



Texas Commission on Environmental Quality

Waste Permits Division Correspondence

Cover Sheet

Date: 10/01/2025

Facility Name: Hillside Recycling and Disposal Facility

Permit or Registration No.: 523B

Nature of Correspondence:

☒ Initial/New

☐ Response/Revision to TCEQ Tracking No.:
_____ (from subject line of TCEQ letter
regarding initial submission)

Affix this cover sheet to the front of your submission to the Waste Permits Division. Check appropriate box for type of correspondence. Contact WPD at (512) 239-2335 if you have questions regarding this form.

Table 1 - Municipal Solid Waste Correspondence

Applications	Reports and Notifications
☐ New Notice of Intent	☐ Alternative Daily Cover Report
☐ Notice of Intent Revision	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Compost Report
☐ New Registration (including Subchapter T)	☐ Groundwater Alternate Source Demonstration
☐ Major Amendment	☐ Groundwater Corrective Action
☐ Minor Amendment	☐ Groundwater Monitoring Report
☐ Limited Scope Major Amendment	☐ Groundwater Background Evaluation
☒ Notice Modification	☐ Landfill Gas Corrective Action
☐ Non-Notice Modification	☐ Landfill Gas Monitoring
☐ Transfer/Name Change Modification	☐ Liner Evaluation Report
☐ Temporary Authorization	☐ Soil Boring Plan
☐ Voluntary Revocation	☐ Special Waste Request
☐ Subchapter T Disturbance Non-Enclosed Structure	☐ Other:
☐ Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

Applications	Reports and Responses
☐ New	☐ Annual/Biennial Site Activity Report
☐ Renewal	☐ CPT Plan/Result
☐ Post-Closure Order	☐ Closure Certification/Report
☐ Major Amendment	☐ Construction Certification/Report
☐ Minor Amendment	☐ CPT Plan/Result
☐ CCR Registration	☐ Extension Request
☐ CCR Registration Major Amendment	☐ Groundwater Monitoring Report
☐ CCR Registration Minor Amendment	☐ Interim Status Change
☐ Class 3 Modification	☐ Interim Status Closure Plan
☐ Class 2 Modification	☐ Soil Core Monitoring Report
☐ Class 1 ED Modification	☐ Treatability Study
☐ Class 1 Modification	☐ Trial Burn Plan/Result
☐ Endorsement	☐ Unsaturated Zone Monitoring Report
☐ Temporary Authorization	☐ Waste Minimization Report
☐ Voluntary Revocation	☐ Other:
☐ 335.6 Notification	
☐ Other:	



BIGGS & MATHEWS ENVIRONMENTAL, INC
TBPE No. F-256 TBPG No. 50222

October 1, 2025

Megan Henson
Manager, Municipal Solid Waste Section
MC-124
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg F
Austin, Texas 78753

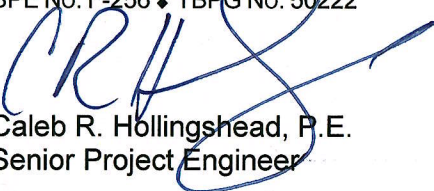
Re: Permit Modification – Alternate Final Cover Design Demonstration
Hillside Recycling and Disposal Facility Permit No. MSW 523B
Grayson County, Texas
RN100217512; CN600127856

Ms. Henson:

On behalf of Waste Management of Texas, Inc., enclosed is a permit modification for the Hillside Recycling and Disposal Facility. This permit modification has been prepared consistent with Title 30 of the Texas Administrative Code (TAC) §305.70(k)(10) for a notice permit modification to include an alternative final cover system design. Please call or e-mail me if you have any questions at 817-563-1144 or chollingshead@biggsandmathews.com.

Sincerely,

BIGGS & MATHEWS ENVIRONMENTAL
TBPE No. F-256 ♦ TBPG No. 50222



Caleb R. Hollingshead, P.E.
Senior Project Engineer

Attachments: Permit Modification (original and two copies)

cc: Guy R. Campbell, Waste Management of Texas, Inc.
Erin Gorman, TCEQ Region 4

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW 523B**

PART III – SITE DEVELOPMENT PLAN

ALTERNATE FINAL COVER DESIGN (COMPOSITE OPTION)

PERMIT MODIFICATION

Prepared for

WASTE MANAGEMENT OF TEXAS, INC.

October 2025



Prepared by

BIGGS & MATHEWS ENVIRONMENTAL
1700 Robert Road, Suite 100 ♦ Mansfield, Texas 76063 ♦ 817-563-1144

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW 523B**

PART III – SITE DEVELOPMENT PLAN

ALTERNATE FINAL COVER DESIGN (COMPOSITE OPTION)

PERMIT MODIFICATION

CONTENTS

PERMIT MODIFICATION APPLICATION FORM

PERMIT MODIFICATION NARRATIVE

ATTACHMENT 1 – LAND OWNERSHIP INFORMATION

ATTACHMENT 2 – MARKED (REDLINE/STRIKEOUT) PAGES

ATTACHMENT 3 – UNMARKED REVISED PAGES



Texas Commission on Environmental Quality

Application Form for Municipal Solid Waste Permit or Registration Modification or Temporary Authorization

Application Tracking Information

Facility Name: _____

Permittee or Registrant Name: _____

MSW Authorization Number: _____

Initial Submission Date: _____

Revision Date: _____

Instructions for completing this form are provided in [form TCEQ-20650-instr](#)¹. If you have questions, contact the Municipal Solid Waste Permits Section by email to mswper@tceq.texas.gov, or by phone at 512-239-2335.

Application Data

1. Submission Type

☐ Initial Submission ☐ Notice of Deficiency (NOD) Response

2. Authorization Type

☐ Permit ☐ Registration

3. Application Type

☐ Modification with Public Notice ☐ Modification without Public Notice
☐ Temporary Authorization (TA) ☐ Modification for Name Change or Transfer

4. Application Fee

Amount

The application fee for a modification or temporary authorization is \$150.

Payment Method

☐ Check
☐ Online through ePay portal www3.tceq.texas.gov/epay/

If paid online, enter ePay Trace Number: _____

¹ www.tceq.texas.gov/downloads/permitting/waste-permits/msw/forms/20650-instr.pdf

5. Electronic Versions of Application

For modifications that require public notice, TCEQ will publish electronic versions of the applications online. Applicants must provide complete electronic copies of their initial applications, responses to notices of deficiencies, and the final technically complete versions. (Refer to instructions for this form for how to submit electronically.)

6. Party Responsible for Mailing Notice

For modifications that require notice, indicate who will be responsible for mailing notice:

☐ Applicant

☐ Agent in Service

☐ Consultant

Contact Name: _____

Title: _____

Email Address: _____

7. Confidential Documents

Does the application contain confidential documents?

☐ Yes ☐ No

If "Yes", reference the confidential documents in the application, but submit the confidential documents as an attachment in a separate binder marked "CONFIDENTIAL."

8. Facility General Information

Facility Name: _____

Contact Name: _____ Title: _____

MSW Authorization Number (if existing): _____

Regulated Entity Reference Number: **RN** _____

Physical or Street Address: _____

City: _____ County: _____ State: TX Zip Code: _____

Phone Number: _____

Latitude (Decimal Degrees): _____

Longitude (Decimal Degrees): _____

9. Facility Types

☐ Type I

☐ Type IV

☐ Type V

☐ Type IAE

☐ Type IVAE

☐ Type VI

10. Description of the Revisions to the Facility

Provide a brief description of revisions to permit or registration conditions and supporting documents referred to by the permit or registration, and a reference to the specific provisions under which the modification or temporary authorization application is being made. Also, provide an explanation of why the modification or temporary authorization is needed:

11. Facility Contact Information

Site Operator (Permittee or Registrant)

Name: _____

Customer Reference Number: **CN**_____

Contact Name: _____ Title: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Phone Number: _____

Email Address: _____

Texas Secretary of State (SOS) Filing Number: _____

Operator (if different from *Site Operator*)

Name: _____

Customer Reference Number: **CN**_____

Contact Name: _____ Title: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Phone Number: _____

Email Address: _____

Texas Secretary of State (SOS) Filing Number: _____

Consultant (if applicable)

Firm Name: _____

Consultant Name: _____

Texas Board of Professional Engineers Firm Registration Number: _____

Contact Name: _____ Title: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Phone Number: _____

Email Address: _____

Agent in Service (required for out-of-state applicants)

Name: _____

Mailing Address: _____

City: _____ County: _____ State: TX Zip Code: _____

Phone Number: _____

Email Address: _____

12. Ownership Status of the Facility

Is this a modification that changes the legal description, the property owner, or the Site Operator (Permittee or Registrant)?

☐ Yes ☐ No

If the answer is "No", skip the next question and proceed to signature page.

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

☐ Yes ☐ No

If "No", provide the following information for other owners.

Owner Name: _____

Mailing Address: _____

City: _____ County: _____ State: TX Zip Code: _____

Phone Number: _____

Email Address: _____

Signature Page

Site Operator or Authorized Signatory

I 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.

Name: Guy R. Campbell Title: Engineering Manager

Email Address: [REDACTED]

Signature: *Guy R. Campbell* Date: 10/1/25

Operator or Principal Executive Officer Designation of Authorized Signatory

To be completed by the operator if the application is signed by an authorized representative for the operator.

I hereby designate _____ 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.

Operator or Principal Executive Officer Name: _____

Email Address: _____

Signature: _____ Date: _____

Notary

SUBSCRIBED AND SWORN to before me by the said Guy R. Campbell

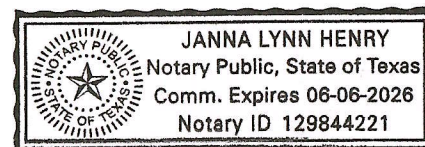
On this 1st day of October, 2025

My commission expires on the 6th day of June, 2026

Janna Lynn Henry

Notary Public in and for

Tarrant County, Texas



Note: Application Must Bear Signature and Seal of Notary Public

Attachments for Permit or Registration Modification with Public Notice

Refer to instruction document **200650-instr** for professional engineer seal requirements.

Attachments Table 1. Required attachments.

Required Attachments	Attachment Number
Land Ownership Map	
Landowners List	
Marked (Redline/Strikeout) Pages	
Unmarked Revised Pages	

Attachments Table 2. Additional attachments as applicable.

Additional Attachments as Applicable (select all that apply and add others as needed)	Attachment Number
☐ TCEQ Core Data Form(s)	
☐ Signatory Authority Delegation	
☐ Fee Payment Receipt	
☐ Confidential Documents	

PERMIT MODIFICATION NARRATIVE

This permit modification provides changes to the Site Development Plan to include alternate final cover designs in accordance with 30 TAC §305.70(k)(10). The Hillside Recycling and Disposal Facility has an approved alternate final cover design consisting of a geosynthetic clay liner, a low density polyethylene membrane, a geocomposite and an erosion layer. This permit modification maintains the approved alternate final cover design and provides additional alternate final cover design for the top deck and for the side slope.

The optional top deck alternate final cover design consists of a 12 inch thick compacted clay infiltration layer, a 40 mil linear low density polyethylene membrane, a double sided geocomposite, and a 24 inch thick erosion layer. The optional side slope alternate final cover design consists of a 12 inch thick compacted clay infiltration layer, a double sided geocomposite, and a 36 inch thick erosion layer.

The purpose of this modification is to provide flexibility in final cover construction based on the availability of materials at the time of construction while providing equivalent reduction in infiltration and protection from erosion as the final cover system specified in 30 TAC §330.457. This permit modification includes revisions to Part III Attachment 6 Groundwater and Surface Water Protection Plan and to Part III Attachment 12 Final Closure Plan.

ATTACHMENT 1
ADJACENT LAND OWNERSHIP INFORMATION

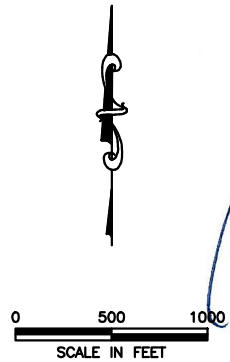
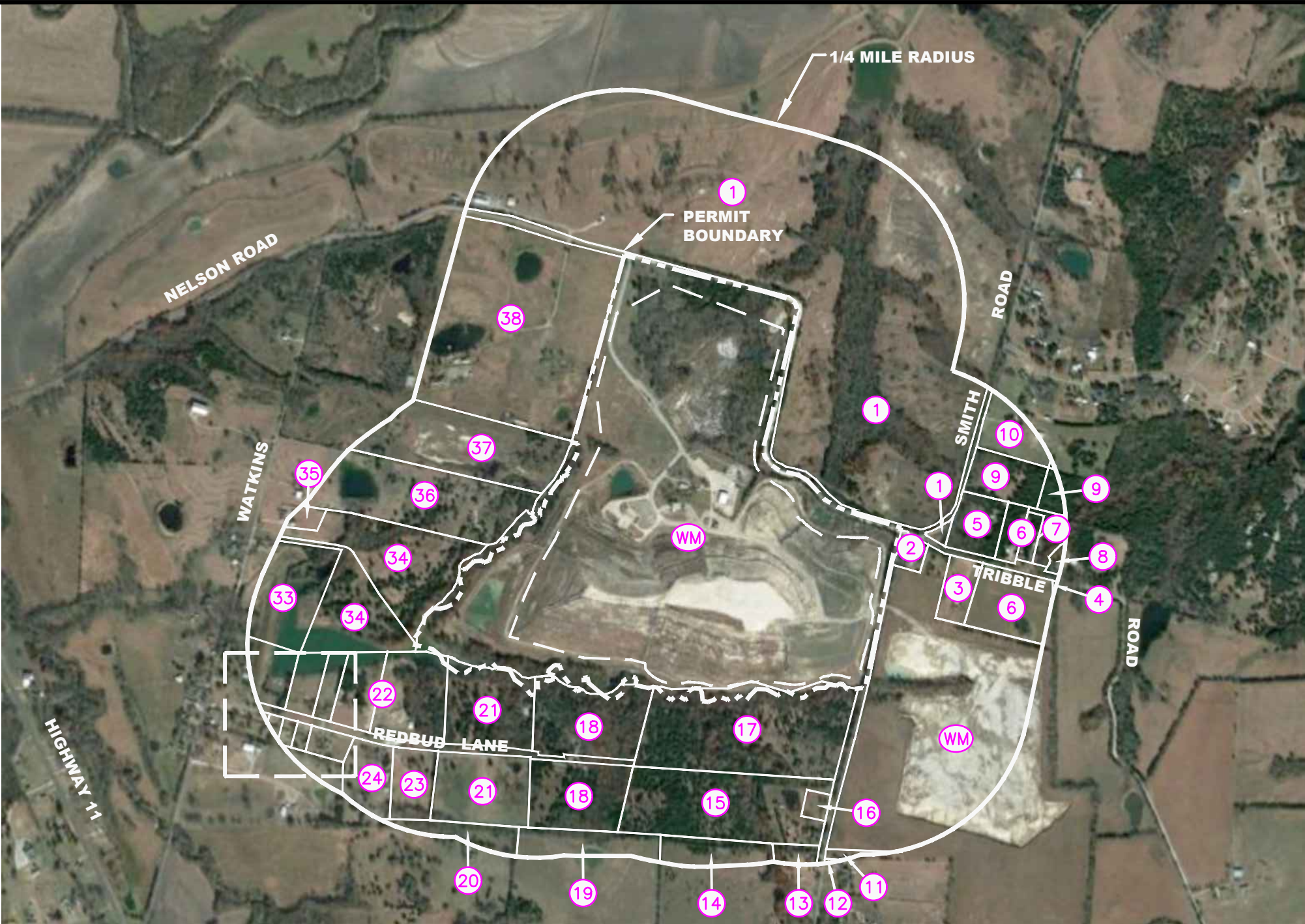
**HILLSIDE RECYCLING AND DISPOSAL FACILITY
ADJACENT PROPERTY OWNERS
(From Grayson County Records, September 12, 2025)**

- | | |
|--|--|
| 1 TRIPLE G AND H LLC JOHN YORK
734 DEER MEADOW LN
SEADRIFT TX 77983-4163 | 16 ORR STEPHEN ETUX CHRISTINE LEE
1849 WEBB SMITH RD
SHERMAN TX 75090 |
| 2 GAINES JAMES L ETUX TERESA M
1446 WEBB SMITH RD
SHERMAN TX 75090 | 17 INMAN SMITH FAMILY
3013 GLASCOW DR
SHERMAN TX 75092-2118 |
| 3 HOLLOWAY MAX B ETUX MARKA L
1335 TRIBBLE RD
SHERMAN TX 75090 | 18 SCALLY G PAUL AND KIETH SCALLY
609 S ANDREWS
SHERMAN TX 75090-6601 |
| 4 ANDERSON JOHN P ETUX CAHTERINE A
1225 TRIBBLE RD
SHERMAN TX 75090-7510 | 19 RHOTON JOANNA L
224 JODY LN
SHERMAN TX 75090-3738 |
| 5 OVERMAN KENNETH J ETUX LYNN M
1344 WEBB SMITH RD
SHERMAN TX 75090 | 20 TRIBBLE GEORG PRESTON
P O BOX 558
TOM BEAN TX 75489 |
| 6 BLAIR JUDI LYNN ETVIR WALTER RAY
1270 TRIBBLE RD
SHERMAN TX 75090 | 21 MADISON ROBERT W
462 REDBUD LN
SHERMAN TX 75090-3782 |
| 7 CONFIDENTIAL OWNER
3208 HARTFORD DR
FLOWER MOUND TX 75028 | 22 LIPSKEY SCOTT M ETUX LESLIE E
285 REDBUD LN
SHERMAN TX 75090 |
| 8 COX BEN
69 SOUTHGALE RD
DENISON TX 75021 | 23 MURPHY FAMILY TRUST
324 REDBUD LN
SHERMAN TX 75090 |
| 9 DICK JOHN A & RHONDA D
1294 WEBB SMITH RD
SHERMAN TX 75090-3767 | 24 CHAMPION ANTHALINE C
286 REDBUD LN
SHERMAN TX 75090 |
| 10 PINA CORY A ETUX DEBORAH J
1194 WEBB SMITH RD
SHERMAN TX 75090-3737 | 25 PAYNE CARL EDWARD ETUX LOUISE MOCK
206 REDBUD LN
SHERMAN TX 75090-3779 |
| 11 TURNER TONA SUE
1950 WEBB SMITH RD
SHERMAN TX 75090 | 26 HAWKINS LARRY
316 WATKINS RD
SHERMAN TX 75090-9461 |
| 12 RUSSELL LARRY J ETUX VICKI
1960 WEBB SMITH RD
SHERMAN TX 75090 | 27 GEARHEART JASON A
199 REDBUD LN
SHERMAN TX 75090 |
| 13 BRENDA FERNANDO ARIAN PEREZ AND
1931 WEBB SMITH RD
SHERMAN TX 75090 | 28 COX TOMMY D
160 REDBUD LANE
SHERMAN TX 75090-3748 |
| 14 WISE PAMELA B
2085 WEBB SMITH RD
SHERMAN TX 75090 | 29 CRANFORD HAROLD D ETUX DARLA A
136 REDBUD LN
SHERMAN TX 75090 |
| 15 ORR CHRISTINE LEE
1849 WEBB SMITH RD
SHERMAN TX 75090 | 30 REEVES STEVEN PAUL ETUX LIGEIA MECHELLE
122 REDBUD LN
SHERMAN TX 75090-3748 |

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
ADJACENT PROPERTY OWNERS
(From Grayson County Records, September 12, 2025)**

- 31 BURGEN LARRY L
94 REDBUD LN
SHERMAN TX 75090
- 32 KARLESKINT MICHAEL A ETUX JANE M
424 WATKINS RD
SHERMAN TX 75090
- 33 BUTLER LEE HESTENE ETUX LAUREN MORGAN
638 WATKINS RD
SHERMAN TX 75090
- 34 MOTAHARNIA PAULA ANNE & AL
650 WATKINS RD
SHERMAN TX 75090
- 35 BILLINGS BARRY B & VICKY D
668 E WATKINS DR
SHERMAN TX 75090
- 36 MONK TOMMY E ETUX JOYCE
732 WATKINS RD
SHERMAN TX 75090
- 37 LEE MITCHELL H AS INDIVIDUAL AND TRUSTEE
787 WATKINS RD
SHERMAN TX 75090-3735
- 38 HARRELL THOMAS E TRUSTEE
1006 NELSON RD
SHERMAN TX 75090-3735

O:\Waste Management\Hillside\Solid Waste\2025 Alt Final Cover Permit Mod\Drawings\Prop Owners 9--8--25.dwg User: Chollingshead Layout: QuarterMile



LEGEND

--- PERMIT BOUNDARY



NOTES:

1. AERIAL PHOTOGRAPH DOWNLOADED FROM GOOGLE EARTH ON JANUARY 10, 2020, IMAGERY DATED NOVEMBER 26, 2018.
2. NUMBER DESIGNATIONS FOR PROPERTIES MATCH LAND OWNERS LIST.
3. PROPERTY LINES INDICATED ON THIS MAP ARE BASED ON GRAYSON COUNTY APPRAISAL DISTRICT RECORDS CURRENT TO SEPTEMBER 2025.

1. TRIPLE G AND H LLC JOHN YORK
734 DEER MEADOW LN
SEADRIFT TX 77983-4163
2. GAINES JAMES L ETUX TERESA M
1446 WEBB SMITH RD
SHERMAN TX 75090
3. HOLLOWAY MAX BYRON
1335 TRIBBLE RD
SHERMAN TX 75090
4. ANDERSON JOHN P ETUX CATHRINE A
1225 TRIBBLE RD
SHERMAN TX 75090-7510
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1344 WEBB SMITH RD
SHERMAN TX 75090
6. BLAIR JUDI LYN ETVIR WALTER RAY
1270 TRIBBLE RD
SHERMAN TX 75090
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FLOWER MOUND TX 75028
8. COX BEN
69 SOUTHGATE RD
DENISON TX 75021
9. DICK JOHN A ETUX RHONDA D
1294 WEBB SMITH RD
SHERMAN TX 75090-3737
10. PINA CORY A ETUX DEBORAH J
1194 WEBB SMITH RD
SHERMAN TX 75090-3737
11. TURNER TONA SUE
1950 WEBB SMITH RD
SHERMAN TX 75090
12. RUSSELL LARRY J ETUX VICKI
1960 WEBB SMITH RD
SHERMAN TX 75090
13. BRENDA FERNANDO ADRIAN PEREZ AND
MARIA RAMERIEZ RANGEL
1931 WEBB SMITH RD
SHERMAN TX 75090
14. WISE PAMELA B
2085 WEBB SMITH RD
SHERMAN TX 75090
15. ORR CHRISTINE LEE
1849 WEBB SMITH RD
SHERMAN TX 75090
16. ORR STEPHEN ETUX CHRISTINE LEE
1849 WEBB SMITH RD
SHERMAN TX 75090
17. INMAN SMITH FAMILY
3013 GLASGOW DR
SHERMAN TX 75092-2118
18. SCALLY G PAUL AND KIETH SCALLY
609 S ANDREWS
SHERMAN TX 75090-6601
19. RHOTON JOANNA L
224 JODY LN
SHERMAN TX 75090-3738
20. TRIBBLE GEORGE PRESTON
P O BOX 558
TOM BEAN TX 75489
21. MADISON ROBERT W
462 REDBUD LN
SHERMAN TX 75090-3782
22. LIPSKEY SCOTT M ETUX LESLIE E
285 REDBUD LN
SHERMAN TX 75090
23. MURPHY FAMILY TRUST
324 REDBUD LN
SHERMAN TX 75090
24. CHAMPION ANTHALINE C
286 RED BUD LN
SHERMAN TX 75090
25. PAYNE CARL EDWARD ETUX LOUISE MOCK
206 REDBUD LN
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26. HAWKINS LARRY
316 WATKINS RD
SHERMAN TX 75090-9461
27. GEARHEART JASON A
199 REDBUD LN
SHERMAN TX 75090
28. COX TOMMY D
160 REDBUD LN
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122 REDBUD LN
SHERMAN TX 75090-3748
31. BURGEN LARRY L
94 REDBUD LN
SHERMAN TX 75090
32. KARLESKINT MICHAEL A ETUX JANE M
424 WATKINS RD
SHERMAN TX 75090
33. BUTLER LEE HESTEN ETUX LAUREN MORGAN
638 WATKINS RD
SHERMAN TX 75090
34. MOTAHARNIA PAULA ANNE & AL
650 WATKINS RD
SHERMAN TX 75090
35. BILLINGS BARRY B & VICKY D
668 E WATKINS DR
SHERMAN TX 75090
36. MONK TOMMY E ETUX JOYCE
732 WATKINS RD
SHERMAN TX 75090
37. LEE MITCHELL H AS INDIVIDUAL AND TRUSTEE
787 WATKINS RD
SHERMAN TX 75090-3735
38. HARRELL THOMAS E TRUSTEE
1006 NELSON RD
SHERMAN TX 75090-3735

LAND OWNERSHIP MAP

WASTE MANAGEMENT OF TEXAS, INC.
HILLSIDE RECYCLING & DISPOSAL FACILITY

BME

**BIGGS & MATHEWS
ENVIRONMENTAL**
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

FOR PERMITTING PURPOSES ONLY

REVISIONS			
REV	DATE	DESCRIPTION	DWN BY

TBPCLS FIRM NO. F-256 AND NO. 10194895
TBPFG FIRM NO. 50222

DRAWING
1

ATTACHMENT 2
MARKED (REDLINE/STRIKEOUT) PAGES

ATTACHMENT 3
UNMARKED REVISED PAGES

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-523B**

**PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 6
GROUNDWATER AND SURFACE WATER
PROTECTION PLAN**

Prepared for

Waste Management of Texas, Inc.

Approved Site Development Plan June 30, 2005
Revised September 2005
Revised October 2025

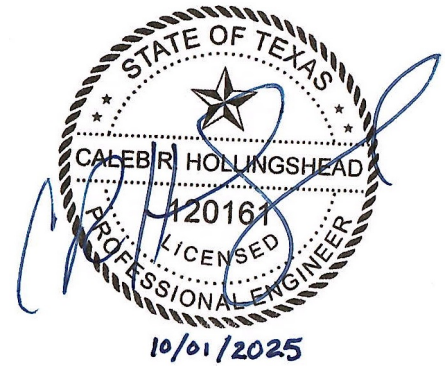


Prepared by

BIGGS & MATHEWS ENVIRONMENTAL
1700 Robert Road, Suite 100 ♦ Mansfield, Texas 76063 ♦ 817-563-1144

TEXAS BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
FIRM REGISTRATION NO. F-256 AND NO. 10194895

TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS
FIRM REGISTRATION NO. 50222



CONTENTS

- 6A** Drainage Design Report
- 6B** Liner, Leachate Collection, and Final Cover System Details
- 6C** Alternate Liner Design Demonstration
- 6D** Alternate Final Cover Design Demonstration
- 6E** Alternate Final Cover Design Demonstration (Composite Option)

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-523B**

**PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 6B
LINER, LEACHATE COLLECTION AND
FINAL COVER SYSTEM DETAILS**

Prepared for

Waste Management of Texas, Inc.

Approved Site Development Plan June 30, 2005

Revised September 2005

Revised October 2025



Prepared by

BIGGS & MATHEWS ENVIRONMENTAL

1700 Robert Road, Suite 100 ♦ Mansfield, Texas 76063 ♦ 817-563-1144

Texas Board of Professional Engineers and Land Surveyors
Firm Registration No. F-256 And No. 10194895

Texas Board of Professional Geoscientists
Firm Registration No. 50222



CONTENTS

GROUNDWATER PROTECTION SYSTEM DESIGN SUMMARY	6B.1
APPENDIX 6B.1 Top of Liner Plan	
APPENDIX 6B.2 Landfill Completion Plan	
APPENDIX 6B.3 Temporary Dewatering System Details	
APPENDIX 6B.4 Liner System Details	
APPENDIX 6B.5 Liner System Details (GCL Option)	
APPENDIX 6B.6 Leachate Collection System Details	
APPENDIX 6B.7 Final Cover Details	
APPENDIX 6B.8 Final Cover Details (GCL Option)	
APPENDIX 6B.9 Final Cover Details (Composite Option)	

Attachment 10 (SLQCP) also includes design and demonstrations for special liner system conditions (e.g., liner construction below highest-measured groundwater elevations). Details of the temporary hydrostatic pressure relief system, which allows the construction of the liner system below the highest-measured groundwater elevations, are presented in Attachment 6B.4.

The site has been designed with three Subtitle D final cover options. The three Subtitle D final cover system options are described below with layers listed from top to bottom.

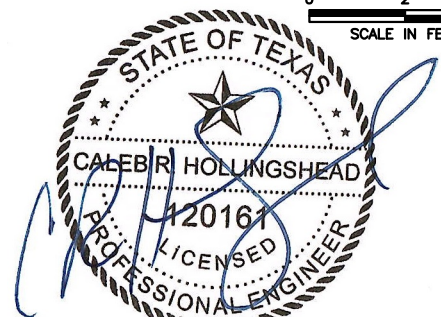
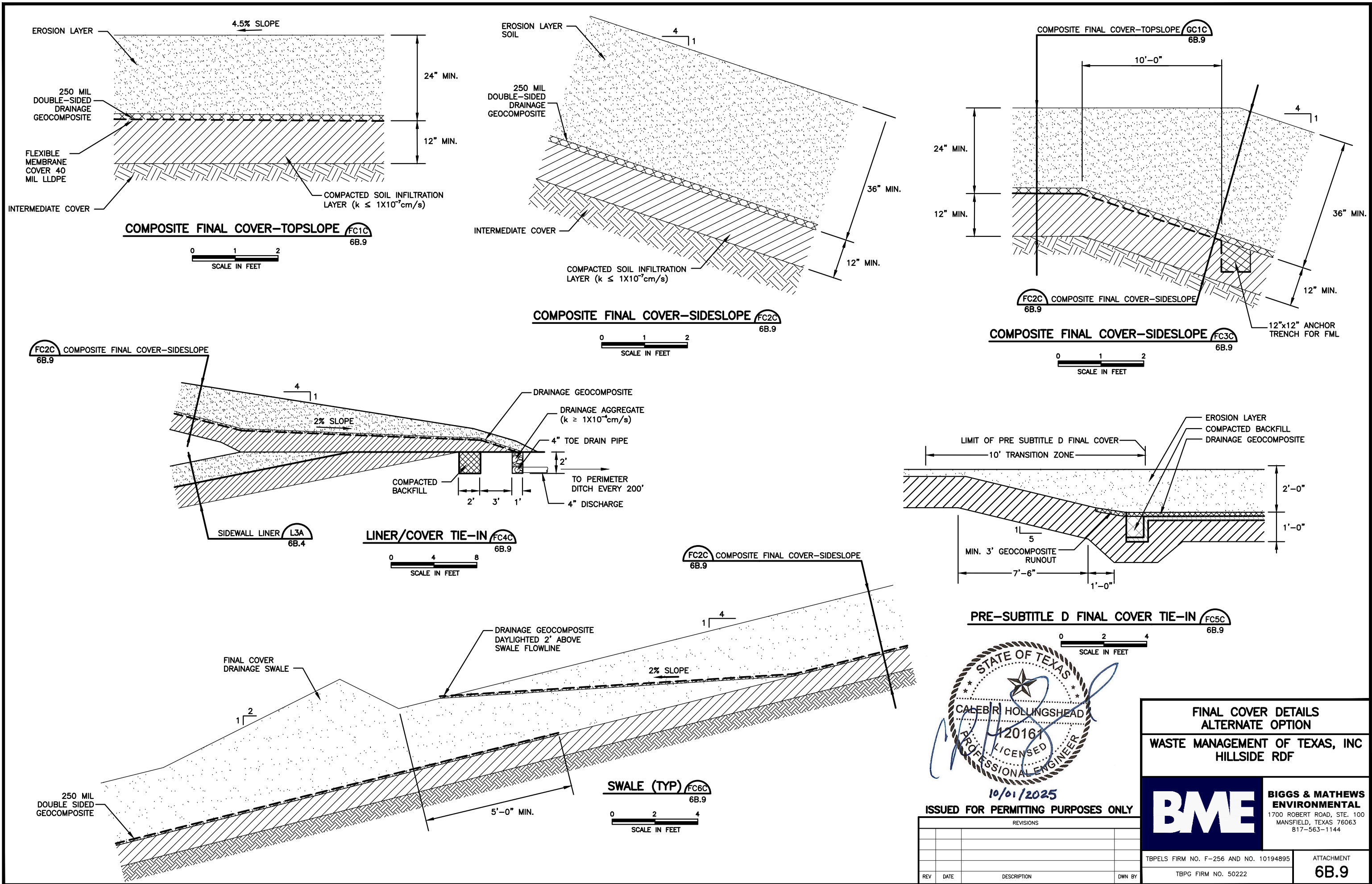
Compacted Clay Standard Subtitle D Infiltration Layer¹ Final Cover System Option		GCL Alternate Subtitle D Infiltration Layer Final Cover System Option		Composite Alternate Subtitle D w/ CCL Infiltration Layer Final Cover System Option	
Top Slopes	Side Slopes	Top Slopes	Side Slopes	Top Slopes	Side Slopes
24-inch-thick erosion layer	24-inch-thick erosion layer	24-inch-thick erosion layer	24-inch-thick erosion layer	24-inch-thick erosion layer	36-inch-thick erosion layer
Single-sided drainage geocomposite	Double-sided drainage geocomposite	Single-sided drainage geocomposite	Double-sided drainage geocomposite	Double-sided drainage geocomposite	Double-sided drainage geocomposite
40 mil VLDPE or LLDPE geomembrane (smooth)	40 mil VLDPE or LLDPE geomembrane (textured)	40 mil VLDPE or LLDPE geomembrane (smooth)	40 mil VLDPE or LLDPE geomembrane (textured)	40 mil LLDPE geomembrane (textured)	N/A
18-inch-thick compacted clay infiltration layer with $k = 10^{-5}$ cm/s	18-inch-thick compacted clay infiltration layer with $k = 10^{-5}$ cm/s	GCL (unreinforced)	GCL (reinforced)	12-inch-thick compacted clay infiltration layer with $k = 10^{-7}$ cm/s	12-inch-thick compacted clay infiltration layer with $k = 10^{-7}$ cm/s

¹ Pre-Subtitle D liner areas are designed with an 18-inch-thick compacted clay infiltration layer with a hydraulic conductivity of equal or less than the hydraulic conductivity of underlying liner systems for the requirements of Title 30 TAC §330.253(b)(2).

The location of the final cover system areas and details are shown on Attachment 6B.2. Details of the final cover system option with compacted clay infiltration layer are presented in Attachment 6B.7. Details of the final cover system option with GCL infiltration layer are presented in Attachment 6B.8. Details of the composite alternate final cover system option with compacted clay infiltration layer are presented on Attachment 6B.9. Design demonstrations for GCL, alternate Subtitle D final cover infiltration layer are presented in Attachment 6D. Design demonstrations for the alternate Subtitle D final cover system option with compacted clay infiltration and composite drainage are presented in Attachment 6E. Material specifications along with construction and testing procedures for the final cover system options are provided in Attachment 12, Appendix 12A – Final Cover System Quality Control Plan.

A geotechnical report including stability demonstrations for both liner and final cover systems is provided in Attachment 4 – Geology and Geotechnical Report.

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ISSUED FOR PERMITTING PURPOSES ONLY

REVISIONS			
REV	DATE	DESCRIPTION	DWN BY

**FINAL COVER DETAILS
ALTERNATE OPTION**

**WASTE MANAGEMENT OF TEXAS, INC
HILLSIDE RDF**

BME

**BIGGS & MATHEWS
ENVIRONMENTAL**
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPCLS FIRM NO. F-256 AND NO. 10194895
TBPG FIRM NO. 50222

ATTACHMENT
6B.9

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-523B**

**PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 6E
ALTERNATE FINAL COVER DESIGN DEMONSTRATION
(COMPOSITE OPTION)**

Prepared for

Waste Management of Texas, Inc.

October 2025



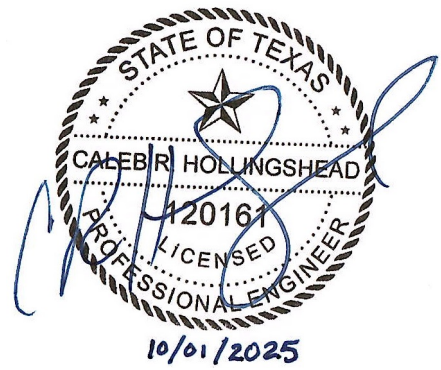
Prepared by

BIGGS & MATHEWS ENVIRONMENTAL

1700 Robert Road, Suite 100 • Mansfield, Texas 76063 • 817-563-1144

TEXAS BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
FIRM REGISTRATION NO. F-256 AND NO. 10194895

TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS
FIRM REGISTRATION NO. 50222



CONTENTS

1	ALTERNATE FINAL COVER	1
2	PERFORMANCE EVALUATION	2
3	RESULTS.....	3

APPENDIX 6E.A Help Model Results

1 ALTERNATE FINAL COVER

In accordance with 30 TAC §330.457(d), the proposed alternate final covers achieve an equivalent reduction in infiltration and provide equivalent erosion protection as the prescribed system. The prescribed final cover system for MSW landfill units with a synthetic bottom liner, as described in 30 TAC §330.457(a)(1,3), consists of the following components from top to bottom:

- A minimum erosion layer consisting of 6-inches of earthen material capable of sustaining native plant growth;
- A clay-rich soil cover layer consisting of a minimum of 18-inches of earthen material with a minimum coefficient of permeability of 1×10^{-5} cm/sec, and;
- A synthetic membrane.

The following additional alternate final cover system is proposed for the Hillside Recycling and Disposal Facility, listed from top to bottom:

Top Deck – Composite Option:

- 24-inch soil erosion layer;
- 250-mil double-sided geocomposite;
- 40-mil LLDPE geomembrane cover, and;
- 12-inch infiltration layer consisting of compacted soils ($k \leq 1 \times 10^{-7}$ cm/s).

Side Slope – Composite Option:

- 36-inch erosion layer;
- 250-mil double-sided geocomposite, and;
- 12-inch infiltration layer consisting of compacted soils ($k \leq 1 \times 10^{-7}$ cm/s).

Perforated HDPE pipe will be installed at the toe of the slope and the geocomposite drainage layer will daylight at intervals approximately 100 feet on the side slopes to collect drainage from the geocomposite drainage layer. The perforated piping will collect the drainage and direct the flow into the perimeter drainage system. The daylighted drainage geocomposite will collect drainage and direct the flow into the invert of the final cover swales and into the final cover letdown structures. Details of the geocomposite alternate final cover system are shown on Attachment 6B-9

2 PERFORMANCE EVALUATION

The performances of the top deck and sideslope composite option alternate final cover designs were evaluated using the HELP computer modelling program (HELP Model Version 4.0.1). The HELP model simulates hydrologic processes for a landfill by performing daily, sequential water budget analyses using a quasi-two-dimensional deterministic approach. The model accepts weather, soil, and design data and uses solution techniques to account for key factors affecting water movement within the landfill. The model accounts for both surface and sub-surface processes including transpiration, surface runoff, evaporation, vertical percolation, saturated lateral drainage, and geosynthetics leakage to estimate the various movements of water within the selected profile.

The performance evaluations were performed for a unit area of landfill final cover modeled for thirty years. Each model assumed near steady-state values for the simulation period. The model requires input design data including daily and general climatological records, site-specific soil parameters, material properties, and landfill design data. Models for the prescriptive and alternate final cover systems are provided in Appendix 6E-A.

3 RESULTS

Four HELP model simulations were conducted to estimate the percolation through the cover systems. Two HELP model simulations were conducted for final cover systems (top deck and sideslope) prescribed by current regulations and two HELP model simulations were conducted for alternate final cover systems (top deck and sideslope). Results from the models are summarized below.

HELP Model Results – Estimated Percolation

Final Cover System Configuration	Description	Avg. Annual Total Summary
		(in.)
Prescriptive	Top Deck	0.2349
	Side Slope	0.2161
Alternate	Top Deck	0.0000
	Side Slope	0.0157

Final Cover System Configuration	Description	Peak Values Summary
		(in.)
Prescriptive	Top Deck	0.0032
	Side Slope	0.0032
Alternate	Top Deck	0.0000
	Side Slope	0.0019

The simulations demonstrate that the proposed alternate final cover systems will provide a greater reduction in infiltration than the prescribed cover system. The erosion layer evaluation, provided in the final cover drainage structure design in Appendix 6A-D, demonstrates the thickness of the alternate final cover erosion layer is greater than the anticipated losses due to erosion.

APPENDIX 6E.A
HELP MODEL
RESULTS

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Hillside FC: Prescribed (Slope... **Simulated On:** 8/25/2025 13:09

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

SiCL - Silty Clay Loam

Material Texture Number 12

Thickness	=	6 inches
Porosity	=	0.471 vol/vol
Field Capacity	=	0.342 vol/vol
Wilting Point	=	0.21 vol/vol
Initial Soil Water Content	=	0.3081 vol/vol
Effective Sat. Hyd. Conductivity	=	4.20E-05 cm/sec

Layer 2

Type 1 - Vertical Percolation Layer

SC/CL - Hillside Clays (Uncompacted)

Material Texture Number 43

Thickness	=	18 inches
Porosity	=	0.464 vol/vol
Field Capacity	=	0.31 vol/vol
Wilting Point	=	0.187 vol/vol
Initial Soil Water Content	=	0.3866 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-05 cm/sec

Layer 3

Type 4 - Flexible Membrane Liner

LLDPE Membrane

Material Texture Number 103

Thickness	=	0.04 inches
Effective Sat. Hyd. Conductivity	=	4.00E-13 cm/sec
FML Pinhole Density	=	3 Holes/Acre
FML Installation Defects	=	4 Holes/Acre
FML Placement Quality	=	3 Good

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	92.4
Fraction of Area Allowing Runoff	=	100 %
Area projected on a horizontal plane	=	1 acres
Evaporative Zone Depth	=	24 inches
Initial Water in Evaporative Zone	=	8.807 inches
Upper Limit of Evaporative Storage	=	11.178 inches
Lower Limit of Evaporative Storage	=	4.626 inches
Initial Snow Water	=	0 inches
Initial Water in Layer Materials	=	8.807 inches
Total Initial Water	=	8.807 inches
Total Subsurface Inflow	=	0 inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	33.59 Degrees
Maximum Leaf Area Index	=	5
Start of Growing Season (Julian Date)	=	92 days
End of Growing Season (Julian Date)	=	304 days
Average Wind Speed	=	3.0205 mph
Average 1st Quarter Relative Humidity	=	76 %
Average 2nd Quarter Relative Humidity	=	75 %
Average 3rd Quarter Relative Humidity	=	62 %
Average 4th Quarter Relative Humidity	=	72 %

Note: Evapotranspiration data was obtained for Sherman, Texas

Normal Mean Monthly Precipitation (inches)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
2.086799	2.828526	3.948355	3.17834	4.303475	4.082366
2.724216	2.00808	3.604575	3.968115	2.603518	2.841304

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54

Normal Mean Monthly Temperature (Degrees Fahrenheit)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
50.1	53.4	61.7	71.6	83.5	91.4
94.8	90.9	83.4	74.1	60.8	56.4

Note: Temperature was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54
 Solar radiation was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54

Average Annual Totals Summary

Title: Hillside FC: Prescribed (Slope)

Simulated on: 8/25/2025 13:12

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	38.18	[4.24]	138,584.9	100.00
Runoff	6.752	[2.453]	24,508.3	17.68
Evapotranspiration	31.218	[3.078]	113,323.1	81.77
Subprofile1				
Percolation/leakage through Layer 3	0.216142	[0.119081]	784.6	0.57
Average Head on Top of Layer 3	4.0109	[2.539]	---	---
Water storage				
Change in water storage	-0.0086	[1.9763]	-31.0	-0.02

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Hillside FC: Prescribed (Slope)

Simulated on: 8/25/2025 13:12

	Peak Values for Years 1 - 30*	
	(inches)	(cubic feet)
Precipitation	4.79	17,401.2
Runoff	3.976	14,432.8
Subprofile1		
Percolation/leakage through Layer 3	0.003240	11.8
Average head on Layer 3	24.0000	
Other Parameters		
Snow water	4.7484	17,236.9
Maximum vegetation soil water	0.4658 (vol/vol)	
Minimum vegetation soil water	0.1928 (vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Hillside FC: Prescribed (Slope)

Simulated on: 8/25/2025 13:12

Simulation period: 30 years

Layer	Final Water Storage	
	(inches)	(vol/vol)
1	1.9169	0.3195
2	6.6335	0.3685
3	0.0000	0.0000
Snow water	0.0000	---

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Hillside FC: Prescribed (Top) **Simulated On:** 8/25/2025 12:39

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

SiCL - Silty Clay Loam

Material Texture Number 12

Thickness	=	6 inches
Porosity	=	0.471 vol/vol
Field Capacity	=	0.342 vol/vol
Wilting Point	=	0.21 vol/vol
Initial Soil Water Content	=	0.3071 vol/vol
Effective Sat. Hyd. Conductivity	=	4.20E-05 cm/sec

Layer 2

Type 1 - Vertical Percolation Layer

SC/CL - Hillside Clays (Uncompacted)

Material Texture Number 43

Thickness	=	18 inches
Porosity	=	0.464 vol/vol
Field Capacity	=	0.31 vol/vol
Wilting Point	=	0.187 vol/vol
Initial Soil Water Content	=	0.4002 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-05 cm/sec

Layer 3

Type 4 - Flexible Membrane Liner

LLDPE Membrane

Material Texture Number 103

Thickness	=	0.04 inches
Effective Sat. Hyd. Conductivity	=	4.00E-13 cm/sec
FML Pinhole Density	=	3 Holes/Acre
FML Installation Defects	=	4 Holes/Acre
FML Placement Quality	=	3 Good

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	91.7
Fraction of Area Allowing Runoff	=	100 %
Area projected on a horizontal plane	=	1 acres
Evaporative Zone Depth	=	24 inches
Initial Water in Evaporative Zone	=	9.046 inches
Upper Limit of Evaporative Storage	=	11.178 inches
Lower Limit of Evaporative Storage	=	4.626 inches
Initial Snow Water	=	0 inches
Initial Water in Layer Materials	=	9.046 inches
Total Initial Water	=	9.046 inches
Total Subsurface Inflow	=	0 inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	33.59 Degrees
Maximum Leaf Area Index	=	5
Start of Growing Season (Julian Date)	=	92 days
End of Growing Season (Julian Date)	=	304 days
Average Wind Speed	=	3.0205 mph
Average 1st Quarter Relative Humidity	=	76 %
Average 2nd Quarter Relative Humidity	=	75 %
Average 3rd Quarter Relative Humidity	=	62 %
Average 4th Quarter Relative Humidity	=	72 %

Note: Evapotranspiration data was obtained for Sherman, Texas

Normal Mean Monthly Precipitation (inches)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
2.086799	2.828526	3.948355	3.17834	4.303475	4.082366
2.724216	2.00808	3.604575	3.968115	2.603518	2.841304

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54

Normal Mean Monthly Temperature (Degrees Fahrenheit)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
50.1	53.4	61.7	71.6	83.5	91.4
94.8	90.9	83.4	74.1	60.8	56.4

Note: Temperature was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54
 Solar radiation was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54

Average Annual Totals Summary

Title: Hillside FC: Prescribed (Top)

Simulated on: 8/25/2025 12:42

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	38.18	[4.24]	138,584.9	100.00
Runoff	6.294	[2.461]	22,845.5	16.48
Evapotranspiration	31.660	[3.111]	114,924.2	82.93
Subprofile1				
Percolation/leakage through Layer 3	0.234856	[0.121003]	852.5	0.62
Average Head on Top of Layer 3	4.4171	[2.565]	---	---
Water storage				
Change in water storage	-0.0103	[2.0048]	-37.3	-0.03

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Hillside FC: Prescribed (Top)

Simulated on: 8/25/2025 12:42

	Peak Values for Years 1 - 30*	
	(inches)	(cubic feet)
Precipitation	4.79	17,401.2
Runoff	3.909	14,190.7
Subprofile1		
Percolation/leakage through Layer 3	0.003240	11.8
Average head on Layer 3	24.0000	
Other Parameters		
Snow water	4.7484	17,236.9
Maximum vegetation soil water	0.4658 (vol/vol)	
Minimum vegetation soil water	0.1928 (vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Hillside FC: Prescribed (Top)

Simulated on: 8/25/2025 12:43

Simulation period: 30 years

Layer	Final Water Storage	
	(inches)	(vol/vol)
1	1.9193	0.3199
2	6.8189	0.3788
3	0.0000	0.0000
Snow water	0.0000	---

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Hillside FC: Opt. Alt. (Top) **Simulated On:** 8/25/2025 12:46

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

SiCL - Silty Clay Loam

Material Texture Number 12

Thickness	=	24 inches
Porosity	=	0.471 vol/vol
Field Capacity	=	0.342 vol/vol
Wilting Point	=	0.21 vol/vol
Initial Soil Water Content	=	0.3406 vol/vol
Effective Sat. Hyd. Conductivity	=	4.20E-05 cm/sec

Layer 2

Type 2 - Lateral Drainage Layer

250-mil DS 6oz Composite

Material Texture Number 123

Thickness	=	0.25 inches
Porosity	=	0.85 vol/vol
Field Capacity	=	0.01 vol/vol
Wilting Point	=	0.005 vol/vol
Initial Soil Water Content	=	0.01 vol/vol
Effective Sat. Hyd. Conductivity	=	5.00E+01 cm/sec
Slope	=	4.5 %
Drainage Length	=	250 ft

Layer 3

Type 4 - Flexible Membrane Liner

LLDPE Membrane

Material Texture Number 103

Thickness	=	0.04 inches
Effective Sat. Hyd. Conductivity	=	4.00E-13 cm/sec
FML Pinhole Density	=	2 Holes/Acre
FML Installation Defects	=	3 Holes/Acre
FML Placement Quality	=	3 Good

Layer 4

Type 3 - Barrier Soil Liner

Liner Soil (High)

Material Texture Number 16

Thickness	=	12 inches
Porosity	=	0.427 vol/vol
Field Capacity	=	0.418 vol/vol
Wilting Point	=	0.367 vol/vol
Initial Soil Water Content	=	0.427 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07 cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	91.7
Fraction of Area Allowing Runoff	=	100 %
Area projected on a horizontal plane	=	1 acres
Evaporative Zone Depth	=	24 inches
Initial Water in Evaporative Zone	=	8.173 inches
Upper Limit of Evaporative Storage	=	11.304 inches
Lower Limit of Evaporative Storage	=	5.04 inches
Initial Snow Water	=	0 inches
Initial Water in Layer Materials	=	13.3 inches
Total Initial Water	=	13.3 inches
Total Subsurface Inflow	=	0 inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	33.59 Degrees
Maximum Leaf Area Index	=	5
Start of Growing Season (Julian Date)	=	92 days
End of Growing Season (Julian Date)	=	304 days
Average Wind Speed	=	3.0205 mph
Average 1st Quarter Relative Humidity	=	76 %
Average 2nd Quarter Relative Humidity	=	75 %
Average 3rd Quarter Relative Humidity	=	62 %
Average 4th Quarter Relative Humidity	=	72 %

Note: Evapotranspiration data was obtained for Sherman, Texas

Normal Mean Monthly Precipitation (inches)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
2.086799	2.828526	3.948355	3.17834	4.303475	4.082366
2.724216	2.00808	3.604575	3.968115	2.603518	2.841304

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54

Normal Mean Monthly Temperature (Degrees Fahrenheit)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
50.1	53.4	61.7	71.6	83.5	91.4
94.8	90.9	83.4	74.1	60.8	56.4

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54

Average Annual Totals Summary

Title: Hillside FC: Opt. Alt. (Top)

Simulated on: 8/25/2025 12:49

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	38.18	[4.24]	138,584.9	100.00
Runoff	4.898	[1.6]	17,779.0	12.83
Evapotranspiration	30.324	[3.064]	110,075.4	79.43
Subprofile1				
Lateral drainage collected from Layer 2	2.9543	[1.8973]	10,723.9	7.74
Percolation/leakage through Layer 4	0.000001	[0]	0.0026	0.00
Average Head on Top of Layer 3	0.0002	[0.0001]	---	---
Water storage				
Change in water storage	0.0018	[1.3604]	6.6246	0.00

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Hillside FC: Opt. Alt. (Top)

Simulated on: 8/25/2025 12:50

	Peak Values for Years 1 - 30*	
	(inches)	(cubic feet)
Precipitation	4.79	17,401.2
Runoff	3.060	11,106.6
Subprofile1		
Drainage collected from Layer 2	0.5751	2,087.8
Percolation/leakage through Layer 4	0.000000	0.0002
Average head on Layer 3	0.0126	---
Maximum head on Layer 3	0.0226	---
Location of maximum head in Layer 2	0.00	(feet from drain)
Other Parameters		
Snow water	4.7484	17,236.9
Maximum vegetation soil water	0.4240	(vol/vol)
Minimum vegetation soil water	0.2100	(vol/vol)

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Hillside FC: Opt. Alt. (Top)

Simulated on: 8/25/2025 12:50

Simulation period: 30 years

Layer	Final Water Storage	
	(inches)	(vol/vol)
1	8.2282	0.3428
2	0.0025	0.0100
3	0.0000	0.0000
4	5.1240	0.4270
Snow water	0.0000	---

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Hillside FC: Opt. Alt. (Slope) **Simulated On:** 8/25/2025 13:18

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

SiCL - Silty Clay Loam

Material Texture Number 12

Thickness	=	36 inches
Porosity	=	0.471 vol/vol
Field Capacity	=	0.342 vol/vol
Wilting Point	=	0.21 vol/vol
Initial Soil Water Content	=	0.3279 vol/vol
Effective Sat. Hyd. Conductivity	=	4.20E-05 cm/sec

Layer 2

Type 2 - Lateral Drainage Layer

250-mil DS 6oz Composite

Material Texture Number 123

Thickness	=	0.25 inches
Porosity	=	0.85 vol/vol
Field Capacity	=	0.01 vol/vol
Wilting Point	=	0.005 vol/vol
Initial Soil Water Content	=	0.01 vol/vol
Effective Sat. Hyd. Conductivity	=	5.00E+01 cm/sec
Slope	=	25 %
Drainage Length	=	100 ft

Layer 3

Type 3 - Barrier Soil Liner

Liner Soil (High)

Material Texture Number 16

Thickness	=	12 inches
Porosity	=	0.427 vol/vol
Field Capacity	=	0.418 vol/vol
Wilting Point	=	0.367 vol/vol
Initial Soil Water Content	=	0.427 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07 cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	92.4
Fraction of Area Allowing Runoff	=	100 %
Area projected on a horizontal plane	=	1 acres
Evaporative Zone Depth	=	36 inches
Initial Water in Evaporative Zone	=	11.804 inches
Upper Limit of Evaporative Storage	=	16.956 inches
Lower Limit of Evaporative Storage	=	7.56 inches
Initial Snow Water	=	0 inches
Initial Water in Layer Materials	=	16.93 inches
Total Initial Water	=	16.93 inches
Total Subsurface Inflow	=	0 inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	33.59 Degrees
Maximum Leaf Area Index	=	5
Start of Growing Season (Julian Date)	=	92 days
End of Growing Season (Julian Date)	=	304 days
Average Wind Speed	=	3.0205 mph
Average 1st Quarter Relative Humidity	=	76 %
Average 2nd Quarter Relative Humidity	=	75 %
Average 3rd Quarter Relative Humidity	=	62 %
Average 4th Quarter Relative Humidity	=	72 %

Note: Evapotranspiration data was obtained for Sherman, Texas

Normal Mean Monthly Precipitation (inches)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
2.086799	2.828526	3.948355	3.17834	4.303475	4.082366
2.724216	2.00808	3.604575	3.968115	2.603518	2.841304

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 33.59/-96.54

Normal Mean Monthly Temperature (Degrees Fahrenheit)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
50.1	53.4	61.7	71.6	83.5	91.4
94.8	90.9	83.4	74.1	60.8	56.4

Note: Temperature was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54
 Solar radiation was simulated based on HELP V4 weather simulation for:
 Lat/Long: 33.59/-96.54

Average Annual Totals Summary

Title: Hillside FC: Opt. Alt. (Slope)

Simulated on: 8/25/2025 13:22

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	38.18	[4.24]	138,584.9	100.00
Runoff	5.309	[1.686]	19,272.5	13.91
Evapotranspiration	31.044	[3.108]	112,688.7	81.31
Subprofile1				
Lateral drainage collected from Layer 2	1.8150	[1.7279]	6,588.5	4.75
Percolation/leakage through Layer 3	0.015730	[0.014488]	57.1	0.04
Average Head on Top of Layer 3	0.0001	[0.0001]	---	---
Water storage				
Change in water storage	-0.0061	[1.9234]	-22.0	-0.02

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Hillside FC: Opt. Alt. (Slope)

Simulated on: 8/25/2025 13:22

	Peak Values for Years 1 - 30*	
	(inches)	(cubic feet)
Precipitation	4.79	17,401.2
Runoff	3.254	11,811.8
Subprofile1		
Drainage collected from Layer 2	0.4938	1,792.6
Percolation/leakage through Layer 3	0.001907	6.9226
Average head on Layer 3	0.0106	---
Maximum head on Layer 3	0.0015	---
Location of maximum head in Layer 2	0.00 (feet from drain)	
Other Parameters		
Snow water	4.7484	17,236.9
Maximum vegetation soil water	0.4152 (vol/vol)	
Minimum vegetation soil water	0.2100 (vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Hillside FC: Opt. Alt. (Slope)

Simulated on: 8/25/2025 13:22

Simulation period: 30 years

Layer	Final Water Storage	
	(inches)	(vol/vol)
1	11.6224	0.3228
2	0.0025	0.0100
3	5.1240	0.4270
Snow water	0.0000	---

**HILLSIDE RECYCLING AND DISPOSAL FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-523B**

**PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 12
FINAL CLOSURE PLAN**

Prepared for

Waste Management of Texas, Inc.

Permit Issued June 30, 2005
Revised September 2005
Revised July 2007
Revised April 2009
Revised July 2022
Revised April 2024
Revised October 2025



Prepared by

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CONTENTS

1	INTRODUCTION	12-1
2	FINAL COVER SYSTEM	12-3
	2.1 Introduction	12-3
	2.2 Cover System Design	12-3
	2.3 Installation Methods and Procedures	12-5
3	CLOSURE PROCEDURES	12-6
	3.1 Sequence of Final Cover Placement	12-6
	3.2 Closure During Active Life	12-6
	3.2.1 Estimate of Largest Areas Ever Requiring Final Cover	12-7
	3.2.2 Estimate of Maximum Inventory of Waste Ever On Site	12-7
4	FINAL CLOSURE SCHEDULE	12-9
	4.1 Final Closure Requirements	12-9
	4.2 Provisions for Extending Closure Period	12-10
5	CLOSURE COST ESTIMATE	12-12

APPENDIX 12A

Final Cover Quality Control Plan

- An 18-inch-thick compacted clay infiltration layer with a coefficient of permeability of less than or equal to 1×10^{-5} cm/sec. This layer may be replaced with a reinforced geosynthetic clay liner (GCL) that has a coefficient of permeability of less than 5×10^{-9} cm/sec.

Subtitle D Area (Alternate Composite Option)

- An erosion layer consisting of 24-inch-thick layer of earthen material (topslope) and 36-inch-thick earthen material (sideslope), with the top 6 inches capable of sustaining vegetative growth.
- A drainage layer consisting of 250-mil double-sided drainage geocomposite.
- A 40-mil textured linear low-density polyethylene (LLDPE) geomembrane on the topslopes, or other equivalent material.
- A 12-inch-thick compacted clay infiltration layer with a coefficient of permeability less than or equal to 1×10^{-7} cm/sec.

Pre-Subtitle D Area

- An erosion layer consisting of a minimum 6-inch-thick layer of earthen material capable of sustaining plant growth. This layer will consist of native or introduced grasses capable of providing 85 percent coverage over the cover.
- An 18-inch-thick infiltration layer with a coefficient of permeability of less than or equal to the permeability of any constructed bottom liner or natural subsoil present. Consistent with §330.253(b)(2), the coefficient of permeability shall not exceed 1×10^{-5} cm/sec.

The erosion layer is provided to minimize the erosion potential of the cover slopes. This layer was evaluated using the universal soil loss equation (USLE) developed by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS). The evaluation is presented in Attachment 6A – Drainage Design Report (Appendix 6A-D). The low permeability components of the final cover system (the geomembrane and/or the compacted clay infiltration layer) are designed to minimize infiltration of surface water into the underlying waste material.

Landfill gas generated in the landfill will be vented to the atmosphere through passive vents or collected by extraction wells, as discussed in Attachment 14 – Landfill Gas Management Plan. The landfill gas passive vents will reduce gas pressure buildup under the final cover.