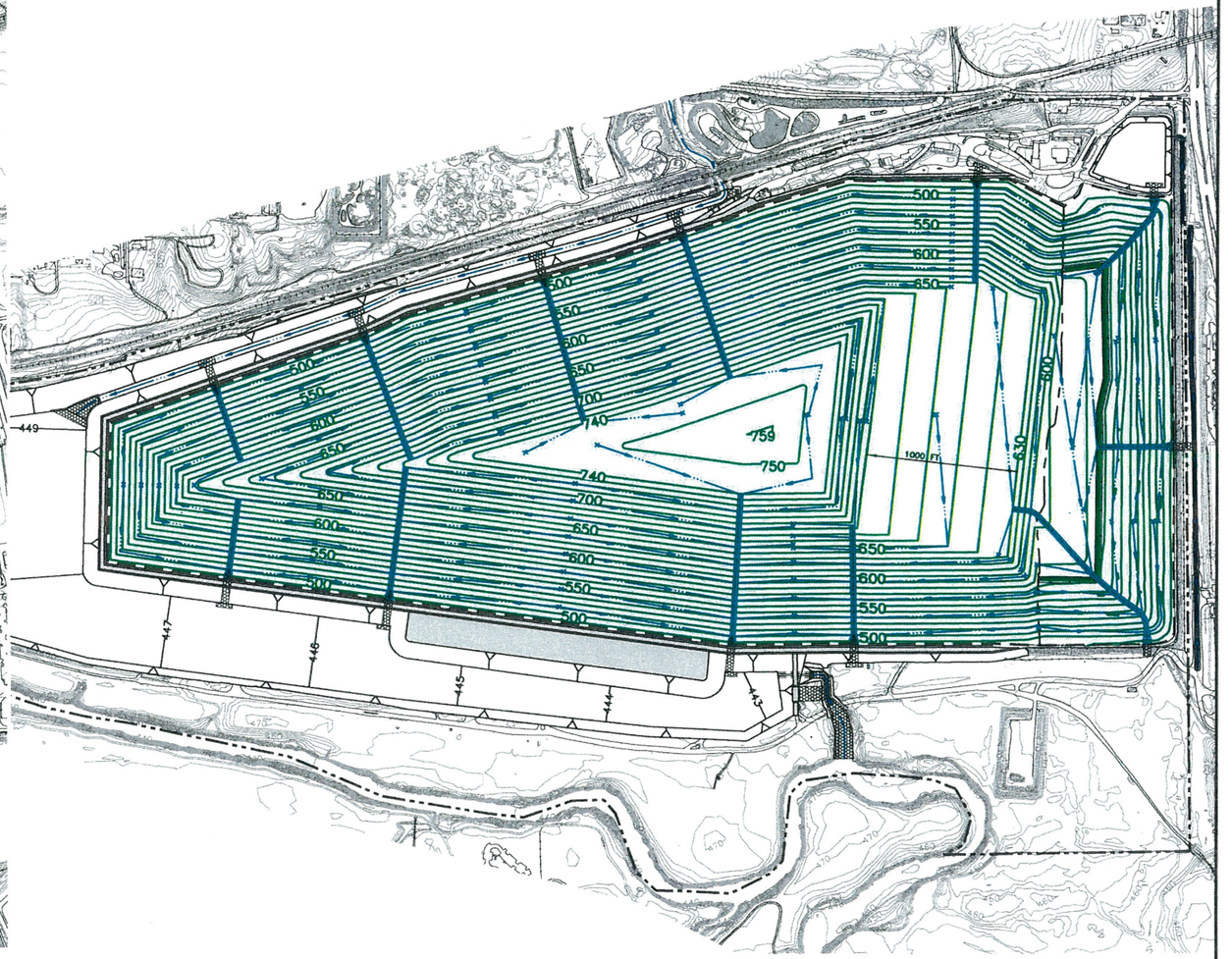
FIGURE 4

O:\0023\404\EXPANSION 2021\PARTS I-II\PROJECT SUMMARY\COORDINATION LETTER\4-SITE PLAN.dwg, rspicer, 1:2




PERMITTED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358B)




PROPOSED LANDFILL COMPLETION PLAN
(TCEQ PERMIT NO. MSW-358C)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 EXISTING CONTOUR
- 580 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN

N

0 500 1000
SCALE IN FEET

GENERAL INFORMATION

| ITEM | EXISTING PERMIT (TCEQ PERMIT NO. MSW-358B) | PROPOSED PERMIT (TCEQ PERMIT NO. MSW-358C) |
|---|---|---|
| PERMIT BOUNDARY | 774.3 ACRES | 774.3 ACRES |
| WASTE DISPOSAL AREA | 382.7 ACRES | 390.5 ACRES |
| PERMITTED TOP DECK ELEVATION | 750 (FT-MSL) | 740 (FT-MSL) |
| MAXIMUM PERMITTED ELEVATION | 759 (FT-MSL) | 759 (FT-MSL) |
| BUFFER AREA | 391.6 ACRES | 383.8 ACRES |

I/IID-228

☐ DRAFT
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☐ ISSUED FOR CONSTRUCTION

DATE: 08/2021
FILE: 0023-404-11
CAD: 5-FINAL COVER COMPARISON.DWG

DRAWN BY: JDW
DESIGN BY: RJS
REVIEWED BY: JAE

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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AND
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REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |

EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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FIGURE 5

## 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: **City of Arlington Landfill**

MSW Permit No.: **358C**

Site Operator/Permittee Name and Mailing Address: **City of Arlington, 801 W. Main St., Mail Stop 01-0370, Arlington, TX 76010**

## 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: **5/19/2022**

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)*

## 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) |
|---|---|---|---|---|
| **FM 157** | **TxDOT** | **5/19/2022** | | ☐Yes ☐No |
| **Mosier Valley Road** | **City of Arlington** | **5/19/2022** | | ☐Yes ☐No |
| **Allan Saxe Parkway** | **City of Arlington** | **5/19/2022** | | ☐Yes ☐No |
| | | | | ☐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

   **Entrance located at southwest corner of FM 157 (North Collins Street) and Mosier Valley Road in Arlington, Texas.**

2. Waste Acceptance Rates

   (a) Initial Waste Acceptance Rate: **3,650 tons/day (Part III, Appendix M)**

   (b) Estimated Maximum Waste Acceptance Rate at any Time During Facility Life: **4,541 tons/day (Part III, Appendix M)**

3. Hours of Operation and Site Life

   (a) a. Operating Hours: **24 hours per day, 7 days per week, although actual hours may vary**

   (b) b. Waste Acceptance Hours: **24 hours per day, 7 days per week, although actual hours may vary**

   (c) c. Estimated Site Life: **33.4 years (Part III, Appendix M)**

4. Other Information Used or Assumed in Estimating Transportation Data: **(1) Growth Rate Projections obtained from Texas Water Development Board, 2021 Regional and 2022 State Water Plan; (2) Traffic Count Data from TxDOT and NCTCOG.**

## 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 | 700 | 700 |
| Employee Vehicles | 100 | 93 |
| Visitors Vehicles | 25 | 25 |
| Other Vehicles | 71 | 64 |
| **Summation of Daily Volume of Traffic to and from the Facility** | | |
| Total Daily Volume of Traffic | **896** | **882** |

(a) Describe the source(s) of or method(s) used to obtain the existing daily volume of traffic generated by the facility: **A 24-hour turning movement count was performed. The collected counts include all vehicles of all types traveling to or from the facility.**

(b) Location(s) of traffic counts (if applicable): **Intersection of Allan Saxe (site entrance) at Mosier Valley**

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 | 1,050 | 1,050 |
| Employee Vehicles | 130 | 120 |
| Visitors Vehicles | 30 | 30 |
| Other Vehicles | 77 | 67 |
| **Summation of Daily Volume of Traffic to and from the Facility** | | |
| Total Daily Volume of Traffic | **1,287** | **1,267** |

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: **Projected growth rates obtained from Texas Water Development Board, 2021 Regional and 2022 State Water Plan.**

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:

## 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) (4) | Surface Type and No. of Lanes | Level of Service (2) | Existing Traffic Generated by the Facility on Each Roadway | Expected Traffic Generated by the Facility on Each Roadway |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FM 157 (north of Mosier Valley Rd) | 30,276 (1) | 43,600 | 40,000-55,000 | 40,000-55,000 | 80,000 | 50/45 | 16'8" underpass | Concrete 6 lanes | D | 889 | 1,277 |
| FM 157 (south of Mosier Valley Rd) | 30,308 (1) | 43,600 | 40,000-55,000 | 40,000-55,000 | 80,000 | 50 | 17' | Concrete 6 lanes | D | 889 | 1,277 |
| Mosier Valley Rd (east of Allan Saxe Pkwy) | 2,425 (1) | 3,500 | 8,000-12,000 | 8,000-12,000 | 80,000 | 30 (3) | N/A | Concrete 2 lanes | A/B | 1,778 | 2,554 |
| Allan Saxe Pkwy | 1,778 (1) | 2,554 | 8,000 | 8,000 | 80,000 | N/A | 23'6" | Concrete 2 lanes | A/B | 1,778 | 2,554 |

(1) Actual daily counts – see attached Traffic Impact Analysis for additional information
(2) Peak hour roadway capacity and level of service included in attached Traffic Impact Analysis. Level of service is not defined at a daily level. The level of service shown above is estimated based on the ratio of volume/capacity.
(3) No speed limit posted – 30 MPH prima facia speed limit assumed
(4) Traffic signals are typically mounted at least 17'6" above the roadway. 17' feet clearance has been shown to traffic signals but was not measured. The maximum allowable vehicle height without a TxDMV permit is 14'.

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) (4) | Surface Type and No. of Lanes | Level of Service (2) | Existing Traffic Generated by the Facility on Each Roadway | Expected Traffic Generated by the Facility on Each Roadway |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Trinity Blvd | 19,493 (1) | 28,100 | 40,000-55,000 | 40,000-55,000 | 80,000 | 40 | 17' | Concrete 6 lanes | C | 205 | 294 |
| Calloway Cemetery | 2,588 (1) | 3,800 | 8,000-12,000 | 8,000-12,000 | 80,000 | 30 (3) | 17' | Asphalt 2 lanes | A/B | <2 | <2 |
| Birds Fort | 5,094 (1) | 7,400 | 8,000-12,000 | 8,000-12,000 | 80,000 | 30 | 17' | Concrete 4 lanes | C | <2 | <2 |
| Blue Lake | 4,994 (1) | 7,200 | 8,000-12,000 | 8,000-12,000 | 80,000 | 30 (3) | 17' | Concrete 2 lanes | C | <2 | <2 |
| Viridian Park | 2,528 (1) | 3,700 | 8,000-12,000 | 8,000-12,000 | 80,000 | 30 (3) | 17' | Concrete 2 lanes | A/B | <2 | <2 |

(1) Actual daily counts – see attached Traffic Impact Analysis for additional information
(2) Peak hour roadway capacity and level of service included in attached Traffic Impact Analysis. Level of service is not defined at a daily level. The level of service shown above is estimated based on the ratio of volume/capacity.
(3) No speed limit posted – 30 MPH prima facia speed limit assumed
(4) Traffic signals are typically mounted at least 17'6" above the roadway. 17' feet clearance has been shown to traffic signals but was not measured. The maximum allowable vehicle height without a TxDMV permit is 14'.

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 **(AM / Facility Peak / PM)** |
|---|---|---|
| FM 157 at Trinity Blvd | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | D / C / D |
| FM 157 at Calloway Cemetery Rd | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | B / B / A |
| FM 157 at Mosier Valley Rd | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | A / A / A |
| FM 157 at Birds Fort Trl | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | B / B / B |
| FM 157 at Blue Lake Rd | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | C / B / C |
| FM 157 at Viridian Park Ln | Signalized intersection capacity analysis presented in attached Traffic Impact Analysis | B / B / B |

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:

## 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:

**Traffic study concludes that access roads within 1 mile at the landfill will continue to provide adequate access to the facility. No roadway improvements are necessary to accommodate facility traffic based on the traffic volumes projected.**

## 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: **Approximately 4 miles north of Interstate Highway 30 to site entrance.**

2. Type of Facility Screening Provided, if applicable: **N/A**

## 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: **Parts I/II, Appendix I/IIB, Pages I/IIB-3 through I/IIB-70.**

## 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: **12/1/2021**

   (b) Enter Date of FAA Response: **01/18/2022 and 04/13/2022**

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:

   **Structure is to be marked/lighted in accordance with FAA Advisory Circular 70/7460-1M, Obstruction Marking and Lighting, red lights-Chapters 4, 5 (Red), and 15.**

## 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.

## XIII. Attachments

- Maps showing the facility boundary and roads within 1 mile of the facility.
  **(Refer to Appendix I/IID – Figure 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**

# APPENDIX I/IIE

# TPDES PERMIT

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

November 11, 2021

Dear Applicant:

Re: TPDES Multi-Sector General Permit (MSGP, TXR050000)
Notice of Intent (NOI) Authorization

Your Notice of Intent (NOI) application for authorization under the general permit for discharge of stormwater associated with industrial activities has been received. Pursuant to authorization from the Executive Director of the Texas Commission on Environmental Quality (TCEQ), the Division Deputy Director of the Water Quality Division has issued the enclosed Certificate.

Please refer to the attached certificate for the authorization number that was assigned to your facility/site and the effective date. Please use this number to reference this facility/site for future communications with the TCEQ.

**All authorizations that are active on September 1 of each year will be assessed an annual water quality fee.** The billing statement will be mailed to the Operator in December/January and payment must be made within 30 days to avoid late fees. **It is the responsibility of the Operator to notify the TCEQ of any change in address supplied on the original NOI by submitting a Notice of Change (NOC).**

A Notice of Termination (NOT) must be submitted when permit coverage is no longer needed. **The NOT must be submitted to the TCEQ before September 1 to avoid the annual water quality fee assessment.**

**All applications must be submitted online using TCEQ's ePermits (STEERS) system, unless the permittee requests and obtains an electronic reporting waiver.**

**Note:** Currently, the NetDMR system is not ready to accept monitoring report online submissions from MSGP permittees. The system will be ready on December 1, 2021. *Please do not attempt to access NetDMR prior to this date.*

For 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. If you have any questions regarding coverage under the MSGP or other 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 stormwater web site at https://www.tceq.texas.gov/permitting/stormwater. Permit and application status information can be found on the TCEQ web site at https://www.tceq.texas.gov/goto/wq-dpa.

Sincerely,

Robert Sadlier, Deputy Director

Water Quality Division

# 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 11, 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:

**TXR05FG45**

Coverage Effective: November 11, 2021
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:**
RN102336039
Arlington Landfill
800 Mosier Valley Rd
Euless, TX 76040
Tarrant County

**Operator:**
CN600132534
Republic Waste Services of Texas, Ltd.
1212 Harrison Ave
Arlington, TX 76011

**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 11, 2021

FOR THE COMMISSION

# APPENDIX I/IIF

# CITY OF ARLINGTON CHARTER PROVISIONS

# THE CHARTER

# of the

# CITY OF ARLINGTON

# TEXAS

(Adopted January 17, 1920, and
amended up to and including November 15, 2018)

NOTE: The Charter of the City of Arlington was adopted under the Home Rule Amendment under the State Constitution at an election held in the City on the 17th day of January, A.D., 1920. There are several amendments and additions to the Charter, adopted under the Home Rule Amendment under the State Constitution. All amendments or additions to the Charter are indicated by the citation immediately following the amended or added provisions. This citation gives the date of its adoption under the Home Rule Amendment of the Constitution. Unless so indicated, the section of the charter derives unchanged from the Charter as adopted in 1920.

For constitutional provisions that charters of Home Rule cities may not be amended more often than every two years, see Constitution of Texas, Article XI, Section 5.

For authority of cities of more than five thousand inhabitants to adopt or amend their charters by a majority vote of the qualified voters of such city at an election held for that purpose, see Constitution of Texas, Article XI, Section 5.

## ORDINANCE HISTORY

| Number | Date of Adoption | Comments |
|---|---|---|
| 88-296 | 05/10/88 | |
| 90-437 | 08/14/90 | Amending Article IV, Section 5, relative to filling vacancies on the City Council. |
| 93-65 | 11/02/93 | Passed final reading on 07/07/93, approved by voters at 11/02/93 election, amending Article IV and Article V to provide for a method of electing city council members; designating the places for holding such election; naming the officers thereof; prescribing the form of ballot and providing for notices. |
| 96-38 | 05/07/96 | Passed final reading on 03/19/96, approved by voters at 05/04/96 election, amending Article IV regarding the timing of runoff elections and to provide that candidates be registered voters; designating the places for holding such election; naming the officers thereof; prescribing the form of ballot and providing for notices. |
| 05-017 | 05/17/05 | Passed final reading on 02/22/05, approved by voters at 05/07/05 election, amending Article IX, Section 4, regarding allowing the City Council to use third party arbitration to make final determinations over certain types of employee disciplinary actions; and amending Article IV, Section 7, relative to adding a City Auditor as an officer appointed by the City Council. |
| 15-006 | 05/19/15 | Passed final reading on 02/24/15, approved by voters at 05/09/15 election, amending Article X, Section 12, relative to prohibiting photographic traffic signal enforcement. |
| 18-042 | 11/15/18 | Passed final reading on 08/20/18, approved by voters at 11/06/18 election, amending Article IV, Section 9, relative to provide that the Mayor and City Council members shall be limited to three elected terms and that no person shall serve as a Council Member for more than three elected terms, and under no circumstances may any person ever serve for more |

## ORDINANCE HISTORY

| Number | Date of Adoption | Comments |
|---|---|---|
| | | than twelve years in combination as a Council Member and Mayor, and the term that each person as Mayor or as a Council Member is currently filling, and all terms served prior to that current term, shall be counted for purposes of determining whether three terms have been served, and that existing Section 9 of Article IV shall be renumbered to Section 10. |

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# ARTICLE I

## CORPORATION NAME

The inhabitants of the City of Arlington, Texas, residing within the limits and boundaries hereinafter described or within such boundaries as may be hereinafter legally fixed or established, and such territory, are and shall continue to be, and are hereby continued and constitute a body politic and corporate, by and under the name and style of the CITY OF ARLINGTON, with all the rights, powers, privileges and immunities hereinafter more fully defined and set forth.

## ARTICLE II

## BOUNDARIES

**Section 1. Limits and Boundaries:** The limits and boundaries of the City of Arlington shall be as provided by ordinance. (Adopted by Charter Amendment, April 5, 1980)

**Section 2. Additional Territory:** The City Council shall have the power by ordinance to fix the boundary limits of the City of Arlington; and to provide for the alteration and the extension of said boundary limits and the annexation of additional territory lying adjacent to the City, with or without the consent of the territory and the inhabitants annexed. However, upon the annexation of any additional territory, the City of Arlington must, in accordance with the laws of the State of Texas, make available governmental and proprietary services to the citizens of such annexed territory. Upon the introduction of any such annexation ordinance by the City Council, it shall be published in the form in which it may be finally passed, in a newspaper published in the City of Arlington, at least one time, and said ordinance shall not thereafter be finally acted upon until at least thirty (30) days have elapsed after the first publication thereof; and upon the final passage of any such ordinance, the boundary limits of the City shall thereafter be fixed in such ordinance; and when any additional territory has been so annexed, same shall be a part of the City of Arlington and the property situated therein shall bear its pro rata part of the taxes levied by the City and the inhabitants shall be entitled to all the rights and privileges of all the citizens and shall be bound by the acts, ordinances, resolutions and regulations of the City. (Adopted by Charter Amendment, April 5, 1980)

**Section 3. Platting of Territory:** Should any property lying within the City's limits or its extraterritorial jurisdiction be platted as provided by State Constitution or law, or by ordinance of this City, such plat shall designate such streets and other easements as may be appropriate to such plat and the Comprehensive Plans of this City, and such streets and other easements shall be laid off, as far as possible, to conform to the streets and other easements adjacent or abutting same; and the owners of such platted property shall file with the appropriate official of the City, and with the County Clerk of Tarrant County, a correct map thereof; provided, that in no event shall the City of Arlington be required to pay for any of said streets or other easements, or any portion thereof unless otherwise established by appropriate City ordinance, or resolution, but by the act of so platting and filing of such map with the appropriate City Official, the Streets and other easements as indicated thereon shall become the property of the City of Arlington for such uses. Nothing in this Charter shall prohibit the City of Arlington, by appropriate ordinance, from establishing other laws and regulations requiring or applicable to platting and its procedures in addition to, and not inconsistent with, those now or hereafter provided by State Constitution or law, where same are for the purpose of the orderly planning,

development and growth of the City of Arlington. (Adopted by Charter Amendment, April 5, 1980)

**Section 4. Privileges and Duties of Inhabitants:** After the admission of territory as provided in the preceding section of this Article, the inhabitants of such added territory shall have all the privileges and be subject to all duties and liabilities of the inhabitants of the above particularly described territory.

**Section 5. City Property Outside City Limits:** The powers and jurisdiction of the City shall extend to property or territory beyond its limits, owned or held by it for municipal purposes.

**Section 6. Disannexation:** The City Council shall have the full authority by ordinance to disannex territory from the corporate boundaries and may prescribe by ordinance procedures governing disannexation. (Adopted by Charter Amendment, April 7, 1984)

**Section 7. Limited Purpose Annexation:** The City Council shall have the power by ordinance to annex an area for the limited purposes of applying its planning, zoning, health and safety ordinances in the area, in accordance with State law. (Adopted by Charter Amendment May 10, 1988)

# ARTICLE III

# MUNICIPAL POWERS

**Section 1. Legislative and Contractual Powers:** The said City of Arlington shall have powers to ordain and establish such acts, laws, rules, regulations, resolutions, and ordinances, not inconsistent with the Constitution and laws of Texas and with this Charter, as shall be needful for the government, interests, health, welfare and good order of said City and its inhabitants. Under the name of the City of Arlington it shall be known in law and have succession and be capable of contracting and being contracted with, suing and being sued, impleading and being impleaded, answering and being answered unto, in all courts and tribunals, and in all amounts whatsoever, subject to the laws of the State of Texas, or which shall hereafter be passed.

The City of Arlington shall have the power to take, hold, lease, grant, purchase and convey such real property or mixed property or estate, situated within, or without, the limits thereof, as the purpose of said corporation may require and shall have and use a corporate seal, and change and renew the same at pleasure.

**Section 2. Rights Reserved:** All suits, taxes, penalties, fines, forfeitures, and all other rights, claims and demands, of every kind and character, which have accrued under the laws in favor of said City, heretofore in force governing the same, shall belong to and vest in said City and shall not abate by reason of the adoption of this Charter, and shall be prosecuted and collected for the use and benefit of the said City of Arlington and shall not be in any manner affected by the taking effect of this Charter; but as to all of such rights, the laws under which they shall have accrued shall be deemed to be in full force and effect.

**Section 3. Local Self-Government:** The City of Arlington shall possess and may exercise the full power of local self-government. It may hold, by gift, deed, devise, or otherwise, any character of property, including any charitable or trust fund, and subject to and within the limits of superior law may act in perpetual succession as a body politic.

**Section 4. Other Powers:** For greater certainty, the following are hereby especially enumerated and referred to as being among the other powers which are hereby conferred upon and which may be exercised by the City of Arlington, to-wit:

A. All of the powers conferred upon cities and towns by Title 22 of the Revised Civil Statutes of the State of Texas, 1911, except as may hereafter be denied, limited or

extended, are hereby conferred upon the City of Arlington as fully and completely as if such powers were herein separately enumerated.

B. All powers, privileges and immunities conferred upon cities of more than five thousand inhabitants, by Section 4 of Chapter 147, acts of the 33rd Legislature, General Laws Regular Session, at pages 310 to 316, entitled, "An Act Authorizing Cities Having More Than Five Thousand Inhabitants, by a Majority Vote of the Qualified Voters of said City, at an Election Held for that Purpose to Adopt and Amend Their Charters," etc.; and such powers are hereby conferred upon the City of Arlington as fully and completely as if each of said mentioned powers were herein separately enumerated; but enumeration of special powers herein, or in the Statutes referred to, shall not be held or construed to preclude the City from exercising all powers of local government not inhibited by the Constitution and laws of the State of Texas, or by special limitations in this Charter contained, the purpose of this Charter being to enlarge upon the power extended by the general laws of cities incorporated thereunder, and to secure to the City of Arlington, all the powers conferred by the Constitution and laws of the State upon Cities having more than five thousand inhabitants.

# ARTICLE IV

# MUNICIPAL GOVERNMENT

**Section 1. Form of Government:** The municipal government provided by this Charter shall be known as the "Council-Manager" government. Pursuant to the provisions of, and subject only to the limitations imposed by the State Constitution, the State laws and this Charter, all powers of the municipal government shall be vested in an elected governing body to be known as the "City Council". The City Council shall be composed of a Mayor and eight (8) other Council members. Five (5) of the Council members shall represent "Single Member Districts", such Districts being numbered 1, 2, 3, 4 and 5, respectively. Three (3) of the Council members shall represent the City at large from Districts numbered 6, 7 and 8, respectively. No legally filed candidate for an office on the City Council may file for any other office on the City Council. (Adopted by Charter Amendment, November 2, 1993)

Elsewhere in this Charter, all references to "City Commission", "Commission", "Board of Commissioners", "Commissioner" and "City Commissioners" be and they are amended to read "City Council", "Council", "City Council", "Councilman", "City Councilman", respectively. References in this Charter to the male gender shall include females, and references to the female gender shall include males. (Adopted by Charter Amendment, April 5, 1980)

The provisions of Article IV, Section 1, regarding "Single Member Districts" shall become effective upon the expiration of the two year term of office of the Mayor and City Council members serving at the time this ordinance is enacted. Therefore, Council members and the Mayor shall serve in an at-large capacity for the remainder of their current term of office and until their successor has been elected. At the first general election for City offices following the adoption of this amendment, the offices of Districts 1, 2, 6 and 7 shall appear on the ballot. The offices of Districts 1 and 2 shall be "Single Member Districts", and the offices of Districts 6 and 7 shall be at-large. The offices of the Mayor and Districts 3, 4, 5 and 8 shall be at-large until the general election for City offices is held on the first Saturday in May of 1995. At that time, the offices of Districts 3, 4 and 5 shall appear on the ballot as "Single Member Districts" and the offices of Mayor and District 8 shall be elected at large. (Adopted by Charter Amendment, November 2, 1993)

Prior to the first day for filing for the first City Council election after adoption of this amendment, the City Council shall divide the City into five (5) contiguous and compact Single Member Districts along voting precinct lines apportioned according to the population of the city as ascertained by the United States Census of 1990, if it has been published, or by any other means allowed by State or Federal law, if it has not been published, and shall number the Districts 1 through 5, respectively. Thereafter, the City

Council shall, after the publication of each Decennial United States Census, and within one (1) year thereof, reapportion the Single Member Districts along voting precinct lines to contain as nearly equal and proportionate population as possible according to the population of the City as ascertained by that Census. (Adopted by Charter Amendment, November 2, 1993)

**Section 2. Elective Officers; Run-off:** The Mayor and the City Council members in Districts 6, 7 and 8 shall be elected from the City at large by a majority vote of the qualified voters at an election held for that purpose. The City Council members in Districts 1, 2, 3, 4 and 5 shall be elected from their respective Districts at an election held for that purpose. In the event no candidate for the office of Mayor or Council member shall receive a majority of the votes cast for said office, a run-off election shall be held not earlier than the 10th or later than the 30th day after the date the final canvass of the regular election is completed, at which time the names of the two candidates having the greatest number of votes in the regular election shall be placed on the ballot. Such run-off election shall be conducted in the same manner as a regular election. (Adopted by Charter Amendment, May 7, 1996)

**Section 3. Qualifications of Officers:** The Mayor and each Council Member shall have such qualifications as are specified by State law for such municipal officers, and shall not be indebted to the City, shall not hold any other public office of emolument, shall not be interested in the profits or emoluments of any contract, job, work or service for the City, or interested in the sale to the City of any supplies, equipment, material or articles purchased and shall not, during the current term of office, enter a plea of guilty to a felony or be convicted in a trial court of a felony. Any members of the City Council who shall, after being elected thereto, cease to possess any of the qualifications herein required, shall forfeit forthwith his office, and any such contract in which such officer is or may become interested shall be void. Any member of the City Council who shall file for any other public office or for another place or position on the City Council at a time when he has more than one (1) year to serve on his current term shall, upon such filing, forthwith forfeit his office.

The Council members elected to Districts 1, 2, 3, 4, and 5 shall, in addition to all other requirements, reside and be registered to vote within the boundaries of their respective Districts at the time of filing for the election. The Mayor and Council members elected to Districts 6, 7 and 8 shall, in addition to all other requirements, reside and be registered to vote within the boundaries of the City of Arlington at the time of filing for the election. The Mayor and all Council members shall continue to reside in the City of Arlington during their term of office. (Adopted by Charter Amendment, May 7, 1996)

**Section 4. Terms of Office:** All elective officers, under this Charter, shall serve, after the first election as herein provided for, the term of two years, and until their successors have been elected and qualified.

**Section 5. Vacancies in the Office of Mayor or Council Member:** In the event there remains more than two hundred seventy (270) days in the unexpired term of the office vacated, the vacancy shall be filled by an election to be ordered by the City Council, for the unexpired term of said vacated office. Said two hundred seventy (270) day period shall be computed from the date the office becomes legally vacated, the date upon which the Council by resolution declares such office vacant, or the date the Council accepts the resignation for such office, as may be applicable in the particular situation. Resignations of officers shall be made to the City Council in writing, subject to the approval and acceptance of the City Council, but the persons resigning may be required to continue in their offices until their successors shall have been elected and qualified. Nothing contained in this Charter shall be construed to authorize the City Council to fill a Council vacancy by appointment. (Adopted by Charter Amendment, August 14, 1990)

**Section 6. Compensation:** Beginning October 1, 1980, and thereafter, the Mayor shall receive a compensation of $250.00 per month, and each Council member shall receive a compensation of $200.00 per month, and all appointive officers of the City Council, except where otherwise provided by law, shall receive such compensation as may be fixed by the City Council. Nothing contained herein shall prohibit the reimbursement of actual official City business expenses of the Mayor and City Council where same are provided in the annual City Budget. (Adopted by Charter Amendment, April 5, 1980)

**Section 7. Appointive Officers:** There shall be appointed by a majority of the City Council, on the nomination of the Mayor or any member of the City Council, a City Manager, a Municipal Judge or Judges, a City Health Officer, a City Attorney, a City Auditor and other officers as may be required by State Constitution or State law, any of whom may be removed by a like majority vote of the said City Council at the pleasure of the City Council. The duties of such officers shall be as prescribed by State law, or ordinance or direction of the City Council not in conflict therewith. The compensation of such offices shall be set by the City Council. Such appointive officers shall appoint and remove any officer or employee placed under his authority and control. (Adopted by Charter Amendment, May 17, 2005)

**Section 8. Qualifications of Appointive Officers:** Officers appointed by the City Council shall possess such qualifications as may be prescribed by State Constitution or law, or as prescribed by ordinance not in direct conflict therewith. (Adopted by Charter Amendment, April 5, 1980)

**Section 9. Term Limits:** No person shall serve as Mayor for more than three (3) elected terms, and no person shall serve as a Council Member for more than three (3) elected terms. Under no circumstances may any person ever serve for more than twelve (12) years in combination as a Council Member and Mayor. For purposes of this section and computing the limitations on terms:

(1) a Mayor or Council Member who vacates, for any reason the office before the end of the term for which he was elected shall be considered to have completed that term.

(2) an appointment or election to fill an unexpired Council Member term, or unexpired Mayor term if applicable, shall be computed as follows:

a. if fifty percent (50%) or more of the term is remaining, it shall be included in the computation of term limits; or

b. if less than fifty percent (50%) of the term is remaining, it shall not be included in the computation of term limits.

(3) Council Member terms are counted by including together terms served as both single-member and at-large districts.

The term that each person as Mayor or as a Council Member is currently filling, and all terms served prior to that current term, shall be counted for purposes of determining whether three (3) terms have been served.

This amendment shall become effective immediately upon adoption at the next municipal election, shall apply to all persons currently occupying the Office of Mayor or Council Member, and shall apply to all municipal elections conducted after the date of adoption. Any resident of the city may seek injunctive relief to enforce this prohibition. (Adopted by Charter Amendment November 15, 2018)

**Section 10. Municipal Court:** There shall be a municipal court comprised of as many divisions as there are judges with such authority as provided by law. One of such judges shall be known as the Presiding Judge of the Municipal Court. The remainder of such judges shall be known as Associate Municipal Court Judges. There shall be a clerk or clerks of said court and its divisions, with such deputies as may be created or provided by ordinance by the City Council. The clerk or clerks of said court and the deputies thereof shall have the power to administer oaths and affidavits, make certificates, affix the seal of said court thereto, and perform all other acts of a court clerk as may be provided by law. The clerk or clerks and deputies of said court shall be appointed and removed by the City Manager. (Adopted by Charter Amendment, May 10, 1988)

# ARTICLE V

# ELECTIONS

**Section 1. General Election Laws:** Except where otherwise provided herein, the general election laws of the State of Texas, insofar as applicable, shall control all elections, general and special, held by the City of Arlington.

**Section 2. Mayor and City Council Members, Date of Election, Filing Fees**: All regular elections for Mayor and City Council members shall be held on such date as is prescribed by State law or City ordinance not in conflict therewith. The Mayor and Council members for Districts 3, 4, 5 and 8 shall be elected in odd numbered years, and the Council members for Districts 1, 2, 6 and 7 shall be elected in even numbered years. The City Council shall have the power to call such special elections as they shall deem proper. Candidates for such offices shall pay such filing fee as may be set by appropriate ordinance of the City Council. (Adopted by Charter Amendment, November 2, 1993)

**Section 3. Order of Election:** All election procedures for the City of Arlington shall be as governed by the laws of the State of Texas for municipal elections, and as provided by City ordinance not in conflict therewith. (Adopted by Charter Amendment, April 3, 1982)

**Section 4. Polling Places:** The City Hall is hereby designated as the polling place at which all City elections shall be held until otherwise provided by ordinance. The board of City Councilmen may, from time to time, create and designate such polling places within the City as may be considered proper; provided, that in all elections general and special there shall be only one polling place for any one election, which shall be at the City Hall, until additional polling places shall be created and designated by the City Councilmen.

**Section 5. Qualified Voters:** Every person residing in the City of Arlington, who is a qualified elector under the laws of the State of Texas shall be entitled to vote for the Mayor and for the Council members elected from Districts 6, 7 and 8. Every person residing within each of the Single Member Districts who is a qualified elector under the laws of the State of Texas shall be entitled to vote in either District 1, 2, 3, 4 or 5, respectively, according to the elector's residence. (Adopted by Charter Amendment, November 2, 1993.)

**Section 6. Form of Ballot and Number of Votes:** In all elections, the vote shall be by official ballot. At the top of the official ballot shall be printed in large letters the words: "OFFICIAL BALLOT". It shall contain a statement of the title of the offices to be filled at such election and the printed names of all candidates for each office in such order as is required by State law or City ordinance. Each qualified voter shall be entitled to only one (1) vote for each office to be filled. No ballot shall be counted at any election unless prepared in accordance with the requirements of this section. (Adopted by Charter Amendment, April 5, 1980)

# ARTICLE VI

## THE BOARD OF CITY COUNCILMEN

**Section 1. Regular Meetings and General Powers:** The City Council shall meet regularly once each week, and more often on the call of the Mayor; provided, however, meetings, including regular meetings, may be cancelled by majority affirmative vote of all members of the Council. Notice of such cancellations shall be posted under the same laws and regulations applicable to the posting of agendas. The City Council shall see that all ordinances necessary and proper for carrying out the powers and duties prescribed in this Charter are passed and enforced. The City Council shall promote, in any way it sees fit, subject only to limitations imposed by the Constitution and laws of this State or by the provisions of this Charter, the welfare of the City and its inhabitants. (Adopted by Charter Amendment, April 5, 1980)

**Section 2. Mayor Pro Tem and Quorum:** The City Council shall elect one of the Council members Mayor Pro Tempore, who shall preside at all meetings at which the Mayor is not present, and a majority of the City Council shall constitute a quorum for the transaction of business. (Adopted by Charter Amendment, April 5, 1980)

**Section 3. Appointments:** The City Council shall appoint by majority vote such officers, boards, and commissions as may be required by State law and may appoint such other boards, commissions, and committees that the City Council may, within its discretion deem proper, any of whom may be removed by a like majority vote of the said Council at the pleasure of the City Council. This power of appointment shall include all other powers necessary to the efficacy of such appointments and the objectives of same. Such power of appointment includes the employment of professional, technical, and other expertise necessary and advisable to the efficient operation of the municipal government. The terms of such appointment shall be as prescribed by State law or City ordinance not in conflict therewith. (Adopted by Charter Amendment, April 5, 1980)

**Section 4. Combining Duties of Officers:** The board of City Councilmen shall also have power to combine the duties of any two or more officers of the City and provide that one person shall perform all the duties heretofore devolving upon the officers holding such offices thus combined.

**Section 5. Providing Subpoena Powers:** The City Council may, by ordinance, provide for subpoena powers to be exercised by City officers and employees in such manner as

the City Council may, by ordinance, specify, not inconsistent with the Constitution and laws of the United States or of this State. (Adopted by Charter Amendment, April 5, l986)

# ARTICLE VII

## POWERS OF THE CITY COUNCIL

**Section 1. Presiding Officer:** The Mayor, when present, shall preside over the City Council and in his absence the Mayor Pro Tempore shall preside.

**Section 2. Power over Members:** The City Council shall be the judge of the election and qualifications of its own members, may determine the rules of its proceedings and shall have power to compel the attendance of absent members and to punish them for disorderly conduct.

**Section 3. Attendance at Meetings:** It shall be the duty of each member of the City Council to attend each regular meeting thereof, and each special meeting of which he has notice, and failure of any member so to do, without good and sufficient excuse, shall constitute misconduct in office.

**Section 4. Election of Mayor Pro Tempore:** At the first meeting of each new Council, or as soon thereafter as practicable, the Council shall elect a Mayor Pro Tempore, who shall hold his office for one year, and in case of the failure, inability or refusal of the Mayor to act in respect to any matter of duty, such Mayor Pro Tempore shall act.

**Section 5. Control of Finances, Property and Ordinances:** The City Council shall have control of the finances of the City, and the control and disposition of its property, subject to the limitations hereof, and shall have power to ordain, alter, amend or repeal all ordinances, resolutions, rules, orders and regulations not repugnant to the Constitution and laws of the United States or of this State, and to enact such ordinances, resolutions, rules, orders, etc., as are necessary or proper for the good government of the City, for its religious interests, the preservation of peace and good order, and for the suppression of vice or immorality within its limits or for the proper promotion of trade and commerce within the City and for the security, preservation and protection of lives, well being and health of, and for the recreation of the inhabitants of the City and of persons within its limits and to accomplish and enforce the duties and powers hereby conferred upon the City or which may hereafter properly be conferred upon it.

**Section 6. Power to Determine Duties of Officers:** The City Council shall have power from time to time to require other and further duties of all officers whose duties are prescribed herein, and to define, prescribe and change, from time to time, the duties of all

officers or employees appointed or elected by it or under its authority to any office or employment under the City, as in the judgment of the City Council may be best for the public interest, and the Council shall require good and sufficient bonds to be given by officers or employees handling funds of the City and may require bonds of other officers or employees if considered proper or necessary.

**Section 7. Petitions and Remonstrances:** Petitions and remonstrances to the City Council shall be presented in writing.

**Section 8. Ordinances:** Ordinances and resolutions shall be introduced in written or printed form, and shall not contain more than one subject which shall be clearly stated in the title except ordinances and resolutions appropriating money, which may contain various subjects and accounts for which monies are appropriated. Except in matters of a temporary character, or those having reference to the conduct of the ordinary and current affairs of the City, the Council shall proceed by ordinance only, and a majority vote of the Council who are present and voting shall be necessary to the adoption of an ordinance or resolution, or the allowance of any claim against the City. The vote on all ordinances and resolutions shall be entered of record, and on demand of any member of the City Council, the vote on any claim shall be so entered. No member of the City Council shall be excused from voting except on matters involving the consideration of his own official conduct, or where his financial interests are involved, or where otherwise disqualified for ethical considerations, or unless excused by the Council for other valid reasons by majority vote. (Adopted by Charter Amendment, April 5, 1980)

**Section 9. Style of Ordinances:** The style of all ordinances shall be "BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARLINGTON," but this style may be omitted when the laws and ordinances of the City are published in book or pamphlet form.

**Section 10. Passage of Ordinances:** No ordinance, except it be an emergency measure as hereinafter defined, shall be passed until it has been read at two meetings of the City Council. One of such readings must be at a regular meeting unless this requirement shall be dispensed with by the affirmative vote of all members of the City Council. (Adopted by Charter Amendment, April 5, 1980)

**Section 11. Emergency Measure, Definition and Passage:** An emergency measure is an ordinance for the immediate preservation of the public peace, property, health, and safety or one providing for the usual daily operation of the City. The Council shall, within its discretion, declare what measures are emergency measures and any ordinance

carrying an emergency clause shall be construed to be an emergency measure. Ordinances declared appropriately to be emergency measures may be passed after a reading at one meeting of the City Council on the affirmative vote of all members of the City Council who are present. (Adopted by Charter Amendment, April 5, 1980)

**Section 12. Emergency, Denial:** Any measure making grant or amendment to, or extension of any franchise or other special privilege, or increasing the rate to be charged for its services by any public utility, shall never be classed as an emergency measure.

**Section 13. Enrolling of Ordinances:** All ordinances and resolutions adopted by the City Council shall, before they take effect, be properly enrolled and be placed in the office of the City Secretary, and it shall be the duty of the Mayor, within ten (10) days after the same shall be placed in the hands of the Secretary, to see that they are properly enrolled, and shall approve or disapprove the same. If the Mayor shall disapprove any such ordinance or resolution, he shall do so in writing, stating his objections, and such order, ordinance or resolution shall be returned to the City Council for further action at a regular or adjourned regular meeting or special meeting, as the case may be, to be held not less than five (5) days after such disapproval of the Mayor; and if, after reconsideration, a majority shall vote in favor of the passage of such ordinance or resolution, their votes to be entered upon the Minutes of the City Council, then such ordinance or resolution shall become effective, the veto of the Mayor to the contrary notwithstanding. (Adopted by Charter Amendment, April 5, 1980)

**Section 14. Effective Date of Ordinance:** Every ordinance or resolution, after final passage, shall be recorded in a separate book kept for that purpose, and shall be effective from and after the approval of the Mayor, or its passage notwithstanding his veto, except penal ordinances.

**Section 15. Ordinances Imposing Penalties:** The descriptive caption of each ordinance stating in summary the purpose of the ordinance and the penalty for violation thereof shall, after its passage, be published two times in the official newspaper of the City before becoming effective. The City Secretary shall note on each such ordinance the fact that the same has been published and the dates of publication, which shall be prima facie evidence of such publication. No publication of any ordinance shall be required except for those imposing a fine, penalty or forfeiture or where State law provides otherwise. (Adopted by Charter Amendment, April 7, 1984)

**Section 16. Publication of Ordinances:** Should the City publish its ordinance in pamphlet form, or in book form, it shall not be necessary to republish such as have been

published, and all ordinances of the City printed or put in book form by authority of the City Council shall be admitted and received in evidence in all courts without further proof, and a statement in such pamphlet or book that the ordinances and measures therein contained are published by authority of the City Council shall be prima facie evidence of the fact thus recited.

**Section 17. Record:** Every ordinance or resolution, upon its becoming effective, shall be recorded in a book kept for that purpose, and shall be authenticated by the signature of the Mayor, and attested by the City Secretary.

# ARTICLE VIII

## DUTIES AND POWERS OF OFFICERS

**Section 1. Required Oath and Bond:** Every person elected by the voters of the City or appointed by the City Council, to any office under the City government shall, before entering upon the duties of his office, take and subscribe the official oath prescribed by the Constitution of this State, and where a bond is required, shall execute such bond to the satisfaction of the City Council.

**Section 2. Duties and Powers of the Mayor:** The Mayor of the City, in addition to duties elsewhere in this Charter prescribed, shall be the presiding officer of the City Council; he shall from time to time communicate to the City Council such information and recommendations as may, in his judgment, tend to the improvement of the finances, police, health, comfort and good government of the City. He shall represent the City in all its relations with other municipalities, and with the State, and the United States, and he shall perform such other duties and exercise such other powers not inconsistent with the provisions and limitations of this Charter and the Constitution of the State of Texas and all laws relative to mayors of home rule cities. (Adopted by Charter Amendment, April 5, 1980)

**Section 3. Duties and Powers of Appointive Officers:** Officers appointed by the City Council shall have such duties and powers as may be prescribed by the State Constitution or law or as prescribed by ordinances of the City of Arlington or directions of the City Council not in conflict therewith. (Adopted by Charter Amendment, April 5, 1980)

# ARTICLE IX

# CITY MANAGER

**Section 1. Qualifications:** The City Manager shall be employed by the governing body. He shall be selected solely on the basis of his executive and administrative qualifications with special reference to his actual experience in or his knowledge of accepted practice with respect to the duties of his office. At the time of his appointment he need not be a resident of the City or State but, during his tenure of office, he shall reside within the City. No member of the governing body shall, during the time for which he is elected or for two years thereafter, be chosen as City Manager.

**Section 2. Compensation:** The City Manager's salary shall be fixed by the governing body of the City.

**Section 3. Term of Office:** The City Manager shall be appointed for an indefinite term and may be removed at any time by a majority vote of the members of the City's governing body.

**Section 4. Powers and Duties:** The City Manager shall be the chief administrative officer of the City government. He shall be responsible to the governing body for the proper administration of all affairs of the City placed under his control by this Charter or by ordinance or resolution of the governing body and to that end he shall:

(a) Except for other officers appointed by the City Council under this Charter, and such other officers' employees, appoint and remove any officer or employee of the City. Notwithstanding this provision, or any other provision in this Charter, the City Council may implement by ordinance or personnel policy a procedure under which third party arbitration is used to make the final determination over certain types of employee disciplinary actions. (Adopted by Charter Amendment, May 17, 2005)

(b) Prepare a budget annually, submit it to the governing body for approval, and be responsible for its administration following adoption;

(c) Keep the governing body advised of the financial condition, administrative activities and future needs of the City, and make such recommendations as may seen desirable;

(d) Attend all meetings of the governing body with the right to take part in the discussion but having no vote; and

(e) Perform such other duties as may be prescribed by this Charter or required of him by the governing body, not inconsistent with the provisions of the Charter.

**Section 5. Absence of City Manager:** During the temporary absence or disability of the City Manager, he shall by letter filed with the City Secretary appoint a qualified administrative officer of the City to perform his duties during such absence or disability. In the event of the incapacity or failure of the City Manager to make such appointment, it may be made by the governing body. During any vacancy in the office of the City Manager, the governing body shall designate by letter filed with the City Secretary a qualified administrative officer of the City to serve as Acting City Manager during the existence of such vacancy.

**Section 6. Governing Body's Relations with City Manager:** The governing body and each of its members shall hold the City Manager responsible for the proper administration of all affairs of the City, but neither the governing body nor any board of Commission created by it, nor any members thereof, shall dictate the appointment of any person to or his removal from office or employment with the City, or in any manner interfere in the appointment of officers and employees in the departments of the administrative service vested in the City Manager by this Charter. Except for the purpose of inquiry, the governing body and its members shall deal with the administrative service solely through the City Manager, and neither the governing body nor any member thereof shall give orders to any subordinate of the City Manager either publicly or privately. (Adopted by Charter Amendment, April 5, 1960)

# ARTICLE X

# MISCELLANEOUS PROVISIONS

**Section 1. Contracts:** All valid and existing contracts to which the City of Arlington is a party, heretofore validly made and not heretofore terminated by agreement, novation, breach or otherwise, shall be unaffected by the adoption of this Charter, and shall be executed in accordance with the provisions of this Charter, and laws applicable thereto, and for such purposes only, all laws and parts of laws applicable to any such contracts, if not in conflict herewith, are continued in full force and effect.

**Section 2. Tax Debt Arrearages:** No money shall be paid by the City upon any claims, debt, demand or account whatsoever, to any person, firm or corporation who is in arrears to the City of Arlington for taxes or otherwise, and the City shall be entitled to a counter claim and offset against any such debt, claim, demand or account, in the amount of taxes or other debt in arrears, and no assignment or transfer of such debt, claims, demands or accounts, after the said taxes or other debts are due, shall affect the right of the City to offset the said taxes or other debts against the same.

**Section 3. Ordinances and Resolutions in Force:** All ordinances and resolutions in force at the time this Charter shall become effective, not inconsistent with its provisions shall continue in force until amended or repealed.

**Section 4. Execution of City Property:** No property owned or held by in the City and held or used for public purposes, or intended for public use and reasonably adapted to such use, shall be subject to any execution of any kind or nature.

**Section 5. Garnishment of City Funds:** No fund of the City shall be subject to garnishment, and the City shall never be required to answer in any garnishment proceedings.

**Section 6. Claims of Damages:** The City shall not be liable on account of any claim for death, injury or damages to any person or property unless the person asserting such claims, or their representative, shall give the City written notice of such claim by filing such written notice with the City Secretary within one hundred eighty (180) days from the time the incident causing such death or damages occurred, with a statement of facts reasonably sufficient to form a basis of an intelligent investigation, and no suit shall be instituted or maintained on any such claim until the expiration of ninety (90) days from

the time such notice shall have been filed. (Adopted by Charter Amendment, May 10, 1988)

**Section 7. Effective Date of Charter:** This Charter, if adopted, shall become effective from and after the votes cast at the election at which it is submitted to the voters shall have been counted and the result of said election declared and an order or ordinance shall have been entered upon the records of the City Council declaring it adopted.

**Section 8. Amendment or Repeal of Charter:** This Charter, if adopted, may be altered, amended or repealed as provided by State law. (Adopted by Charter Amendment, April 5, 1980)

**Section 9. Recording of Charter:** This Charter, if adopted, shall be recorded in full in the Minutes of the City Council, and as part of the proceedings of the meeting at which it is declared adopted, and the City Secretary shall carefully preserve the original in his office. As soon as practicable after it is adopted, it shall be the duty of the Mayor to certify to the Secretary of State, as required by statute, a duly authenticated copy hereof, under the seal of the City, for record in the office of said Secretary of State.

**Section 10. Conformity of Charter with State Laws:** The Charter herewith submitted is and shall be cumulative of all other laws of the State governing cities of more than five thousand inhabitants, not in conflict herewith, and the enumeration of the powers made in this Charter shall never be construed to preclude, by implication or otherwise, the City from doing any and all things not inhibited by the Constitution and laws of Texas.

**Section 11. Force and Effect of Charter:** This Charter shall have the force and effect of a general law, and it shall not be necessary to plead or prove the same, or any part thereof, in any suit or legal proceedings, and all courts shall take judicial notice.

**Section 12. Photographic Traffic Signal Enforcement:** The City of Arlington shall not use photographic traffic signal enforcement systems to civilly, criminally, or administratively enforce any state law or City Ordinance against the owner or operator of a vehicle operated in violation of a traffic control signal, specified by Section 544.007(d) of the Texas Transportation Code, nor shall it collect any money from any recipient of a Notice of Violation issued, in whole or in part, in connection with the use of a photographic traffic signal enforcement system. (Adopted by Charter Amendment, May 19, 2015)

# ARTICLE XI

# REVENUE AND TAXATION

**Section 1. Power to Levy Taxes; Limit:** The City Council shall have power to levy taxes to the extent and for all purposes authorized by the laws of the State of Texas and by this Charter, not to exceed, however, the constitutional and statutory limit of Two Dollars and Fifty Cents ($2.50) on each One Hundred Dollars ($100.00) of the assessed valuation, and provide for the mode and manner of levying, assessing and collecting the same, and apportion such taxes as in the discretion of the City Council shall be to the best interest of the City. (Adopted by Charter Amendment, September 11, 1954)

**Section 2. Taxes for General Purposes and Current Expenses:** It shall be the duty of the City Council, annually, to levy, assess and collect such taxes on the assessed valuation of all taxable property within the City as may be necessary for general purpose and current expenses of the City, provided that the rate of taxation shall never exceed the limit prescribed by this Charter.

**Section 3. Taxes to Pay Indebtedness:** The City Council shall have power to annually levy, assess and collect such taxes as may be necessary to pay the interest on, and create a sinking fund or funds for the bonded or other indebtedness of the City now existing or hereafter to be created.

**Section 4. Taxes for Civic Improvements:** In addition to the taxes hereinabove provided for, the City Council shall provide for the opening, maintenance and improvements of the streets, alleys, bridges, culverts, etc., and may provide for the maintenance and support of a public free library; for the maintenance and beautifying of the City cemeteries, and other improvements herein authorized.

**Section 5. Occupation Taxes and Licenses:** The City Council shall have the power, and it is hereby authorized, to levy, assess and collect occupation taxes upon all trades, professions, occupations, callings and businesses of every kind or character carried on in the City, on which a license or occupation tax is levied by the State at the time this Charter shall go into effect, and all such trades, professions, occupations, callings and all other businesses of every kind or character, which may hereafter be subject to a license or occupation tax as provided by the general laws of the State; but at no time shall the occupation tax of license levied by said City for any year on persons or corporations pursuing any trade, profession, occupation, calling or business, of any kind or character, subject to a license or tax under the laws of the State, exceed one-half of said license or

tax levied by the State for the same period on such trade, profession, occupation, calling or business. All licenses or occupation taxes shall be received and collected by the assessor and collector of taxes, and shall be paid to that officer by each and every person and corporation, chargeable therewith, before engaging in any trade, profession, occupation, calling or business upon which said tax or license is charged, and the City Council shall have the power and authority and is hereby vested with all powers delegated to and prescribed for the collection of occupation taxes and licenses under the general laws of the State, either civil or criminal, except as they may be in conflict herewith, and in addition thereto the City may collect such taxes by suit in any court having jurisdiction of the amount. Any person pursuing more than one trade, profession, occupation, calling or business subject to the payment of occupation taxes or license, shall pay one occupation tax or license on each, and no tax or license shall extend to more than one profession, trade, occupation, calling or business.

**Section 6. Granting of Occupation Taxes and Licenses:** The City Council shall authorize the proper officer of the City to grant and issue occupation taxes and licenses, and shall direct the manner of issuing and registering the same, and fix the fees and charges therefor. No tax or license shall issue for a longer period than one year, and shall not be assignable except by permission of the City Council; nor shall same be issued except for the City's fiscal year or the unexpired portion thereof.

**Section 7. Lien to Secure Payment of Taxes:** The property of all persons owing any taxes to the City of Arlington is hereby made liable for all such taxes, whether the same be due upon personal or real property, or both, and a lien is hereby expressly fixed upon all such property to secure the payment of said taxes; and the ad valorem taxes due on any one piece of property shall not be received by the collector from the owner or other persons interested therein separately without paying the ad valorem taxes owing by him on other property.

**Section 8. Provisions for Prompt Collection of Taxes:** The City Council shall have full power to provide by ordinance for prompt collection of taxes levied, assessed and imposed under this Charter and the ordinances of said City, and it is hereby authorized, and to that end shall have full power and authority to sell, or cause to be sold, all kinds of property, real and personal, and shall make such rules and regulations, ordain and pass such ordinances, as it may consider necessary to the levying, imposing, assessing and collecting of any and all taxes provided for in this Charter and unless otherwise provided by ordinance, all property in said City liable and subject to taxation shall be assessed, and said taxes shall be levied and collected, in accordance with the provisions of the general laws of the State of Texas.

**Section 9. Collections for Bonded and Other Indebtedness:** All monies arising from the collection of taxes levied for the payment of interest on, and providing a sinking fund for, bonded or other indebtedness of the City, shall be maintained in a separate fund, to be designated "Interest and Sinking Fund" series of indebtedness.

**Section 10. Irregularities in Levy and Assessment:** No irregularities in the time and manner of making and returning of the assessment rolls, or the approval of such rolls, shall invalidate any assessment, nor shall any irregularity in the time and manner of making a levy or the form thereof invalidate any tax levy made hereunder.

**Section 11. Levying Taxes:** The City Council, at its first meeting in July of each year, or as soon thereafter as practicable, shall levy the annual taxes for each year. Special taxes or assessments provided for by this Charter may be levied, assessed and collected at such time or times as the City Council may provide. (Adopted by Charter Amendment, April 7, 1984)

**Section 12. Forced Collection of Taxes:** The City Council may provide by ordinance for the prompt collection, by suit, sale or otherwise, of all taxes of every kind due the City. Penalty and interest upon delinquent taxes shall be imposed in accordance with State law. (Adopted by Charter Amendment, April 7, 1984)

**Section 13. Hotel Occupancy Tax:** (Deleted by Charter Amendment May 10, 1988)

# ARTICLE XII

# PUBLIC UTILITIES

**Section 1. Jurisdiction over Public Utilities:** The City of Arlington shall have the power to construct, own, purchase or lease, within or without the City Limits, and to maintain and operate a system or systems of waterworks, sewers, sewage disposal plants, gas and electric light plants, parks, hospitals, telephone systems, street railways, garbage disposal plant and all other public utilities, and to receive compensation for services furnished for private purposes or otherwise, and to exercise the right of eminent domain, as by this Charter provided, for the appropriation of lands and rights-of-way that may be proper and necessary to efficiently carry out such objects; to adopt by ordinance such rules and regulations as it may consider necessary and advisable for the acquiring and operation of any such public utilities; to manufacture its own electricity, gas and ice, and to purchase, and make contracts with any person or corporation for the purpose of purchasing gas, electricity and ice, and to sell the same to the public on such terms as the Council may provide.

**Section 2. Municipal Service:** The rates charged for service furnished by any of the said public utility plants shall be fixed by the City Council, and shall be just and equitable and there shall not be allowed any person, firm or corporation, or to any officer or employee of said City, any service free of charge, except that free service may be provided for buildings and institutions owned or operated by the City. In determining the rates to be charged and collected for such service, the cost of operation, maintenance, depreciations, replacements, betterments, interest charges, and the creation of a sinking fund to pay the principal and the interest of any bonds issued for the construction or acquirement or improvement of any such public utilities, shall be taken into consideration; provided, that the City may charge a greater rate for such service to persons, firms or corporations without the City Limits than for the same service to those within the City Limits.

# ARTICLE XIII

## BONDING POWER, INDEBTEDNESS

**Section 1.** **Authority to Incur Indebtedness:** The Council shall have the power to incur, create, refund and refinance indebtedness and borrow money for public purposes, to issue special or general obligation bonds or other evidences of indebtedness in connection therewith and to secure and pay the same form the source or sources in the amount and manner, subject to the elections and in accordance with the procedures provided and required by State law. (Adopted by Charter Amendment, April 5, 1980)

**Section 2.** **Treasury Interest Bearing Warrants:** In addition to the power set forth in Section 1 of this article, the City Council shall have the power, when in its discretion it deems expedient and necessary, and at a regular meeting, to pass an ordinance or ordinances authorizing the issuance of interest-bearing time warrants with or without coupons for the purpose for which bonds are authorized to be issued under this Charter, such warrants to bear interest not to exceed that amount permitted by general law, payable annually or semi-annually, and to mature at such times and to be payable at such places as may be fixed by the City Council, but before any such warrants shall be delivered to the purchaser, the Mayor shall name twelve (12) citizens who must be legal voters and taxpayers as shown by the City Tax Rolls. Notice of naming these citizens shall be made public at least ten (10) days before the regular meeting at which said citizens committee is to consider proposed issue of warrants, and a majority of these twelve (12) citizens must give their written approval of such warrants and signs the minutes of the meeting at which warrants are ordered to be issued. Their approval shall not be given earlier than one regular meeting after the proposal to issue warrants by the City Council. At the time any such warrants are ordered to be issued, the City Council shall levy a sufficient tax to provide for the payment of the necessary annual interest thereon, and to create a sinking fund for such warrants as are authorized to be issued. In lieu of the taxes required to be levied in the sentence next above, the Council may secure and pay any such warrants from any other unencumbered revenues of the City. They shall be signed by the Mayor, counter-signed by the City Secretary and shall provide the purpose for which they are issued, the place where payable, and shall bear the seal of the corporation. (Adopted by Charter Amendment, April 5, 1980)

# ARTICLE XIV

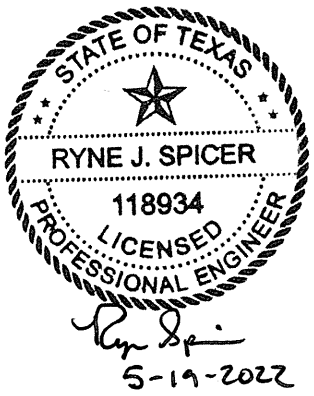
## CITY DEPOSITORY

The provision of the general laws of the State governing the selection and designation of a City depository is hereby adopted as the law governing the selection and designation of a depository for the City of Arlington.

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## PART III – SITE DEVELOPMENT PLAN
## SITE DEVELOPMENT PLAN NARRATIVE




Prepared for

City of Arlington
and
Republic Waste Services of Texas, Ltd.

May 2022

Prepared by:

**Weaver Consultants Group, LLC**
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Fort Worth, TX 76109
817-735-9770

WCG Project No. 0023-404-11-104

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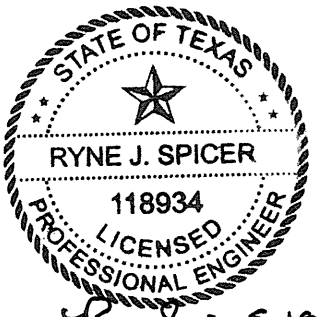


5-19-2022

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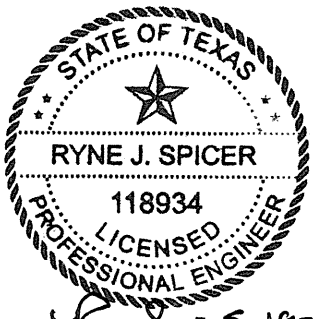


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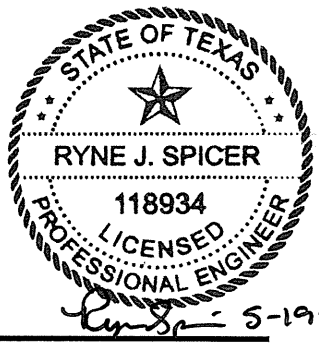


## CONTENTS (Continued)

**APPENDIX IIIM**
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# 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.

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

PCBs – polychlorinated biphenyls

PI – point of intersection

# LIST OF ACRONYMS (Continued)

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

UEL – upper explosive limit

USACE – United States Army Corps of Engineers

## LIST OF ACRONYMS (Continued)

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 City of Arlington 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.

*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 site entrance is located at the intersection of Allan Saxe Parkway and Mosier Valley Road, approximately 350 feet west of the intersection of Mosier Valley Road and FM 157. Access is controlled by a gate. The gate is locked when the site is not in operation.

The site secondary construction entrance is located off Blue Lake Boulevard, approximately 875 feet southwest of the intersection of Blue Lake Boulevard and FM 157. Entry through the secondary construction entrance will be restricted to only vehicles transporting uncontaminated clean soil and construction equipment whose entry is authorized by the City of Arlington Landfill management. No solid waste vehicles will enter through the secondary construction entrance. Access is controlled by a gate. The gate is locked when the site is not in operation or when the secondary construction entrance is not in use.

### 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/IIA.12 – Access Control Plan, an existing chain-link fence and natural barriers located along the permit boundary limits to prevent unauthorized access to the site.

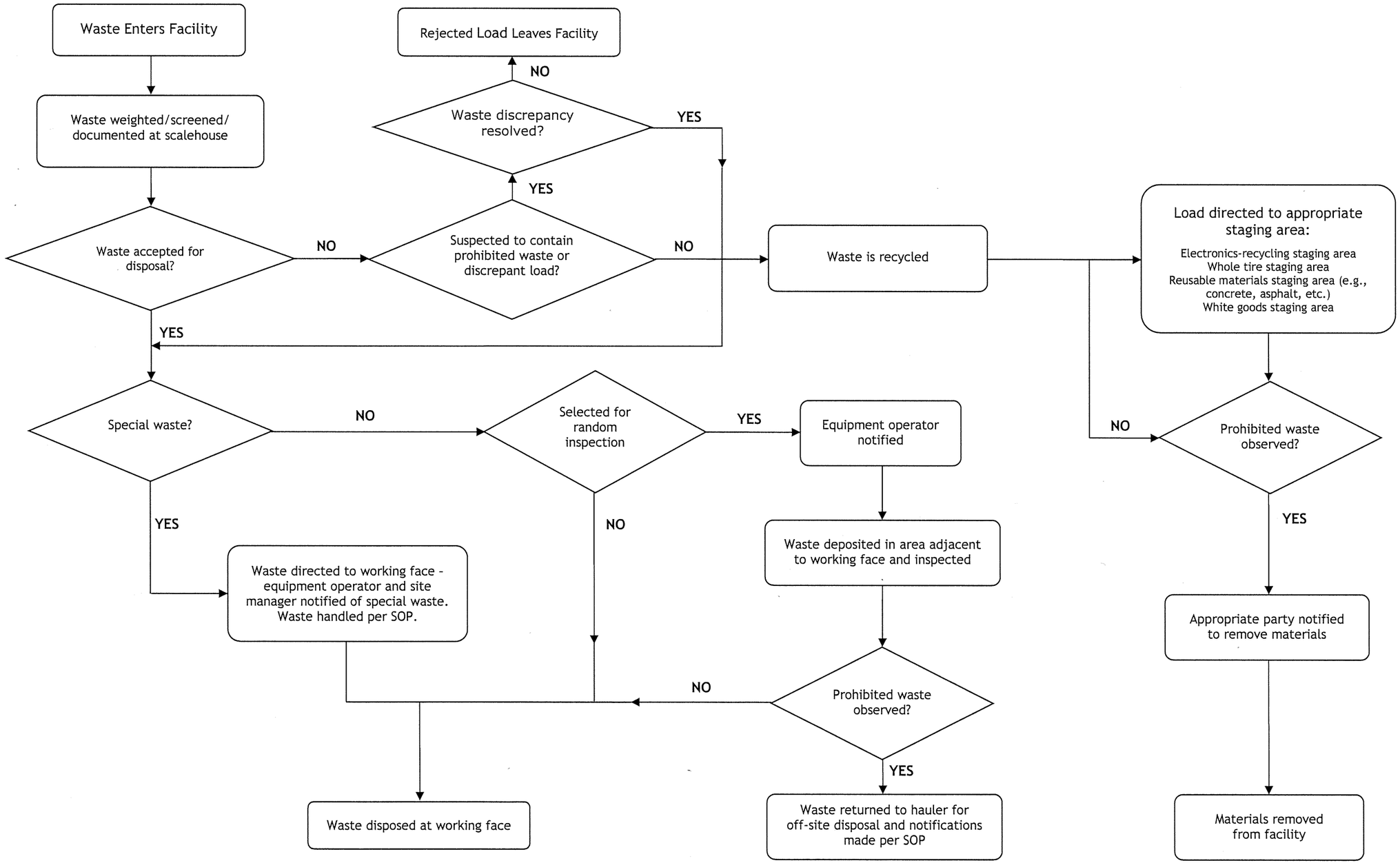
Republic Waste Services of Texas, Ltd. will restrict entry to the landfill to designated site operations personnel, solid waste haulers authorized to use the facility, TCEQ personnel, and properly identified persons whose entry is authorized by the Landfill Manager or his designee. Republic Waste Services of Texas, Ltd 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))

Waste movement at the facility will remain unchanged from existing operations. Figure III-1 (shown on the following page) provides the existing waste movement flow diagram for the facility. 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))

A schematic view of the facility operations including 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 operation will occur in open areas within the permitted waste disposal footprint; therefore, adequate ventilation will be provided. The existing Citizens Convenience Center is located in a well ventilated area (open air). The containers located at the Citizens Convenience Center will be unloaded at the working face on a routine basis to minimize odors. 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 the existing Citizens Convenience Center are included in Parts I/II, Appendix I/IIA and in this SDP (e.g., Appendix IIIA). 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 City of Arlington 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.

## 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).

# 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.

## 3.2 Site Drainage Patterns

The permit boundary encompasses approximately 774.3 acres located west of FM 157, north of the West Fork Trinity River, south of Trinity Boulevard, and east of Green Belt Road. Hurricane Creek currently divides the landfill as it traverses north to south between the two disposal units. The site reconfiguration proposes to relocate Hurricane Creek around the north and west parts of the landfill and discharge into the West Fork at its original discharge location.

The final cover system includes erosion control structures to effectively minimize erosion of final cover soils. The drainage system also includes a perimeter channel system that will convey stormwater collected from the landfill area to detention ponds. The stormwater detention ponds are designed to attenuate stormwater flow before stormwater is discharged into existing drainage features located downstream of the site. As discussed in Appendix IIIF, the site's stormwater management system is designed to not adversely alter existing permitted drainage patterns or have any adverse impact on offsite drainage features.

## 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, and culverts. 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 towards detention ponds and ultimately discharges to the West Fork of the Trinity River. The drainage and 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/IIA.4 through I/IIA.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 detailed in Part III, Appendix IIIF-F – Erosion Control Plan for All Phases of Landfill Operations 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. Erosion control plans for above grade scenarios are presented in Part III, Appendix IIIF-F – Erosion Control Plan for All Phases of Landfill Operation.

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. 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. 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 City of Arlington 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 the landfill completion plan included in Part III, Appendix IIIA-A.

## 3.7 Floodplain Information (§330.63(c)(2))

Detailed floodplain information is included in Parts I/II and Appendix IIIN. As discussed in Appendix IIIN, flood storage will be created to offset the flood storage consumed by the proposed landfill reconfiguration. The site is located within the Trinity River corridor and a Trinity River Corridor Development Certificate (CDC) will be approved by the City of Arlington and the USACE for the continued development of the landfill. In addition, a CLOMR will be approved by the City of Arlington and FEMA to allow for the proposed development within the 100-year floodplain. The CDC and CLOMR permit applications are included in Appendix IIIN, and represent the approvals required to develop the site so that the waste disposal area will be protected from the 100-year floodplain.

## 3.8 Wetlands Information

The City of Arlington 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 reconfiguration of the landfill will require USACE authorization under Section 404 of the Clean Water Act (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 City of Arlington 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 will be constructed of crushed stone, gravel, or other suitable material and will provide access from the entrance road to the fill area. The perimeter road around the site is a minimum of 15 feet wide. Mosier Valley Road and Allan Saxe Parkway are paved roadways that provides access to the entrance facilities. From the entrance facilities, the landfill haul road is a crushed stone road. The paved access roads and crushed stone haul roads 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.

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 approximately 4H:1V, and the aerial fill top slope will be approximately 5 percent. Final cover placement will generally follow the sequence of development as shown in Parts I/II, Appendix I/IIA, 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 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 options that will be constructed within the undeveloped sectors are described below.

**Table III-1**
**Liner System Components**

| Standard Subtitle D Composite Liner System | Alternative Subtitle D Composite Liner System |
|---|---|
| 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 | 60-mil HDPE Geomembrane |
| 2-foot-thick Compacted Clay Liner (CCL) | Geosynthetic Clay Liner (GCL) |

A summary of the liner system design and 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 424.5 ft-msl, which occurs in Sector 8.

### 4.3.2 Overliner System for the Pre-Subtitle D Area

The overliner system for the pre-Subtitle D area of the landfill is designed consistent with Title 30 TAC §330.331(a)(1). The system is designed to convey leachate

generated over the existing pre-Subtitle D area to leachate collection sumps. The overliner system is described below with layers listed from top to bottom.

**Table III-2**
**Overliner System Components**

| Composite Overliner System |
|---|
| 24-inch-thick Soil Protective Cover |
| Drainage Geocomposite Leachate Collection Layer |
| 40-mil LLDPE Textured Geomembrane |
| Geosynthetic Clay Liner (GCL) |
| 12-inch-thick Foundation Layer |

The overliner system design and details are also summarized in Appendix IIIA – Landfill Unit Design Information. A Point of Compliance (POC) Demonstration, prepared consistent with Title 30 TAC §330.331(a)(1), is included in Appendix IIIB. The purpose of the POC demonstration is to demonstrate that the proposed waste containment system design will meet the waste containment system requirements specified in §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)(1)) in the uppermost aquifer at the POC.

### 4.3.3 Leachate Collection System

A leachate collection system (LCS) has been designed to remove leachate from the Subtitle D areas of the landfill. The LCS layout is shown on Drawing A.1 –Top of Liner Plan in Appendix IIIA-A. Design of the proposed 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 systems for the site are summarized in Table III-3. The final cover systems 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/IIA.8 – Landfill Completion Plan, a maximum of 5 percent top slopes and 4H:1V sideslopes are provided to minimize erosion and facilitate drainage of the landfill. The regulatory pre-Subtitle D final cover system will be constructed over the existing pre-Subtitle D waste disposal area. A composite final cover will be constructed over the Subtitle D

waste disposal areas. The final cover system options are described in Table III-3 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 759 ft-msl and the maximum waste elevation is 757 ft-msl (note that a 12-inch-thick intermediate cover layer is also included in this calculation).

**Table III-3**
**Final Cover System Components**

<table>
<tr><th colspan="2">Composite Final Cover System</th><th colspan="2">GCL Alternative Composite Final Cover System</th><th rowspan="2">Regulatory Pre-Subtitle D Final Cover System</th></tr>
<tr><th>Top Slopes</th><th>Side Slopes</th><th>Top Slopes</th><th>Side Slopes</th></tr>
<tr><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td rowspan="3">12-inch-thick erosion layer</td></tr>
<tr><td>Single-sided drainage geocomposite</td><td>Double-sided drainage geocomposite</td><td>Single-sided drainage geocomposite</td><td>Double-sided drainage geocomposite</td></tr>
<tr><td>40 mil LLDPE geomembrane (smooth or textured)</td><td>40 mil LLDPE geomembrane (textured)</td><td>40 mil LLDPE geomembrane (smooth or textured)</td><td>40 mil LLDPE geomembrane (textured)</td></tr>
<tr><td>18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td><td>18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td><td>Geosynthetic Clay Liner (GCL)</td><td>Geosynthetic Clay Liner (GCL)</td><td>18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td></tr>
</table>

## 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.

## 4.4 Estimated Rate of Solid Waste Deposition (§330.63(d)(4)(D))

The City of Arlington Landfill primarily serves residences and businesses in Dallas, Denton, Johnson, and Tarrant Counties. The City of Arlington Landfill estimated a waste inflow increase to 1,043,900 tons per year (3,650 tons per day based on a 286-day operating schedule) in 2021. After 2021, 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 1,298,726 tons per year or 1,527,913 cubic yards (assuming an in-place density of 1,700 lb/cy) of solid waste (4,541 tons per day based on a 286-day operating schedule).

The population equivalent, as defined in §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 (33.4 years – refer to Appendix IIIM) was calculated as follows:

$$\frac{(1{,}298{,}726^{1}\ \text{tons/year}) \times (2{,}000\ \text{pounds/ton})}{(5\ \text{pounds/person/day}) \times (365\ \text{days/year})} = 1{,}423{,}261\ \text{persons}$$

[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 (4,541 tons/day x 286 days/year = 1,298,726 tons/year). Refer to Appendix IIIM 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.

## 4.7 Waste Relocation Plan

Two historic waste fill areas (south of the WDA pre-Subtitle D area and along Hurricane Creek) will be relocated to the main disposal area of the City of Arlington Landfill. Refer to Section 6 of Appendix IIIA for additional information.

# 5 COMPLIANCE WITH §330.63(e) THROUGH §330.63(j)

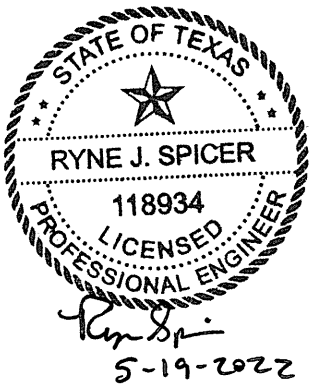
The following table provides references to each SDP appendix that was developed to meet the specified rule.

| Rule | SDP Appendix |
|---|---|
| §330.63(e) | Appendix IIIG – Geology Report and Appendix IIIE – Geotechnical Report |
| §330.63(f) | Appendix IIIH – Groundwater Monitoring, Sampling, and Analysis Plan |
| §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 and Postclosure Care Cost Estimates |

# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## PART III – SITE DEVELOPMENT PLAN
## APPENDIX IIIA
## LANDFILL UNIT DESIGN INFORMATION




Prepared for

City of Arlington
and
Republic Waste Services of Texas, Ltd.

May 2022

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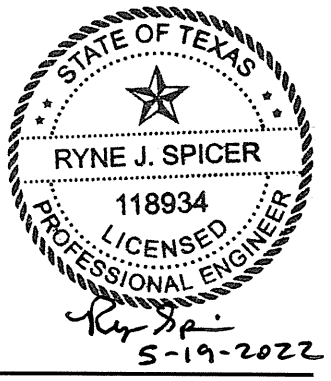


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# 1 LANDFILL UNIT DESIGN INFORMATION

The purpose of this appendix is to present the details of the liner system, overliner system, and final cover system 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 system, overliner system to be constructed over the pre-Subtitle D area, and final cover systems.

*This appendix addresses §330.331, §330.333, and §330.457.*

# 2 PROPOSED LINER SYSTEM FOR THE SUBTITLE D AREA

The proposed composite liner systems are designed to meet the requirements of Title 30 TAC §330.331(a)(2) and §330.331(e). The composite liner system that will be constructed within the undeveloped sectors is described below.

**Table IIIA-1**
**Liner System Components**

| Standard Subtitle D Composite Liner System | Alternative Subtitle D Composite Liner System |
|---|---|
| 24-inch-thick Soil Protective Cover | 24-inch-thick Soil Protective Cover |
| Drainage Geocomposite Leachate Collection Layer | Drainage Geocomposite Leachate Collection Layer |
| 60-mil HDPE Geomembrane | 60-mil HDPE Geomembrane |
| 2-foot-thick Compacted Clay Liner (CCL) | Geosynthetic Clay Liner (GCL) |

Drawing A.1 (Appendix IIIA-A) presents the top of liner plan for the undeveloped areas at the City of Arlington Landfill. This drawing also references the location of the various liner system details. Material specifications, construction, and testing requirements for the liner system are provided in Appendix IIID – LQCP.

As shown on Typical Sections A through E (Drawings B.4 through B.8 in Appendix IIIA-B) and on Drawing B.1 in Appendix IIIA-B, the existing permitted waste disposal area will be reconfigured with this major permit amendment application, resulting in a net increase in disposal area of approximately 7.8 acres.

As discussed in Appendix IIIG – Geology Report, there are two hydraulically interconnected shallow water-bearing stratums. The first one is the lowermost portion of the alluvial deposits consisting of laterally discontinuous coarse-grained materials with an increasing amount of gravel sized particles in some areas (Stratum B). The second one is the intermittent, non-continuous sandstone, sand and interbedded sandstone, and shale deposits of the Woodbine Group (Stratum D). These two water-bearing stratums are locally interconnected and define the uppermost transmissive zone. The interval between these zones is generally a shaley clay that represents the division between the Quaternary alluvial and the Woodbine. This zone is thin (approximately 1 foot) in some areas, and is likely absent in others, allowing hydraulic interconnection in some areas. Primary areas

of interconnection will be where thin or absent shaley clay overlies a sand or sandstone portion of the Woodbine. The weathered shale portion of the Woodbine Group (Stratum C) and the Unweathered shales, siltstones, and limestone of the Woodbine Group (Stratum E) act as aquicludes to restrict vertical movement of groundwater.

A hydrostatic pressure relief system design is provided in Appendix IIID – LQCP to ensure that potential groundwater hydrostatic pressure at the base of the liner system will be controlled. The analysis of the temporary hydrostatic pressure relief (dewatering) system along with ballast demonstrations are provided in Appendix IIID – LQCP. Details depicting the underdrain system are presented on Drawings A.4 through A.8A.

The proposed liner systems, as shown on Drawings A.4 through A.8 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, is 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 equivalency demonstration is provided in Appendix IIIB-C.

A geotechnical report including a stability demonstration for the liner system is provided in Appendix IIIE – 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 critical sections. 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.
- **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

Sectors 2, 3, 4, 5, and Overliner Sector 1A/2A were constructed to Subtitle D standards under Permit No. MSW-358A and Permit No. MSW-358B. The existing composite liner systems for the developed Subtitle D sectors are described in Table IIIA-2.

**Table IIIA-2**
**Existing Liner System Components**

| Sectors 2, 3, 4, and 5 | Overliner Sector 1A/2A |
|---|---|
| 24-inch-thick Soil Protective Cover | 24-inch-thick Soil Protective Cover |
| Drainage Geocomposite Leachate Collection Layer | Drainage Geocomposite Leachate Collection Layer |
| 60-mil HDPE Geomembrane Liner | 40-mil LLDPE Textured Geomembrane |
| 2-foot-thick Compacted Clay Liner (CCL) | Geosynthetic Clay Liner (GCL) |
| | 12-inch-thick Foundation Layer |

The existing composite liner systems for Sectors 2, 3, 4, and 5 include a hydrostatic pressure relief system, as discussed in the LQCP (Appendix IIID).

The impact of differential settlement on the performance of the currently constructed leachate collection systems in the Subtitle D areas is analyzed in Appendix IIIE-B and summarized in Table IIIA-3.

The existing pre-Subtitle D liner areas include the West Disposal Area (WDA) unit, which is approximately 128 acres, and Sector 1 of the East Disposal Area (EDA) unit, which is approximately 57.5 acres. Since 1970, the Texas State Board of Health MSW Regulations required that a natural or artificial barrier be in place, which most commonly was the placement of a 3-foot-thick compacted clay or in-situ clay liner ($k \leq 1x10^{-7}$ cm/s). The Texas Department of Health (TDH) permit for the site was issued in March 1978 (Permit No. 358). Detailed liner requirements were listed in this permit for either a 3-foot-thick low-permeability compacted clay or in-situ liner ($k \leq 1x10^{-7}$ cm/s).

## Table IIIA-3
## Leachate Collection Layer Analysis Summary
## for the Developed Subtitle D Areas

| 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 | Post-Settlement Slope of Leachate Collection Pipe |
|---|---|---|---|---|
| 2, 3, 4, 5 | 2.0% | 0.6% | 2.1% | 0.6% to 0.7% |

As shown, the slope change 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 downstream portion of the cell is expected to be negligible due to the development of the landfill. The foundation/bottom liner settlement analysis is presented in Appendix IIIE-B-1 of Appendix IIIE. 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.

# 4 OVERLINER SYSTEM FOR THE PRE-SUBTITLE D AREA

The overliner system for the pre-Subtitle D area of the landfill has been designed consistent with the requirements listed in Title 30 TAC §330.331(a)(1). The proposed system is designed to convey leachate generated over the existing pre-Subtitle D area to leachate collection sumps in the adjacent Subtitle D sectors. The overliner system components are described in Table IIIA-4.

The Top of Overliner Plan is shown on Drawing A.2. Details for the overliner system are presented on Drawings A.9 through A.11. Material specifications, construction, and testing requirements for the proposed overliner system are provided in Appendix IIID - LQCP.

The point of compliance (POC) demonstration for the overliner system is presented in Appendix IIIB. The purpose of the POC demonstration is to demonstrate that the proposed containment system design will meet the POC requirements specified in Title 30 TAC §330.331(a) by demonstrating that the predicted concentrations of leachate chemical constituents do not exceed maximum contaminant levels (as listed in Table 1 in §330.331(a)(1)) in the uppermost aquifer at the POC.

# Table IIIA-4
# Overliner System Components

| Component | Description |
|---|---|
| Geosynthetic Clay Liner (GCL) | The reinforced GCL will be installed on top of the existing pre-Subtitle D final cover infiltration layer. As noted in Section 2.3.3 of Appendix IIID – LQCP, the existing erosion layer and the top 6 inches of the 18-inch-thick compacted clay infiltration layer will be removed and any required subgrade fill will be placed. The foundation layer will have a maximum hydraulic conductivity of $1x10^{-6}$ cm/s and a minimum thickness of 12 inches, as discussed in Appendix IIID, Section 2.3.3. The reinforced GCL will be installed on top of the foundation layer. Section 4 of Appendix IIID – LQCP provides detailed specifications and construction procedures for the overliner GCL. |
| 40-mil LLDPE Textured Geomembrane Liner | The 40-mil LLDPE geomembrane textured on both sides will be installed on top of the GCL. 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 textured geomembrane to collect and convey leachate to the leachate collection system sumps 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 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 a sump that will be located in the adjacent Subtitle D sectors (refer to Drawing A.2 in Appendix IIIA-A). The leachate collection pipes will be SDR 17 HDPE smooth wall pipe or equivalent.<br><br>The leachate collection pipe design calculations are provided in Appendix IIIC. These calculations (1) demonstrate the adequacy of the pipes to convey leachate to the sumps, (2) verify the structural stability of the pipes, and (3) verify that the perforation requirements are met. |
| Leachate Collection Sumps and Pumps | Temporary leachate storage will be provided by leachate collection sumps in the adjacent Subtitle D sectors. The leachate collection sumps have been sized based on the amount of leachate generated. Leachate is pumped from the leachate collection sumps to the onsite aboveground storage tank(s). Sump volume calculations are provided in Appendix IIIC. Details of the leachate collection sump are provided on Drawing A.8 in Appendix IIIA-A. |

A geotechnical report, including a stability demonstration for the overliner system, is provided in Appendix IIIE – Geotechnical Report and is summarized below.

- **Overliner System Stability.** The stability of the overliner system was evaluated in Appendix IIIE-A. The interfaces of the overliner system components were evaluated to determine the factor of safety against sliding failure. The minimum factor of safety generated is greater than the minimum required factor of safety in all cases.
- **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 in Appendix IIIE-B and are developed from the settlement analysis included in Appendix IIIE (Appendix IIIE-B-3). The post-settlement slopes of the overliner system were used to demonstrate that the overliner leachate collection system will maintain positive drainage slopes and the leachate will be conveyed within the thickness of the leachate collection layer. Also, it is demonstrated that leachate drain pipes will be stable and maintain positive drainage after settlement. The strain analysis demonstrates that the maximum strain calculated is significantly lower than the allowable strain for the overliner system components.

# 5 WDA PRE-SUBTITLE D AREA LEACHATE MONITORING AND REMOVAL PLAN

The WDA pre-Subtitle D area has been closed since 1999 following the construction of the pre-Subtitle D final cover which consisted of an 18-inch-thick low-permeability compacted clay infiltration layer overlain by a 6-inch-thick erosion layer. The final cover has been in-place for over 20 years and has performed as a hydraulic barrier to minimize infiltration into the existing waste. The WDA pre-Subtitle D area also has an active landfill gas collection and control system (GCCS) which consists of vertical landfill gas (LFG) extraction wells, horizontal collection trenches, and a flare. The GCCS has also contributed to reducing the moisture content of the existing waste by extracting gas and condensate (i.e., condensate sumps, forcemains, etc.). Thus, it is expected that the moisture content of the existing waste has decreased in the last 20 years since the WDA closure in 1999. Additionally, nine dedicated leachate removal wells (LRWs) and a forcemain were installed in 2020. The LRWs were installed to the bottom of the WDA pre-Subtitle D waste. Each well is equipped with a transducer level monitoring device and a leachate removal pump. Furthermore, the overliner system is expected to virtually eliminate the potential for percolation into the pre-Subtitle D area since all of the leachate that is generated from above the pre-Subtitle D area is collected and pumped to a permitted off-site treatment facility. As demonstrated in Appendix IIIB, the maximum percolation rate through the overliner is less than 1 mm/year.

The purpose of this leachate monitoring and removal plan is to provide additional requirements to (1) monitor and remove any liquids that may collect at the bottom of the LFG extraction wells, (2) improve the performance of the GCCS to further reduce the moisture content of the existing waste, and (3) remove any liquids that may collect on the liner by operating the dedicated leachate removal wells. The existing final cover, GCCS, overliner, and leachate monitoring/ removal plan will work together to minimize the presence of leachate in the pre-Subtitle D area.

## 5.1 Existing Pre-Subtitle D Area Leachate Monitoring Systems

The site currently has two leachate monitoring systems in the pre-Subtitle D area. As discussed in Section 5.2, the LFG extraction wells are used to monitor for the presence of leachate or condensate levels, which is removed if the liquid level reaches the action level. As discussed in Section 5.3, the dedicated leachate removal

wells are used to monitor for the presence of leachate at the bottom of the pre-Subtitle D area, which is removed if the liquid level reaches the action level.

## 5.2 Leachate/Condensate Removal from LFG Extraction Wells

Site personnel or their representatives will monitor liquid levels in the WDA pre-Subtitle D area LFG extraction wells in accordance with this plan. If the liquid level in an LFG extraction well reaches the action level, a liquid removal pump will be used to remove the collected leachate or condensate. As shown on Drawing A.23, a liquid removal pump can be placed in each well to remove the collected leachate or condensate. The locations of the existing LFG extraction wells are shown on Drawing A.22 and a typical LFG extraction well detail is shown on Drawing A.23.

The LFG extraction wells will be monitored and pumped out in accordance with the schedule and procedures listed below.

- The leachate/condensate level in each LFG extraction well within the pre-Subtitle D area will be monitored on a quarterly basis.
- When preparing to take a liquid level, the technician should:
  - Remove the flexible hose from the lateral and cap the lateral riser with a Fernco cap to prevent air infiltration into the header.
  - Remove the wellhead or open the access port.
  - Measure and record the depth to liquid using the liquid level indicator.
  - Obtain and record the depth to bottom of well measurements.
  - Reinstall the wellhead or close the access port.
- If the leachate/condensate level in the extraction well is more than 3 feet above the bottom of the extraction well, then a pump will be used to remove the collected leachate/condensate. Approximately 36 inches of leachate head on the pump is required to operate the pump oriented vertically. The pump will automatically shut off when leachate head in the well is approximately 36 inches or less from the bottom of the well. The pumps will be rotated, as needed, to remove leachate/condensate in the extraction wells.
- The extracted leachate/condensate will be handled consistent with Appendix IIIC, Section 4 (Leachate Storage) and Section 5 (Leachate Disposal).
- Records of the leachate/condensate level monitoring and the volume of leachate/condensate removed from each well will be maintained in the Site Operating Record.

Prior to development of each overliner area, existing LFG extraction wells will either be extended vertically with a geomembrane boot/skirt (Drawing A.16), converted to

horizontal gas collection, or abandoned based on site conditions at the time of construction. Alternatively, the site may also request authorization from the TCEQ to discontinue monitoring the LFG extraction wells; however, the leachate/condensate monitoring and removal will continue until written approval is obtained from TCEQ.

## 5.3 Dedicated Pre-Subtitle D Area Leachate Removal Wells

To monitor for the presence of leachate at the bottom of the pre-Subtitle D area, nine dedicated leachate removal wells (LRW) have been installed. The location of the leachate removal wells is shown on Drawing A.22, and a typical leachate removal well detail is shown on Drawing A.23.

The leachate removal wells will be operated following the procedure listed below.

- The leachate level in each LRW will be monitored once per week and documented in the Site Operating Record.
- As shown on Drawing A.23, a leachate removal pump is installed in each well to remove any collected leachate. The pumps will be used to remove the collected leachate if the leachate level in the LRW is more than 3 feet above the bottom of the LRW.
- Leachate sensing floats, transducers, or an equivalent level monitoring device will be used to automatically activate the pumps. The pumps' outlet hoses will be connected to a forcemain that will convey leachate to a leachate storage tank.
- The extracted leachate will be conveyed to an on-site leachate storage tank before being discharged to a POTW, consistent with Appendix IIIC, Section 4 (Leachate Storage) and Section 5 (Leachate Disposal).

The dedicated leachate removal wells will be decommissioned to accommodate overliner construction. The site may also request authorization from the TCEQ to discontinue monitoring and pumping of the leachate removal wells; however, the leachate monitoring and removal will continue until written approval is obtained from TCEQ.

# 6 WASTE RELOCATION PLAN

Two historic waste fill areas located south of the WDA pre-Subtitle D area and along Hurricane Creek will be relocated to the main disposal area within the City of Arlington Landfill. The estimated limits of historic waste fill are shown on Drawing A.18 and typical sections are shown on Drawings A.20 and A.21 for the existing and proposed post-development conditions. The estimated limits are based on previous subsurface investigations for the facility and visual observations. The waste relocation will occur in the historic waste fill area south of the WDA pre-Subtitle D area prior to development of Sector 8 and overliner Sector 6. Waste relocation will occur along Hurricane Creek prior to development of Sector 6, Sector 7, and overliner Sector 5. The waste relocation procedure is discussed in Part IV – SOP, Section 4.25.

Additionally, waste relocation will occur in the northern portion of the WDA pre-Subtitle D unit. The area where waste relocation will occur is shown on Drawing A.18 and a typical section is shown on Drawing A.19 for the existing and proposed post-development conditions. The waste relocation will occur prior to relocating Hurricane Creek to the west. The waste relocation procedure is discussed in Part IV – SOP, Section 4.25.

# 7 FINAL COVER SYSTEM

Once the site reaches the permitted waste fill grades, a final cover system will be installed to limit the infiltration of stormwater into the deposited waste. Two composite final cover systems and the regulatory pre-Subtitle D final cover system have been designed for use at the site and are discussed in Section 7.1. In addition, the existing pre-Subtitle D final cover that will remain in place is discussed in Section 7.2 and is shown on Drawing A.3.

## 7.1 Final Cover System Options

The composite final cover system options that are applicable for the composite liner areas, overliner area, and pre-Subtitle D area are shown in Table IIIA-5. Additionally, the regulatory pre-Subtitle D final cover system may be installed for areas constructed with a pre-Subtitle D liner. The landfill completion plan is shown on Drawing A.3 in Appendix IIIA-A. Details of the final cover system options are presented on Drawings A.12 through A.15 in Appendix IIIA-A. Material specifications along with construction and testing procedures for the final cover systems are provided in Appendix IIIJ-A – Final Cover System Quality Control Plan (FCSQCP).

**Table IIIA-5**
**Final Cover System Components**

<table>
<tr><th colspan="2">Composite Final Cover System</th><th colspan="2">GCL Alternative Composite Final Cover System</th><th rowspan="2">Regulatory Pre-Subtitle D Final Cover System</th></tr>
<tr><th>Top Slopes</th><th>Side Slopes</th><th>Top Slopes</th><th>Side Slopes</th></tr>
<tr><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td>12-inch-thick erosion layer</td><td rowspan="2">12-inch-thick erosion layer</td></tr>
<tr><td>Single-sided drainage geocomposite</td><td>Double-sided drainage geocomposite</td><td>Single-sided drainage geocomposite</td><td>Double-sided drainage geocomposite</td></tr>
<tr><td>40 mil LLDPE geomembrane (smooth or textured)</td><td>40 mil LLDPE geomembrane (textured)</td><td>40 mil LLDPE geomembrane (smooth or textured)</td><td>40 mil LLDPE geomembrane (textured)</td><td rowspan="2">18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td></tr>
<tr><td>18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td><td>18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s</td><td>Geosynthetic Clay Liner (GCL)</td><td>Geosynthetic Clay Liner (GCL)</td></tr>
</table>

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 – Surface Water Drainage Report. 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 a 60 percent ground coverage. If there are areas that do not maintain at least 60 percent coverage they will be re-seeded until at least 60 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. The design of the final cover system erosion control structures is provided in Appendix IIIF-B.

## 7.2 Existing Final Cover System

The constructed regulatory pre-Subtitle D final cover system over the east pre-Subtitle D area will remain in place as shown on Drawing A.3.

## 7.3 Final Cover Stability Analysis

A stability analysis for the existing and proposed final cover systems is provided in Appendix IIIE – Geotechnical Report and is summarized below.

- **Final Cover Stability.** The stability of the proposed final cover slopes was evaluated at the most critical sections (e.g., where the 4H:1V slopes are the longest). 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.




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DRAWING A.2 – Top of Overliner Plan
DRAWING A.3 – Landfill Completion Plan
DRAWING A.4 – Liner System Details
DRAWING A.5 – Liner System Details
DRAWING A.5A – Liner System Details
DRAWING A.6 – Liner System Details
DRAWING A.7 – Liner System Tie-In Details
DRAWING A.8 – Leachate Collection System Details
DRAWING A.8A – Underdrain Sump Details
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DRAWING A.23 – WDA Pre-Subtitle D Area Leachate Removal Details

STATE OF TEXAS
RYNE J. SPICER
118934
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PROFESSIONAL ENGINEER
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SCALE IN FEET

L7 A1 A7 LINER TIE-IN
L5 A1 A6 SIDEWALL LINER TRANSITION
L3 A1 A5 LEACHATE COLLECTION TRENCH
L2 A1 A4 SIDEWALL LINER SYSTEM
L1 A1 A4 FLOOR LINER SYSTEM
L4 A1 A5 SIDEWALL LINER/ ANCHOR TRENCH
L6 A1 A6 SIDEWALL LINER TRANSITION W/LCS TRENCH
LCS3 A1 A8 RISER/CLEANOUT TERMINATION
LCS1 A1 A8 LEACHATE COLLECTION SUMP PLAN

MOSIER VALLEY ROAD
F.M. 157 NORTH COLLINS STREET
C.R.I.&P. RAILROAD
SCALEHOUSE

SECTOR 12
SECTOR 11
SECTOR 10
SECTOR 9
SECTOR 8
SECTOR 6
SECTOR 5A2B
SECTOR 5B2
SECTOR 5A2A
SECTOR 5B1
SECTOR 5A1
SECTOR 4
SECTOR 3
SECTOR 2
SECTOR 7
SECTOR 1 (PRE-SUBTITLE D AREA)

OVERLINER SECTOR 6
OVERLINER SECTOR 1C
OVERLINER SECTOR 4
OVERLINER SECTOR 1B
OVERLINER SECTOR 2B/3
OVERLINER SECTOR 5C, 1A/2A
OVERLINER SECTOR 5

GP-1A GP-2 GP-3 GP-4 GP-5 GP-7 GP-8 GP-9 GP-10 GP-11 GP-12R GP-13 GP-16 GP-17 GP-18 GP-19 GP-20 GP-21 GP-22 GP-23 GP-24 GP-25 GP-26 GP-27 GP-28A
MW-1 MW-2 MW-3 MW-11 MW-16 MW-17 MW-23 MW-29 MW-30 MW-31 MW-32 MW-33 MW-34 MW-35 MW-36 MW-37 MW-38 MW-39 MW-40 MW-41 MW-42 MW-43 MW-44

N 6979500 N 6978000 N 6976500 N 6975000 N 6973500
E 2389500 E 2391000 E 2392500 E 2394000 E 2395500 E 2397000 E 2398500

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 440 TOP OF LINER CONTOUR
- 506 TOP OF OVERLINER CONTOUR
- 510 AS-BUILT TOP OF LINER CONTOUR
- 448 APPROXIMATE TOP OF PRE-SUBTITLE D LINER (SEE NOTE 8)
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
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. ELEVATION OF DEEPEST EXCAVATION AT THE LCS SUMP IS 424.5 FT-MSL.
5. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.4 THROUGH I/IIA.7.
6. REFER TO APPENDIX IIIF FOR DRAINAGE DESIGN INFORMATION.
7. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.
8. TOP OF PRE-SUBTITLE D LINER IS APPROXIMATE AND WAS REPRODUCED FROM CROSS-SECTIONS INCLUDED IN THE 1977 PERMIT APPLICATION PREPARED BY HENNINGTON, DURHAM & RICHARDSON, INC.

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DESIGN BY: JBM
REVIEWED BY: RJS

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TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
# TOP OF LINER PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING A.1

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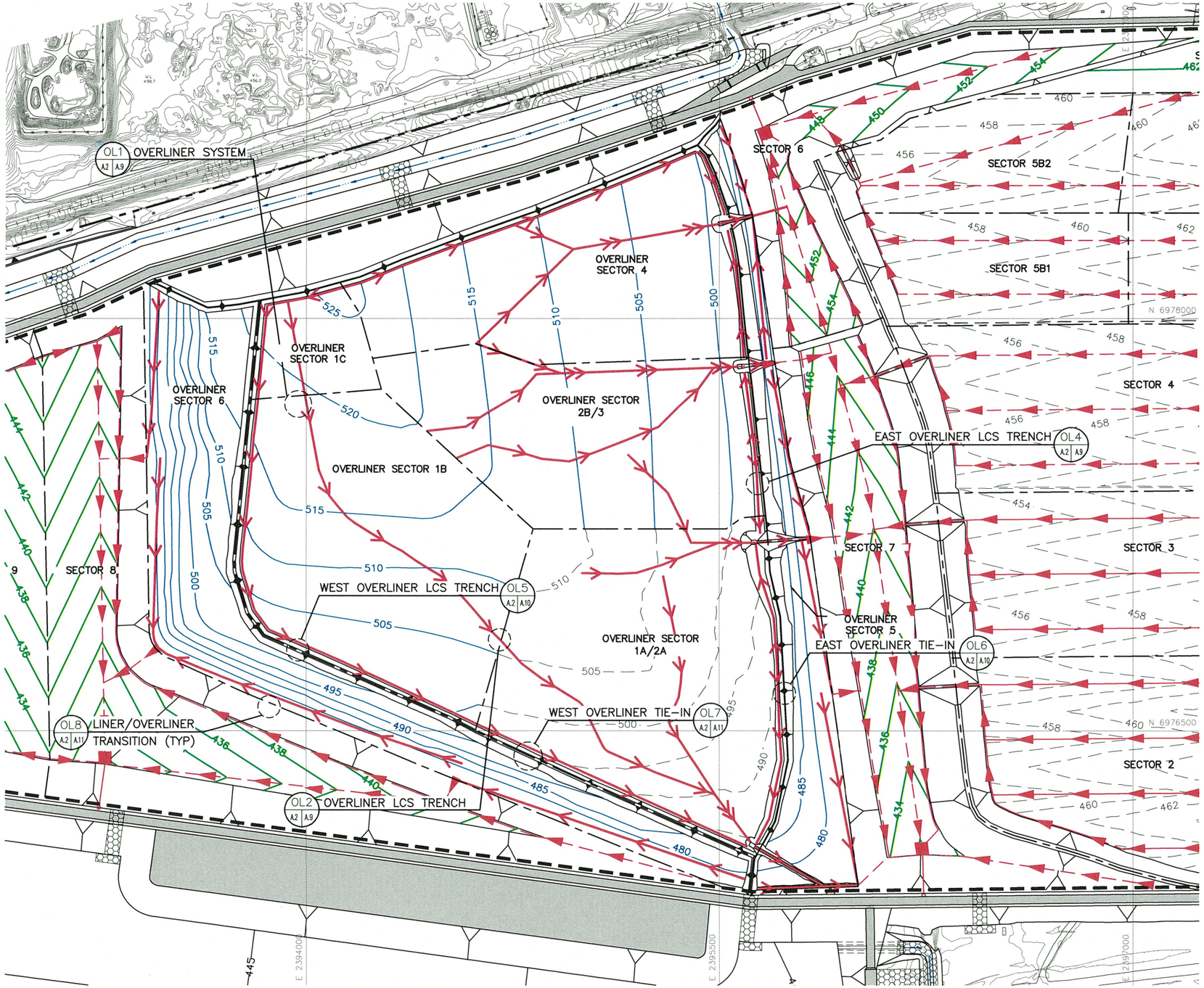


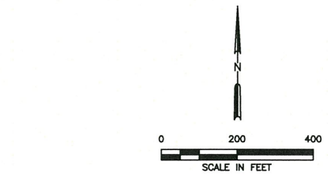


LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 440 TOP OF LINER CONTOUR
- 506 TOP OF OVERLINER CONTOUR
- 510 AS-BUILT TOP OF LINER CONTOUR
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
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. ELEVATION OF DEEPEST EXCAVATION AT THE LCS SUMP IS 424.5 FT-MSL.
5. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.4 THROUGH I/IIA.7.
6. REFER TO APPENDIX IIIB FOR OVERLINER AND POINT OF COMPLIANCE DEMONSTRATION.
7. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.

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118934
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DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
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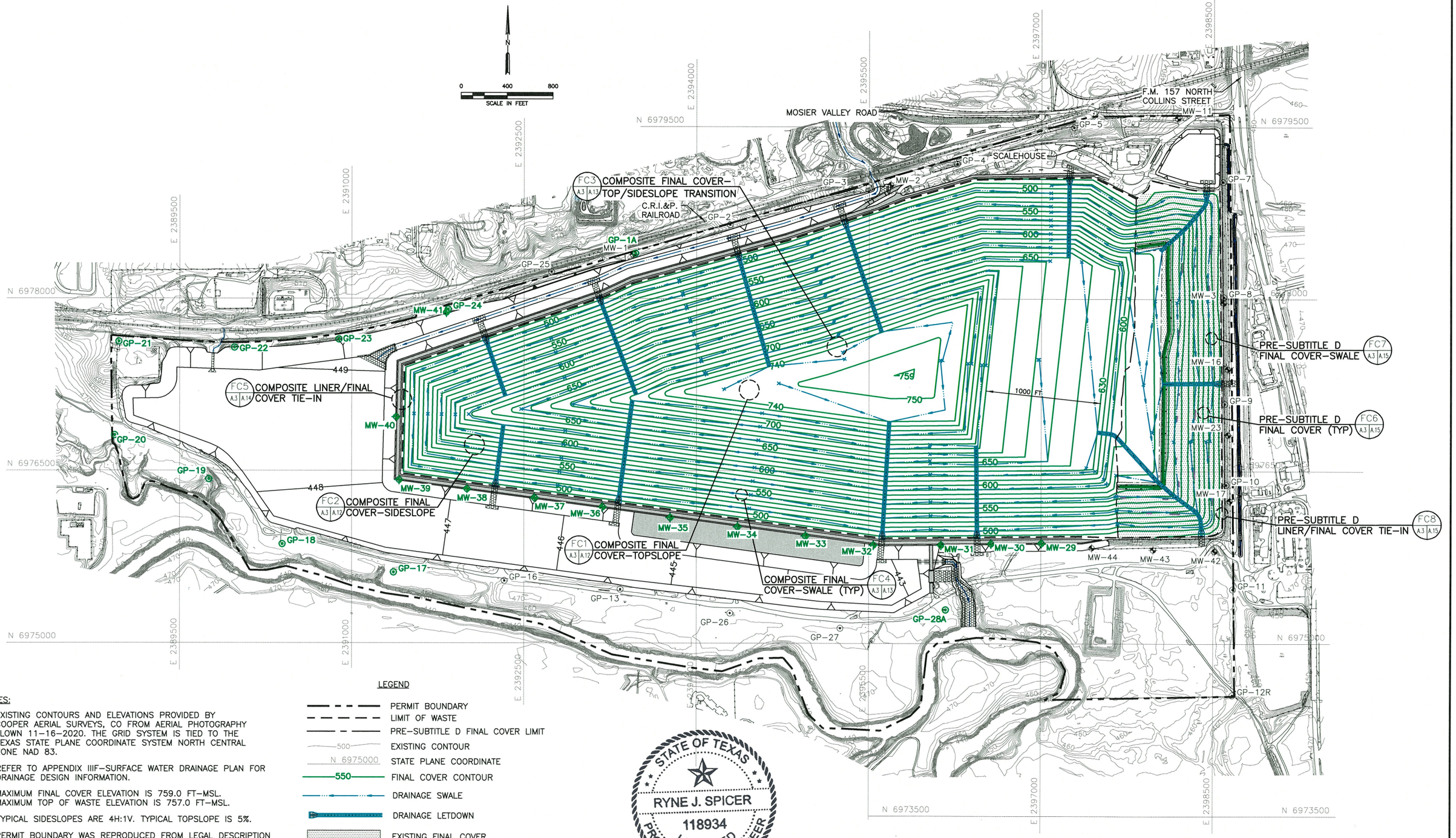


NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 759.0 FT–MSL. MAXIMUM TOP OF WASTE ELEVATION IS 757.0 FT–MSL.
4. TYPICAL SIDESLOPES ARE 4H:1V. TYPICAL TOPSLOPE IS 5%.
5. PERMIT BOUNDARY WAS REPRODUCED FROM LEGAL DESCRIPTION PROVIDED BY LANDES & ASSOCIATES, INC. DATED MARCH 2011.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE–SUBTITLE D FINAL COVER LIMIT
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 550 FINAL COVER CONTOUR
- DRAINAGE SWALE
- DRAINAGE LETDOWN
- EXISTING FINAL COVER
- MW–8 EXISTING GROUNDWATER MONITORING WELL
- MW–40 PROPOSED GROUNDWATER MONITORING WELL
- GP–2 EXISTING LANDFILL GAS MONITORING PROBE
- GP–17 PROPOSED LANDFILL GAS MONITORING PROBE

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REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT LANDFILL COMPLETION PLAN

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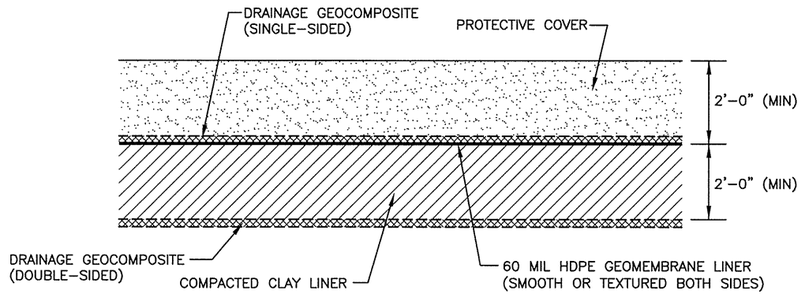
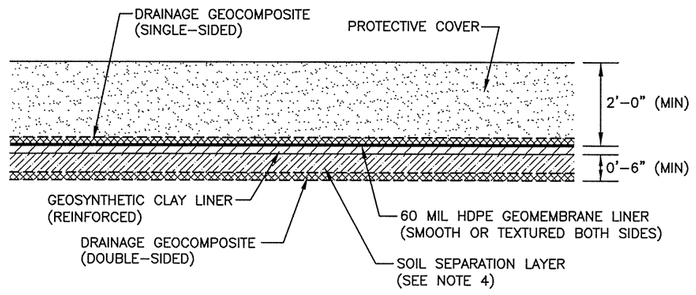
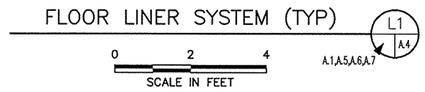
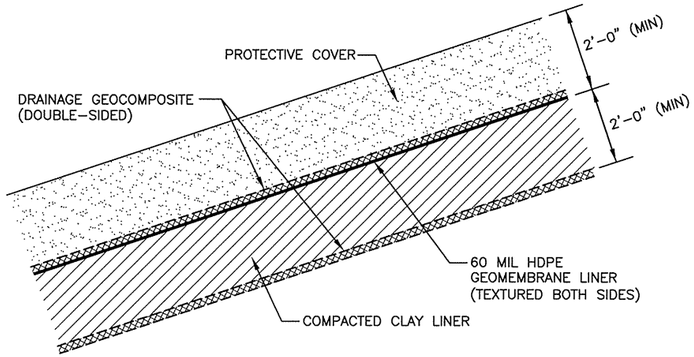



COMPACTED CLAY LINER OPTION

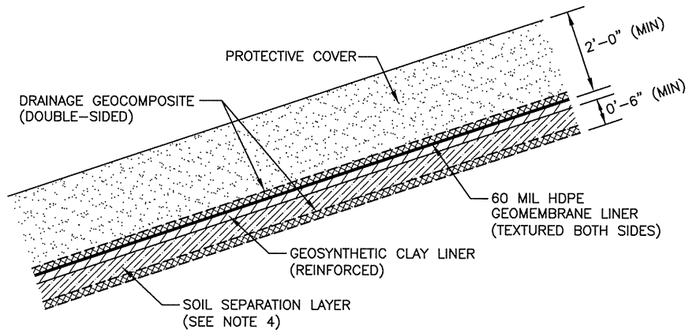



GCL OPTION




COMPACTED CLAY LINER OPTION

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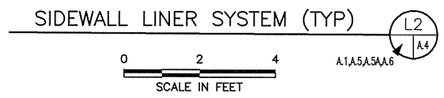
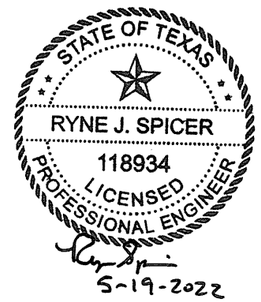



NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID–C FOR UNDERDRAIN DEWATERING SYSTEM DESIGN INFORMATION.
4. SOIL SEPARATION LAYER WILL BE A MINIMUM 6 INCHES IN THICKNESS, AND WILL BE PLACED IN A MANNER THAT DOES NOT SHOVE, DISPLACE OR DAMAGE UNDERLYING GEOCOMPOSITE. SOIL SEPARATION LAYER MAY BE COMPRISED OF GENERAL FILL SOILS WITH NO STONES, ROOTS, OR DEBRIS LARGER THAN 2 INCHES THAT MIGHT DAMAGE GEOCOMPOSITE.

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.4 LINER SYSTEM.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: CAM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
# LINER SYSTEM DETAILS

CITY OF ARLINGTON LANDFILL
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SHEET IIIA–A.4

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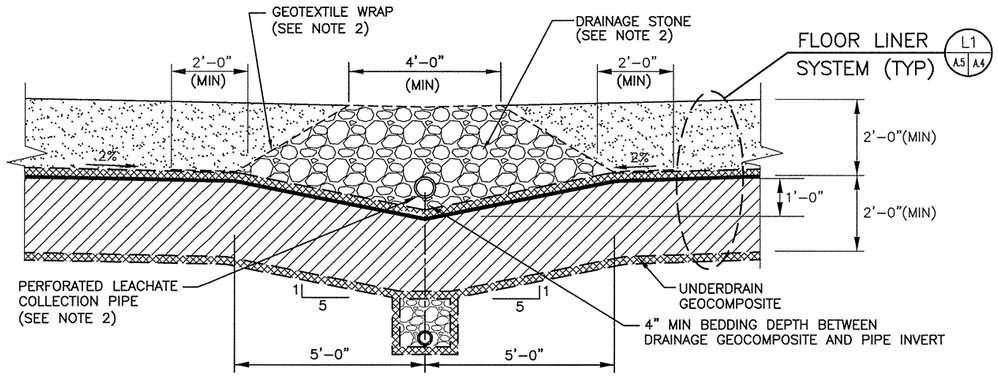
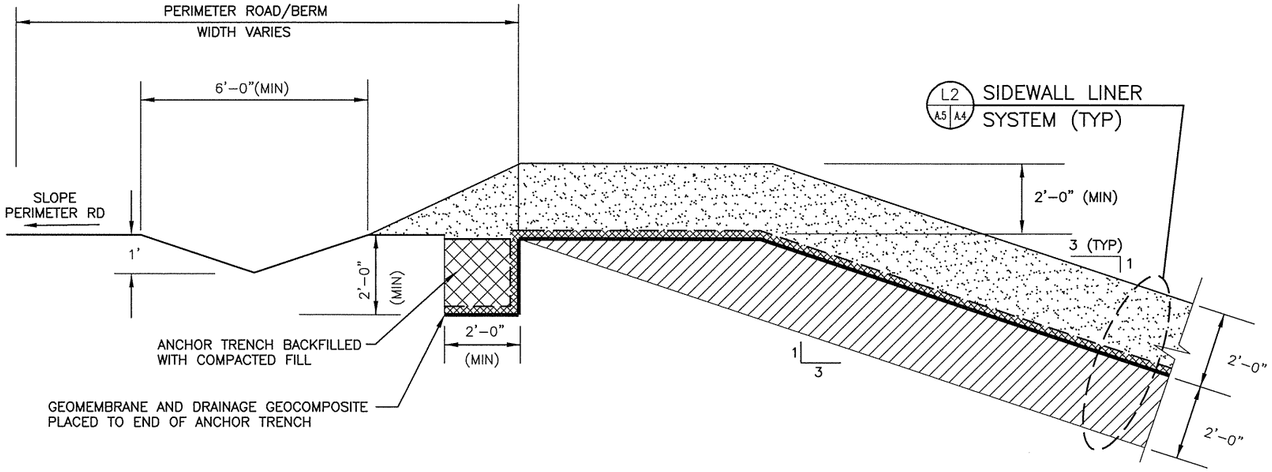
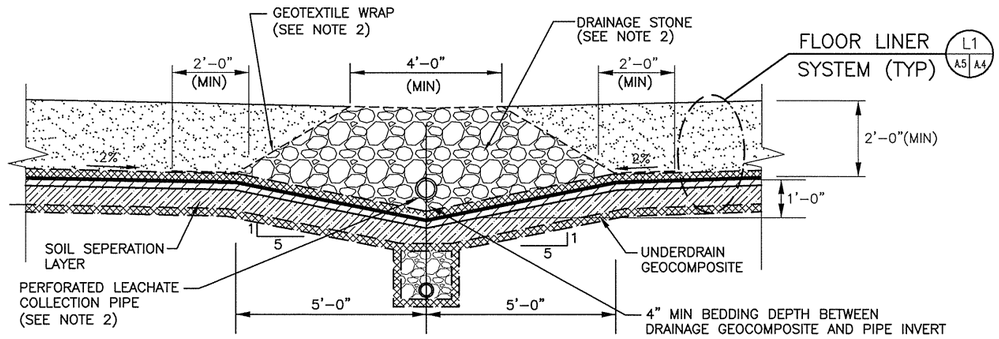


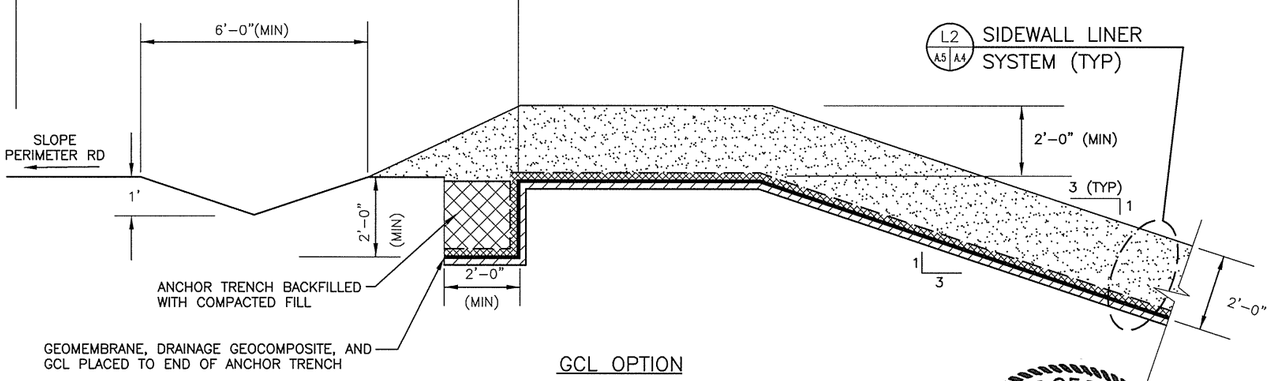

COMPACTED CLAY LINER OPTION




COMPACTED CLAY LINER OPTION




GCL OPTION

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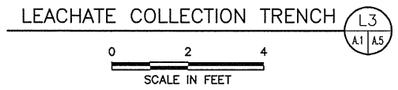
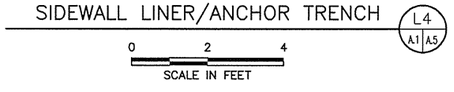
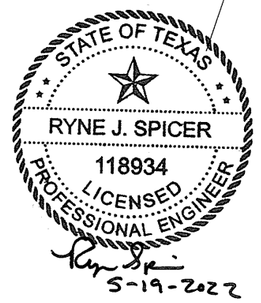



NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID–C FOR DEWATERING SYSTEM DESIGN INFORMATION AND DETAIL DRAWINGS.

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.5 LINER SYSTEM.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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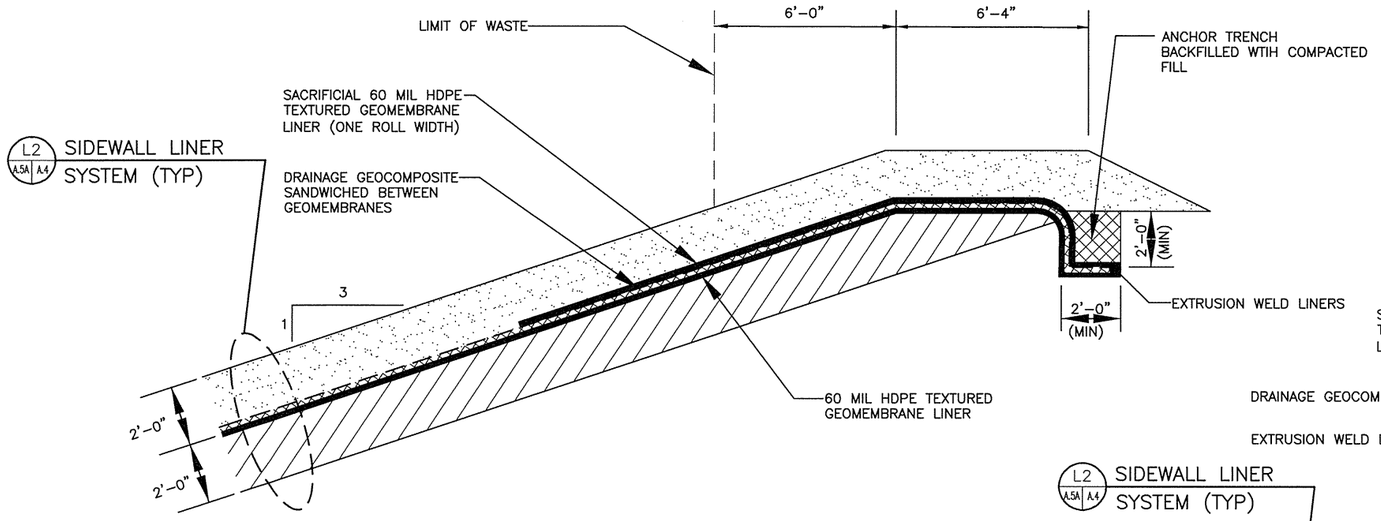
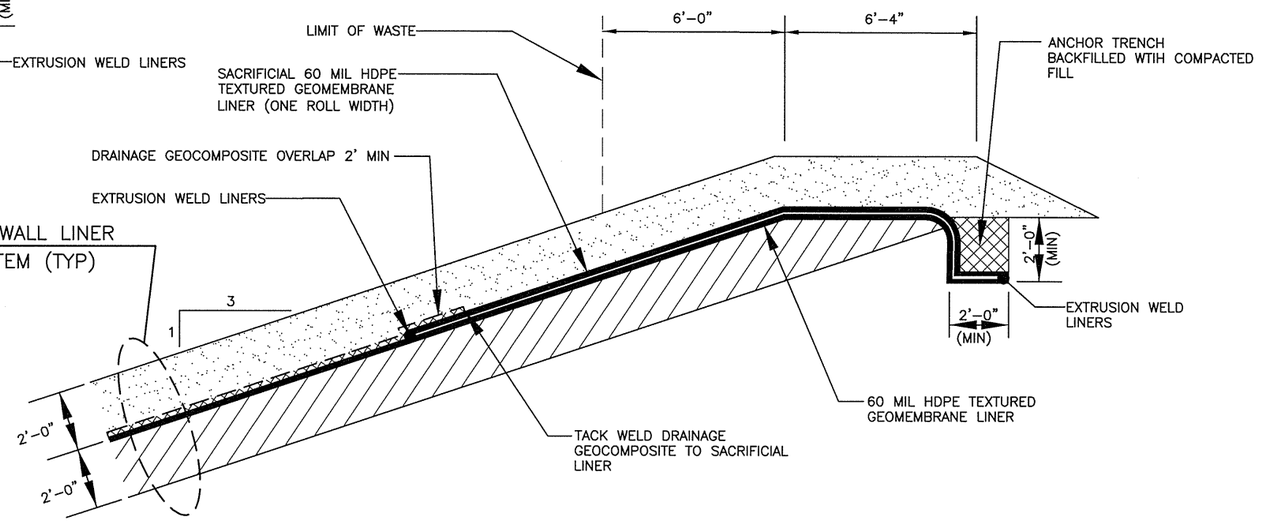
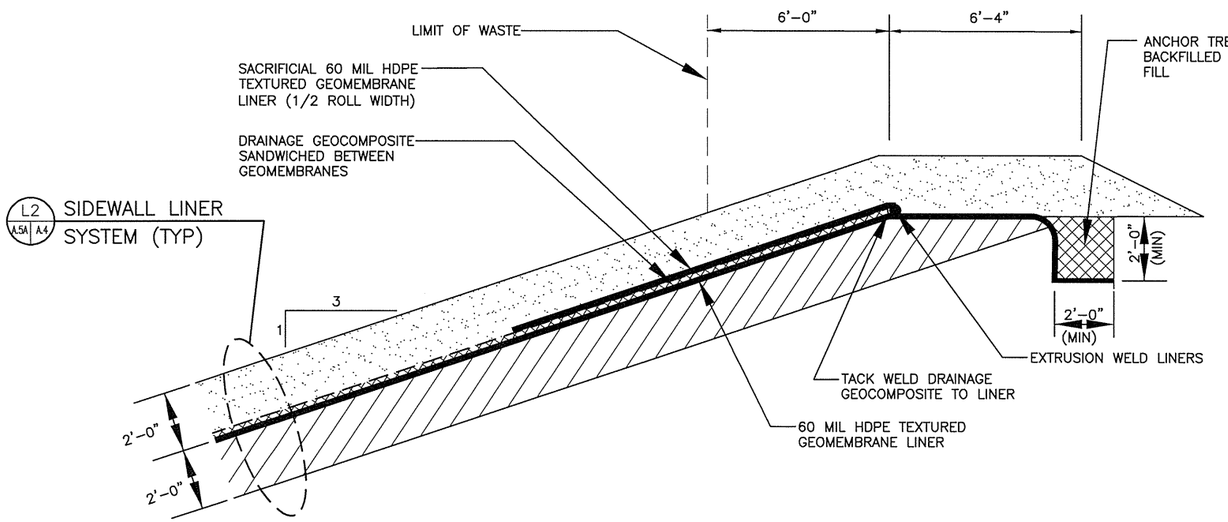



SIDEWALL LINER/ANCHOR TRENCH (OPTION 2) L5A A.1 A.5A

0 2.5 5

SCALE IN FEET




SIDEWALL LINER/ANCHOR TRENCH (OPTION 3) L5B A.1 A.5A

0 2.5 5

SCALE IN FEET

SIDEWALL LINER/ANCHOR TRENCH (OPTION 4) L5C A.1 A.5A

0 2.5 5

SCALE IN FEET

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF THE COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID–C FOR DEWATERING SYSTEM DESIGN INFORMATION AND DETAIL DRAWINGS.
4. DETAILS ARE SHOWN UTILIZING A COMPACTED CLAY LINER, HOWEVER, A GEOSYNTHETIC CLAY LINER MAY BE USED IN LIEU OF THE 2–FT COMPACTED CLAY.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.6 LINER SYSTEM.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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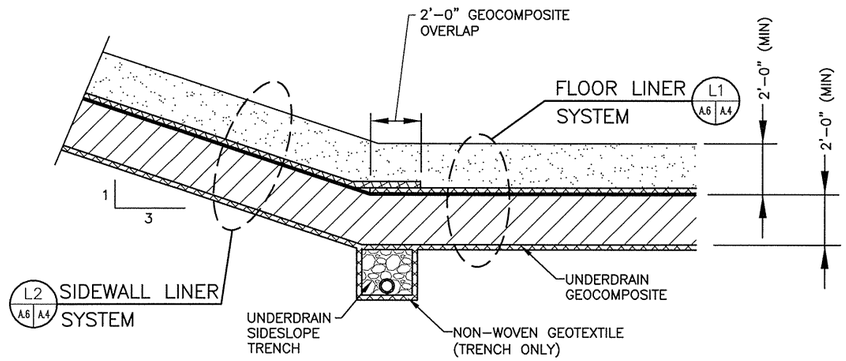
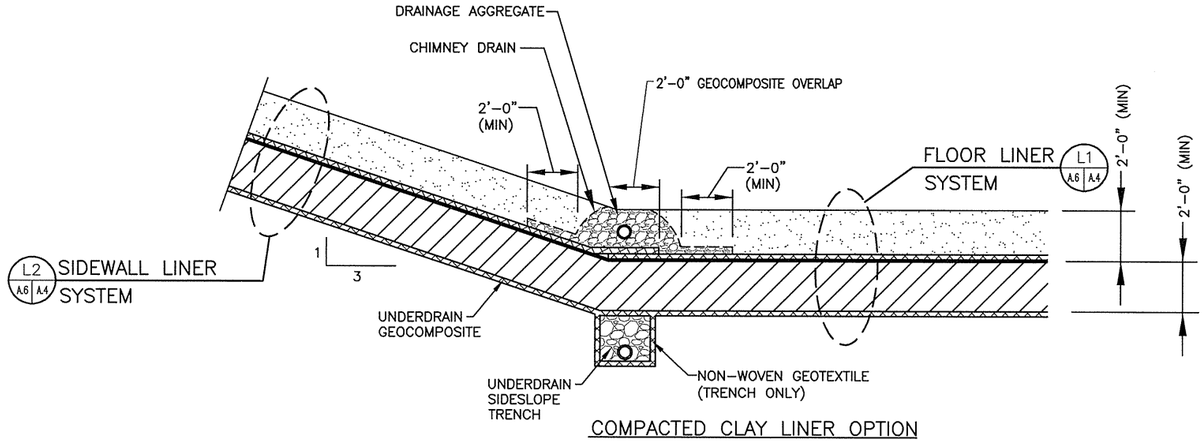
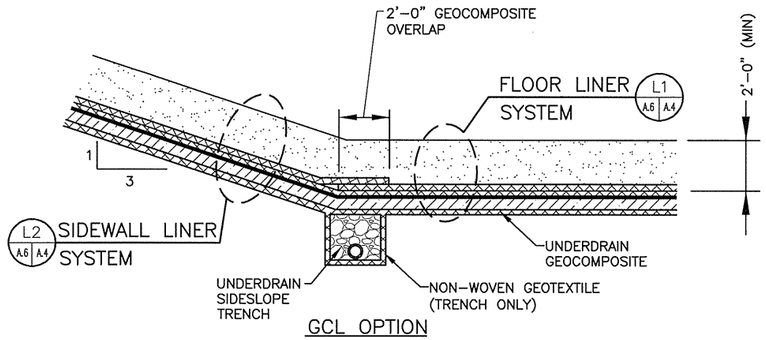



COMPACTED CLAY LINER OPTION




COMPACTED CLAY LINER OPTION

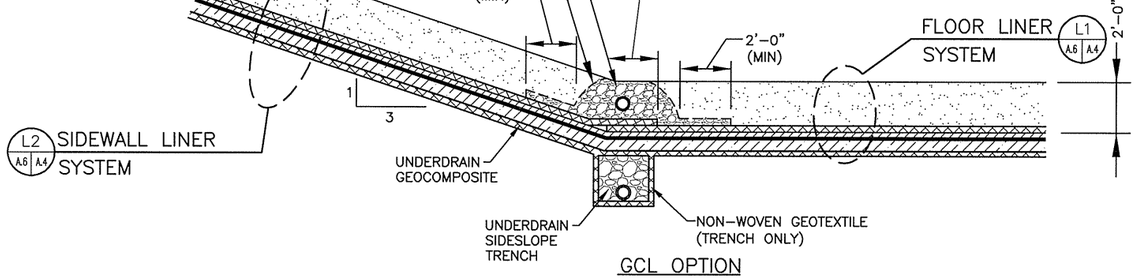



GCL OPTION

SIDEWALL LINER TRANSITION L5 (A.1 | A.6)

0 3 6

SCALE IN FEET




GCL OPTION

SIDEWALL LINER TRANSITION L6 (A.1 | A.6)
W/ LCS TRENCH

0 3 6

SCALE IN FEET

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID–C FOR DEWATERING SYSTEM DESIGN INFORMATION.

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118934
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5-19-2022

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FILE: 0023-404-11
CAD: A.6 LINER SYSTEM.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# LINER SYSTEM DETAILS

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DRAWING A.6

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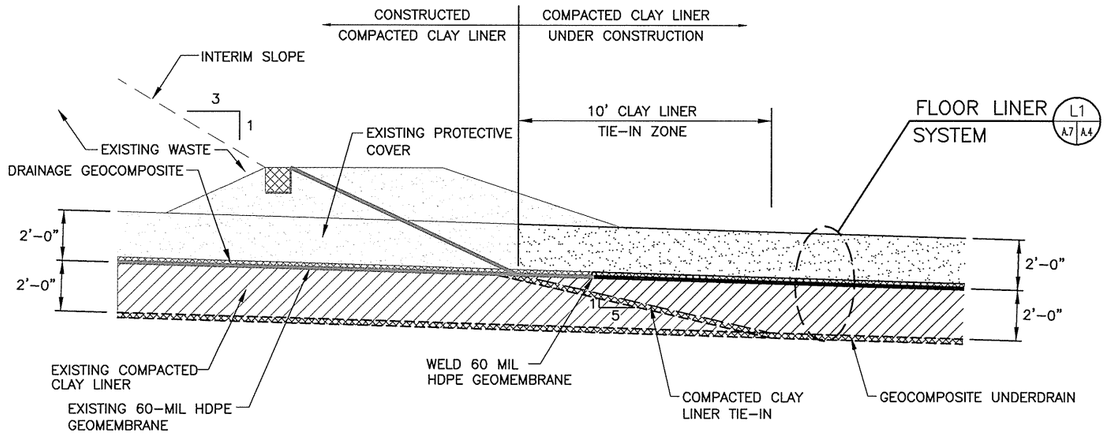
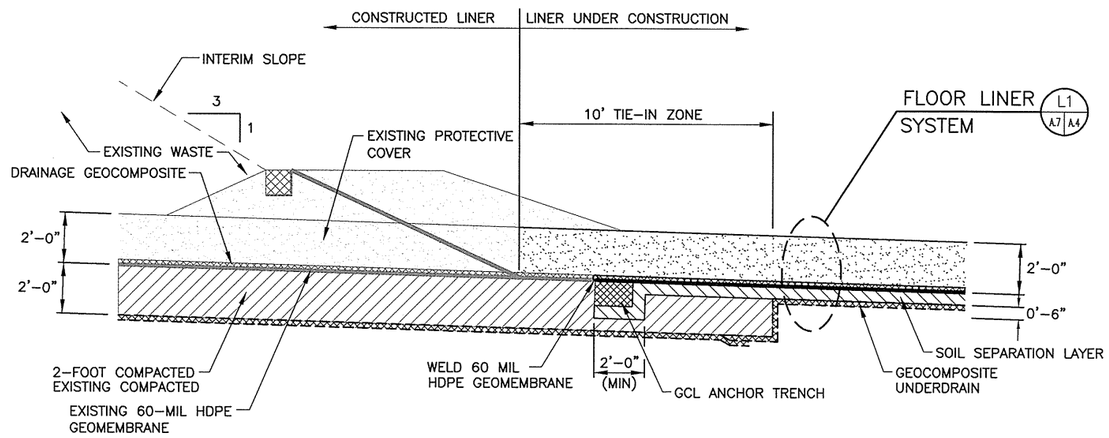



COMPACTED CLAY LINER/COMPACTED CLAY LINER TIE–IN




COMPACTED CLAY LINER/GCL LINER TIE–IN




GCL LINER/COMPACTED CLAY LINER TIE–IN




GCL LINER/GCL LINER TIE–IN

LINER TIE–IN L7 (A1 | A7)

0 3 6

SCALE IN FEET

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID–C FOR DEWATERING SYSTEM DESIGN INFORMATION.
4. PREVIOUSLY CONSTRUCTED BOTTOM LINERS INCLUDE 2–FOOT–THICK COMPACTED CLAY LINER.

STATE OF TEXAS
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118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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FILE: 0023–404–11
CAD: A.7 LINER SYSTEM.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# LINER SYSTEM TIE–IN DETAILS

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TARRANT COUNTY, TEXAS

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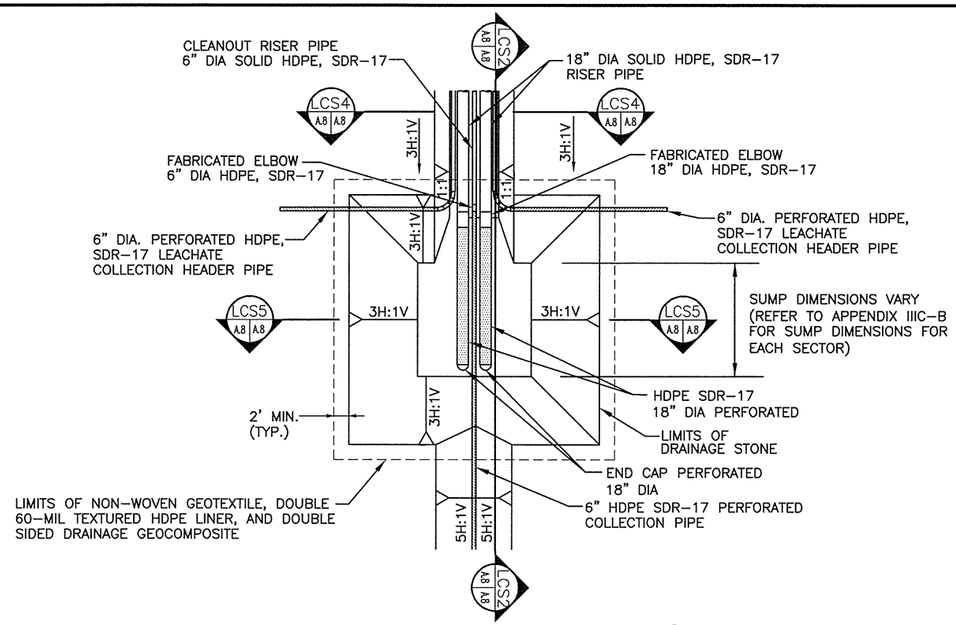


LEACHATE COLLECTION SUMP PLAN LCS1 (A.1 | A.8)

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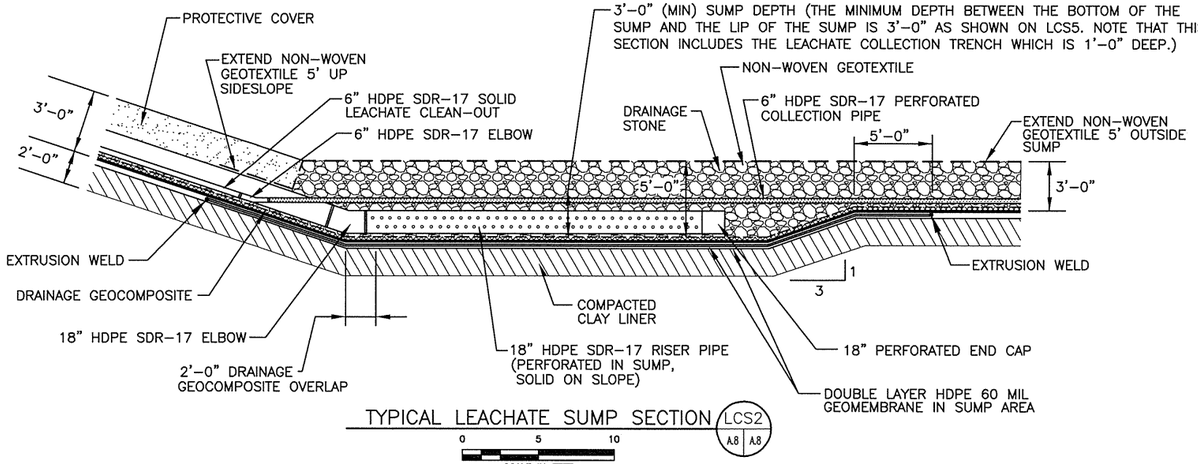


TYPICAL LEACHATE SUMP SECTION LCS2 (A.8 | A.8)

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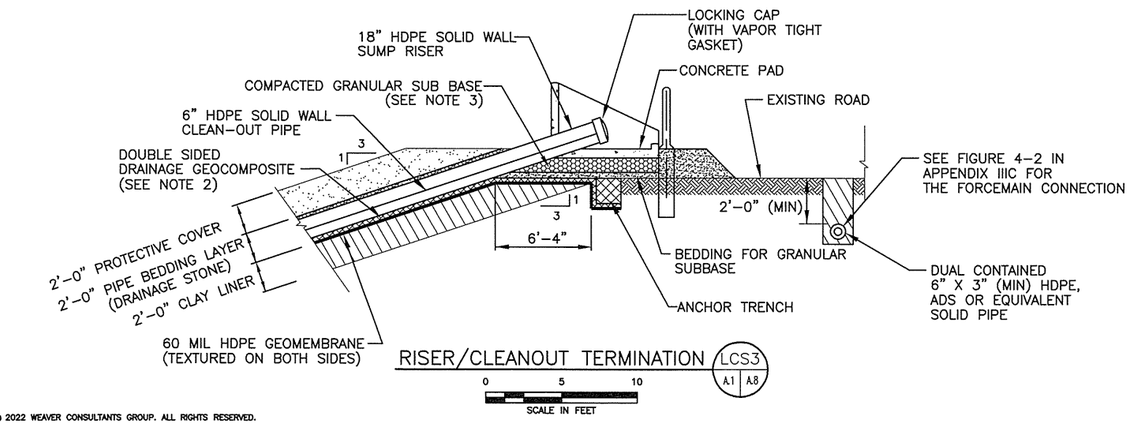
SCALE IN FEET




RISER/CLEANOUT TERMINATION LCS3 (A.1 | A.8)

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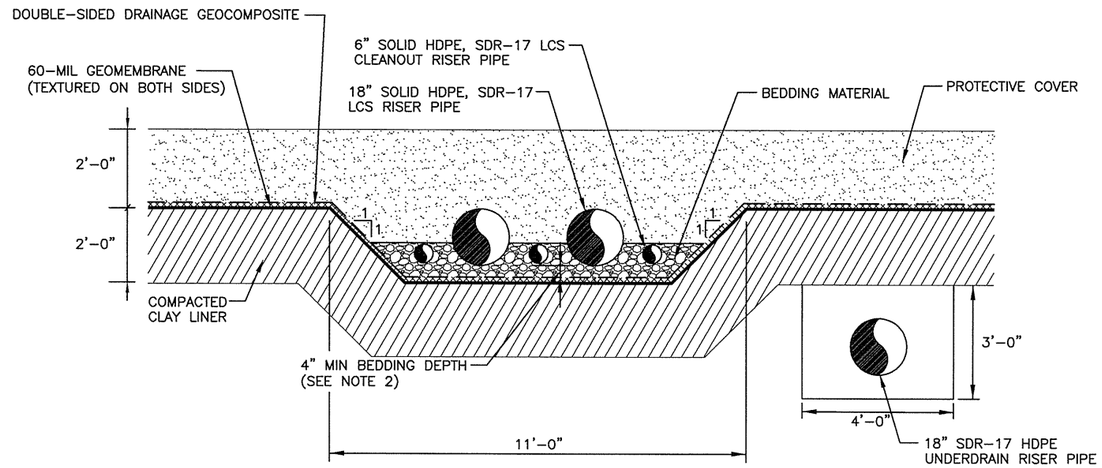
SCALE IN FEET




LEACHATE RISER PIPES LCS4 (A.8 | A.8)

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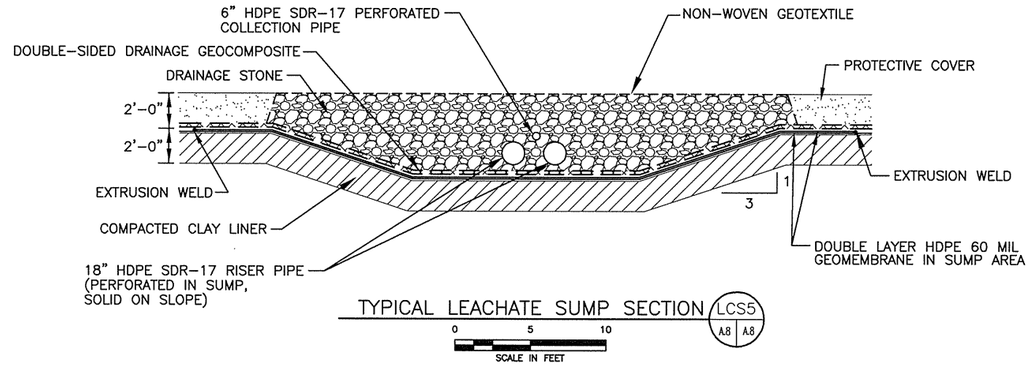
SCALE IN FEET




TYPICAL LEACHATE SUMP SECTION LCS5 (A.8 | A.8)

0 5 10

SCALE IN FEET

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.
3. REFER TO APPENDIX IIID, APPENDIX IIID-C FOR DEWATERING SYSTEM DESIGN INFORMATION AND DETAIL DRAWINGS.
4. DETAILS SHOWN ARE FOR COMPACTED CLAY LINER OPTION. A GCL MAY BE SUBSTITUTED FOR THE COMPACTED CLAY LINER (REFER TO DRAWING A.4).
5. SEE DRAWING A.8A FOR UNDERDRAIN SUMP DETAILS.

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.8 LEACHATE COL SYSTEM.DWG

DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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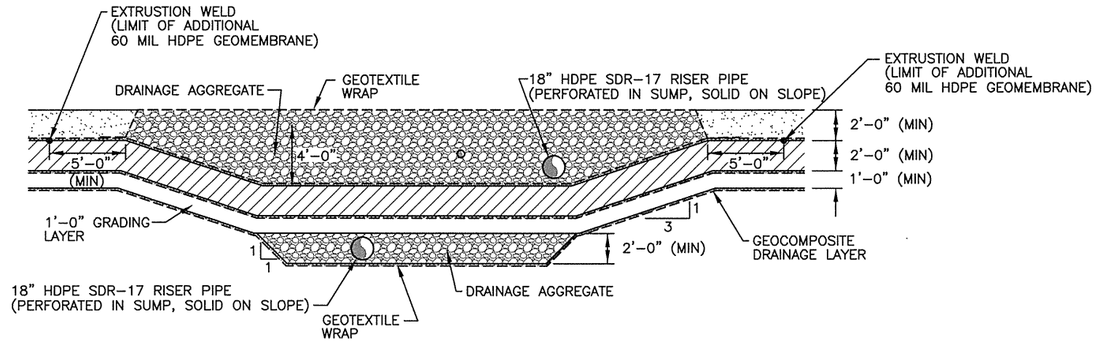
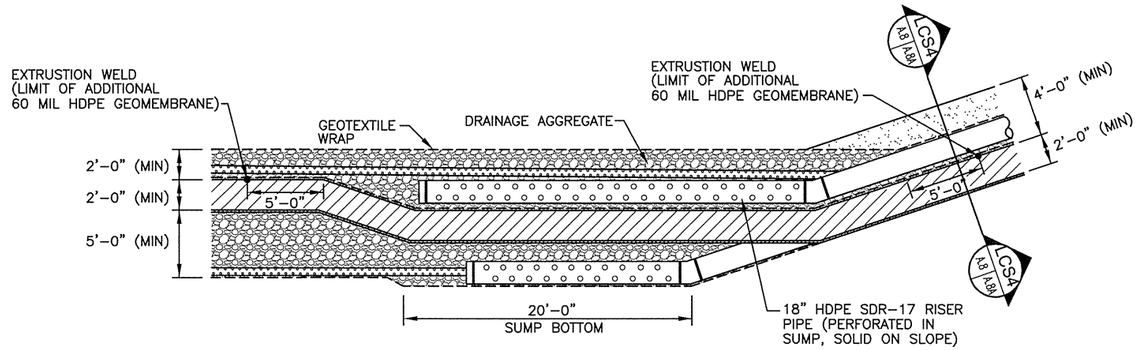
O:\0023\404\EXPANSION 2021\PART III\IIIA\A.8-LEACHATE COLL SYS DETAILS.dwg, jwilson, 1:2




TYPICAL LEACHATE/UNDERDRAIN SUMP SECTION (UD1 / - | A.8A)

0 5 10

SCALE IN FEET




TYPICAL LEACHATE/UNDERDRAIN SUMP SECTION (UD2 / A.8A | A.8A)

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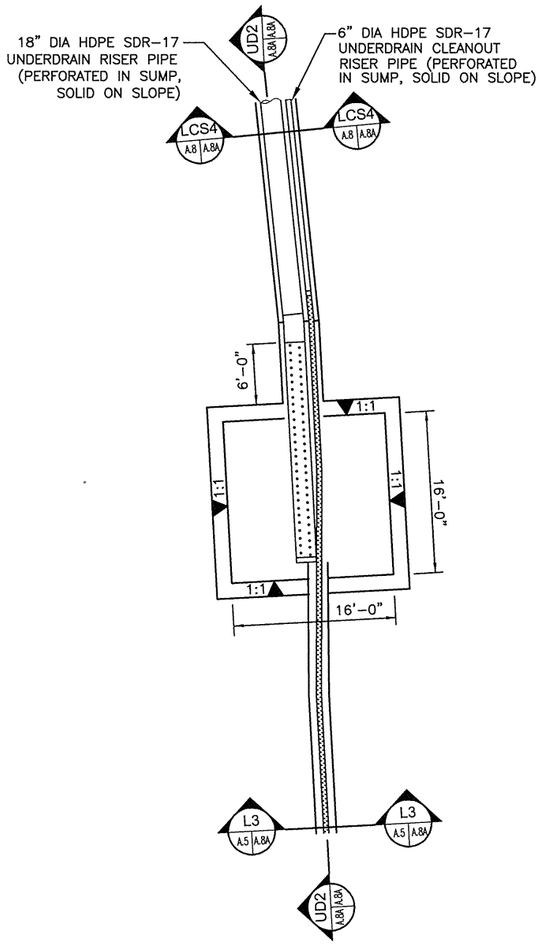
SCALE IN FEET




UNDERDRAIN COLLECTION SUMP (UD3 / - | A.8A)

0 7.5 15

SCALE IN FEET

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118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DRAWN BY: RAA
DESIGN BY: DEP
REVIEWED BY: DEP

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# MAJOR PERMIT AMENDMENT
# UNDERDRAIN SUMP DETAILS

CITY OF ARLINGTON LANDFILL
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DRAWING A.8A

SHEET IIIA-A.8A

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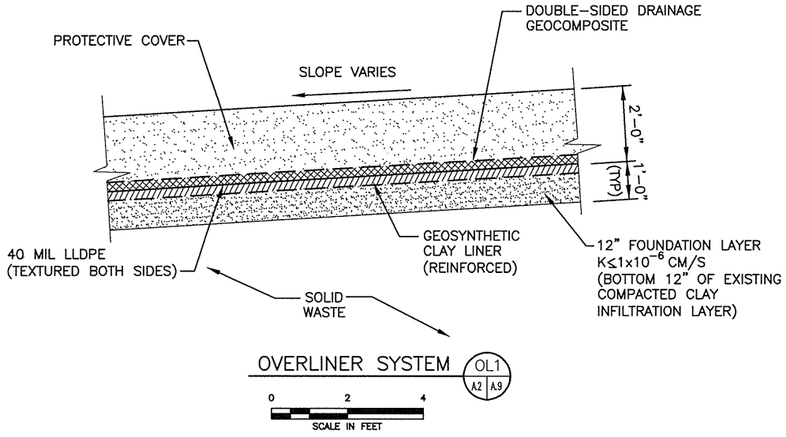
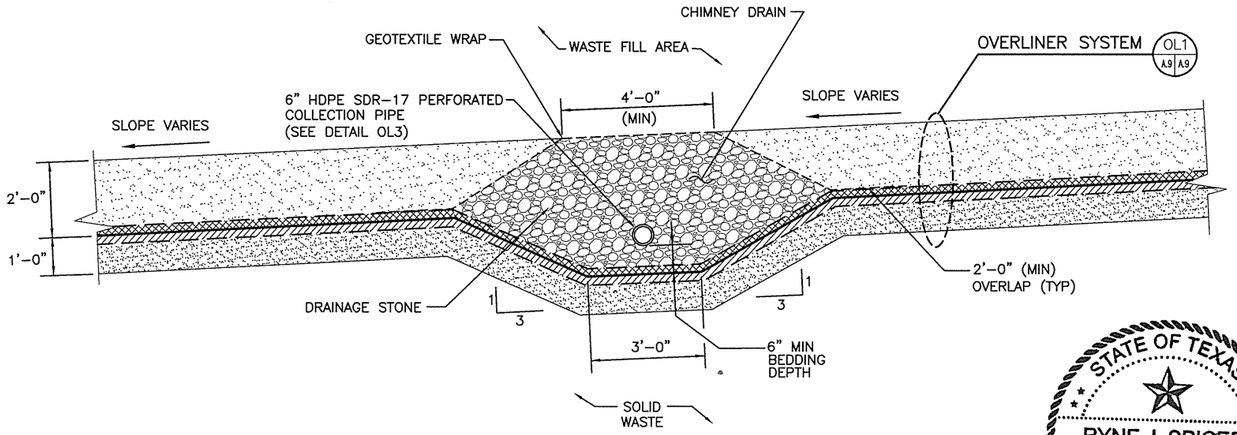



OVERLINER SYSTEM (OL1 | A2 | A9)

0 2 4
SCALE IN FEET




OVERLINER LCS TRENCH (OL2 | A2 | A9)

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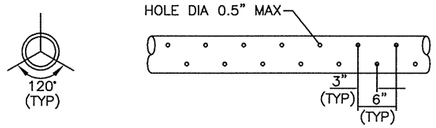
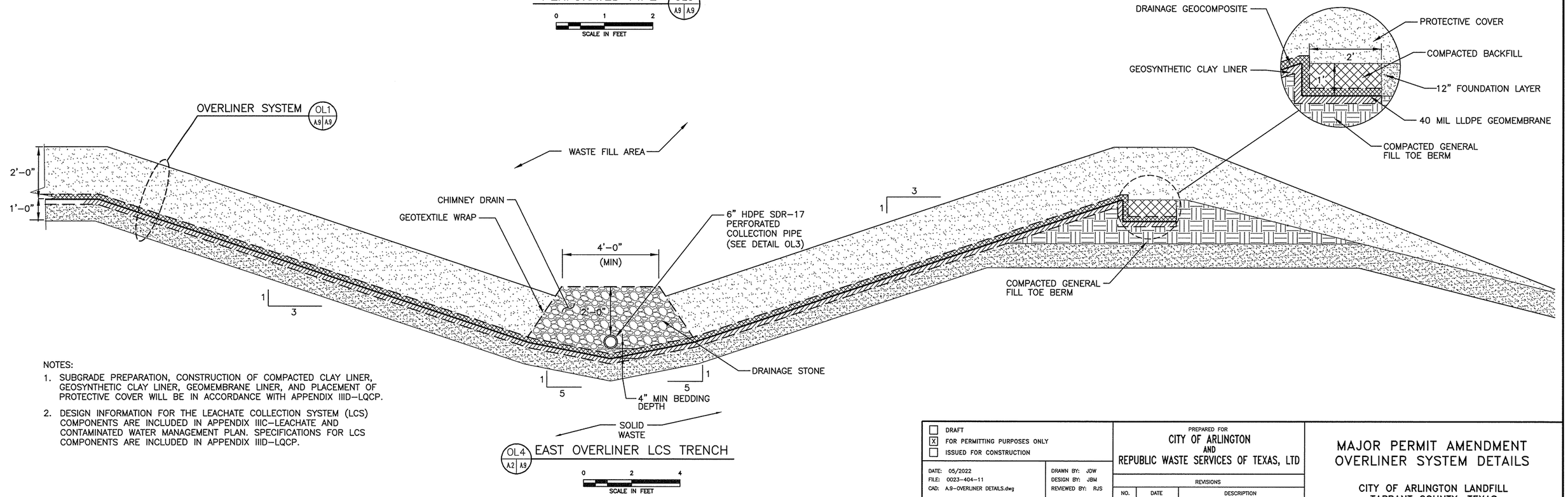
SCALE IN FEET




PERFORATED PIPE (OL3 | A9 | A9)

0 1 2
SCALE IN FEET




NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF COMPACTED CLAY LINER, GEOSYNTHETIC 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.

EAST OVERLINER LCS TRENCH (OL4 | A2 | A9)

0 2 4
SCALE IN FEET

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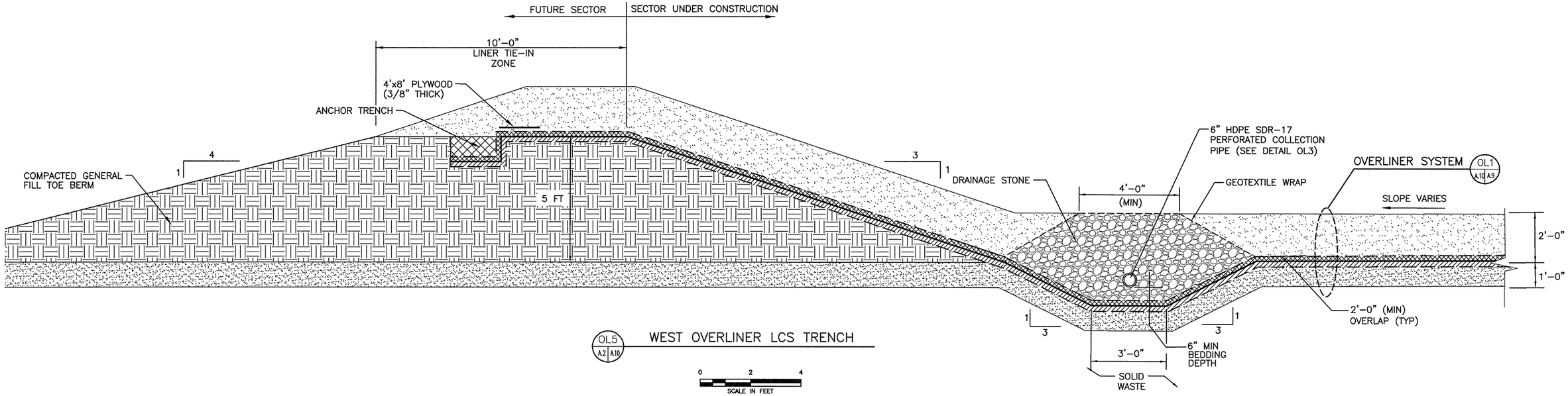
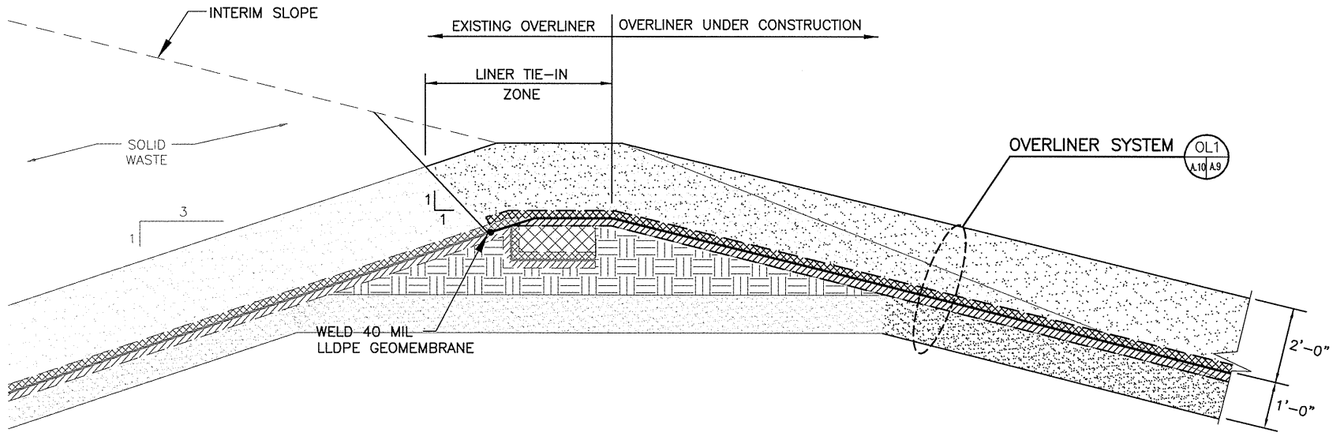



OL5 A2 A10 WEST OVERLINER LCS TRENCH

0 2 4
SCALE IN FEET




OL6 A2 A10 EAST OVERLINER TIE–IN

0 2 4
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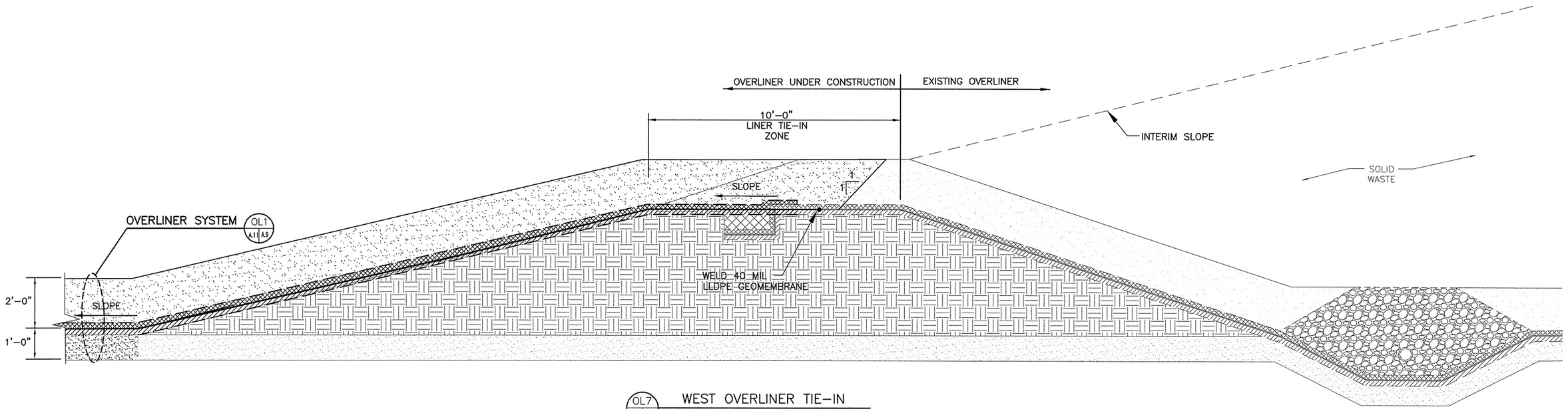
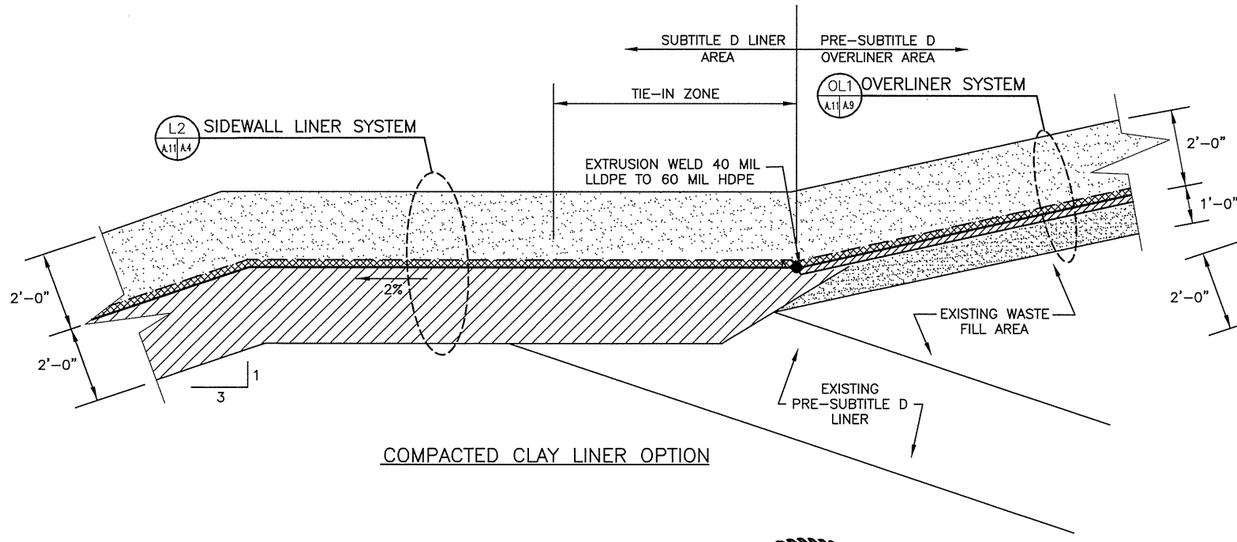
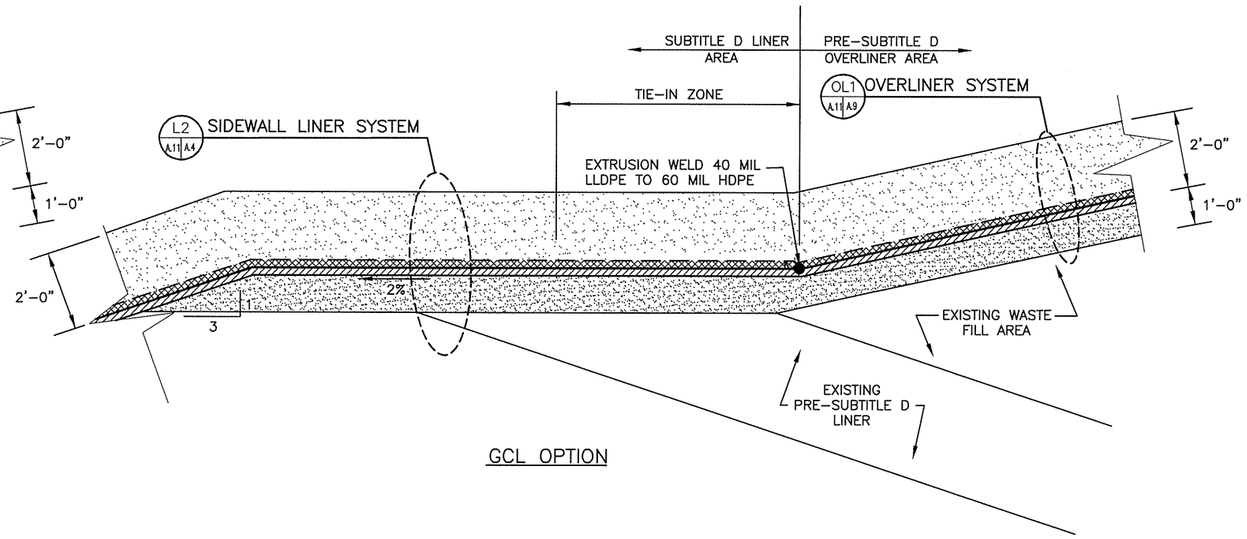



OL7 A.2 A.11 WEST OVERLINER TIE–IN

0 2 4
SCALE IN FEET




COMPACTED CLAY LINER OPTION




GCL OPTION

LINER/OVERLINER TRANSITION (TYP) OL8 A.2 A.11

0 2 4
SCALE IN FEET

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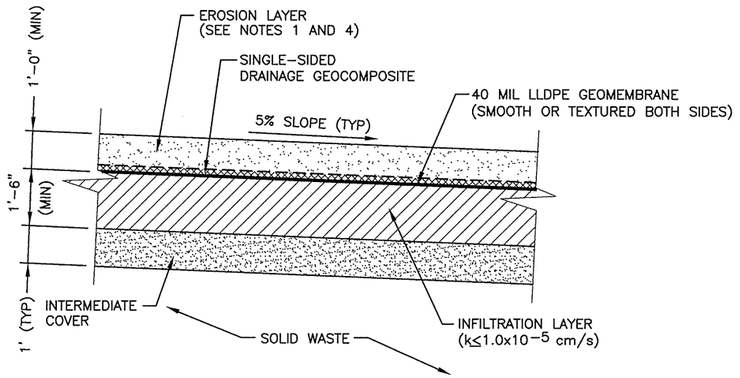
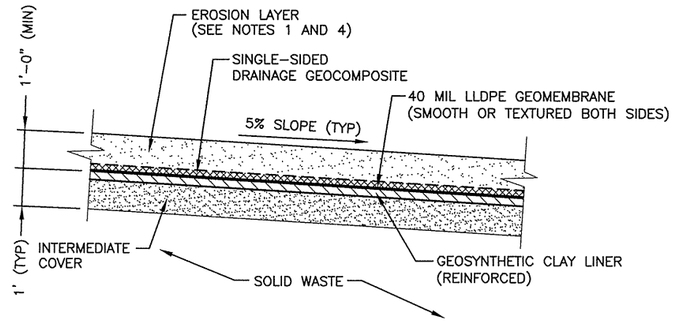



INFILTRATION LAYER OPTION



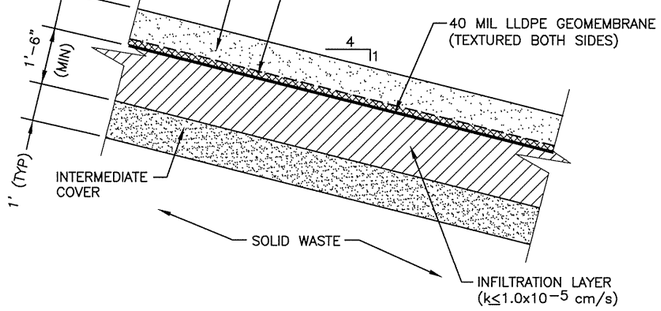

GCL OPTION

COMPOSITE FINAL COVER–TOPSLOPE (FC1 | A.12)

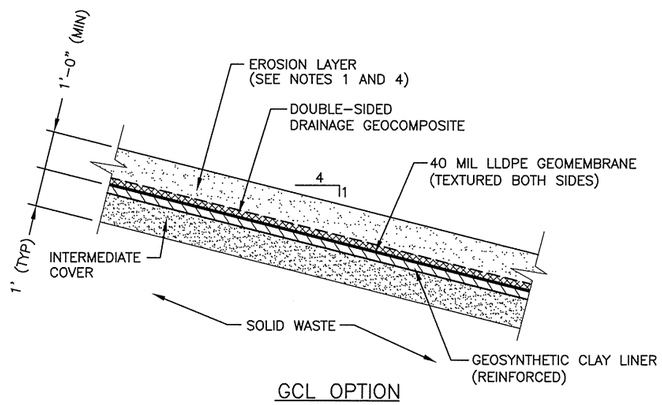
A.3,A.13

0 2 4

SCALE IN FEET




INFILTRATION LAYER OPTION




GCL OPTION

COMPOSITE FINAL COVER–SIDESLOPE (FC2 | A.12)

A.3,A.13,A.14

0 2 4

SCALE IN FEET

NOTES:

1. FINAL COVER EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. DRAINAGE LAYER CONSISTS OF A 250–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 (APPENDIX IIIJ–A).
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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CAD: A.12 FINAL COVER DETAILS.DWG
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# COMPOSITE FINAL COVER DETAILS

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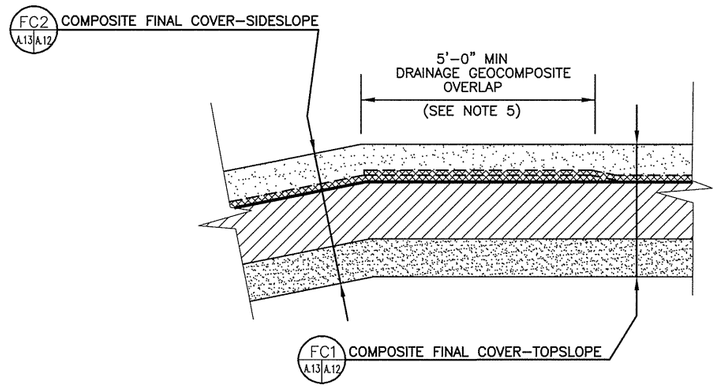
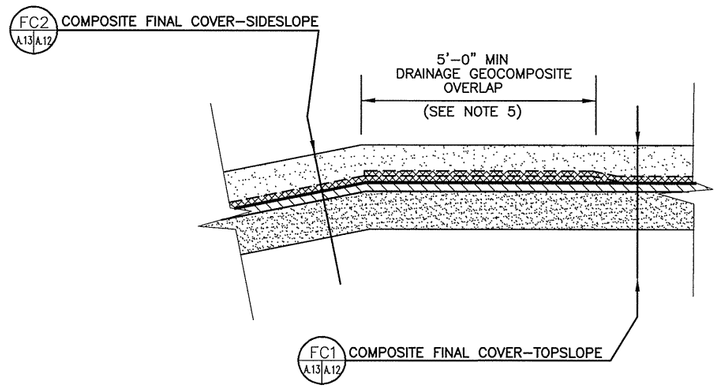


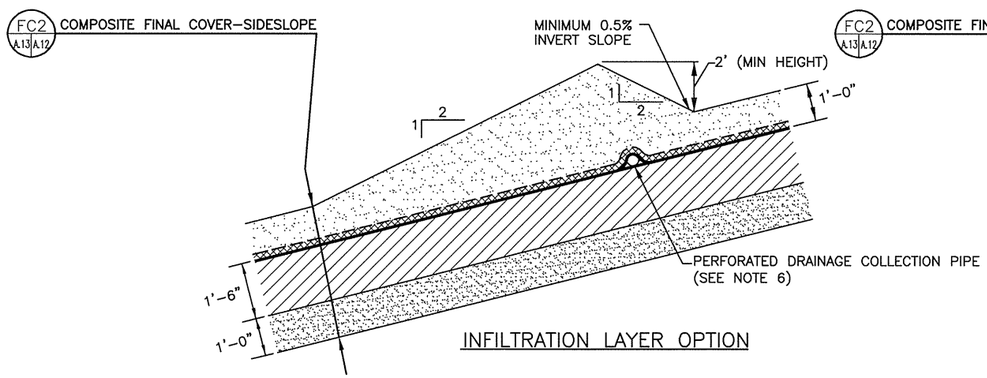

INFILTRATION LAYER OPTION



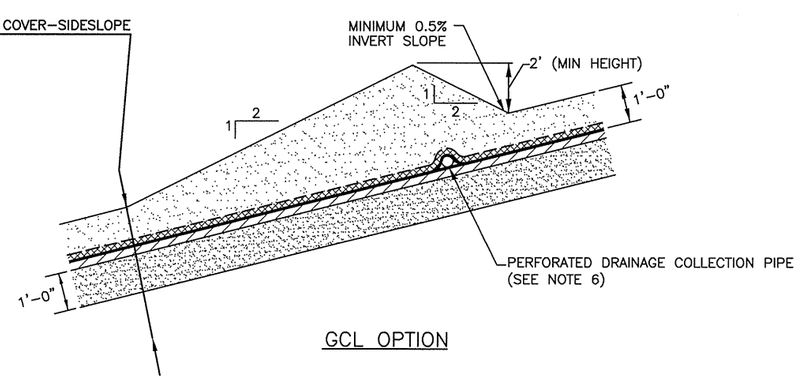

GCL OPTION

COMPOSITE FINAL COVER–
TOP/SIDESLOPE TRANSITION (FC3 A.3 A.13)

0 2 4
SCALE IN FEET




INFILTRATION LAYER OPTION




GCL OPTION

COMPOSITE FINAL COVER–SWALE (TYP) (FC4 A.3 A.13)

0 2 4
SCALE IN FEET

NOTES:

1. FINAL COVER EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. DRAINAGE LAYER CONSISTS OF A 250–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 (APPENDIX IIIJ–A).
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. REFER TO APPENDIX IIIJ–A–A FOR THE DRAINAGE COLLECTION PIPE DESIGN. AS AN OPTION TO THE DRAINAGE COLLECTION PIPE, THE DRAINAGE GEOCOMPOSITE MAY BE DAYLIGHTED 2 FEET ABOVE THE SWALE FLOWLINE.

STATE OF TEXAS
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DESIGN BY: JBM
REVIEWED BY: RJS

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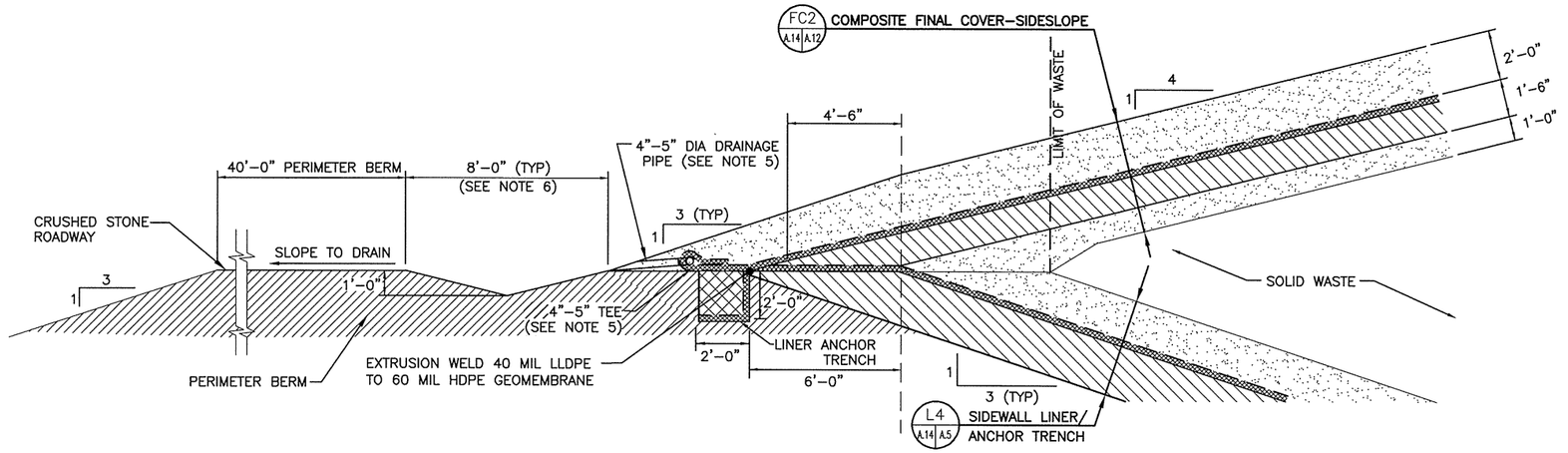
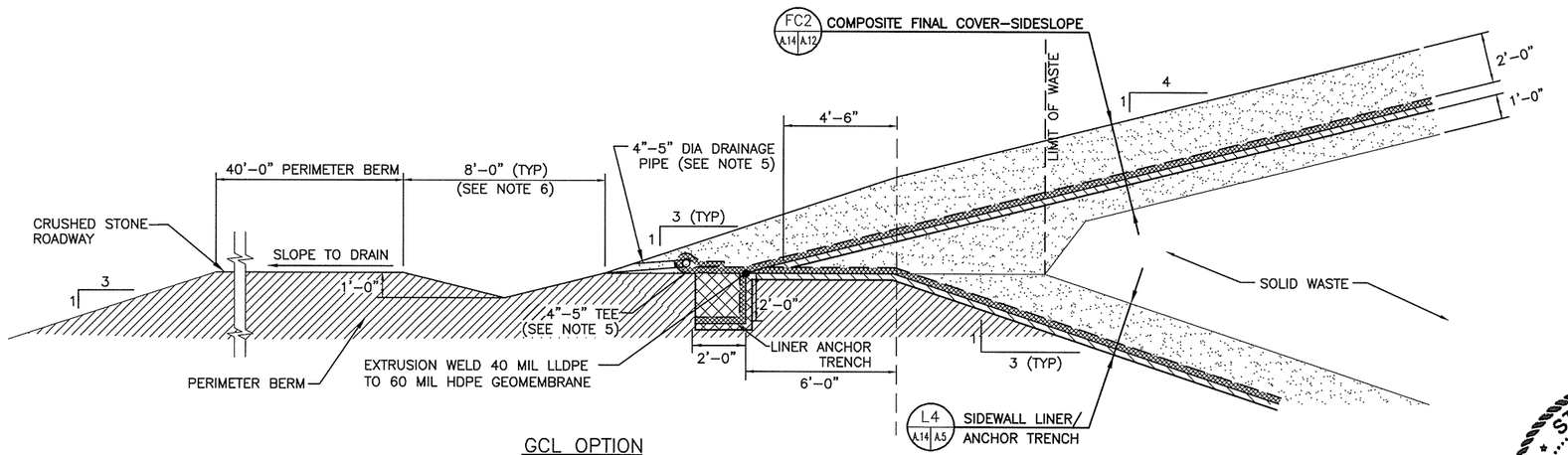



INFILTRATION LAYER/COMPACTED CLAY LINER OPTION




GCL OPTION

COMPOSITE LINER/FINAL COVER TIE–IN FC5 A.3 A.14

0 3 6
SCALE IN FEET

NOTES:

1. FINAL COVER EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. DRAINAGE LAYER CONSISTS OF A 250–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 (APPENDIX IIIJ–A).
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 IIIJ–A–A FOR THE DRAINAGE COLLECTION PIPE DESIGN.
6. THE "V" CHANNEL WILL INTERCEPT FLOW COMING OFF THE LANDFILL BELOW THE LOWERMOST SWALE AND DIRECT IT TO THE DRAINAGE CHUTES, AND ULTIMATELY TO PERIMETER CHANNELS OR PONDS.

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DESIGN BY: JBM
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# COMPOSITE FINAL COVER DETAILS

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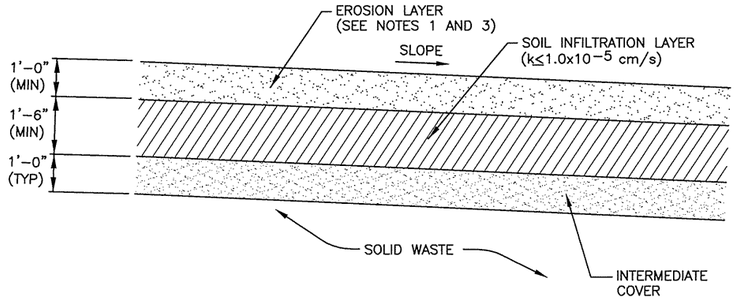


PRE−SUBTITLE D FINAL COVER (TYP) FC6 A.15 A.3,A.15

0 2 4
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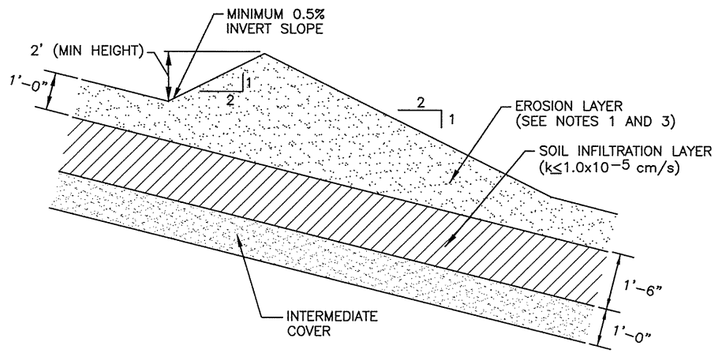
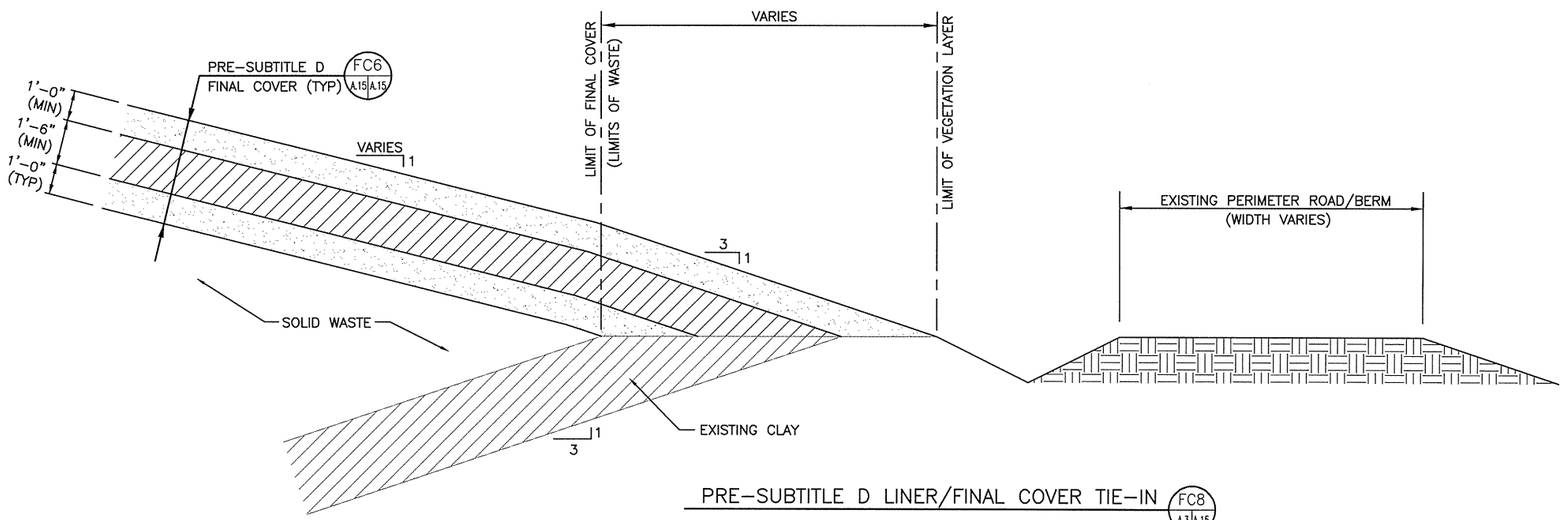



PRE−SUBTITLE D FINAL COVER−SWALE (TYP) FC7 A.3 A.15

0 2 4
SCALE IN FEET




PRE−SUBTITLE D LINER/FINAL COVER TIE−IN FC8 A.3 A.15

0 2.5 5
SCALE IN FEET

NOTES:

1. FINAL COVER EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. FINAL COVER COMPONENTS WILL BE CONSTRUCTED ACCORDING TO FCSQCP (APPENDIX IIIJ−A).
3. 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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DESIGN BY: JBM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# PRE−SUBTITLE D FINAL COVER DETAILS

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING A.15

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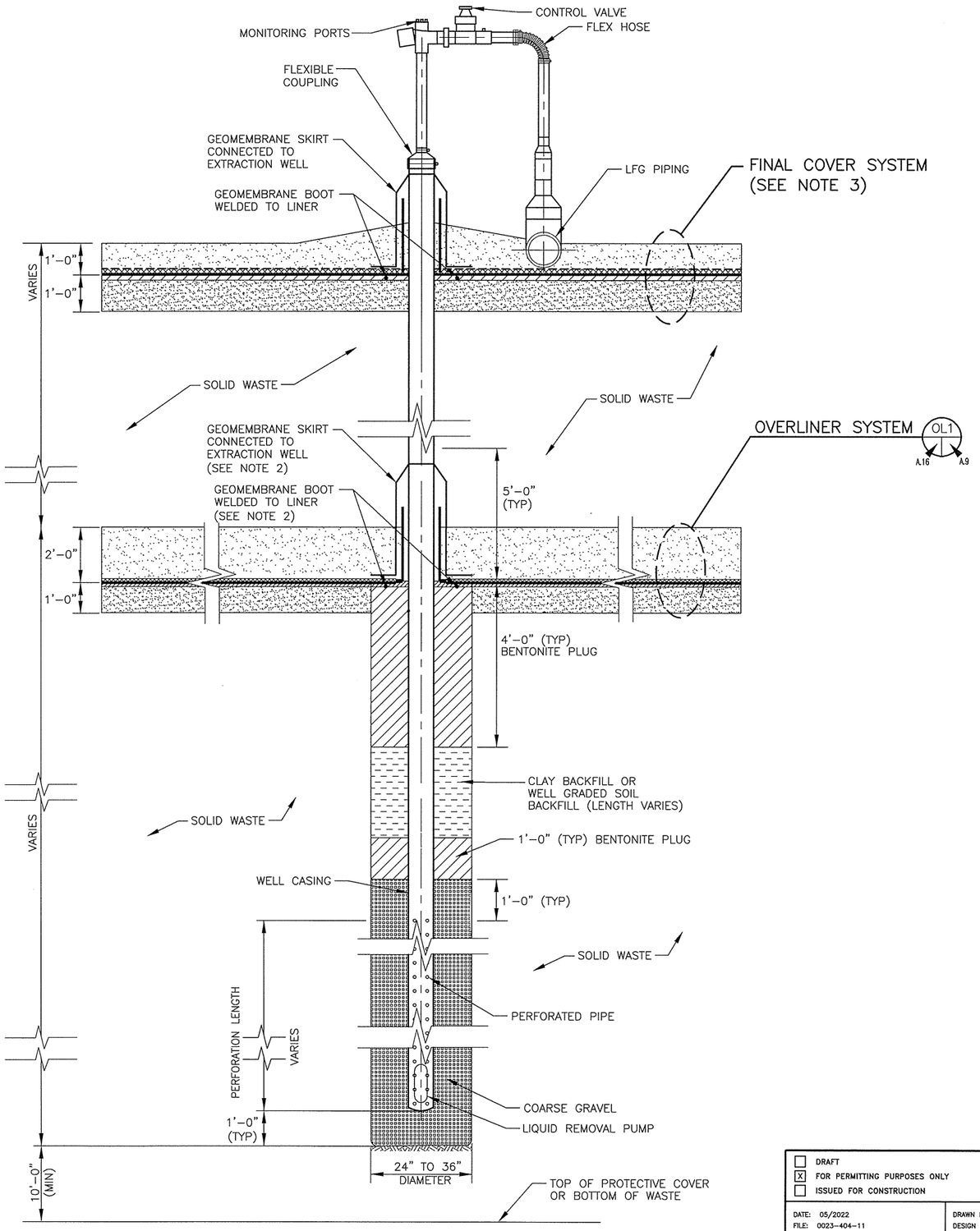


TYPICAL LFG EXTRACTION WELL
INSTALLED WITH OVERLINER SYSTEM
NTS

NOTES:

1. THE SITE WILL EXTEND EXISTING LFG EXTRACTION WELLS WITH SOLID PIPING TO APPLY VACUM TO PRE SUBTITLE D BELOW OVERLINER.
2. THE GEOMEMBRANE BOOT AND SKIRT WILL BE INSTALLED ON EXTRACTION WELLS WHICH ARE EXISTING AT THE TIME OF OVERLINER INSTALLATION.
3. A GCL FINAL COVER SYSTEM IS SHOWN IN THIS DRAWING. ACTUAL FINAL COVER COMPONENTS MAY VARY BASED ON THE TYPE OF FINAL COVER SYSTEM USED.

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118934
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PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: A.16-EXT.WELL DETAILS.dwg
DRAWN BY: JDW
DESIGN BY: JBM
REVIEWED BY: RJS

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MAJOR PERMIT AMENDMENT
OVERLINER SYSTEM TYPICAL
LFG EXTRACTION WELL DETAIL
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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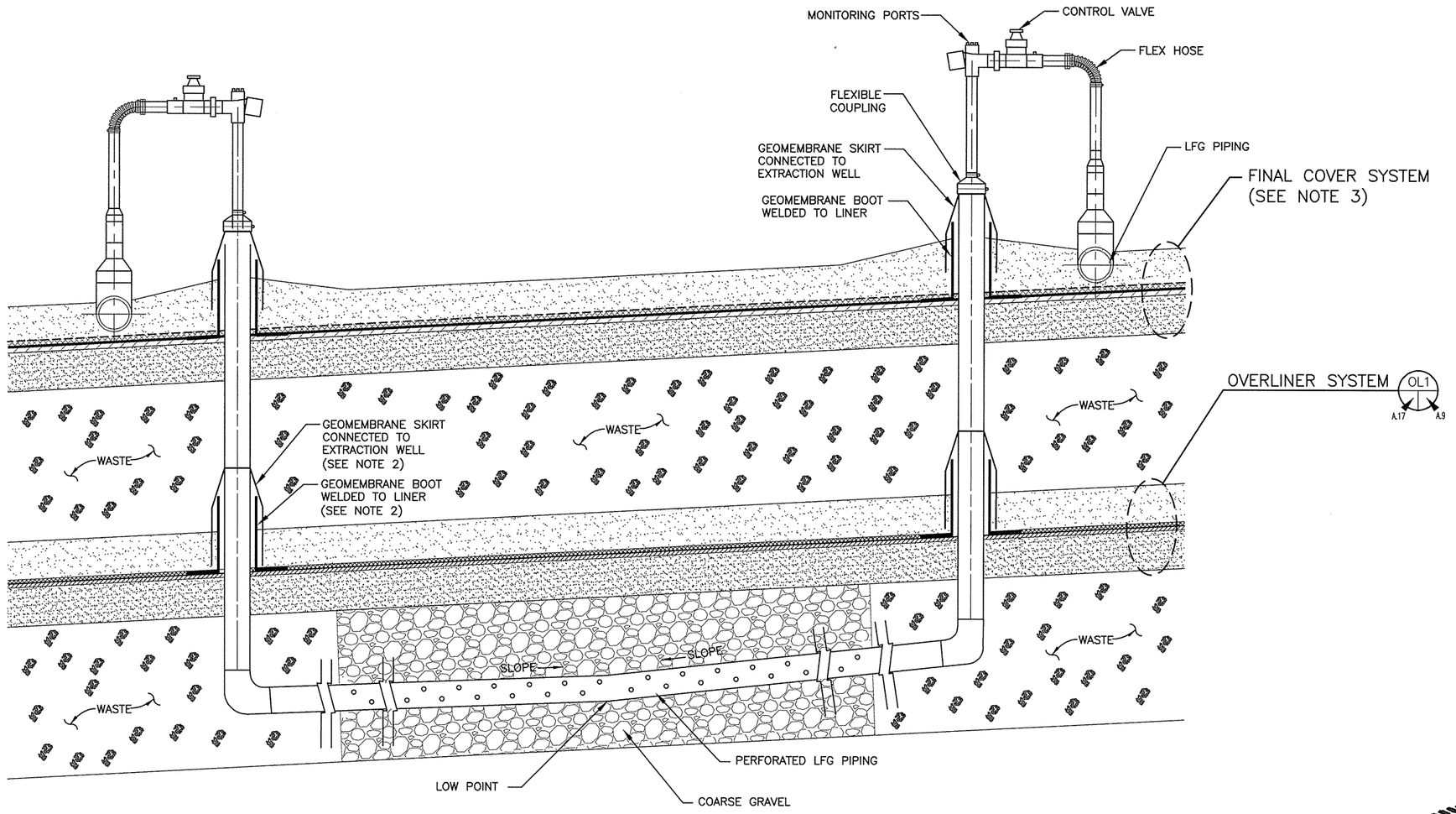


NOTE:

1. AT SOME LOCATIONS THE HORIZONTAL COLLECTOR MAY EXTEND BEYOND THE LIMITS OF THE OVERLINER. AS SUCH THE BOOT AND SKIRT COMPONENT MAY NOT BE APPLICABLE.
2. THE GEOMEMBRANE BOOT AND SKIRT WILL BE INSTALLED ON EXTRACTION WELLS WHICH ARE EXISTING AT THE TIME OF OVERLINER INSTALLATION.
3. A GCL FINAL COVER SYSTEM IS SHOWN IN THIS DRAWING. ACTUAL FINAL COVER COMPONENTS MAY VARY BASED ON THE TYPE OF FINAL COVER SYSTEM USED.

## TYPICAL HORIZONTAL LFG COLLECTOR

NTS

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MAJOR PERMIT AMENDMENT
OVERLINER SYSTEM TYPICAL LFG HORIZONTAL COLLECTOR DETAIL
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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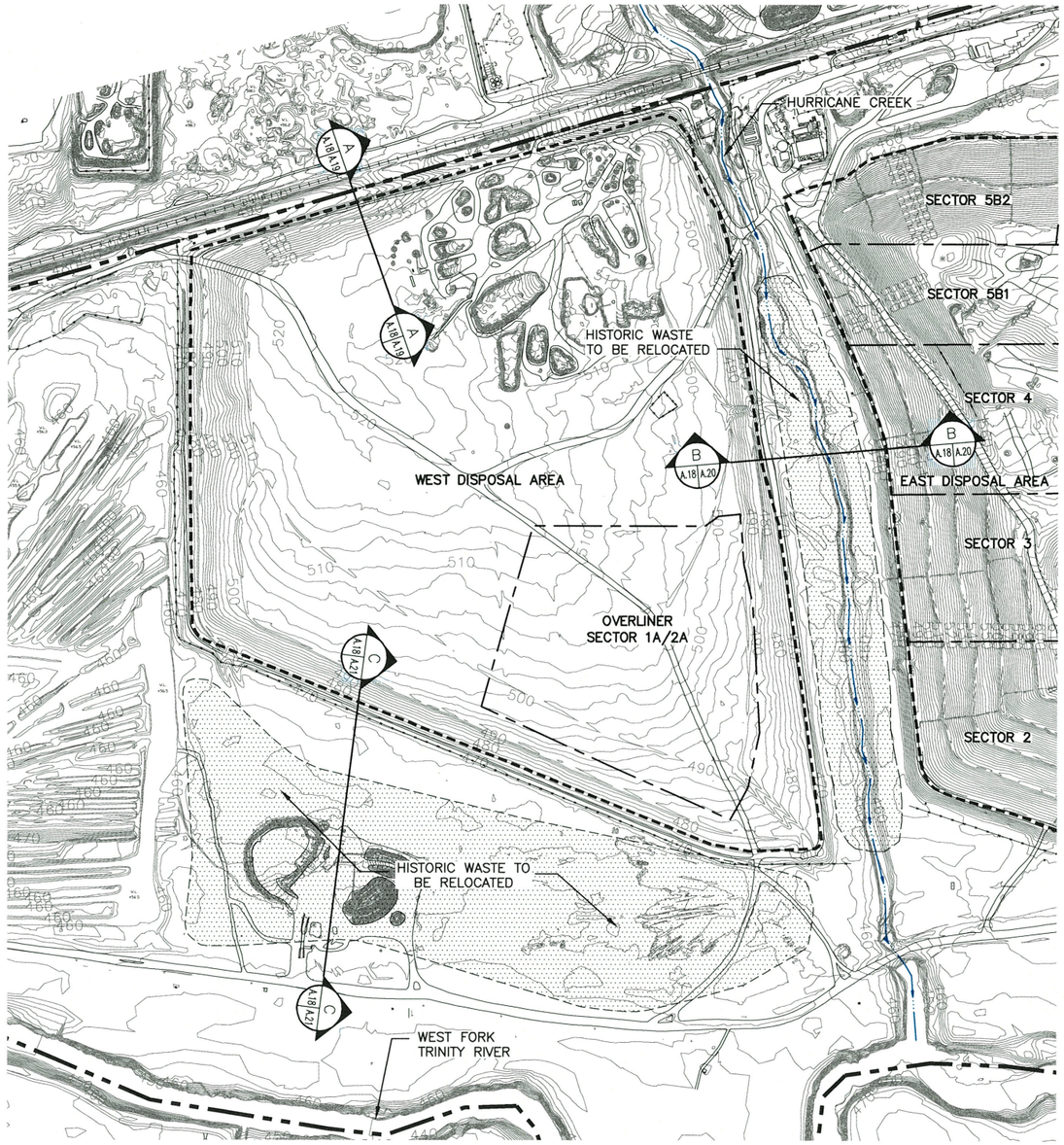
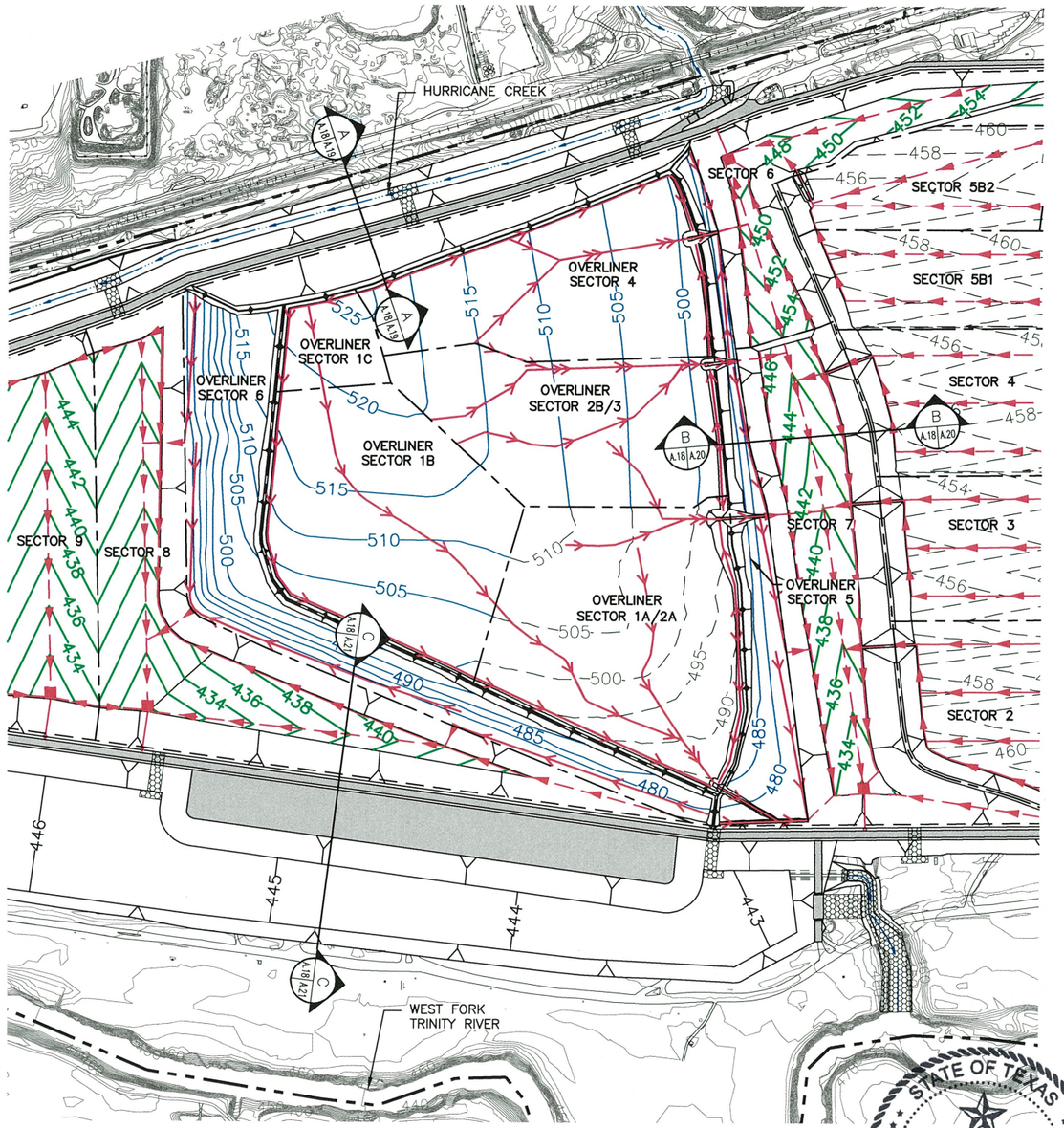



EXISTING SITE CONDITIONS




PROPOSED POST-DEVELOPMENT CONDITIONS




LEGEND

- PERMIT BOUNDARY
- PROPOSED LIMIT OF WASTE
- CONSTRUCTED LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 440 TOP OF LINER CONTOUR
- 506 TOP OF OVERLINER CONTOUR
- HISTORIC WASTE TO BE RELOCATED
- 510 AS-BUILT TOP OF LINER CONTOUR
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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DATE: 05/2022
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DESIGN BY: RJS
REVIEWED BY: JAE

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# MAJOR PERMIT AMENDMENT
# WASTE RELOCATION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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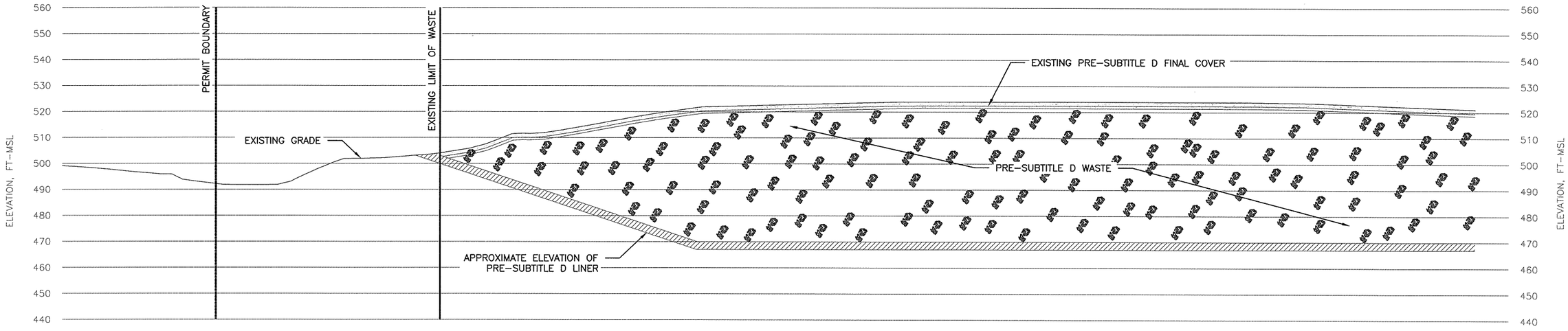
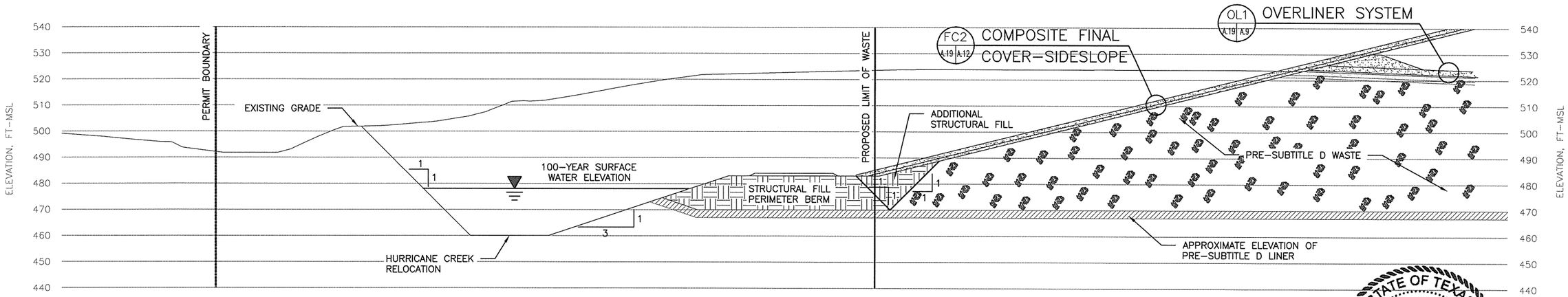



EXISTING SITE CONDITIONS




PROPOSED POST-DEVELOPMENT CONDITIONS

TYPICAL SECTION A (A A.18 A.19)

0 20 40
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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MAJOR PERMIT AMENDMENT
WASTE RELOCATION PLAN
TYPICAL SECTION A
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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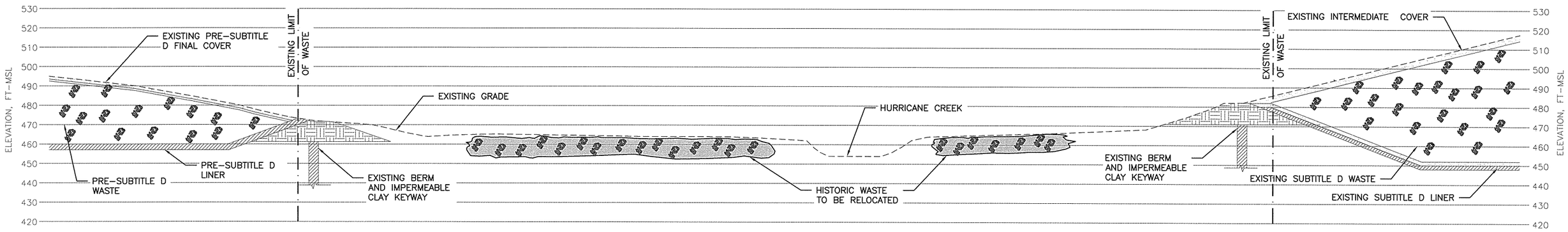
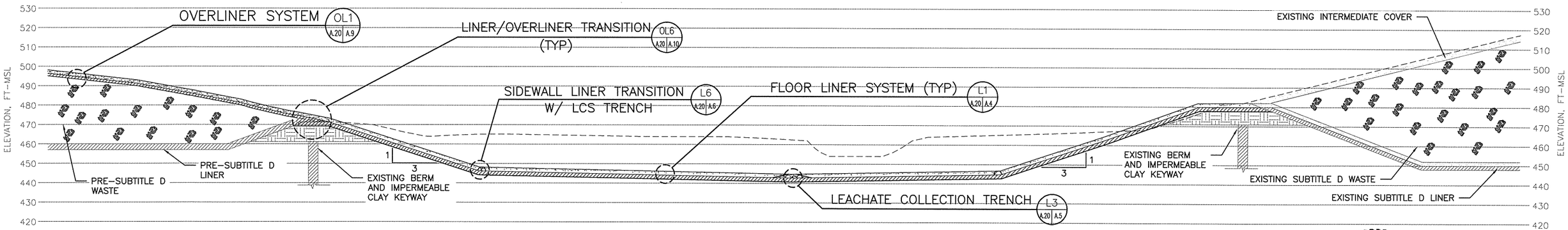



EXISTING SITE CONDITIONS




PROPOSED POST-DEVELOPMENT CONDITIONS

TYPICAL SECTION B (B, A.18 | A.20)

0 25 50
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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MAJOR PERMIT AMENDMENT
WASTE RELOCATION PLAN
TYPICAL SECTION B
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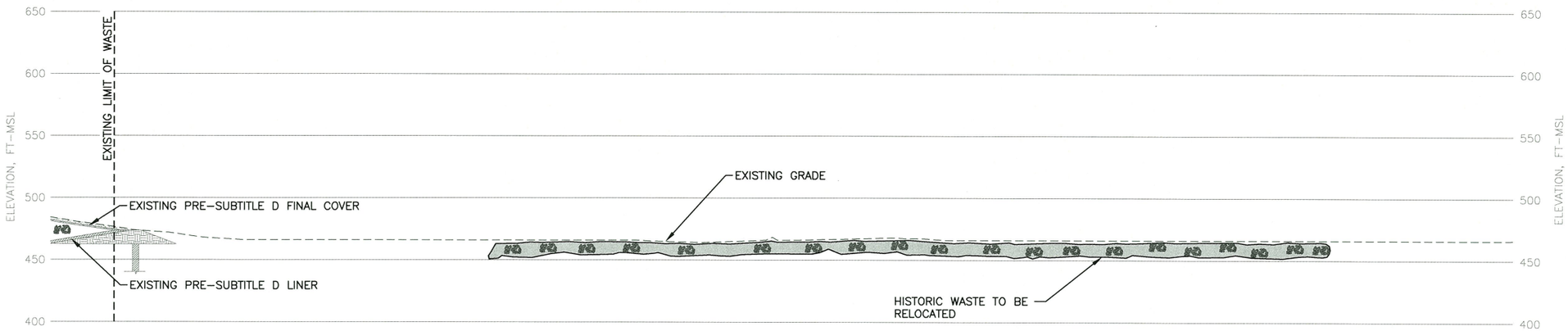
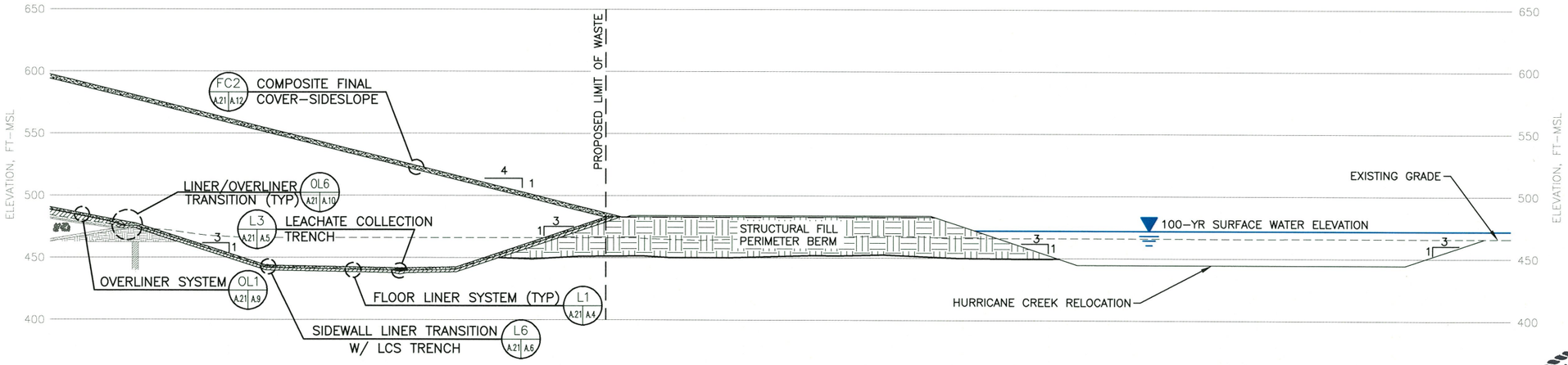



EXISTING SITE CONDITIONS




PROPOSED POST-DEVELOPMENT CONDITIONS

TYPICAL SECTION C (C A.18 A.21)

0 50 100
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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MAJOR PERMIT AMENDMENT
WASTE RELOCATION PLAN
TYPICAL SECTION C
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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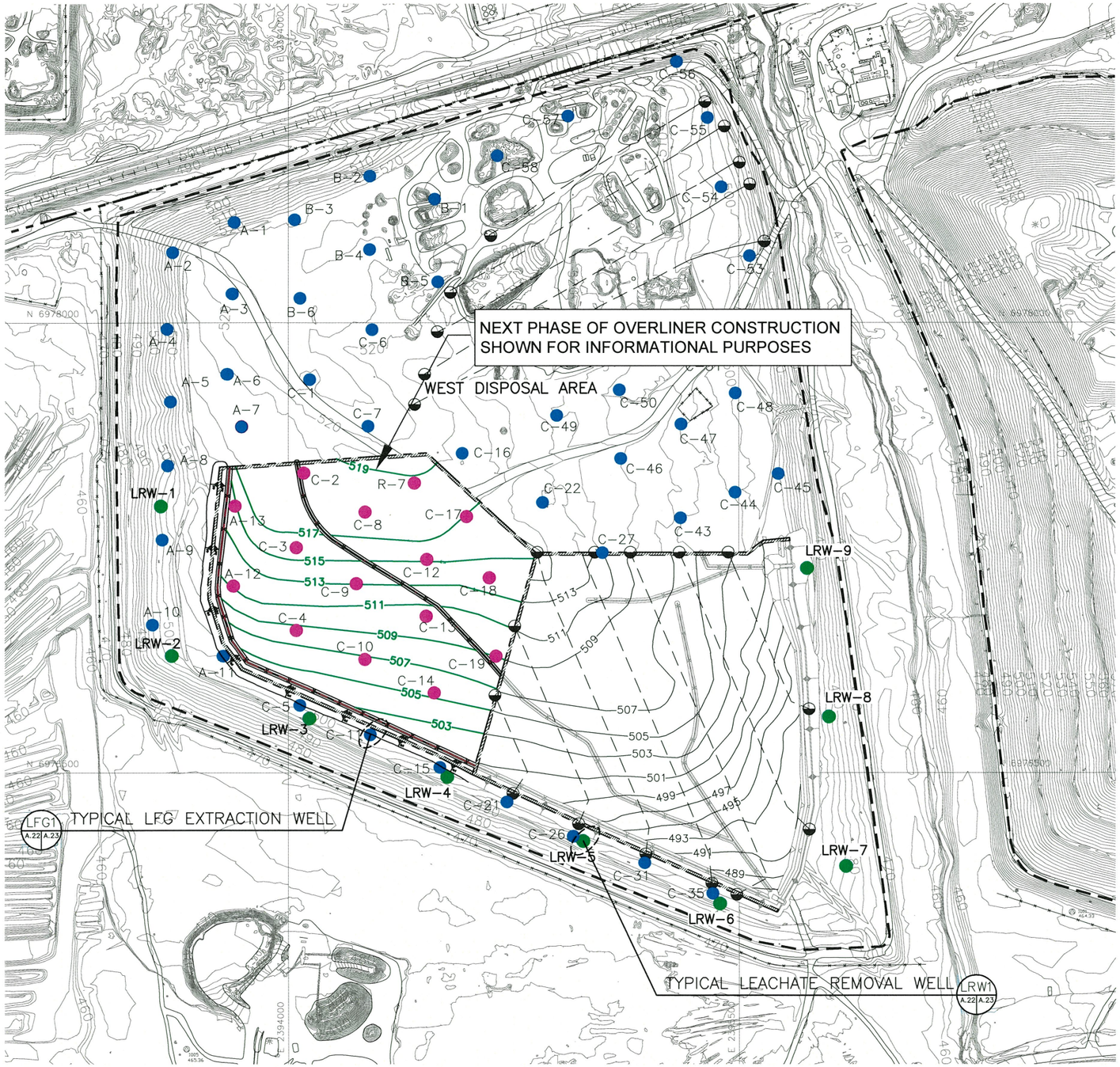


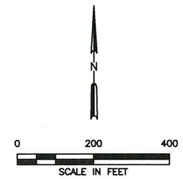


LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- N 6767200 — STATE PLANE COORDINATE
- 500 — EXISTING CONTOUR
- 501 — CONSTRUCTED OVERLINER
- 509 — OVERLINER TOP OF PROTECTIVE COVER CONTOUR
- OVERLINER LEACHATE COLLECTION TRENCH
- EXISTING HORIZONTAL LFG COLLECTION PIPE
- LRW-1 — EXISTING DEDICATED LEACHATE REMOVAL WELL (LIQUID MONITORING/REMOVAL LOCATION)
- A-1 — EXISTING LFG EXTRACTION WELL (LIQUID MONITORING/REMOVAL LOCATION)
- C-8 — EXISTING LFG EXTRACTION WELL (TO BE CONVERTED TO HORIZONTAL GAS COLLECTION)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS CO. FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020.

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# MAJOR PERMIT AMENDMENT
# WDA PRE-SUBTITLE D AREA LEACHATE REMOVAL PLAN

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TARRANT COUNTY, TEXAS

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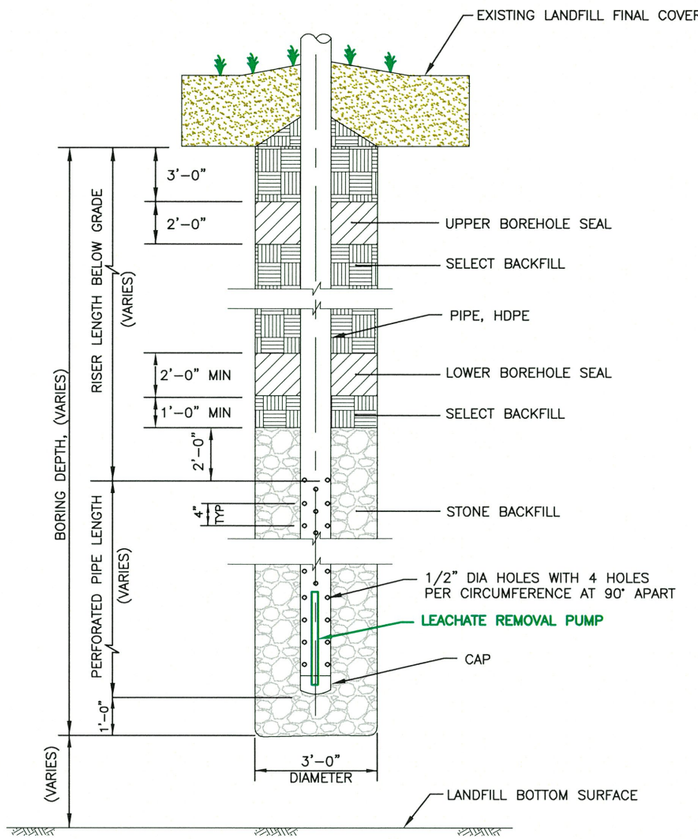
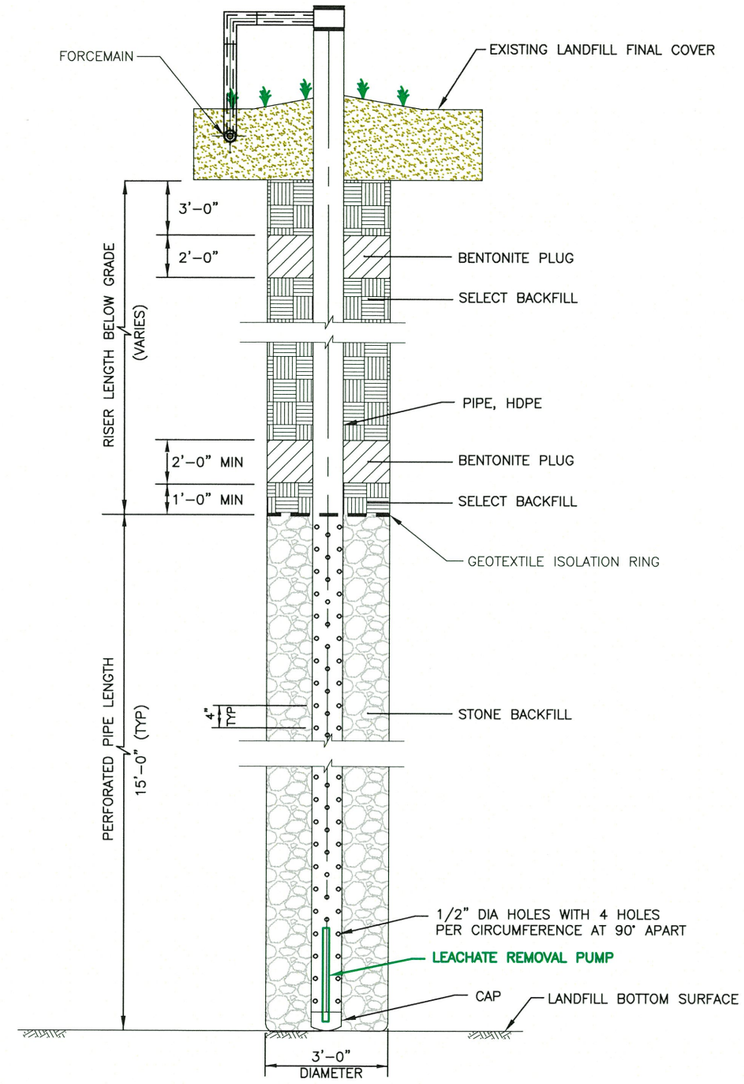



TYPICAL LFG EXTRACTION WELL (LFGT A.22 A.23)
NTS




TYPICAL LEACHATE REMOVAL WELL (LRWT A.22 A.23)
NTS

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# MAJOR PERMIT AMENDMENT
# WDA PRE–SUBTITLE D AREA LEACHATE REMOVAL DETAILS
CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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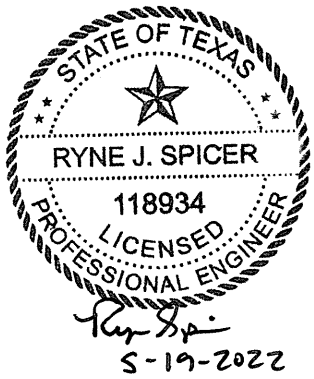
# CITY OF ARLINGTON LANDFILL
# TARRANT COUNTY, TEXAS
# TCEQ PERMIT NO. MSW-358C

## MAJOR PERMIT AMENDMENT APPLICATION

## PART III – SITE DEVELOPMENT PLAN
## APPENDIX IIIA-B
## LANDFILL UNIT CROSS SECTIONS




Prepared for

City of Arlington
and
Republic Waste Services of Texas, Ltd

May 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. 0023-404-11-104

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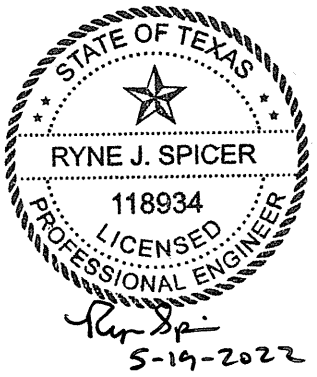


# CONTENTS

DRAWING B.1 – Typical Section Site Plan
DRAWING B.2 – Landfill Completion Plan
DRAWING B.3 – Top of Liner 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
DRAWING B.8 – Typical Section E




LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMIT OF WASTE
- PROPOSED LIMIT OF WASTE
- NEWLY PERMITTED LIMIT OF WASTE
- PERMITTED PRE-SUBTITLE D LIMIT OF WASTE
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- EXISTING SUBTITLE D COMPOSITE LINER AREA
- G-1 1984-1995 EMCON BAKER-SHIFLETT BORING
- EXP-1 2008/2009 GOLDER ASSOCIATES BORING
- B-101 2010 GOLDER ASSOCIATES BORING
- B-11.1 2011 GOLDER ASSOCIATES BORING
- MW-1 EXISTING GROUNDWATER MONITOR WELL
- MW-14 FORMER GROUNDWATER MONITOR WELL
- MW-30 FUTURE GROUNDWATER MONITOR WELL

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. BORING LOCATIONS HAVE BEEN REPRODUCED FROM VARIOUS SUBSURFACE INVESTIGATIONS. REFER TO APPENDIX IIIG – GEOLOGY REPORT FOR MORE INFORMATION.

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SHEET IIIA-B.1

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CAD: B.1 SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION LOCATIONS

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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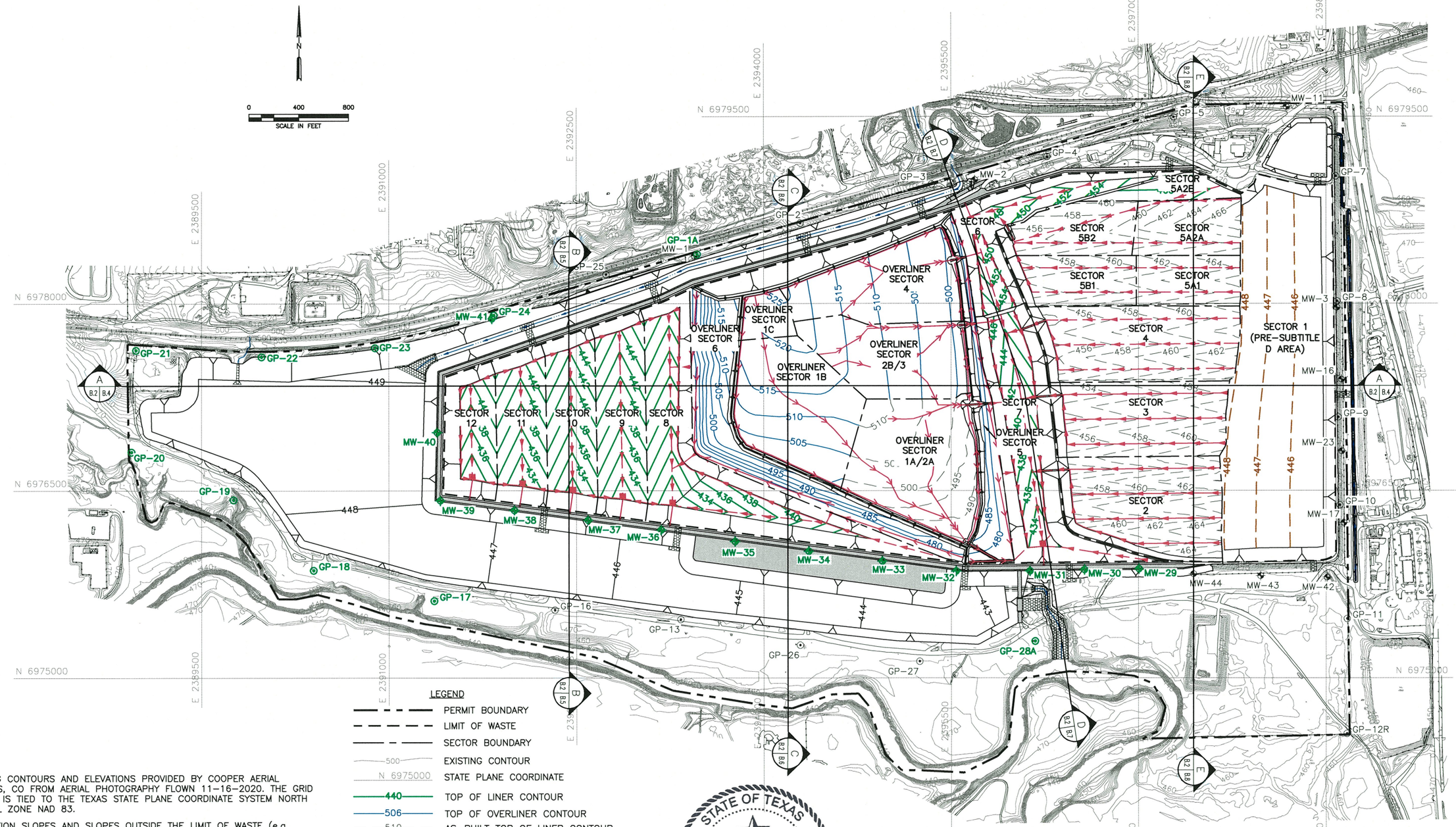
DRAWING B.1




LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- SECTOR BOUNDARY
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 440 TOP OF LINER CONTOUR
- 506 TOP OF OVERLINER CONTOUR
- 510 AS-BUILT TOP OF LINER CONTOUR
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION SUMP
- LEACHATE RISER PIPE
- OVERLINER LEACHATE DRAINAGE PIPE
- OVERLINER LEACHATE DRAINAGE PIPE (MULTIPLE PIPES IN TRENCH)
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
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. ELEVATION OF DEEPEST EXCAVATION AT THE LCS SUMP IS 424.5 FT-MSL.
5. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.4 THROUGH I/IIA.7.
6. REFER TO APPENDIX IIIF FOR DRAINAGE DESIGN INFORMATION.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

SHEET IIIA-B.2

- [ ] DRAFT
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DATE: 05/2022
FILE: 0023-404-11
CAD: B.2-PROPOSED LINER.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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CITY OF ARLINGTON
AND
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# MAJOR PERMIT AMENDMENT
# TOP OF LINER/OVERLINER PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING B.2

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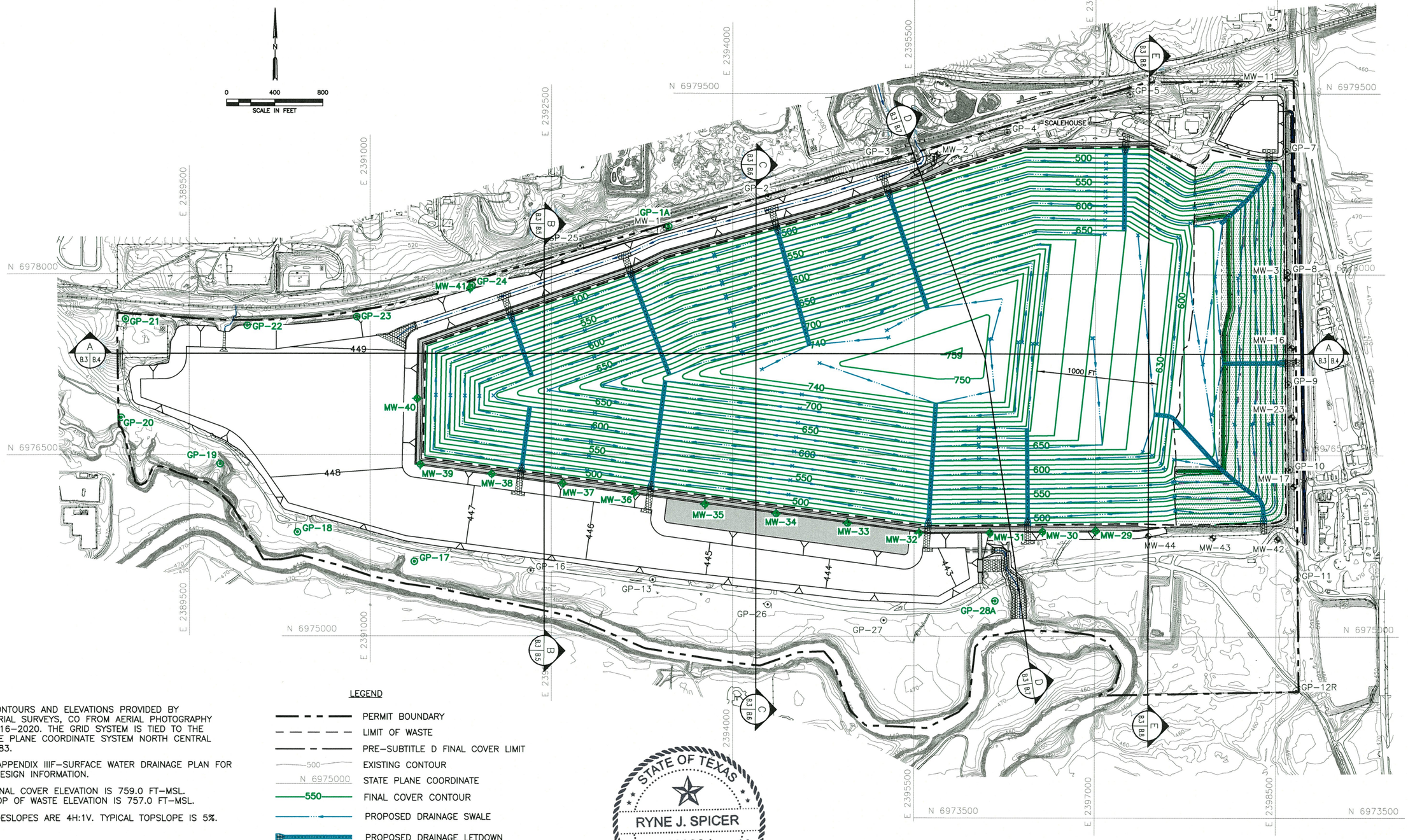
O:\0023\404\EXPANSION 2021\PART III\IIA\B.2-PROPOSED LINER.dwg, jwilson, 1:2




NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 759.0 FT-MSL. MAXIMUM TOP OF WASTE ELEVATION IS 757.0 FT-MSL.
4. TYPICAL SIDESLOPES ARE 4H:1V. TYPICAL TOPSLOPE IS 5%.

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- PRE-SUBTITLE D FINAL COVER LIMIT
- 500 EXISTING CONTOUR
- N 6975000 STATE PLANE COORDINATE
- 550 FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE LETDOWN
- EXISTING PRE-SUBTITLE D FINAL COVER
- MW-8 EXISTING GROUNDWATER MONITORING WELL
- MW-40 PROPOSED GROUNDWATER MONITORING WELL
- GP-2 EXISTING LANDFILL GAS MONITORING PROBE
- GP-17 PROPOSED LANDFILL GAS MONITORING PROBE

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

SHEET IIIA-B.3

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DATE: 05/2022
FILE: 0023-404-96
CAD: B.3-COMPLETION PLAN.DWG

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

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT LANDFILL COMPLETION PLAN

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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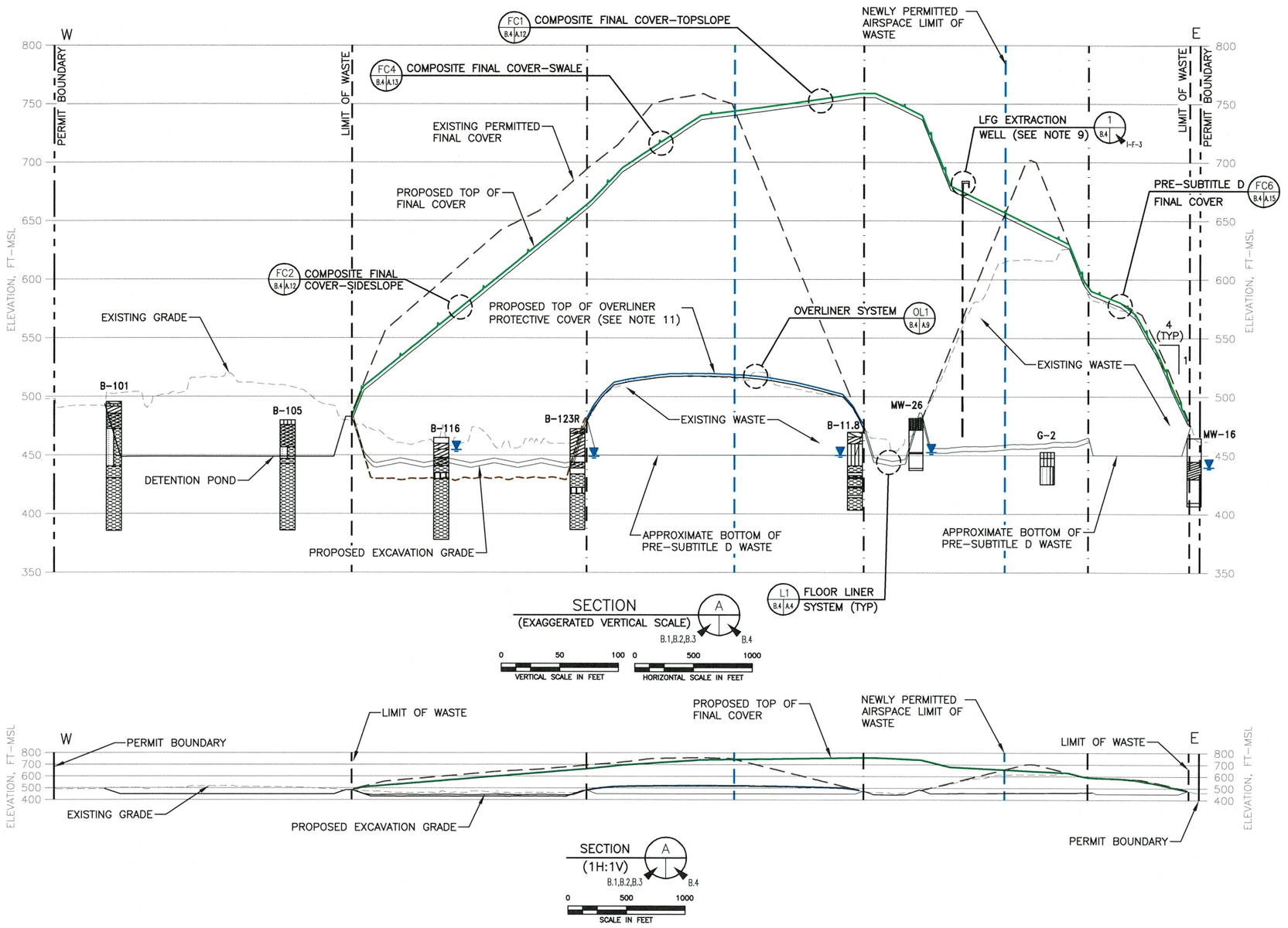
DRAWING B.3

0:\0023\404\EXPANSION 2021\PART III\IIIA\B.3-COMPLETION PLAN.dwg, jwilson, 1:2




SECTION (EXAGGERATED VERTICAL SCALE) A — B.1,B.2,B.3 — B.4

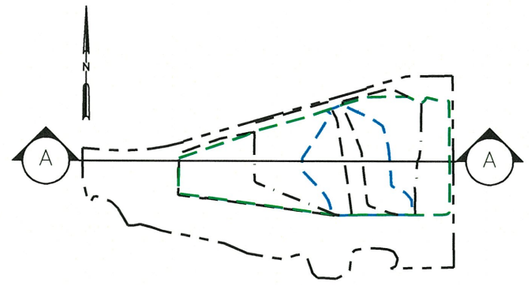
0 50 100 VERTICAL SCALE IN FEET

0 500 1000 HORIZONTAL SCALE IN FEET




SECTION (1H:1V) A — B.1,B.2,B.3 — B.4

0 500 1000 SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE–SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- EXISTING PERMITTED FINAL COVER
- EXISTING PERMITTED EXCAVATION
- STATIC GROUNDWATER ELEVATION (FT–MSL)

| | | |
|---|---|---|
| CLAYEY SAND | SILTY SAND | SANDY CLAY |
| SHALEY CLAY | SANDSTONE AND SHALE | CLAY |
| SAND | SANDSTONE | SHALE |
| FILL | SILT | SANDY SILT |
| SILTSTONE | | SANDSTONE AND SILTSTONE |

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF 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. 358C) 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 AT LCS SUMPS IS 424.5 FT–MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) FORCEMAIN INFORMATION.
11. REFER TO APPENDIX IIIA–A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE–SUBTITLE D AREA.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023–404–11
CAD: B.4–CROSS SECTION A.DWG
DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION A

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING B.4

SHEET IIIA–B.4

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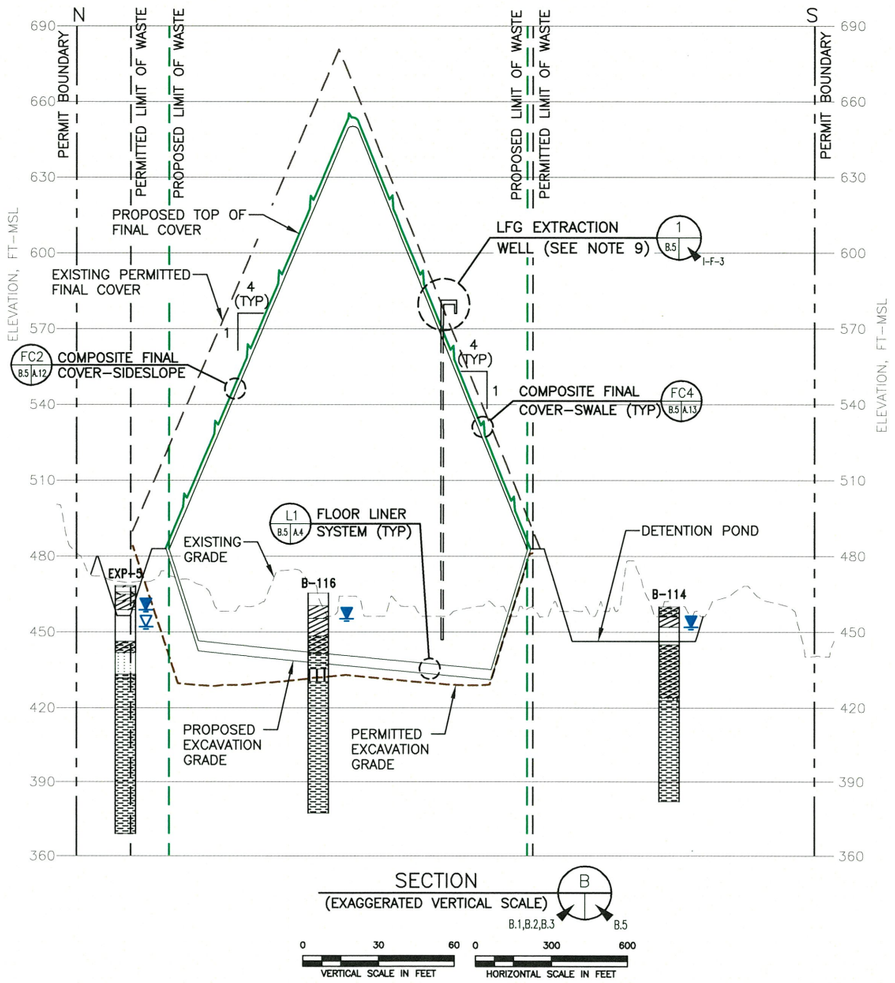
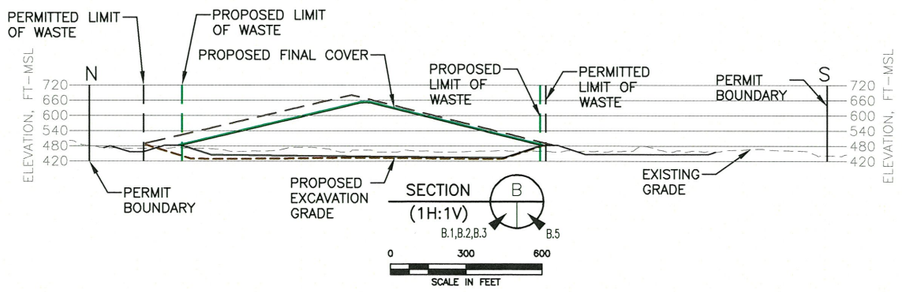


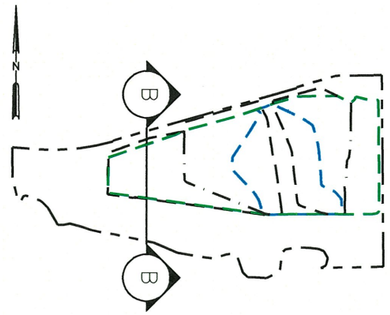

SECTION B
(EXAGGERATED VERTICAL SCALE)
B.1,B.2,B.3 B.5

0 30 60 VERTICAL SCALE IN FEET
0 300 600 HORIZONTAL SCALE IN FEET




SECTION B
(1H:1V)
B.1,B.2,B.3 B.5

0 300 600 SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE-SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- EXISTING PERMITTED FINAL COVER
- EXISTING PERMITTED EXCAVATION
- STATIC GROUNDWATER ELEVATION (FT-MSL)
- GROUNDWATER ELEVATION AT TIME OF DRILLING (FT-MSL)
- CLAYEY SAND
- SANDY CLAY
- SHALEY CLAY
- CLAY
- SAND
- SHALE
- SILTSTONE
- SANDSTONE AND SILTSTONE
- SANDSTONE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA-A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF 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. 358C) 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 AT LCS SUMPS IS 424.5 FT-MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) FORCEMAIN INFORMATION.
11. REFER TO APPENDIX IIIA-A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE-SUBTITLE D AREA.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

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DATE: 05/2022
FILE: 0023-404-11
CAD: B.5-CROSS SECTION B.DWG
DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

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TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION B

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING B.5

SHEET IIIA-B.5

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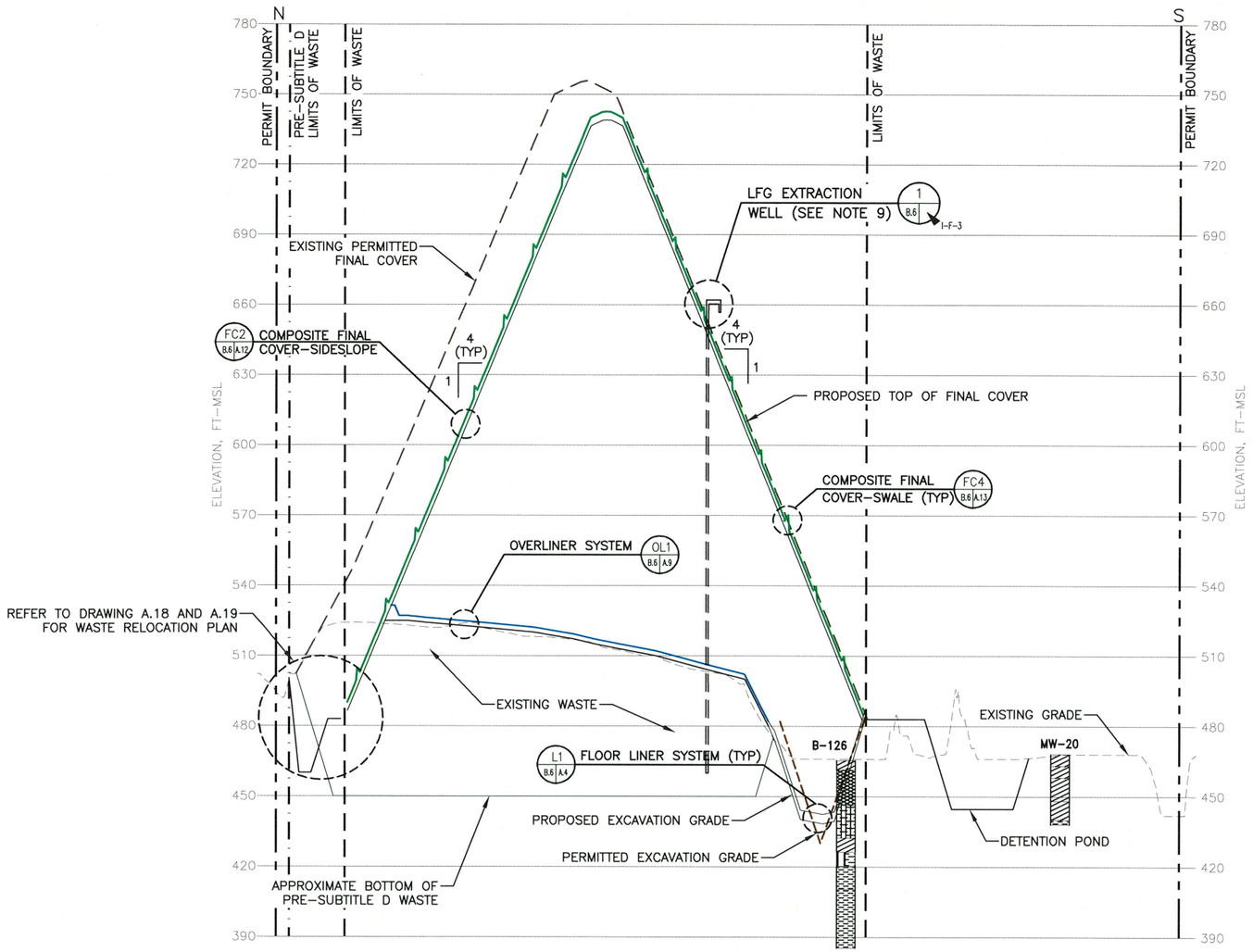
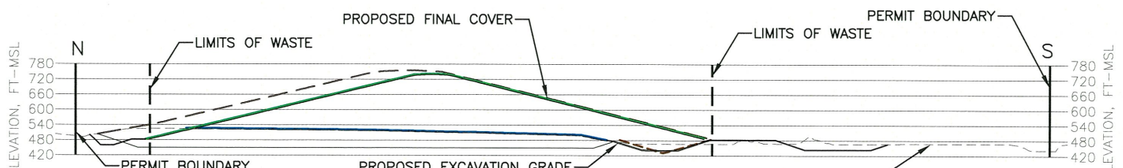



SECTION C
(EXAGGERATED VERTICAL SCALE)
B.1,B.2,B.3 B.6

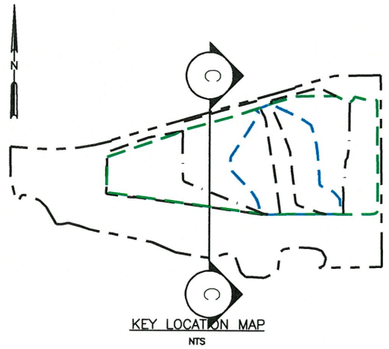
0 30 60
VERTICAL SCALE IN FEET

0 300 600
HORIZONTAL SCALE IN FEET




SECTION C
(1H:1V)
B.1,B.2,B.3 B.6

0 300 600
SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE-SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- EXISTING PERMITTED FINAL COVER
- EXISTING PERMITTED EXCAVATION

- FILL
- SILTSTONE AND SHALE
- SILTY SHALE
- SANDY CLAY
- CLAY
- SHALE

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA-A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF SECTION. SEE DRAWING B.1 FOR LOCATION.
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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 AT LCS SUMPS IS 424.5 FT-MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) FORCEMAIN INFORMATION.
11. REFER TO APPENDIX IIIA-A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE-SUBTITLE D AREA.

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DATE: 05/2022
FILE: 0023-404-11
CAD: B.6-CROSS SECTION B.DWG

DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

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# MAJOR PERMIT AMENDMENT
## TYPICAL SECTION C

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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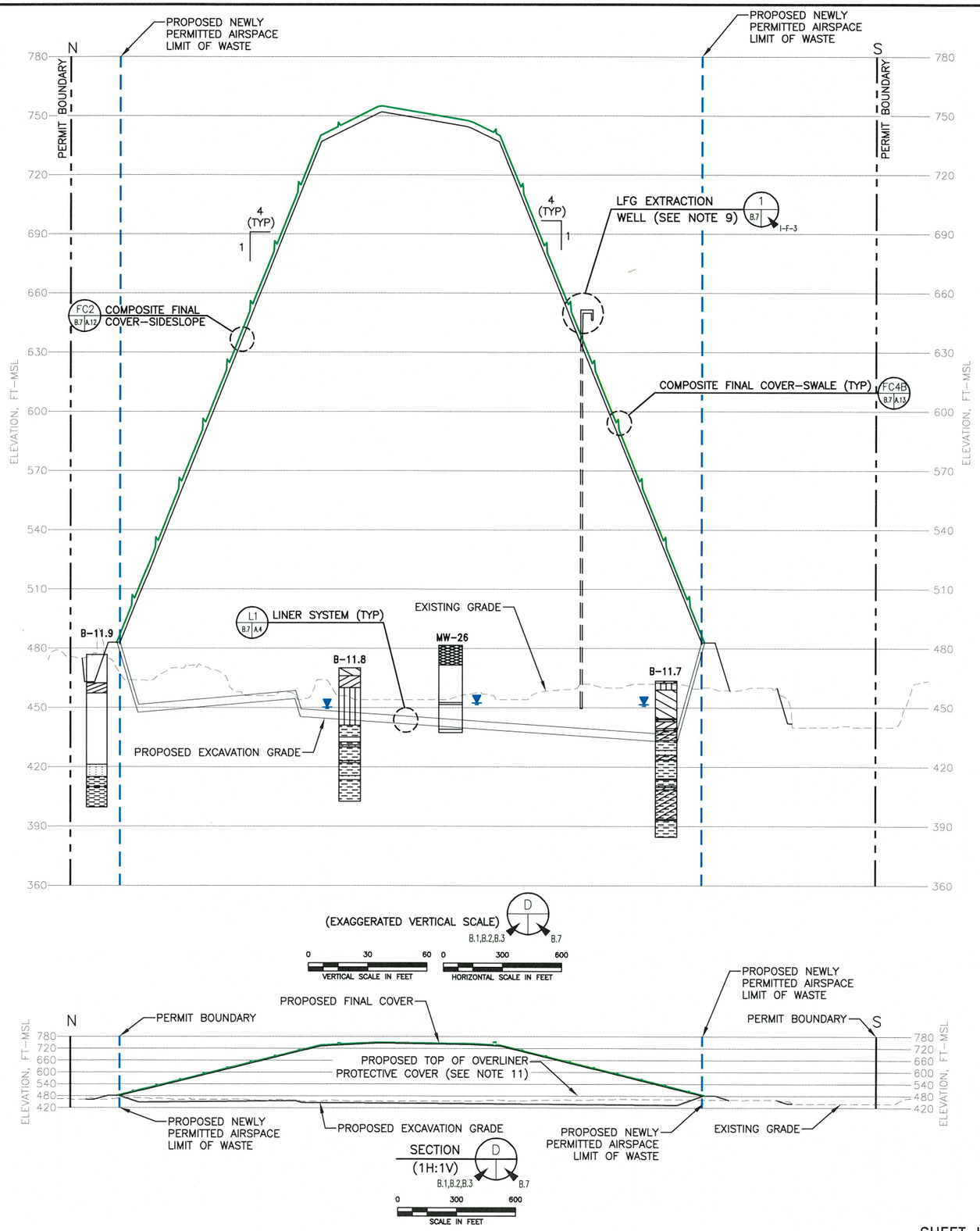



(EXAGGERATED VERTICAL SCALE)

D
B.1,B.2,B.3
B.7

0 30 60
VERTICAL SCALE IN FEET

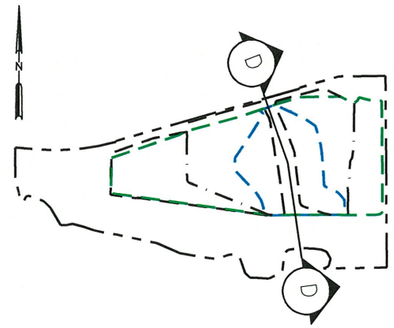
0 300 600
HORIZONTAL SCALE IN FEET




SECTION (1H:1V)

D
B.1,B.2,B.3
B.7

0 300 600
SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE-SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- STATIC GROUNDWATER ELEVATION (FT-MSL)

| | | |
|---|---|---|
| CLAYEY SAND | SILTY SAND | CLAY |
| SHALEY CLAY | SANDSTONE | SHALE |
| SAND | SILT | SANDY SILT |
| FILL | SANDY CLAY | |

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11-16-2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA-A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF 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. 358C) 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 AT LCS SUMPS IS 424.5 FT-MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) FORCEMAIN INFORMATION.
11. REFER TO APPENDIX IIIA-A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE-SUBTITLE D AREA.

- [ ] DRAFT
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DATE: 05/2022
FILE: 0023-404-11
CAD: B.7-CROSS SECTION D.DWG

DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION D

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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SHEET IIIA-B.7

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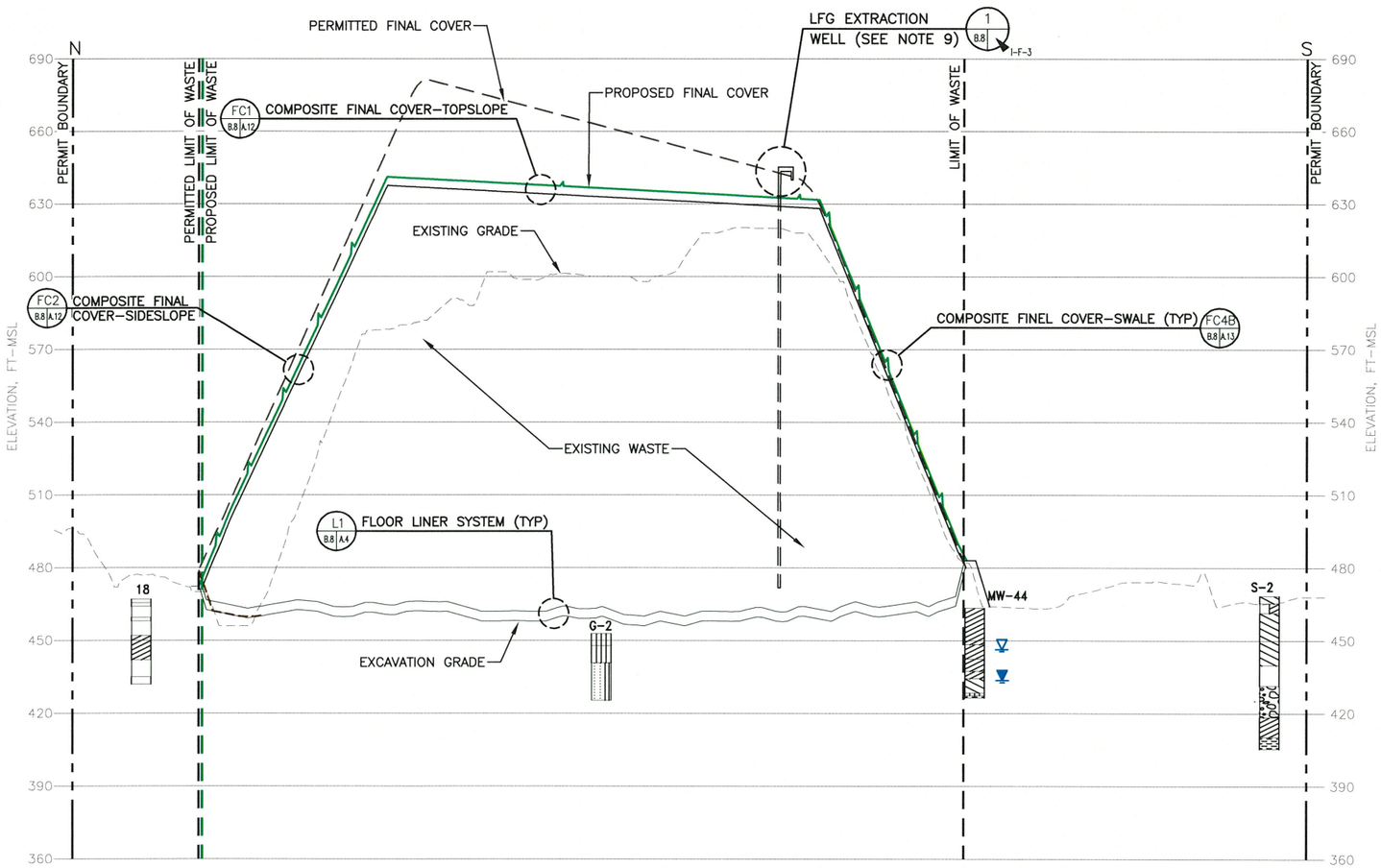
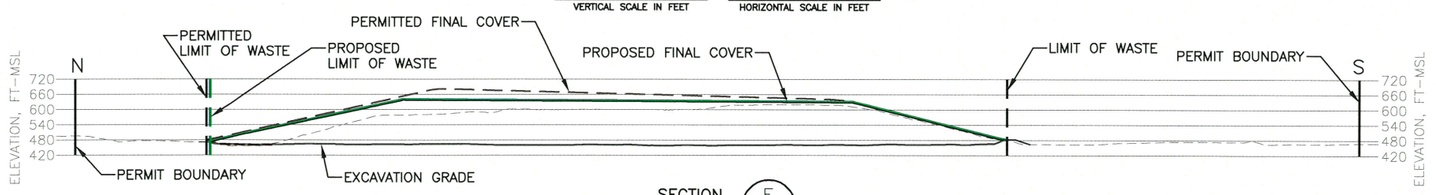


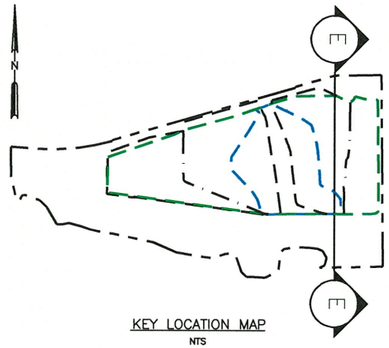

SECTION E
(EXAGGERATED VERTICAL SCALE)
B.1,B.2,B.3 — B.8

0 30 60 — VERTICAL SCALE IN FEET
0 300 600 — HORIZONTAL SCALE IN FEET




SECTION E
(1H:1V)
B.1,B.2,B.3 — B.8

0 300 600
SCALE IN FEET




KEY LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- PERMITTED PRE–SUBTITLE D LIMIT OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- EXISTING PERMITTED FINAL COVER
- EXISTING PERMITTED EXCAVATION
- STATIC GROUNDWATER ELEVATION (FT–MSL)
- GROUNDWATER ELEVATION AT TIME OF DRILLING (FT–MSL)

- CLAYEY SAND
- SAND WITH CLAY
- SAND
- SILTY SAND
- SANDSTONE AND SHALE
- SILT
- GRAVEL
- SANDY CLAY
- CLAY
- SHALE
- SANDY SILT

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY COOPER AERIAL SURVEYS, CO FROM AERIAL PHOTOGRAPHY FLOWN 11–16–2020. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 83.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, LEACHATE COLLECTION, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF 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. 358C) 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 AT LCS SUMPS IS 424.5 FT–MSL.
8. STATIC GROUNDWATER ELEVATIONS AND GRONDWATER AT TIME OF DRILLING NOT REPORTED IN ALL BOREHOLES.
9. LOCATIONS OF TYPICAL LFG EXTRACTION WELLS CAN BE FOUND IN APPENDIX IIII.
10. REFER TO APPENDIX IIIC FOR LEACHATE COLLECTION SYSTEM (LCS) FORCEMAIN INFORMATION.
11. REFER TO APPENDIX IIIA–A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER THE PRE–SUBTITLE D AREA.

STATE OF TEXAS
RYNE J. SPICER
118934
LICENSED
PROFESSIONAL ENGINEER
5-19-2022

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

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FILE: 0023–404–11
CAD: B.8–CROSS SECTION E.DWG

DRAWN BY: SRF
DESIGN BY: CAM
REVIEWED BY: RJS

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
CITY OF ARLINGTON
AND
REPUBLIC WASTE SERVICES OF TEXAS, LTD

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# MAJOR PERMIT AMENDMENT
# TYPICAL SECTION E

CITY OF ARLINGTON LANDFILL
TARRANT COUNTY, TEXAS

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DRAWING B.8

SHEET IIIA–B.8

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