CORRESPONDENCE COVER SHEET
WASTE PERMITS DIVISION
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Date: 11/18/2022
Facility Name: City of Victoria Landfill
Permit or Registration No.: MSW #1522-B, RN100212968

Nature of Correspondence:
☐ Initial/New
☒ Response/Revision*

*If Response/Revision, please provide previous TCEQ Tracking No.: 27435345
(Previous TCEQ Tracking No. can be found in the Subject line of the TCEQ's response letter to your original submittal.)

This cover sheet should accompany all correspondences submitted to the Waste Permits Division and should be affixed to the front of your submittal as a cover page. Please check the appropriate box for the type of correspondence being submitted. For questions regarding this form, please contact the Waste Permits Division at (512) 239-2335.

Table 1 - Municipal Solid Waste

APPLICATIONS	REPORTS and RESPONSES
☐ New Notification	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Groundwater Alternate SRC Demonstration
☐ New Registration (including Subchapter T)	☐ Groundwater Corrective Action
☒ Major Amendment	☐ Groundwater Monitoring Report
☐ Minor Amendment	☐ Groundwater Statistical Evaluation
☐ Limited Scope Major Amendment	☐ Landfill Gas Corrective Action
☐ Notice Modification	☐ Landfill Gas Monitoring
☐ Non-Notice Modification	☐ Liner Evaluation Report
☐ Transfer/Name Change Modification	☐ Soil Boring Plan
☐ Temporary Authorization	☐ Special Waste Request
☐ Voluntary Revocation	☐ Other:
☐ Subchapter T Workplan	
☐ Other:	

Table 2 - Industrial & Hazardous Waste

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

December 9, 2022

Mr. Frank Zeng
Project Manager
Waste Permits Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building F (MC-124)
Austin, TX 78753

Re: Response to Second Technical Notice of Deficiency (TCEQ Tracking No. 27435345)
City of Victoria Landfill (Type I)
Victoria, Victoria County, Texas
CN600243257/RN100212968
Proposed TCEQ Permit Number MSW-1522B
Major Amendment Permit Application

Dear Mr. Zeng:

On behalf of the City of Victoria, Burns & McDonnell is submitting the enclosed response to the second technical notice of deficiency (NOD) provided via email on October 3, 2022 from the Texas Commission on Environmental Quality (TCEQ) for the City of Victoria Landfill application. The permit application has been revised to address the NOD. The NOD comments and responses are provided in the following NOD table. As a result of the NOD comments and subsequent discussion with TCEQ, this response includes revised final cover and stormwater design elements for the proposed expansion area. Additionally, the landfill gas collection system plan has been updated to reflect recent collection well installation at the Landfill.

Attached is an original and one (1) unmarked copy of the pages that were revised to address the NOD. In addition, one redline/strikeout copy of the revised pages is also attached. An additional one (1) unmarked copy has been mailed directly to the TCEQ Region 14 Regional Office.

We appreciate your review of the enclosed materials and look forward to your comments. If you have any questions, please do not hesitate to contact me.

Sincerely,

Tonya Koller, PE
Project Engineer

TK/dlk

Copies submitted: Electronic Copy; 1 original and 2 copies (1 unmarked and 1 marked)

cc: Darryl Lesak, City of Victoria
Jeffrey Reed, Lloyd, Gosselink Rochelle & Townsend, P.C.

NOD ID	NOD Description	Response
NT1	*a. Compared to Drawing I/II.A.5, the revised Figure I/II.A.7 shows more wells within the proposed facility/permit boundary. Revise the drawing to distinguish between groundwater monitoring wells and water wells (potable and non-potable). It is noted that Section 13.0 of Part I/II states, "Existing active wells are associated with environmental monitoring."*	Figures I/II.A.5 and I/II.A.7 have been revised to show all wells within the proposed facility/permit boundary. Wells shown on Figure I/II.A.7 have been color-coded to indicate whether wells are monitoring, potable, or non-potable water wells. Section 13.0 of Part I/II has been updated to clarify the existing wells present onsite.
	b. The revised Drawing I/II.A.7 does not show any (active or abandoned) gas or oil wells. Revise Section 13.0 to be specific about active or abandoned gas or oil wells within the permit boundary (not just within the waste footprint).	Section 13.0 of Part I/II has been revised to specify that no active or abandoned gas or oil wells were identified within the permit boundary.
	c. Revise Section 13.0 to discuss how the water wells will be handled in accordance with 330.61(l)(1). It is noted that Section 13.0 includes discussions on future abandonment of the 2 non-potable water wells currently used for the existing composting operation. Note drinking water wells are not allowed within the permit boundary. Revise Section 13.0 to identify the 2 composting associated wells by well numbers shown in Drawing I/II.A.5. Revise Part IV, SOP as necessary.	Section 13.0 of Part I/II has been revised to discuss how wells 193787 and 155301 will be handled in accordance with 30 TAC 330.61(l)(1). These wells are shown on Figure I/II.A.5 in Appendix I/II-A.
	d. Discuss how the separately authorized composting operation will be handled when the landfill cells are developed. Revise the application as necessary.	Compost facility relocation is planned to occur prior to affected expansion development through the TCEQ registration process for composting operations. The application has been revised to include this language in Part I/II Section 13.0, Part III Section 4.8, and Part IV Section 8.0.
NT2	*NT14 of the first NOD was not adequately addressed. "Section I of the WAP indicates a special waste acceptance plan is included in SOP as Attachment 2. Revise the SOP to provide Attachment 2; or revise the WAP and SOP for consistency."*	Part I/II Appendix C-WAP has been revised to include the updated reference to the special waste acceptance plan (Appendix IV-B).
	It is noted that Appendix B in the SOP was revised to be Appendix IV-B while Section I of the Part I/II Appendix C-WAP still indicates a special waste acceptance plan in SOP, Attachment 2. Revise the application for consistency with references of appendices and attachments.	Part I/II Appendix C-WAP has been revised to include the updated reference to the special waste acceptance plan (Appendix IV-B).

NOD ID	NOD Description	Response
T3	*When addressing the following comments, please refer to the original comments under T15 of the first NOD if necessary.*	Noted.
	a. In response to the previous comment, a new table, Table I/II-1, is added to list the pre-Sub D areas (developed) and Sub D areas (developed or approved not yet developed). Revise Section 2.3.2 (Existing Liner System) of Part I/II to discuss leachate sumps installed at each area (or type of area). Revise I/II.B4 and Drawing C003 of Attachment 1 to show locations of leachate sumps for all existing cells (including cells to be vertically expanded); and if an existing cell does not have leachate sump, revise to clarify as such. Revise Section 2.3.2 to clarify whether the liner system described in Section 2.3.2 has been installed in pre-Sub D areas, Sub D areas, or both. Revise Section 2.3.2 to include additional liner descriptions as necessary. Ensure consistency between Section 2.3.2 of Part I/II and Section 4.6 text and table in Part III.	Section 2.3.2 of Part I/II has been revised to state which cells in the existing area have sumps. The locations of the sumps in the existing area have been added to Attachment III-1, Drawings III.A1.4 and III.A1.5. Section 2.3.2 has also been revised to clarify the components of the liner system for the Pre-Subtitle D and Subtitle D cells.
	b. To address Comment T3.a above, revise Drawing III.A1.12 to identify an additional cross-section for the north portion of the landfill. The new cross-section needs to run the same direction as the existing Cross-section A.	An additional cross section was added to Attachment III-1, Drawing III.A1.15B (new drawing) showing an east-west cut through Trench 9-10 sumps. The alignment of this new cross section is shown in the Base Grading Plans, Final Grading Plans and Environmental Monitoring Plan.
	c. Revise Section 2.3 to describe the final covers installed in areas listed in Table I/II-1.	Section 2.3.4 of Part I/II has been added to describe the components of the final covers installed in the areas listed in Table I/II-1.
	d. Revise Table I/II-1 to note the type of liner and the type of final cover installed, or to be installed, in each area.	Table I/II-1 has been revised to include footnotes that reference the relevant sections of Part I/II that discuss the liner system (Section 2.3.2 of Part I/II) and the final cover system (Section 2.3.4 of Part I/II) in each area. Section 2.3.4 of Part I/II also references the appropriate historic drawings that contain final cover details.
	e. Revise Table I/II-1 to identify which pre-Sub D areas are overlain by which Sub-D areas. Note Section 2.3.1 of Part I/II states that pre-Sub D areas are overlain by Sub D areas. Identify the Sub D areas that have	Section 2.3.1 of Part I/II has been revised to clarify that disposal following Subtitle D permit updates "was completed in accordance with the Subtitle D updates and vertical expansion as previously

NOD ID	NOD Description	Response
	or will be developed over the pre-Sub D areas. Revise Section 2.3.1 to specify where the detailed design information for the Sub D areas overlying the pre-Sub D areas are contained in this application.	approved by the TCEQ (formerly TNRCC), and no Subtitle D cells are overlaying pre-Subtitle D cells."
	f. Table I/II-1 lists Trenches 11 and 12 as developed Sub D areas. Revise Section 2.3 and Table I/II-1 to identify their locations (refer to drawings where they are shown) and to describe the liner and final cover installed.	Section 2.3.2 of Part I/II has been revised to include the liner components for the Subtitle D areas, including Trenches 11 and 12. Section 2.3.4 of Part I/II has been revised to include the final cover components for the Subtitle D areas, including Trenches 11 and 12. Table I/II-1 has been revised to include footnotes that reference these two sections. The last sentence of Section 2.3 of Part I/II has been revised to state the drawings that identify the locations of Trench 11 and Trench 12.
	g. Revise Section 2.3.3 of Part I/II to clarify whether the existing leachate collection system applies to pre-Sub D areas, Sub D areas or both areas. Revise this section to add more descriptions on existing leachate collection systems, as necessary. If necessary, revise Table I/II-1 to note the type of leachate collection system installed at each area. Note Sub D liner must be installed before Sub D areas can be developed over the Pre-Sub D areas.	Section 2.3.3 of Part I/II has been revised to describe the leachate collection system installed in each Cell/Trench. The section has also been revised to state that existing pre-Subtitle D cells do not have an existing leachate collection system. As clarified in Section 2.3.1 of Part I/II (in response to comment T3e), no subtitle D cells were constructed overlying pre-Subtitle D areas and vertical expansion in this area was completed in accordance with the previously approved permit and design.
	h. Regarding areas where vertical expansions are proposed over the existing areas, revise to discuss leachate sump design and operation. Revise Drawing III.A1.4 and other relevant drawings to show sumps for the western portion of the existing/authorized areas.	Section 2.3.2 of Part I/II has been revised to address leachate sumps in the vertical expansion area. As described in Attachment III-3-Leachate and Contaminated Water Plan, the previously permitted leachate sumps, conveyance, and storage design for this area are expected to be sufficient as increases in waste column will reduce peak leachate production and the prescriptive final cover design will reduce infiltration. Any sumps in Trench 5-10 have been added to Attachment III-1, Drawings III.A1.4-6 as appropriate.
T4	*a. As requested in the previous comment, revise Section 14.9.1 of Part I/II and other relevant portions of the application (for example, but not limited to, Section 4.6.1 of Part III) to use porosities determined from testing the actual materials involved. The effective porosities used in*	Section 14.9.1 of Part I/II and Section 4.6.1 of Part III have been revised to clarify assumptions and the associated justification for the selected porosities.

NOD ID	NOD Description	Response
	Attachment 5 (Geology Report) were estimated for fine sand. Justify the use of the estimated effective porosities.	
	b. The response to T21 Comment in the first NOD is acknowledged. Please address the original comment T21(e) regarding adding a demonstration based on the flow rate over a unit area (or flux). Note that fully addressing T21(e) Comment will unlikely change the current demonstration conclusion.	Section 14.9.1 of Part I/II has been revised to include a demonstration based on flux through the layer. The results of the flux demonstration confirm the proposed engineered subgrade will meet or exceed the groundwater protection resulting from the prescribed soil layer requirements of 30 TAC §335.584(b)(2).
	c. Revise the second paragraph in Section 4.3 of Part III by replacing "may" with "will" to designate all cells in the lateral areas for below grade Class 1 disposal with MSW only in the above grade areas. Revise Section 14.9.1 of Part I/II, Section 4.3 of Part III, and other relevant portions of the application, to indicate that prior to developing a cell in the lateral expansion areas for MSW only disposal, a permit modification must be filed to change that cell's designation.	Section 4.3 of Part III and Section 14.9.1 of Part I/II have been revised to state that all cells in the lateral expansion area will be used for the disposal of Class 1 waste below grade, and that prior to developing a cell in the lateral expansion area for MSW-only disposal, a permit modification will be filed to change that cell's designation.
	d. Revise Drawing III.A1.3 and other relevant drawings to specify that all cells in the lateral expansion are designated as a cell in which the Class 1 waste will be disposed of in below grade area with a note about changing this designation through a permit modification prior to the cell development (refer to Comment T4.c. above).	The Class 1 designation for each cell was provided on Attachment III-1, Drawing III.A1.4 in the previous submittal. A note has been added to Drawing III.A1.3 to reference that location, where the T4(d) revisions were made. The Class 1 designation has been revised to remove "OPTION FOR" and note 1 has been revised.
T5	*a. Revise the relevant portions in the application to specify that the material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in the landfill development (including waste and construction materials); and the professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed. The relevant portions of the application include, but not limited to, Attachments 4, 5, 7, 9, and 10 of Part III.*	Relevant sections of the application have been revised to specify that the material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in Landfill development and results will be reviewed to decide whether the stability analysis results are still valid. The professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed.
	b. Revise Part III, Attachment 7 to separately discuss veneer stability analysis results for liner and final cover systems; or, revise to include	Discussion of the veneer stability analysis results for liner and final cover systems has been included in Attachment III-7.

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	veneer stability analyses. Refer to the above comment on material properties.	
	c. Revise Part III, Attachment 10 to discuss necessary measures for construction on slopes steeper than 25%.	Attachment III-10 has been revised to discuss the necessary measures for construction on slopes steeper than 25%.
	d. Revise Part IV, Site Operating Plan, to discuss necessary measures for operation on slopes steeper than 25%. The necessary measures include, but not limited to, safe operation of waste hauling vehicles and waste spreading/compacting equipment.	Section 3.2 of Part IV has been revised to include training for the necessary measures for operation on slopes steeper than 25%.
T6	*a. The response to Comment T25 indicates that stability analysis for the existing areas (not under the vertical expansion) is not included in the application. Revise Attachment 7 to include all the existing areas in the stability analyses. Refer to Comment T3 of this NOD.*	As demonstrated in Attachment III-7, Appendix 7-A (Subsurface Information) and Appendix 7-D (Sections) the site is considered in whole. The specific interfaces changed by the proposed modification were evaluated in the slope stability analyses conducted by Burns & McDonnell and included in the Attachment III-7. Historical stability analyses are included for reference (and were previously added in response to Comment T25) as Attachment III-4, Appendix 4-I (Historical Analyses) for those areas not impacted by the proposed expansion. The historical analysis was performed by Golder Associates and accepted by TCEQ as part of the prior 1522 permit submittal.
	b. Revise to add stability analysis using peak strength for the cross-section which the factor of safety (FOS) is smaller than 1.5 in Table 6 on page Attachment 7-9.	Stability analysis using peak strength has been added for the cross-section with FOS smaller than 1.5.
T7	*a. The revisions made to address Comment T27 of the first NOD issued on June 30, 2022 (for example, but not limited to, Attachment 2, Section 3.1) are not clear whether the existing Outfall South and Outfall Northeast will continue function during the post-development (i.e., the conditions that will be authorized under the proposed MSW 1522B). If necessary, revise Section 3.1 of Attachment 2, Drawing III.A2.2, and Table 5-1 to discuss and show their pre- and post-development*	Attachment III-2, Section 3.1 has been updated (paragraph 2) to state that Outfalls Southwest and Northeast will continue to function post-expansion with no changes required. Attachment III-2 Drawings have been updated to clarify locations of all outfalls. Table 5-1 has not been updated as calculations have not been completed for existing permitted outfalls, but reference to historic drainage calculations in Appendix 2B have been included for reference.

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	conditions and the comparisons. Note the pre-development conditions are the ones authorized in the MSW 1522A.	
	b. The revised second paragraph on page Attachment 2-6 seems to indicate that there is no surface runoff onto the permit boundary for the pre- post-development comparison purpose. If it is true that there are no run-ons, revise to be clear about this.	Paragraph has been revised to clarify pre and post development run-on/runoff through the permit boundary.
	c. Revise the post-development drawings (for example, but not limited to, Drawing III.A2.2-1) to remove drainage features/routes that will be removed or will not be used under the post-development conditions. Drawing III.A2.2-1 shows a drainage route running through the middle of the west portion of the expansion area under the final closure condition.	Drainageways being removed/relocated/re-routed have been removed from Appendix 2A, Drawings III.A2.2 - III.A2.4.
	d. After addressing T4.a.-c., if necessary, revise Section 3.1 of Attachment and other relevant portions of the application to update the comparisons and their conclusions.	Relevant sections in Attachment III-2 have been reviewed and revised as appropriate. Existing landfill drainage design and calculations provide reference to Historical Drainage Report for MSW 1522A and are provided in Appendix 2B.
	e. The revisions made to Section 3.1 indicate that both West Pond and East Pond will function as Water Quality Ponds (and be of retention pond characteristic); and both ponds are unlined. The revisions also state that the water quality ponds will be used to improve the quality of the outfall from the proposed solid waste landfill. Since the applicant decides to design, install, and operate the ponds as water quality ponds with permanent pools, revise to provide sufficient freeboard and liner in accordance with 330.207 and 330.331(b). Revise to specify that the liner will be constructed following Attachment 4, Soil Liner Quality Control Plan. Refer to Comment T13 of this NOD related to on the ponded water infiltration.	Design of both ponds has been revised to remove the wet permanent pool and now only consist of dry bottom detention basins, the east basin to detain 25-year runoff and the west basin to detain the 1.5-inch first flush. The ponds were designed only to capture stormwater runoff and provide water quality as a best management practice. Neither pond is intended to capture leachate or contaminated landfill runoff, and converting to dry bottom basin, all references to "water quality" have been removed and replaced with "detention" or "basin", therefore no liner system is required.
	f. Revise to include the design to show how the water quality improvement is achieved. Revise Section 5.1.2 of Attachment 2 to refer	Mention of "ponds" and "water quality improvements" has been deleted as impoundments will now function strictly revised to dry detention basins (not pond), and no longer with a permanent pool.

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	to where the pond maintenance procedures are contained in the application.	Therefore, a liner system or specific pond maintenance procedures are no longer needed.
	g. The responses to Comment T27 are not clear where the runoff from the west portion of the existing area will discharge. Revise Drawings III.A2.2, III.A2.3 and III.A2.4 as necessary. Note Drawing III.A2.4 appears to show runoff from swales will discharge into existing downchutes then to a perimeter drainage system. Revise the newly added Table 3-1 on page Attachment 2-8 as necessary.	Appendix 2A, Drawings III.A2.2 - III.A2.4 flow arrows and notes revised to indicate that discharge from the existing west area (Outfall Southwest) will remain as-is, but the accepting downstream channel will be re-routed west along north expansion property line to Drainage Channel 1 along the west property line instead of running south from the existing detention pond straight through the expansion property.
	h. The response to Comment T27 states that water from the 100-year flood will be backed up into the perimeter drainage systems. Revise to clarify or revise to ensure that the water in the perimeter ditches will be at least one foot lower than the elevation of the top of the liner system during the 100-year flood events. It is noted that Drawings C-301 and C-503 show the landfill toe areas.	The perimeter drainage design takes into account the surrounding floodplain elevations that create the potential downstream submerged boundary conditions at Site Discharge Comparison points. Following 30 TAC 330.307, the minimum 3-foot of freeboard has been provided between the surrounding 100-year floodplain elevation and the elevation of perimeter embankments and the liner system. Following 30 TAC 330.303, the perimeter drainage system has been design to manage run-on and runoff during the 25-year rainfall event. After accounting for the downstream floodplain boundary condition, 1-foot of freeboard has been provided between the 25-year storm and liner system top elevation which also ensures capacity for the 100-year storm to not overtop the perimeter berm and remain below the top of liner elevation, however 1-foot of freeboard is not provided at all location. No freeboard requirement between 100-year and liner system could be found in the TAC.
	i. Drawing III.A2.4 shows the existing downchutes for the west portion of the existing area. The newly added Table I/II-1 indicates that some existing cells do not have final cover installed. Clarify whether the final contours and drainage systems of the existing cells will be altered in this application. Revise the application as necessary.	The final contours and drainage systems of existing constructed cells will not be altered in this new design. Additional scrutiny of final cover extents was provided in response to this comment and it was confirmed that the Trenches showing existing constructed downchutes have received Final Cover.

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	j. Revise Section 3.8 and 3.9 of Part III, Attachment 2 to briefly discuss the design of the 2 ponds; and refer to where the detailed design/modeling information is contained in the application. Revise to add the design information as necessary. For each pond, add one cross-section to show the pond profile in the direction of water flow. Ensure the cross-sections show the liner system.	Sections 3.8 and 3.9 of Part III have been expanded to further describe the basin design and references provided to additional sections and the appendix for modeling results summaries. Cross section of ponds added to Permit Drawings (Attachment III-1, III.A1.21 and 21B). Wet pond and permanent pool design has been eliminated for dry bottom detention basins, so no liner system is proposed.
	k. Revise Drawing III.A1.21 to show the ponds' inlet structures.	Basin inlet structures included on Attachment III-1, Drawings III.A1.21 and III.A2.21B.
T8	*a. Per 330.167, revise Attachment 3, Section 3.1 to be consistent with Section 7.19 of Part IV with respect to "seven day" requirements. Insert "that is not contaminated" between "Ponded water" and "in areas" in the last paragraph on page IV-48. Change "Water" in the last sentence of the first paragraph on page IV-49 to "Uncontaminated water."*	Section 3.1 of Attachment III-3 has been revised to be consistent with Section 7.19 of Part IV regarding the "seven day" requirement. The text in Section 7.19 of Part IV has been modified to clarify how non-contaminated water and contaminated water will be managed.
	b. Revise to address Comment T31(i) of the first NOD. Note the working face is defined/described in Part IV, SOP (for example, but not limited to, in Section 7.2.1). For clarification purpose, revise other portions of the application as appropriate (for example, but not limited to, Section 4.0 of Attachment 2, Section 3.0 and Appendix 3E of Attachment 3). Refer to the definition of Active Disposal Area under 330.3(2).	Detail 6 on Drawing III.A1.17 in Attachment III-1 has been modified to show a key map with general dimensions of the working face. The description of the working face is Part IV, Section 7.2.1 and 7.2.4 has been updated to properly reference daily cover and ADC. Attachment III-3 Appendix 3E and Attachment III-2 Section 4.0 have been updated to refer to this area as "working face" rather than "active face".
	c. Detail 6 added to Drawing III.A1.17 seems to show berms built on intermediate cover. Note that under 330.165(a) and (c), runoff from intact daily cover or intermediate cover is not considered as having come into contact with the working face or leachate. Revise Detail 6 and other relevant portions of the application as appropriate. Also, refer to the above comments.	Detail 6 on Drawing III.A1.17 in Attachment III-1 has been revised to remove the intermediate cover that had been shown within the active face while keeping the 2-foot depth of the containment/diversion berms. The term "Stormwater" has been changed to "Uncontaminated Water" per comment T8(a).
	d. The responses to Comment T31 of the first NOD stated that evaporation pond has been removed from the application. The revised application still includes evaporation pond as a leachate management	Evaporation has been removed from the application, including from Sections 2.2.6 and 2.2.7 of Attachment III-3.

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	measure (for example, but not limited to, Sections 2.2.6 and 2.2.7 of Attachment 3). Ensure evaporation is removed from the entire application.	
T9	*a. Revise to address Comment T35(f) of the first NOD regarding adding information (in text and drawings), to show the relationships between the proposed floodplain "levee" and the perimeter structures of the landfill.*	Section 7.0 of Attachment III-2 has been expanded to describe the structures (channel re-route & perimeter berm) proposed to redefine the 100-year floodplain extents. Floodplain extents, perimeter berm, and channels are also shown on the figures in Attachment III-2 - Appendix 2A.
	b. Revise to address Comment T35(b) of the first NOD. Note the proposed levee is used to re-define the 100-year floodplains. The information requested for inclusion in this application is not for the purpose of approving the levee. Refer to the comment T9.c. below.	Applicable requirements of 301.33 - 301.36 applied to the Perimeter Berm design (freeboard, 100-year floodplain requirements, property notifications, etc.). Perimeter berm location and cross sections shown on Attachment III-1 Permit Drawings. Section 7.0 of Attachment III-2 has been expanded to describe the structures (channel re-route & perimeter berm) proposed to redefine the 100-year floodplain extents. Floodplain extents, perimeter berm, and channels are also shown on the figures in Attachment III-2 - Appendix 2A.
	c. Revise relevant portions in Part I/II and Part III to clearly identify (text and drawing) the structures that will be used to redefine the 100-year floodplain limits at the landfill site. It is noted that both the original and the revised Section 14.3.1 of Part I/II seem to identify a tributary ditch and the landfill perimeter berms as structures in revising the 100-year floodplain limits. Revise Section 14.3.1 as necessary.	Section 7.0 of Attachment III-2 has been expanded to describe the structures (channel re-route & perimeter berm) proposed to redefine the 100-year floodplain extents. Floodplain extents, perimeter berm, and channels are also shown on the figures in Attachment III-2 - Appendix 2A. Section 14.3.1 of Part I/II is consistent with Section 7.0 of Part III.
	d. Address Comment T35(g) of the first NOD as appropriate.	Section 14.3.1 of Part I/II has been revised to clarify that the Perimeter Berm will be owned by the Landfill owner (City of Victoria) and may be maintained by the City directly or through contract with the designated site operator.
T10	*a. Revise the newly added Detail 4 on Drawing III.A1.19 to show a ridge between the Class 1 liner and the MSW liner, with the liners*	Detail 4 on Drawing III.A1.19 in Attachment III-1 has been revised to show the high-point of a ridge at the MSW-Class 1 liner division.

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	sloping away from the ridge. The currently designed cell division is acceptable if the slopes lead leachate away from the cell division and not flow into the adjacent cell. Note that a cell must be developed entirely of either Class 1 liner or MSW liner.	Every cell shall be constructed of a single liner type to adhere to the leachate flow pattern shown in this detail.
	b. Revise Section 4.3 of Part III and other relevant portions (text and drawings) of the application to describe and show transitions between Class 1 waste and MSW waste. Note that there must be a 50-ft set-back filled with MSW waste, from the cell division into the Class 1 waste.	Detail 4 on Drawing III.A1.19 in Attachment III-1 has been revised to show a 50-foot typical overlap of MSW into Class 1 cells, as requested. There are several options for waste placement that will allow the MSW setback to meet or exceed 50 feet, depending on whether MSW and Class 1 are placed concurrently or at different times.
T11	*a. The NOD response to Comment T41 of the first NOD states that, "Part III has been modified to clarify that an overliner will not be installed prior to vertical expansion. Attachment III-7 has been revised accordingly and no longer includes the term piggyback." Discuss the vertical expansion schedule and revise the development sequence shown in drawings (including, but not limited to, Drawing I/II.B.4, III.A1.4).*	Section 4.6 of Part III has been revised to include discussion of the phasing of the vertical expansion (Trenches 7 and 8) and lateral expansion (Cells A1 through I2).
	b. To demonstrate compliance with 330.331(a), revise Section 4.6 of Part III and other relevant portions of the application (text and drawings) to describe the existing liner system (including liner, leachate collection and sump) at the cells where vertical expansion is planned; and discuss whether an overliner system (a liner built on top of existing waste) is required. If an overliner system is needed, provide design and installation requirements for the overliner system (including subgrade, liner, leachate collection and sump) as necessary. Note if the requested information is already included in other portions of the application, revise Section 4.6 of Part III to refer to where the relevant information is contained. Refer to Comment T1 of this NOD for liners installed in the existing cells.	Section 4.6 of Part III has been revised to specify that the previously permitted cells under the proposed vertical expansion have not yet been developed and a composite liner will be installed prior to waste acceptance. No overliner is needed to comply with 30 TAC 330.331(a).
T12	*a. The response to Comment T56 of the first NOD is acknowledged. It has been common practice that a thicker soil layer like a 24" soil over*	The final cover for future cells has been revised to the prescriptive composite cover profile. An additional 6 inch protective soil layer

NOD ID	NOD Description	Response
	the geomembrane is preferred for vegetation establishment and maintenance under the Texas climate. Note that per Section 8.3 of Part III, 90% grass coverage is required for final cover erosion control. A failure to continuously meet the 90% coverage will cause difficulty in successfully exiting the post-closure care period. Also, a thinner layer of soil will be more likely to have the geomembrane exposed due to erosion. Per Comment T56 of the first NOD, revise Table 4-2 of Part III and other relevant portions of the application (including but not limited to, slope stability analysis, final closure plan and closure cost estimate).	has been added below the final cover profile to improve constructability and maintain geomembrane integrity. This also results in no change to total thickness of the final cover, resulting in no impacts to the proposed limits of waste, capacity, or closure costs as a result of the change in final cover profile.
	b. The NOD response to Comment T56 of the first NOD states that the final cover designs were alternative final cover allowable under 330.457(d). Note that the only alternative final cover that may be acceptable is water balance (or ET) cover, of which a technical guidance can be found at https://www.tceq.texas.gov/downloads/permitting/waste-permits/publications/rg-494.pdf.	The final cover profile has been revised to the prescriptive cover and reference to "alternative" cover has been removed.
T13	*The response to Comment T60 of the first NOD states that part of the reason for the 4' permanent pool in the West and East ponds is to promote water quality and infiltration. Note that the infiltration could potentially impact the groundwater quality and hydrogeologic conditions. Revise the application to have the ponds lined (refer to the comment on installing pond liner of this NOD.*	Initial pond design has been revised to a dry detention basin without a permanent pool, and references to “water quality” and “infiltration” have been removed so as not to impact groundwater quality or hydrogeologic conditions. Therefore, installing pond liners is no longer required.
T14	*a. The revisions made to address Comment T62 of the first NOD included using WAP to refer to Appendix IV-B, Special waste Acceptance Plan. Note WAP (Waste Acceptance Plan) is a content included in Part I/II of the application. Revise Appendix IV-B and other relevant portions of the application to refer to Appendix IV-B, Special Waste Acceptance Plan as SWAP when applicable.*	Part IV and Appendix IV-B have been revised to refer to Appendix IV-B - Special Waste Acceptance Plan (SWAP), to distinguish it from the Waste Acceptance Plan (WAP) discussed in Part I/II.
	b. In response to Comment T62 of the first NOD, a new Table 7-3 was added to the SOP. It is suggested that revising the new table by	The "Testing Requirements" column in Table 7-3 in Part IV has been revised to "Testing/Acceptance Requirements"

NOD ID	NOD Description	Response
	changing the column title of Testing requirements to Testing/Acceptance Requirements. (See the comment below).	
	c. It is noted that "None" is entered in the Testing Requirements column for many wastes (for example, but not limited to, Used Oil Filters). Revise this column to refer to the acceptance criteria described in the corresponding subsection in Section 7.20 for each of the listed special waste (for example, Section 7.20.9 for Used Oil Filters). Ensure the testing and acceptance criteria in Table 7-3 are consistent with the text in Section 7.20.	The "Testing/Acceptance Requirements" column (formerly "Testing Requirements") has been revised to refer to the acceptance criteria discussed in the corresponding subsections of Section 7.20 of Part IV for each special waste type.
T15	*a. Note that only leachate and gas condensate may be recirculated into the waste, if authorized. Revise the title and contents of the newly added Section 10 of Part IV to be clear that only leachate and gas condensate may be recirculated into the waste.*	Section 10.0 of Part IV has been revised to state that leachate and gas condensate will only be recirculated if authorized, and that only leachate and gas condensate will be recirculated into waste.
	b. Revise the newly added Section 10 of Part IV to include measures for compliance with 330.991(a)(7). Revise Section 10 to indicate that recirculation of gas condensate will follow the same procedures as for leachate.	Section 10.0 of Part IV has been revised to include measures for compliance, and states that recirculation of gas condensate will follow the same procedures as for leachate.
	c. Define the meaning of "trench" used in the second paragraph. Note the first paragraph does not indicate recirculation through a trench. The term "trench" is used in the development sequencing, though. Revise to eliminate any confusion.	Section 10.0 of Part IV has been revised to define a trench as areas sharing a sump.
	d. Revise Section 4.7 of Part III and Sections 3 and 4 of Attachment 3 to refer to Section 10 of Part IV for recirculation of leachate and gas condensate and the procedures.	Reference to Section 10.0 of Part IV for recirculation of leachate and gas condensate and the procedures has been added to Section 4.7 of Part III and Sections 2.2.7 (Leachate Disposal) and 4.0 (Gas Condensate Management) of Attachment III-3.
	e. The NOD response to T65 of the first NOD states, "HELP modeling presented in Attachment III-3 demonstrates the leachate collection and removal system are properly designed and sized based on the potential for leachate recirculation." Revise the leachate collection/removal system design and HELP modeling in Attachment 3, to ensure that the	Responses to prior comments in this NOD clarify that an overliner is not required and has not been installed. No revision is necessary.

NOD ID	NOD Description	Response
	leachate collection/removal system has the capacity to handle the recirculated leachate when an overliner system is utilized.	
T16	*The response to Comment T68 of the first NOD states that Section 2.2.7 of Attachment 3 has been revised. Provide the redline/strikeout version of the revised Section 2.2.7.*	A redline/strikeout version of the revised Section 2.2.7 of Attachment III-3 has been included.
T17	*Submit site map showing surveyed locations and elevations of all borings, including "previous" borings. This information was not found*	A site map showing the surveyed locations and elevations for all borings, previously approved by TCEQ in the submitted soil boring plan (2018) has been added to Part III.
T18	*Submit cross-sections spanning the expanded site as proposed. The sections will depict the generalized strata at the facility and be based on integrated new and pre-existing boring logs.*	Cross-sections spanning the expanded site as proposed are included in Attachment III-1.
T19	*Provide information on sitewide static water level, based on integrated data from new piezometers and pre-existing monitoring wells. This information shall pertain to the site.*	Integrated data from new and pre-existing wells is presented in Attachment III-5 Appendix 5J.
T20	*Identify graphically the seasonal high water table. Use this information to annotate the cross-sections required in 330.63(e)(4)(G). This information shall pertain to the site and is based on investigation findings.*	The seasonal high groundwater level has been added to the cross-sections required in 30 TAC 330.63(e)(4)(G).
T21	*Name, and specifically describe, the uppermost regulated aquifer below the site, including information on the water bearing stratigraphic unit(s), intercalated and/or confining layers.*	Section 2.3 of Attachment III-5 has been revised to specifically name the Chicot aquifer as the uppermost regulated aquifer from Gulf Coast aquifer formation. As described in Section 2.3, the heterogenous character of the sediments in the area of the site make correlation of the sands and clays difficult over several miles. The lithology of alternating silty clays and water bearing sands can extend for hundreds of feet while some pinch-out at relatively short distances. The observation of a clay lower confining layer was observed in soil borings in the expansion area and in historical borings is described in Section 4.1 of Attachment III-5.
T22	*Identify any lower aquifers that may be hydraulically connected to the regulated aquifer. Discuss such connectivity if any.*	As described in Section 2.3 of Attachment III-5, the Evangeline aquifer underlies the Chicot aquifer, followed by the Burkeville

NOD ID	NOD Description	Response
		confining system. The Chicot aquifer is confined by interbedded clay and silty sand layers within the Beaumont Formation and is generally present at approximately 65 ft amsl.
T23	*Provide a Groundwater Sampling and Analysis Plan (GWSAP) for the proposed facility, as expanded. Re-design/update the older plan that was last revised in 2013.*	A Groundwater Sampling and Analysis Plan has been updated based on TCEQ Guidance RG-074 (2018) and provided for the proposed facility as a new Appendix 6A to Attachment III-6.
T24	*Provide a monitoring system dedicated to groundwater. Include the specific information requested by the cited rule.*	Drawing III.A1.12 in Attachment III-1 contains locations of dedicated groundwater monitoring wells. Landfill gas monitoring probes are also shown but these systems serve separate purposes and those purposes are indicated on the Drawing. The specific information requested by 30 TAC 330.63(f)(1) is included (point of compliance, topographic map, etc.).
T25	*Provide signed, sealed logs of boring for all existing, operational monitoring wells.*	Where available, Attachment III-5, Appendix 5K has been updated to include signed, sealed logs of borings for all existing, operational monitoring wells.
T26	*1. Provide the following specifications for existing monitoring wells:*	The requested information has been added to Attachment III-5, Appendix 5K for the existing monitoring wells.
	a. casing:	
	b. screening;	
	c. filter pack	
	d. annular seal	
	e. concrete pad to be placed on top of the casing seal for existing monitoring wells	
	f. protective collar	
T27	*Submit surveyed locations and elevations sealed by a Texas registered professional land surveyor (RPLS) for existing monitoring wells. Acknowledge that new wells will be surveyed by a RPLS.*	Where available, the requested information has been added to Attachment III-5, Appendix 5K. Attachment III-6 has been updated to include an acknowledgement that new wells will be surveyed by a RPLS.

NOD ID	NOD Description	Response
T28	*Submit well installation report (Monitor well Data sheet) for each of the existing monitoring well.*	Where available, Monitor Well Data Sheets for the existing monitoring wells have been added to Attachment III-5, Appendix 5K.
T29	*Submit a dedicated, clearly annotated landfill gas monitoring network. Drawing will show locations of all monitoring probes and on-site structures.*	Drawing III.A1.12 of Attachment III-1 contains locations of dedicated landfill gas monitoring probes and on-site structures to be monitored. Groundwater monitoring wells are also shown but these systems serve separate purposes and those purposes are indicated on the Drawing.

Facility Name: City of Victoria Landfill
Permittee/Registrant Name: City of Victoria
MSW Authorization #:1522-B
Initial Submittal Date: 3/28/2022
Revision Date: 11/18/2022

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:

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://**info.burnsmcd.com/tceq-permits-city-of-victoria-landfill**

6. Application Publishing
Party Responsible for Publishing Notice: ☒ Applicant ☐ Agent in Service ☐ Consultant Contact Name: **Darryl Lesak** Title: **Director of Environmental Services**

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: **Victoria Public Library** Physical Address: **302 N Main St** City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77901** (Area code) Telephone Number: **(361) 485-3301**

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)	☐	☐	☐
Other (describe)	☐	☐	☐
Other (describe)	☐	☐	☐
Other (describe)	☐	☐	☐

12. General Facility Information

Facility Name: City of Victoria Landfill

Contact Name: **Darryl Lesak** Title: **Director of Environmental Services**

MSW Authorization No. (if available): **1522B**

Regulated Entity Reference No. (if issued)*: RN**100212968**

Physical or Street Address (if available): **18545 FM 1686**

City: **Victoria** County: **Victoria** State: **TX** Zip Code: **77905**

(Area Code) Telephone Number: **361-897-1622**

Latitude (Degrees, Minutes Seconds): **28° 41' 36" North**

Longitude (Degrees, Minutes Seconds): **96° 54' 23" West**

Benchmark Elevation (above mean sea level): **64.97** ft.

Provide a description of the location of the facility with respect to known or easily identifiable landmarks: **The Landfill site entrance is located 0.75 miles east of the intersection of FM 1686 and State Highway 185 in Victoria County, Texas.**

Detail access routes from the nearest United States or state highway to the facility: **The Landfill is located along FM 1686 and can be accessed via State Highway 185 or US-87. From the intersection of SH-185 and FM 1686, vehicles will travel east and the site entrance is approximately 1.5 miles on FM 1686. From the intersection of US-87 and FM 1686, vehicles will travel west and the site entrance is approximately 2.5 miles on FM 1686.**

*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.

Lateral and vertical expansion of the Landfill, including the addition of the option for below-grade disposal of Class 1 non-hazardous industrial waste in the lateral expansion area. This expansion is requested to extend landfill life. The City of Victoria landfill is the only permitted Type I MSW landfill located in the County and the Regional Planning Commission.

17. Facility Contact Information

Site Operator (Permittee/Registrant) Name: City of Victoria

Customer Reference No. (if issued)*: CN**600243257**

Contact Name: **Darryl Lesak** Title: **Director of Environmental Services**

Mailing Address: **700 Main Center, Suite 124**

City: **Victoria** County: **Victoria** State: **TX** Zip Code: **77902**

(Area Code) Telephone Number: **361-485-3381**

Email Address: **dlesak@victoriatx.gov**

TX Secretary of State (SOS) Filing Number: **N/A**

*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 Service of Texas, Ltd

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

Contact Name: **Scott** Title: **Trebus**

Mailing Address: **10554 Tanner Road**

City: **Houston** County: **Harris** State: **TX** Zip Code: **77041**

(Area Code) Telephone Number: **713-849-0400**

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

TX SOS Filing Number: **0155761000**

[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): Burns & McDonnell Engineering

Texas Board of Professional Engineers Firm Registration Number: **120819**

Contact Name: **Tonya Koller** Title: **Senior Civil Engineer**

Mailing Address: **8911 N Capital of TX Hwy, Building 3, Suite 3100**

City: **Austin** County: **Travis** State: **TX** Zip Code: **78759**

(Area Code) Telephone Number: **(952) 656-3615**

Email Address: **tkoller@burnsmcd.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: Yoakum

District Engineer's Name: **Valente Olivarez Jr., P.E. (interim)**

Street Address or P.O. Box: **1701 S. Padre Island Drive**

City: **Corpus Cristi** County: **Nueces** State: **Texas** Zip Code: **78416**

(Area Code) Telephone Number: **361-808-2275**

Email Address: **Valente.Olivarez@txdot.gov**

The Local Governmental Authority Responsible for Road Maintenance (if applicable): N/A

Contact Person's Name:

Street Address or P.O. Box:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email Address:

City Mayor Information

City Mayor's Name: **Jeff Bauknight**

Office Address: **P.O. Box 1758**

City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77902**

(Area Code) Telephone Number: **(361) 485-3030**

Email Address: **jbauknight@victoriatx.gov**

City Health Authority: See County Health Authority

Contact Person's Name:

Street Address or P.O. Box:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email Address:

County Judge Information

County Judge's Name: **Ben Zeller**

Street Address or P.O. Box: **101 N Bridge Street, Suite 102**

City: **Victoria** County: **Victoria** State: **TX** Zip Code: **77901**

(Area Code) Telephone Number: **361-575-4558**

Email Address: **bzeller@vctx.org**

County Health Authority: Victoria County Public Health Department

Contact Person's Name: **David Gonzales, Public Health Director**

Street Address or P.O. Box: **2805 N. Navarro Street**

City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77901**

(Area Code) Telephone Number: **(361) 578-6281**

Email Address: **dgonzales@vctx.org**

State Representative Information

District Number: **30**

State Representative's Name: **Geanie W. Morrison**

District Office Address: **1908 N Laurent Suite 500**

City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77901**

(Area Code) Telephone Number: **(361) 572-0196**

Email Address: **geanie.morrison@house.texas.gov**

State Senator Information

District Number: **18**

State Senator's Name: **Lois Kolkhorst**

District Office Address: **5606 North Navaro #300M**

City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77904**

(Area Code) Telephone Number: **(361) 573-7300**

Email Address: **lois.kolkhorst@senate.texas.gov**

Council of Government (COG) Name: Golden Crescent Regional Planning Commission

COG Representative's Name: **Michael Ada**

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

Street Address or P.O. Box: **1908 N. Laurent, Suite 600A**

City: **Victoria** County: **Victoria** State: **Texas** Zip Code: **77901**

(Area Code) Telephone Number: **(361)-578-1587**

Email Address: **michaela@gcrpc.org**

River Basin Authority Name: Guadalupe-Blanco River Authority

Contact Person's Name: **Charles M Hickman, PE**

Watershed Sub-Basin Name: **Guadalupe-Lavaca**

Street Address or P.O. Box: **1064 TX-316**

City: **Port Lavaca** County: **Calhoun** State: **Texas** Zip Code: **77979**

(Area Code) Telephone Number: **(361) 552-9751**

Email Address: **chickman@gbra.org**

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: **None**

Within Extraterritorial Jurisdiction of: **None**

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, Jesús A. Garza, City Manager,
(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: 12-01-22

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 ____________
On this 01 day of Dec, 2022
My commission expires on the 07 day of 21, 2026
Victoria A Rocha
Notary Public in and for
Victoria County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)

VICTORIA ALEXA ROCHA
Notary Public, State of Texas
Comm. Expires 07-21-2026
Notary ID 133870541

Part I Attachments

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

Required Attachments	**Attachment No.**
Supplementary Technical Report	**Application Part I/II Report**
Property Legal Description	**Part I/II- Appendix I/II-D**
Property Metes and Bounds Description	**Part I/II- Appendix I/II-D**
Facility Legal Description	**Part I/II- Appendix I/II-D**
Facility Metes and Bounds Description	**Part I/II- Appendix I/II-D**
Metes and Bounds Drawings	**Part I/II- Appendix I/II-D**
On-Site Easements Drawing	**Part I/II- Appendix A, Drawing I/II.B.2**
Land Ownership Map	**Fig I/II.A.6 in Appendix I/II-A**
Land Ownership List	**Appendix I/II-A**
Electronic List or Mailing Labels	**Labels in Part I/II Application**
Texas Department of Transportation (TxDOT) County Map	**Figure I/II.A.1 in Appendix I/II-A**
General Location Map	**Fig I/II.A.1 in Appendix I/II-A**
General Topographic Map	**Fig I/II.A.2a and Fig I/II.A.2b in Appendix I/II-A**
Verification of Legal Status	**Part I/II- Section 5.0**
Property Owner Affidavit	**Part I/II- Appendix I/II-E**
Evidence of Competency	**Part I/II- Section 6.0**

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

- ☐ TCEQ Core Data Form(s)
- ☐ Signatory Authority Delegation
- ☒ Fee Payment Receipt — **Copy of Check 113979 provided in binder**
- ☐ Confidential Documents
- ☐ Waste Storage, Processing and Disposal Ordinances
- ☐ Final Plat Record of Property
- ☐ Certificate of Fact (Certificate of Incorporation)
- ☐ Assumed Name Certificate

Part I/II Landfill Permit Amendment Existing Conditions Summary and Supplementary Technical Report TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part I/II Landfill Permit Amendment Existing Conditions Summary and Supplementary Technical Report TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2
November 18, 2022

prepared by

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
ags	Above ground surface
amsl	Above mean sea level
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
C&D	Construction and demolition
CDP	Census designated place
CFC	Chlorofluorocarbon
City	City of Victoria, Texas
COG	Council of Government
cy	Cubic yard
FIRM	Flood Insurance Rate Map
FM 1686	Farm-to-Market Road 1686
ft	Feet
FY	Financial year
GCRPC	Golden Crescent Regional Planning Commission
Landfill	City of Victoria Landfill
MSW	Municipal solid waste
NHD	National Hydrography Dataset
NHIW	Non-hazardous industrial waste
NRACM	Non-regulated asbestos-containing material
PCB	Polychlorinated biphenyl
QA/QC	Quality Assurance/Quality Control

Abbreviation	**Term/Phrase/Name**
RACM	Regulated asbestos-containing material
RN	Registration number
SDP	Site Development Plan
SOP	Site Operating Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNRCC	Texas Natural Resources Conservation Commission (now TCEQ)
TRC	Texas Railroad Commission
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
USGS	United States Geological Survey
WAP	Waste Acceptance Plan

1.0 INTRODUCTION

The purpose of this Major Permit Amendment is to secure authorization to expand the existing City of Victoria Landfill (Landfill), Texas Commission on Environmental Quality (TCEQ) Municipal Solid Waste (MSW) Landfill Permit No. 1522A (Landfill). The proposed permit amendment will increase the height of fill in a portion of the existing permitted waste footprint, expand the waste footprint laterally into the adjacent property, and allow for the option of below-grade (i.e., below natural grade) Class 1 non-hazardous industrial waste (NHIW) within the lateral expansion area. The permit amendment will result in both a vertical and lateral expansion. The height of the existing Landfill will be increased from 144 feet above mean sea level (amsl) to 168 feet amsl. The lateral expansion will have a maximum final cover height of approximately 188 ft amsl. Currently, there is approximately 6.07 million cubic yards of airspace remaining. The proposed lateral and vertical expansions will add approximately 35.9 million cubic yards of additional airspace, providing for long term solid waste disposal planning for the City of Victoria, Victory County, and the extended Golden Crescent Regional Planning Commission (GCRPC) area.

General activities to occur at the facility include but are not limited to:

- Acceptance and disposal of municipal solid waste and industrial wastes;
- Excavation and earth moving for cell construction;
- Construction and quality assurance of composite liner system and composite final cover system;
- Excavation of soils and application thereof for daily, intermediate, and/or final cover;
- Maintenance of equipment, roads, and working face;
- Environmental monitoring.

The Landfill consists of a perimeter fence, a scale house, all-weather roads, borrow areas, soil stockpiles, landfill gas collection system, gas monitoring wells, landfill gas-to-energy system, groundwater monitoring wells, leachate collection and leachate storage tanks, and solid waste disposal area, and stormwater controls. Composting activities occur on an adjacent parcel owned by the City but operated by a third-party (Texas Landfill Management LLC) and permitted through a separate registration (Registration 42034). The composting parcel is located within the expansion area footprint and will be relocated to another parcel coincident with Landfill expansion of the permit boundary.

The General Application Requirements (Part I) and Existing Conditions (Part II) sections of this permit amendment application for the Landfill have been prepared in accordance with the State of Texas requirements set forth in Title 30 Texas Administrative Code (TAC) Sections 330.57, 330.59, 330.61, and 305.45. Part II has been combined with Part I in accordance with 30 TAC 330.57(c)(2). Section 2.0 of this 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 and II present information on specific existing conditions on and around the site, and regulatory matters related to the TCEQ MSW Landfill Permit Amendment Application process.

2.0 GENERAL INFORMATION

2.1 Facility Description

The Landfill is a Type I MSW landfill serving the City and surrounding communities in the Golden Crescent Regional Planning Commission area (Calhoun, Dewitt, Goliad, Gonzales, Jackson, Lavaca, and Victoria Counties). Existing and permitted conditions for the current Landfill footprint are shown in Drawing I/II.B.2 in Appendix I/II-B.

The Landfill currently receives approximately 155,000 tons per year of waste. To extend the life of this facility, the proposed permit amendment includes a lateral expansion to the South extent of the current footprint and a vertical expansion over portions of the existing Landfill footprint (currently permitted Trench 7 and 8). The proposed permit amendment also includes the option to accept Class 1 NHIW for below-grade disposal in the expansion area.

The total remaining available waste disposal capacity of the Landfill is approximately 6.4 million cubic yards. The proposed expansion would increase the disposal capacity by approximately 36.1 million cubic yards, for a total of approximately 42.5 million cubic yards. Detailed site capacity and Landfill life calculations are presented in Part III Site Development Plan (SDP).

2.2 Size and Location of Facility [30 TAC 330.59(b)]

This Type I Municipal Solid Waste Management Facility is located on an approximately 515-acre site owned by the City of Victoria, and located 0.75 miles east of the intersection of FM 1686 and State Highway 185 in Victoria County, Texas. The physical address is 18545 FM 1686, VICTORIA, TX 77905. A general site map is provided in Appendix I/II-A. The legal description of metes and bounds is provided in Appendix I/II-D.

Coordinates and Elevation of Site Permanent Benchmark:

Latitude: 28° 41' 36" North
Longitude: 96° 54' 23" West
Elevation: 64.97 feet above mean sea level (amsl)

2.3 Existing Conditions Summary [30 TAC 330.61(a)]

A portion of the site is currently operating as a Type I Municipal Solid Waste Landfill in accordance with TCEQ Municipal Solid Waste Rules and Regulations. The site's existing permitted waste footprint consists of approximately 134.3 acres, most of which contains waste. This permit amendment would add approximately 225.4 acres of additional waste disposal area to the south of the existing Landfill, for a total permitted waste disposal area of approximately 360 acres. The current development conditions of each existing cell are summarized in Table I/II-1. The liner and final cover systems for each of the cell types outlined in Table I/II-1 are provided in Table I/II-2 and Table I/II-3. The locations of Pre-Subtitle D cells and Developed Subtitle D cells, including Trench 11 and Trench 12 are provided in Attachment III-1, Appendix 1A, Drawing 2A and 3.

Table I/II-1: Current Development Conditions

Cell Type	Cell/Trench	Liner System[1]	Capacity Remaining	Final Cover[2]
Pre-Subtitle D	Cell 1A-7	Installed	No	Installed
	Cell 1A-6	Installed	No	Installed
	Cell 1A-5	Installed	No	Installed
	Cell 1A-4	Installed	No	Installed
	Cell 1A-3	Installed	No	Installed
	Cell 1A-2	Installed	Yes	Not Installed
	Cell 3A-4	Installed	No	Installed
	Cell 3A-5	Installed	No	Installed
	Cell 3A-3	Installed	No	Installed
	Cell 3A-2	Installed	No	Installed
	Cell 3A-1	Installed	Yes	Not Installed
	Cell 4A-6	Installed	No	Installed
	Cell 4A-5	Installed	No	Installed
	Cell 4A-4	Installed	No	Installed
	Cell 4A-3	Installed	Yes	Not Installed
	Cell 4A-2	Installed	Yes	Not Installed
	Cell 4A-1	Installed	Yes	Not Installed
	Cell 4A-1A	Installed	Yes	Not Installed
	Cell 2A-2	Installed	No	Installed
	Cell 2A-1	Installed	No	Installed
Developed Subtitle D	Cell 4A-7	Installed	No	Installed
	Cell 4A-8	Installed	No	Installed
	Trench 11	Installed	No	Not Installed
	Trench 12	Installed	No	Installed
	Trench 5	Installed	Yes	Not Installed
	Trench 10	Installed	Yes	Not Installed
Previously Approved Not Yet Developed Subtitle D	Trench 6	Partially Installed	Yes	Not Installed
	Trench 7	Not Installed	Yes	Not Installed
	Trench 8	Not Installed	Yes	Not Installed
	Trench 9	Partially Installed	Yes	Not Installed

[1] Details on the components of the liner system for the Pre-Subtitle D cells, Developed Subtitle D cells, and Approved Not Yet Developed Subtitle D cells are provided in Section 2.3.2. Details on the components of the leachate collection system for the Pre-Subtitle D cells, Developed Subtitle D Cells, and Approved Not Yet Developed Subtitle D cells are provided in Section 2.3.3.
[2] Details on the components of the final cover system for the Pre-Subtitle D cells, Developed Subtitle D cells, and Approved Not Yet Developed Subtitle D cells are provided in Section 2.3.4.

2.3.1 Facility History

The Landfill was originally permitted with a start date of June 29, 1982 and includes both Pre-Subtitle D and Subtitle D disposal areas. As detailed in Table I/II-1, twenty Pre-Subtitle D cells were developed in the western half of the existing footprint prior to the Landfill's Subtitle D permit issuance. All subsequent disposal to the permitted limits of waste in the western half of the landfill was completed in accordance with the Subtitle D updates and vertical expansion as previously approved by the TCEQ (formerly TNRCC), and no Subtitle D cells are overlaying Pre-Subtitle D cells. Final closure of 51.6 acres (including Pre-Subtitle D and Subtitle D cells, as shown in Part III, Appendix 1A, Drawing 1A) was completed and the final cover system evaluation report issued to TCEQ in August 2015.

The proposed expansion layout (shown in Drawings in Appendix I/II-B) was chosen to extend Landfill life while minimizing potential construction and maintenance issues that may arise from filling on top of existing infrastructure on the southern portion of the existing Landfill. The general expansion approach is to tie into the currently undeveloped Trenches 7 and 8 of the existing Landfill. The existing waste containment system for these fill areas is described in Sections 2.3.2 through 2.3.5, below, to provide existing conditions relevant to the proposed expansion. Additional design considerations specific to the option for below-grade disposal of Class 1 wastes are discussed in Section 14.9.1. Full design details are presented in Part III Site Development Plan (SDP). No Pre-Subtitle D cells are overlain by the vertical expansion.

2.3.2 Existing Liner System

The existing liner system's design for the Pre-Subtitle D cells listed in Table I/II-1 consists of a minimum of 2 feet of compacted soil liner.

The existing liner system's design for the developed Subtitle D cells and the approved not yet developed Subtitle D cells listed in Table I/II-1 follows the TCEQ prescriptive composite liner system as described in 30 TAC 330.331. The composite system for these cells, including Trench 11 and Trench 12, consists of the following from top to bottom:

- 60-mil high density polyethylene geomembrane (HDPE), and
- 2 feet of compacted soil liner with a maximum hydraulic conductivity of 1×10^{-7} cm/s.

The sumps in the existing area are shown on Attachment III-1, Drawings III.A1.4 and III.A1.5. Sumps are located in the following cells:

- Two sumps in Cell 4A-8

- One sump in Trench 12
- One sump in Trench 11
- One sump in Trench 10
- One sump in Trench 5
- One sump in Trench 9

Sump locations for Trench 8 and the cells in the lateral expansion area are shown in Attachment III-1, Drawing III.A1.4. Sump sizing and design within the vertical expansion area is sufficient; as described in Part III, Attachment III-3, Leachate and Contaminated Water Plan, increases in waste column with reduce peak leachate production and the proposed final cover design will reduce infiltration-driven leachate production.

The liner system for each of the cell types outlined in Table I/II-1 is provided in Table I/II-2.

Table I/II-2: Existing Liner System Components for Landfill Areas

Liner System Component (top to bottom)	Existing Area Pre-Subtitle D	Existing Area Subtitle D Option 1	Existing Area Subtitle D Option 2	Expansion Area Trenches 7 and 8 and Cells A1-I2 (if MSW Only)
Protective Cover	NA	12-inch protective cover	24-inch protective soil layer	24-inch protective soil layer
Leachate Collection System		12-inch granular drainage sand (minimum of $1x10^{-2}$ cm/sec)	Drainage Geocomposite	Drainage Geocomposite
Geomembrane	NA	60-mil HDPE Geomembrane	60-mil HDPE Textured Geomembrane	60-mil HDPE Textured Geomembrane
Compacted Soil Liner	24-inch (minimum) compacted clay liner	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)
Subgrade	Prepared Subgrade	Prepared Subgrade	Prepared Subgrade	Prepared Subgrade

2.3.3 Existing Leachate Collection System

The Pre-Subtitle D cells do not have an existing leachate collection system. The existing leachate collection system for the Subtitle D cells consists of one of two options:

- Option 1: 12 inches of granular drainage sand material with minimum hydraulic conductivity of $1x10^{-2}$ cm/sec and 12 inches of protective cover soil; or
- Option 2: 200-mil double-sided geocomposite drainage layer overlain with 24 inches of protective cover soil.

Option 1 was constructed for Cells 4A-8 and 4A-7 and Trench 5. Option 2 was constructed for Trenches 6, 9 and 10. Trenches 7 and 8 are yet to be constructed.

Chimneys (areas of higher hydraulic conductivity) are required to be employed if protective cover permeability is less than $1x10^{-4}$ cm/sec.

2.3.4 Existing Final Cover System

The existing final cover design for the Pre-Subtitle D cells consists of the following from top to bottom:

- 6 inches of protective soil, and
- 18 inches of compacted clay-rich soil with permeability no greater than 1×10^{-7} cm/sec.

The existing final cover design for the Subtitle D Cells 4A-7, 4A-8, and Trench 12 consist of the following from top to bottom:

- 2 feet of an erosion layer capable of sustaining native plant growth,
- 200-mil geocomposite,
- 40-mil linear low-density polyethylene (LLDPE) geomembrane, and
- 18 inches of compacted clay-rich soil with permeability no greater than 1×10^{-5} cm/sec.

The final cover system for Trench 11 will also consist of the components listed above for the Subtitle D final cover (Historic Prescribed Cover).

The final cover system for each of the cell types outlined in Table I/II-1 is provided in Table I/II-3. Final cover details for Pre-Subtitle D and Subtitle D cells are provided in Part III, Attachment III-1, Drawings A3, A4, and A5.

Table I/II-3:Existing Final Cover Components for Landfill Areas

Final Cover System Component	Pre-Subtitle D Existing Area – Pre-Subtitle D (CLOSED and To Be Closed)	Historic Prescribed Composite Existing Area – Subtitle D (CLOSED) & Existing Area – Trench 11
Erosion Control Layer	6-inch protective soil layer	24-inch erosion layer capable of sustaining native plant growth
Drainage Geocomposite	None	200-mil double-sided drainage geocomposite (side slopes) and cushion geotextile (top deck)
Geomembrane	None	40-mil LLDPE geomembrane (smooth on top deck and textured on sides)
Compacted Clay Layer	18-inch compacted clay-rich soil with permeability no greater than 1 x 10^{-7} cm/sec	18-inch compacted clay-rich soil with permeability no greater than 1 x 10^{-5} cm/sec

2.3.5 Existing Landfill Gas Management System

The existing landfill gas management system consists of gas monitoring probes surrounding the currently permitted area of the Landfill, and gas extraction wells installed on the western half of the existing Landfill area where existing permitted final grades have been met. The existing system is connected with various lateral collection lines flowing into the main header pipe. Additionally, an air line and condensate forcemain are buried with the header and in branches across the Landfill. The air line provides compressed air to the pneumatic pumps in the sumps at each low point around the Landfill, and the condensate is pumped out of the sumps and into the condensate force main, which is collected at the leachate holding tanks at the north end of the site for hauling offsite for disposal at a wastewater treatment plant (WWTP). The landfill gas is collected and beneficially utilized off-site or combusted at the flare skid at the north end of the site.

The construction and operation of the facility shall comply with subchapter U of 30 TAC Chapter 330 (relating to Standard Air Permits for Municipal Solid Waste Landfill Facilities and Transfer Stations) or other approved air authorizations.

2.4 Waste Acceptance Plan (WAP) [30 TAC 330.61(b)]

2.4.1 Sources and Characteristics of Wastes

The TCEQ Waste Acceptance Plan Form Type I and Type IAE Landfill Facilities and Waste Acceptance Plan document are provided in Appendix I/II-C. Waste acceptance procedures are described in more detail in Part IV Site Operating Plan.

As noted above, this permit amendment seeks to allow the option for below-grade disposal Class 1 waste in the proposed lateral expansion area (Cells A1 through I2 as shown in Appendix I/II-B and discussed in detail in the Part III Site Development Plan (SDP)). Class 1 NHIW materials (as classified by 30 TAC §335.505) will be accepted only for disposal below the natural grade in dedicated cells designed and constructed in accordance with the requirements of 30 TAC §330 and 30 TAC §335 related to disposal of Class 1 industrial solid waste in Type I MSW landfill units. Details for dedicated cells for below-grade Class 1 disposal are shown in Part III SDP.

Consistent with 30 TAC §330.173(e), Class 1 wastes will not be disposed "in excess of 20 percent of the total amount of waste (not including Class 1 wastes) accepted during the current or previous year."

Regulated hazardous waste, except for waste from conditionally exempt small quantity generators, will not be accepted at this facility. Polychlorinated biphenyl (PCB) waste(s) as defined in 30 TAC §330.3, Class 2 industrial solid waste that interferes with site operations, radioactive wastes, lead-acid batteries, Chlorofluorocarbon (CFC)-containing equipment, whole tires, and used oil and oil filters will not be accepted at this facility.

See Appendix I/II-C for the TCEQ Waste Acceptance Plan Form Type I and Type IAE Landfill Facilities and the proposed amended WAP for the Landfill. Waste acceptance procedures are described in more detail in Part IV Site Operating Plan and Appendix IV–B - Special Waste Acceptance Plan.

2.4.2 Service Area and Population Equivalent

The Landfill is presently the only active Type I MSW landfill in the Golden Crescent Regional Planning Commission (GCRPC). As such, it provides solid waste disposal for the counties of Calhoun, Dewitt, Goliad, Gonzales, Jackson, Lavaca, and Victoria. The current and projected populations for the service area are shown in Table I/II-4 below, based on Texas Water Development Board (TWDB) population projections.

Table I/II-4: Current and Projected Service Area Population

County Name	2020	2030	2040	2050
CALHOUN	24,037	26,866	29,622	32,276
DEWITT	20,855	21,555	21,900	22,216
GOLIAD	8,427	9,519	10,239	10,545
GONZALES	21,751	23,921	25,963	28,330
JACKSON	14,606	15,119	15,336	15,515
LAVACA	19,263	19,263	19,263	19,263
VICTORIA	93,857	100,260	105,298	109,785
TOTAL	**202,796**	**216,503**	**227,621**	**237,930**

The estimated maximum amount of solid waste to be accepted annually for the facility are shown in Table I/II-5. These estimates are not permit limits. Values were approximated based on a disposal rate of 5 lbs/person-day for the entire population of the GCRPC service area in 2020 (202,796 persons). Long term, the amount and types of wastes accepted at the facility will also depend on the commercial and industrial trends in the surrounding communities.

Table I/II-5: Estimated Maximum Annual Waste Acceptance Rate

Year	Maximum Annual Waste Acceptance (tons per year)
2021	185,000
2022	185,000
2023	185,000
2024	185,000
2025	185,000

In FY 2019, the Landfill accepted 154,677 tons of waste for disposal, or approximately 595 tons per day average over 260 operating days. Solid waste may be accepted for disposal at this site at a rate of approximately 711 tons per day, but is not limited to this amount. Waste acceptance rates in excess of this amount are not anticipated in the near future given historical waste acceptance and projected growth rates in the area (as presented in Part I/II-Section 9.0). If the annual waste acceptance rate exceeds this rate, and the waste increase is not due to a temporary occurrence, the City will file an application to modify the permit application, including the revised estimated waste acceptance rate, in accordance with §305.70(k), within 90 days of the exceedance as established by the sum of the previous four quarterly summary reports, proposing any needed changes in the site operating plan to manage the increased waste acceptance rate.

2.5 Internet Posting

As required by 30 TAC §330.57(i), a complete copy of this permit amendment application will be posted to the internet at the following publicly accessible website link: https://info.burnsmcd.com/tceq-permits-city-of-victoria-landfill. Any future revisions and/or supplements to this application will be posted at the same website link. This internet posting is for informational purposes only.

2.6 Existing Permits/Authorizations

As required by TAC §305.45(a)(7), the related permits and authorizations for the Landfill facility are summarized in the Part I Form submitted with this application. Details are shown in Table I/II-6.

Table I/II-6: Summary of Existing Permits/Authorizations[1]

Program	Type	Permit Number	Status
Air New Source Permits	Registration	81012	Active
Air Operating Permits	Permit	1451	Active
Stormwater	Industrial Authorization	TXR05E173	Active
MSW Processing	Registration	48036	Active
Industrial and Hazardous Waste	Solid Waste Registration	H1522	Active

1. Based on a search of the associated regulated entity (RN100212968)

3.0 MAPS

30 TAC §330.59(c), §330.61(c) through (g)

The following maps and aerial photos required by 30 TAC 330.59(c)(1) and 305.45(a)(6)(A) are located in Appendix I/II-A.

Figure I/II.A.1: General Location Map (TxDOT Map)
Figure I/II.A.2a and I/II.A.2b: General Topographic Map
Figure I/II.A.3: Existing Conditions Aerial
Figure I/II.A.4: Habitable Structures within 500 ft
Figure I/II.A.5: Well Locations
Figure I/II.A.6: Property Ownership
Figure I/II.A.7: Land Use
Figure I/II.A.8: Area Airports
Figure I/II.A.9: Wind Rose
Figure I/II.A.10: General Location

3.1 Property Ownership [30 TAC 330.59(c)]

Property ownership has been verified through a search of the property tax rolls for Victoria County. A map showing the property ownership within 1/4-mile of the site is shown in Figure I/II.A.6 in Appendix I/II-A. Following the figure, is a list of each of the property owners' mailing addresses. Prepared printed mailing labels are also included with this application. No mineral interest ownership information was available within the Victoria Central County Appraisal District records for the facility property.

3.2 General

a) Texas Department of Transportation (TXDOT) Map locating the site is included in Figure I/II.A.1 in Appendix I/II-A.
b) Latitudes and longitudes are identified on the United States Geological Survey (USGS) map in Figure I/II.A.2 in Appendix I/II-A.
c) Area streams are identified on the USGS map in Figure I/II.A.2a and 2b and Figure I/II.A.3 in Appendix I/II-A. Also shown on this map are the locations of the wells, springs, and surface water body in the area in accordance with 30 TAC §305.45(a)(6)(A)
d) The points of interest described in 30 TAC §330.61(c)(4) and (12) are shown on Figure I/II.A.3 in Appendix I/II-A. There are no schools, licensed day care facilities, churches, hospitals, cemeteries, or recreational areas, within one mile of the site. There are no archaeological sites, historical sites, or sites with an exceptional aesthetic quality adjacent to the site.

e) Approximate locations of the known structures are shown on the maps in Figure I/II.A.3 and Figure I/II.A.4 in Appendix I/II-A.

f) A water well search of the area surrounding the Landfill was completed and the resulting maps and well data are included in Figure I/II.A.5 in Appendix I/II-A.

g) The permit boundary of the Landfill is depicted in the figures in Appendix I/II-A.

3.3 Facility Layout Plan [30 TAC 330.61(d)]

See Appendix I/II-B for the facility layout plans. The following drawings are included with this Part I/II submittal:

I/II.B.2: Existing Conditions with Proposed Expansion Footprint

I/II.B.3: Landfill Cell Expansion Plan

I/II.B.4: Waste Placement Phasing Plan

I/II.B.5: Final Environmental Monitoring Plan

4.0 PROPERTY OWNER INFORMATION

30 TAC §330.59(d)

See Appendix I/II-D for the legal description metes and bounds.

A signed property owner affidavit is provided in Appendix I/II-E.

5.0 LEGAL AUTHORITY

30 TAC §330.59(e)

The City of Victoria is a political body duly authorized and existing under the Statues of the State of Texas and governed in accordance with the City Charter by its Mayor and City Council. The City is duly qualified and authorized to carry on the governmental functions and operations as contemplated in this landfill application and any permit issued as a result of this application. The City has the power, authority, and legal right, to enter into and perform its obligation under the terms of this application and the performance of a permit issued here. The City of Victoria is the sole owner of the property proposed to be permitted, as described in Appendix I/II-D.

6.0 EVIDENCE OF COMPETENCY

30 TAC 330.59(f)

The Landfill is owned by the City of Victoria, Texas and operated by Republic Services of Texas, Ltd. (Republic). The City does not own, has not operated, and does not have a direct financial interest in, any other landfills in the last ten years.

Republic owns, operates, or maintains a financial interest in the Texas facilities identified in Table I/II-7. which includes 42 Type I MSW landfills and 15 other solid waste and recycling facilities, both open and closed. Consistent with the requirements in 30 TAC §330.59(f)(1), a list of all Texas solid waste sites owned or operated by Republic is provided in Table I/II-6. Consistent with 30 TAC §330.52(f)(2), a list of all known solid waste sites owned or operated by Republic in other states is presented in Table I/II-7. These tables are provided at the end of Section 6.0.

All facility employees and other persons involved in facility operations shall be qualified, trained, educated, and experienced to perform their duties so as to achieve compliance with this permit. The permittee shall comply with the technical requirements of Part I of the Application, Evidence of Competency, and as described in Part I of this permit. The permittee shall further ensure that personnel are familiar with safety procedures, contingency plans, the requirements of the Commission’s rules and this permit, commensurate with their levels and positions of responsibility, in accordance with Part III and Part IV of this permit.

6.1 Other Facilities

Consistent with the requirements in 30 TAC §330.59(f)(1), a list of all Texas solid waste sites owned or operated by Republic is provided in Table I/II-7. Consistent with 30 TAC §330.59(f)(2), a list of all known solid waste sites owned or operated by Republic in other states is presented in Table I/II-8. These tables are provided at the end of Section 6.0.

6.2 Key Personnel

The key personnel from the City of Victoria who are involved in the management and operation of the Landfill are:

- **Darryl Lesak, Director of Environmental Services.** Mr. Lesak directs the City of Victoria’s Environmental Services Department and is responsible for the oversight and long-term planning of the City of Victoria Landfill. Mr. Lesak has a Texas Class A license for Landfill Management and Operations.

The key personnel from Republic Services who are involved in the management and operation of the Landfill are:

- **Richard Kang, Area President.** Mr. Kang is responsible for the hauling, transfer stations, and landfill operations in the South Texas area. Responsibilities include financial planning and environmental compliance, as well as other management responsibilities.
- **Scott A. Trebus, Area Environmental Manager.** Mr. Trebus is responsible for the engineering management, regulatory coordination, and environmental compliance of Republic's facilities in the South Area. He has several years of experience in environmental engineering related projects, which includes Texas MSW facilities.
- **Operations Manager.** The operations manager is responsible for the daily operations of the Landfill. Responsibilities include oversight of hourly employees, equipment maintenance, construction management, and operations compliance. The operations manager is required to have a Texas Class A license for Landfill Management and Operations.

6.3 Equipment Listing

The equipment listed in Part IV, Site Operating Plan (SOP) is used to operate this site. Additional or different equipment units may be used as necessary to enhance operational efficiency. Other equivalent equipment units may be substituted for this equipment, as needed. Operators will have the necessary training and licensing to operate this equipment.

Table I/II-7: List of Republic Services, Inc. Solid Waste Facilities in Texas (as of March 2022)

Name	County	Permit Type & No.	Dates of Operation[1]
Victoria Landfill	Victoria	Type 1, MSW No. 1522A	Nov. 15, 1982 to present
SOUTH TEXAS AREA			
BFI Burnet TS	Burnet	Registration No. 40035	Aug. 17, 1994 to present
BFI Sealy TS	Austin	Registration No. 40025	April 19, 1995 to present
BFI Corpus Christi Recyclery	Nueces	Registration No. 65019	July 31, 2002 to present
BFI Galveston County TS	Galveston	Registration No. 1680	Oct. 4, 1989 to present
Blue Ridge Landfill	Fort Bend	Type 1, MSW No. 1505A	Dec. 10, 1990 to present
Cefe Valenzuela Landfill	Nueces	Type 1, MSW No. 2269	July 22, 2005 to present
City of El Campo CCS	Wharton	Type 5CC, MSW No. 120025	March 17, 2009 to present
El Centro Landfill	Nueces	Type 1, MSW No. 2267	2003 to present
Galveston County Landfill	Galveston	Type 1, MSW No.1149B	January 14, 1971 to present
Golden Triangle Landfill	Jefferson	Type 1, MSW No. 2027	May 24, 1991 to present
Gulf West Landfill	Chambers	Type 1, MSW No. 39039	March 1991 to present
Hardin County Landfill	Hardin	Type 1, MSW No. 2214A	September 2017 to present
Holmes Road Landfill	Harris	Type 1, MSW No. 38 (N ½)	CLOSED in 1978
		& MSW No. 377 (S ½)	
Houston Northwest TS	Harris	Type 5TS, MSW No. 1092	Jan. 12, 1999 to present
Houston Southeast TS	Harris	Type STS, MSW No.1074	December 22, 1983 to present
Houston Southwest TS	Harris	Type STS, MSW No. 1091	November 23, 1977 to present
Kerrville Landfill	Kerr	Type 1, MSW No. 1506A	1984 to present
La Feria TS	Cameron	Type 5TS, MSW No. 2375	November 9, 2011 to present
La Gloria Ranch Landfill	Hidalgo	Type 1, MSW No. 2348	May 24, 2007 to present
La Porte LF	Harris	Type 1, MSW No. 1765	Closed in 1988
McCarty Road Landfill	Harris	Type 1, MSW No. 2618	1972 to present
North County Landfill	Galveston	Type 4, MSW No.1849B	April 24, 1998 to present
Pinn Road 1 Landfill	Bexar	Type 1 and IV, MSW No. 92	Type I: 1975 to April 1986; revised to Type IV to Sept. 1991 (CLOSED)
Pinn Road 2 Landfill	Bexar	Type 1, MSW No.14	Jul. 1975 to 1994 (CLOSED)
Port Arthur Landfill	Jefferson	Type 1, MSW No. 1815	CLOSED in 1985
Rio Grande Valley Landfill	Hidalgo	Type 1, MSW No. 1948	Jan. 19, 1994 to present

Name	County	Permit Type & No.	Dates of Operation[1]
Sinton Landfill	San Patricio	Type 1, MSW No. 242A	Sept. 8, 1972, to 2003 (CLOSED)
Sunset Farms Landfill	Travis	Type 1, MSW No. 1447	May 17, 1982 to present
Tessman Road Landfill	Bexar	Type 1, MSWNo.1410B	1981 to present
Total Roll-Offs TS	Washington	Registration No. 40173	Sept. 4, 2001 to present
Whispering Pines Landfill	Harris	Type 1, MSW No. 1193	Jan. 1, 1984 to present
NORTH TEXAS AREA			
Southwest Landfill	Randall	Type 1, MSW No. 1663B	1985 to present
Abilene Regional Landfill	Jones	Type 1, MSW No. 1469A	1983 to present
Brazos Transfer Station	Parker	Type 5TS, MSW No. 2356	April 7, 2008 to present
Camelot Landfill	Denton	Type 1, MSW No. 1312B	Dec. 1979 to present
Charter Waste Landfill	Ector	Type 1, MSW No. 2158A	May 26, 1992 to present
City of Arlington Landfill	Tarrant	Type 1, MSW No. 358A	March 14, 1978, to present
City of Fort Worth Southeast Landfill	Tarrant	Type 1, MSW No. 218C	1976 to present
CSC Landfill	Ellis	Type 1, MSW No. 1209B	July 15, 1999 to present
ECD Landfill	Ellis	Type 1, MSW No. 1745B	1988 to present
Fort Worth Regional Landfill	Tarrant	Type 1, MSW No. 464A	Mar. 1987 to Oct. 1995 (CLOSED)
Fort Worth Transfer Station	Tarrant	Type V, MSW No. 2275	2001 to present
Greenwood Farms Landfill	Smith	Type 1, MSW No. 1972A	Sept. 1988 to present
Hutchins Landfill	Dallas	Type 1, MSW No. 1236A	CLOSED in 1992
Itasca Landfill	Hill	Type 1, MSW No. 241D	1988 to present
Lewisville Landfill	Denton	Type 1V, MSWNo.1749B	1986 to present
Maloy Landfill	Hunt	Type 1, MSW No. 1195A	January 23, 1979 to present
Mexia Landfill	Limestone	Type 1, MSW No. 1558A	1983 to present
Mill Creek Landfill	Tarrant	Type 1, MSW No. 208A	1973 to Nov. 2001 (CLOSED)
Pinehill Landfill	Gregg	Type 1, MSW No. 1327B	Dec. 1987 to present
Pleasant Oaks Landfill	Titus	Type 1, MSW No. 797 A	1960 to present
Quail Canyon Landfill	Lubbock	Type 1, MSW No. 987 A	1977 to 1992 (CLOSED)
Royal Oaks Landfill	Cherokee	Type 1, MSW No. 1614A	Dec. 1988 to present
Trinity Oaks Landfill	Dallas	Type 1, MSW No. 556	1976 to Nov. 2002 (CLOSED)

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

Table I/II-8: List of Republic Services, Inc. Solid Waste Sites in Other States (as of March 2022)

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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
Bel-Art TS	Gardena	CA	TS	May 1995 to Present
Del Norte Regional Recycling and TS	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

Facility Name	Location		Facility Type	Dates of Operation[a]
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	October1997 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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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 lA	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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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-AII Landfill	Fort Wayne	IN	LF	*
Sycamore Ridge Landfill	Pimento	IN	LF	*
Wabash Valley Landfill	Wabash	IN	LF	*
Advantage Transfer Station	Huntingburg	IN	TS	*
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 Ill	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

Facility Name	Location		Facility Type	Dates of Operation[a]
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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-AII	Danville	KY	TS	May 2000 to Present
St. John Pickup Station	Laplace	LA	TS	December 1999 to Present
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
CEC–S - 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

Facility Name	Location		Facility Type	Dates of Operation[a]
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 Ml - Whitefeather LF	Pinconning	MI	LF	August 2002 to Present
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

Facility Name	Location		Facility Type	Dates of Operation[a]
Arbor Hills Recyclery	Northville	MI	MRF	December 1999 to Present
B & RTS	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
SMDATS	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	*

Facility Name	Location		Facility Type	Dates of Operation[a]
Eden Prairie Recyclery	Eden Prairie	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 Prairie	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 Prairie	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	*
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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 1991to 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	*

Facility Name	Location		Facility Type	Dates of Operation[a]
ECDC Logistics Office Northeast	Harrison	NY	LF	*
Staten Island TS	Staten Island	NY	TS	*
Bronx TS	Bronx	NY	TS	December 1999 to Present
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	Brooklyn	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 - Niagara 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	*

Facility Name	Location		Facility Type	Dates of Operation[a]
CSI Waste Services - Evansdale	Evansdale	OH	TS	*
National Serv-AII 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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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	*
Alba–y - Lebanon Sanitation	Albany	OR	LF	*
Peltier ReaI Estate	Corvallis	OR	LF	*
Allied Waste Transportation Services	Woodburn	OR	TS	December 1999 to Present
Coffin Butte LF	Corvallis	OR	LF	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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
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

Facility Name	Location		Facility Type	Dates of Operation[a]
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 MSW TS	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

Facility Name	Location		Facility Type	Dates of Operation[a]
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
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	LF	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

Facility Name	Location		Facility Type	Dates of Operation[a]
Roosevelt Associates	West Roosevelt	WA	LF	*
Roosevelt lntermodal	Roosevelt	WA	LF	*
B Z Corners Drop Box TS	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 lntermodal, 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
Lake Area (Permit #3474) LF	Sarona	WI	LF	March 1998 to Present

Facility Name	Location		Facility Type	Dates of Operation[a]
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.

Regulatory agencies for Republic Services, Inc. solid waste sites are:

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 (IEP A)
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 (MD E)
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 (MD EQ)
Waste Management Division
Constitution Hall, 525 West Allegan Street, P.O. Box 304 73, 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 (NYSD EC)
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 (RID EM)
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

7.0 APPOINTMENTS

30 TAC 330.59(g)

The appointment prepared for this permit application meets the requirements of Title 30 TAC §330.59(g) and §305.44. The Notice of Appointments are included in Appendix I/II-E.

8.0 APPLICATION FEES

30 TAC 330.59(h)

In accordance with §305.53, the application fee for this permit major amendment is $2,050. This fee has been paid via check (Number 113979). Additional information is provided on the Part I Application Form and a copy of the check is provided following the Part I Application Form.

The City of Victoria regulated entity does not have any delinquent fees.

9.0 IMPACT ON SURROUNDING AREA

30 TAC 330.61(h)

The Landfill expansion will have minimal impact on the surrounding area. The land has been used for solid waste disposal for decades, and the operations at the Landfill will not significantly change as a result of this permit modification. The ability to dispose of Class 1 NHIW will provide additional flexibility to the community for their industrial solid waste disposal needs.

9.1 Characterization of Surrounding Land Use

A land use evaluation was performed for the area within one mile of the Landfill boundary. Land use information is summarized in the following maps (in Appendix I/II-A):

- The proximity to residences and other uses are shown in Appendix I/II-A, Figure I/II.A.4. There are two residential areas and two industrial areas within one mile of the facility. Based on land use analysis and aerial imagery, there are an estimated 39 residences within one mile of the facility boundary. The nearest residence, excluding temporary RV sites, is located approximately 0.5 miles southwest of the Landfill. There are an estimated 3 commercial establishments within 1 mile of the Landfill. The nearest is the Kinder Morgan facility, located 0.55 miles west of the Landfill. Chocolate Bayou and other streams identified in the National Hydrography Dataset (NHD) are also shown on Figure. No schools, churches, hospitals, cemeteries, historic structures and sites, archaeologically significant sites, or sites having exceptional aesthetic quality were identified within one mile of the facility.
- Land use surrounding the facility is primarily agricultural (shown in Appendix I/II-A, Figure A-7) Based on land use analysis and aerial imagery, land use is primarily cultivated crops and pasture/hay. Developed land surrounding the facility are the small areas of residential and industrial uses described above and shown in Figure.
- The City of Victoria has not adopted a zoning ordinance or regulation. The current Landfill activities are allowed for in the current and lateral expansion parcels in Victoria County.

9.2 Growth Trends of the Nearest Community

The City of Victoria is located approximately 7 miles NNW of the Landfill. The City of Victoria is the largest city in and the county seat of Victoria County. Based on estimates from the US Census Bureau, Victoria County is growing at a rate of 0.22 percent and the City of Victoria had a total population of 66,916 in 2019, with an average annual growth rate of 0.8 percent since the 2010 Decennial Census. This is significantly slower growth than for the total Texas population (approximately 10 percent) and the US population (approximately 4 percent) over similar time periods.

There are no incorporated areas within five miles of the facility; however, the unincorporated census designated places (CDPs) of Bloomington and Placedo are within five miles of the facility. As of the 2010 Census, Bloomington had a population of 2,459 and Placedo had a population of 692. Growth trends in these unincorporated areas are unknown.

9.3 Oil and Water Wells Within 500 Feet

A map of water and oil and gas wells within 500 feet of the facility boundary is provided in Appendix I/II-A (Figure), based on information provided by the TWDB for submitted driller’s report water wells, known groundwater monitoring wells, and the Texas Railroad Commission (TRC) for oil and gas wells. A total of 38 wells were identified within 500 feet of the facility: 32 wells associated with the Landfill operation, 4 groundwater test wells, 2 industrial water wells associated with the on-site composting operation, and 1 environmental soil boring well.

No oil and gas wells were identified within 500 feet of the Landfill.

10.0 TRANSPORTATION

30 TAC §330.61(i)

10.1 Traffic Summary and TxDOT Coordination

All site traffic will enter from FM 1686 via State Highway 185 or U.S. Highway 87. State Highway 185, and U.S. Highway 87 have no weight loading restrictions, beyond the legal limit of 80,000 pounds per vehicle as prescribed by law. The current load rating of FM 1686 is 58,420 pounds, which is adequate to handle existing waste vehicles which have a gross weight of approximately 45,000 to 54,000 pounds.

A Texas Department of Transportation Map locating the site is included in Figure in Appendix I/II-A. It is estimated that at peak filling rates, the maximum truck traffic will be approximately 100 vehicles per day. This maximum vehicle traffic rate remains unchanged since the 1997 permit, and traffic volumes have not materially changed in at least 20 years. The proposed expansion is designed to increase Landfill life and is not anticipated to materially change traffic or waste volumes. The average daily volume of traffic for access roads within 1-mile of the facility, based on the Texas Department of Transportation (TxDOT) Traffic Count Database System (TCDS), are 744 vehicles for FM 1686 and 10,372 vehicles for State Highway 185. The traffic count as discussed above (an estimated maximum of 100 vehicles per day) includes the current vehicle traffic at the Landfill and potential additional future traffic volumes due to population growth. Additionally, correspondence from TxDOT, dated May 21, 2021, is included in Appendix I/II-F, which states that the TxDOT Yoakum District has reviewed the proposed expansion and staff do not anticipate any adverse impacts as a result of the project.

The existing paved entrance road will continue to provide access to the site from FM 1686.

10.2 Facility Impact on Airports

There are no public-use airports within six miles of the proposed facility, thus the proposed expansion meets the airport safety requirements of 30 TAC §330.545(a) and (b). Specifically, there are:

- No runways used by turbojet aircraft within 10,000 feet of the Landfill
- No runways used by piston-type aircraft within 5,000 feet of the Landfill
- No small general service airport runways within a 6-mile radius of the Landfill
- No large general public commercial airport runways within a 5-mile radius of the Landfill

The Landfill is located approximately 10 miles south of the nearest public-use airport runway, located at Victoria Regional Airport (VCT). The Landfill is located approximately 7.25 miles north-northwest of the nearest airport runway, located at Green Lake Ranch, a private airport with a single hard-surfaced runway.

See Appendix I/II-F for the coordination letter with the Federal Aviation Administration (FAA) confirming the compliance of the Landfill expansion with federal airport location restrictions, as demonstrated via the FAA Notice Criteria Tool.

11.0 GENERAL GEOLOGY AND SOILS STATEMENT

30 TAC 330.61(j)

During prior phases of Landfill development, the subsurface conditions at the site were evaluated by drilling 56 borings ranging in depth from 30 to 100 feet below ground surface. During subsequent evaluation of the lateral expansion area, twenty-four soil borings (EB-01 through EB-24) ranging in depth from 37 to 102 feet were advanced to supplement the existing information related to geologic and hydrogeologic characteristics of the Landfill property and to further define the characteristics beneath the proposed expansion area.

Subsurface conditions observed during the investigation of the proposed expansion area were consistent with previous investigations at the Landfill. In general, the soil profile consists of a medium to highly plastic clay stratum overlying a sand/silty sand, which varies both in depth and thickness across the site. Below the silty sand, interbedded strata of stiff clays and sands/silty sands were encountered. In the lateral expansion area, the upper clay stratum has coefficients of permeability of less than 1.5×10^{-8} cm/sec.

A summary of fault areas, seismic impact zones, and stable areas is presented below to conform to Part I/II requirements. A full geological report of subsurface conditions is included in Part III, SDP, Geology Report.

11.1 Fault Areas [330.61(j)(2)]

The City of Victoria Landfill and the surrounding area were examined for the presence of geological faulting in accordance with 30 TAC §330.555, including a review of historical regional fault investigations in the vicinity, available literature and maps, and current aerial photography. The Beeville-Bay City sheet of the Geologic Atlas of Texas, the Tectonic Map of Texas (Bureau of Economic Geology, 1994), and a review of the USGS Quaternary Fault and Fold Database did not indicate any faults within 10 miles of the Landfill. Detailed fault studies (30 TAC §330.555(b)) are not required as no active fault is known to exist within ½ mile of the site.

Based on a review of the USGS 7.5-minute 2019 Bloomington, Texas Quadrangle Map, current aerial photographs of the site and site visits conducted from the past several years, no unusual relief or topographic features were identified within 200 feet of the site. No evidence of faulting was found associated with surrounding, adjacent or on-site roadways. This review confirms site compliance with 30 TAC §330.555 criteria.

11.2 Seismic Impact Zones [330.61(j)(3)]

Based on 30 TAC §330.557, the Landfill is not located in a seismic impact zone. According to the 2014 U.S. Geological Survey National Seismic Hazard Maps, the region is considered low hazard with 0.02 peak ground acceleration (expressed as a fraction of standard gravity) for 2% probability of exceedance in 50 years (Petersen et al., 2014, Documentation for the 2014 update of the United States national seismic hazard maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p.). This is equivalent to less than 10% probability over 250 years. The location restriction criterion in 30 TAC §330.557 requires that new disposal units and lateral expansions not be located in seismic impact zones, defined as an area with a 10% or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 250 years. The area was predicted to have a less than 1% chance of potentially minor or moderate damage from ground shaking due to natural and induced earthquakes in 2018 (most recent data available [Petersen et al. 2018, "One-year seismic hazard Forecast for the central and eastern United States from induced and natural earthquakes." *Seismological Research Letters*, 89 (3), 1049-1061]).

11.3 Unstable Areas [330.61(j)(4)]

As presented in the Part III, Site Development Plan (SDP), the Landfill area is geologically stable. The soil profile consists of highly plastic clays, stiff clays, and silty sand. Significant differential settling is not anticipated at the site. There are no oil and gas wells within 1 mile of the site to cause potential land subsidence. The site is not located in a karst region.

12.0 GROUNDWATER AND SURFACE WATER STATEMENT

30 TAC 330.61(k)

12.1 Groundwater

In the existing permitted area, groundwater levels are monitored with the existing Landfill semi-annual detection, assessment, and corrective action monitoring activities. Historically, water levels range from 22-32 feet amsl. Groundwater data for the proposed lateral expansion area was obtained through six piezometers, with monitoring beginning in February 2019 in conjunction with existing Landfill monitoring.

Groundwater flow direction during February 2019 was to the southwest, consistent with historical data from the existing Landfill. Groundwater elevations across the proposed expansion area ranged from 24.65 feet amsl to 33.50 feet amsl over the monitoring period since February 2019, and a seasonal high groundwater elevation of 33.50 feet amsl was assumed for the design.

Part III, SDP, Groundwater Characterization Report, further discusses the groundwater at the site.

12.2 Surface Water

The ground surface near the site is near flat to gently sloping. The slope of the surface is generally from north to south. The area is drained by a series of man-made and natural drainage structures. The Victoria County Drainage District #2 is responsible for maintaining the majority of the drainage structures off of the Landfill site. The Texas Department of Transportation is responsible for maintaining the ditch that is adjacent to and parallel to FM 1686. A portion of the lateral expansion area is currently used as a borrow area for soils used in Landfill cell development.

Surface water flowing from the north is prevented from flowing over the Landfill site by FM 1686. Water from the northern portion of the Landfill is carried by the ditch on the southern side of FM 1686 directly to Chocolate Bayou and eventually, Lavaca Bay.

Within the existing Landfill, the majority of the surface water from the Landfill is carried through a series of on-site drainage structures to a stormwater basin and an outfall located in the southeastern portion of the Landfill. This outfall is connected to a drainage ditch that carries the water south until it reaches Chocolate Bayou, approximately two miles south of the Landfill site and eventually into Lavaca Bay.

For the proposed expansion area, within the Landfill footprint, tack-on terraces will be used for stormwater conveyance to the letdown channels to maximize waste volume, and gabions will be used to minimize the letdown thickness. In the existing footprint, chutes will be extended, where required, to integrate with the existing stormwater management infrastructure.

Runoff will generally be segregated for management on the East and West of the Landfill. Runoff from the vertical expansion area of the existing Landfill and the East portion of the lateral expansion will be conveyed to a new East Detention Pond. Runoff from the Western portion will be conveyed to the new West Detention Pond. The existing detention pond will be used to manage stormwater from the existing closed area. The West Detention Pond will discharge from the South into the existing tributary ditch, which will be re-routed to accommodate the Landfill expansion (as discussed in more detail in Part III (SDP)).

The 100-year flood elevation is approximately 60.8 – 61.8 feet on the East side of the expansion area (east side tributary Chocolate Bayou) and 62.7 – 63.4 feet on the West side of the expansion area. The determination of 100-year flood elevations are described in Attachment III-2. FEMA’s endorsement of the CLOMR included a thorough review of the HEC-RAS hydraulic model and establishes the 100-year flood elevations for the project site, even though the CLOMR maintains the floodplain as a Zone A boundary. To prevent run-on from the 100-year flood, the edge of the Landfill perimeter berm will be constructed at a minimum elevation of 66.4 feet amsl to meet 3-foot freeboard requirements. The Part III, SDP further details the surface water and its protection thereof.

The facility has been 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 Landfill has a current Texas Pollution Discharge Elimination System (TPDES) multi-sector general permit (MSGP) for industrial activity (Permit No. TXR05EI73) which is included in Appendix I/II-I. The facility is in full compliance with TPDES under the Clean Water Act, Section 402, as amended. Any stormwater that has become contaminated by contact with the working face or with leachate will be handled in accordance with the Leachate and Contaminated Water Management Plan included in Part III of this application. The Landfill maintains a current Stormwater Pollution Prevention Plan (SWPPP) as required for coverage under the TPDES MSGP. The Landfill will update and maintain TPDES coverage (Current Permit TXR05E173) as required throughout the construction and site life and to reflect approved permit modifications.

All liquids resulting from the operation of the Landfill shall be disposed of in a manner that will not cause surface water or groundwater pollution. The Landfill shall provide for the treatment of wastewaters resulting from waste management activities and from cleaning and washing, and stormwater and wastewater management will be performed in compliance with applicable regulations.

13.0 ABANDONED OIL AND WATER WELLS

30 TAC 330.61(l)

No abandoned water supply or oil and gas wells were identified within the permit boundary. Existing active wells around the perimeter of the current waste footprint are associated with environmental monitoring.

Two water supply wells are situated within the lateral expansion area but outside of the previously permitted and currently installed groundwater monitoring network (as shown on Figure I/II.A.5 in Appendix I/II-A). These industrial wells (193787 and 155301) are associated with the existing composting facility operations within the lateral expansion area of cells H1, H2, I1, and I2. As shown in Part III, Attachment III-1, Drawing III.A1.4, site development in the lateral expansion area will begin with Cell G2 and move southwest to Cell A1. In conjunction with site development into the lateral expansion area, the temporary monitoring network will be installed as shown in Part III, Attachment III-1, Drawing III.A1.12. Composting operations will continue in the existing location and these wells will be maintained consistent with the requirements in 30 TAC §330.61(l)(1) as wells 193787 and 155301 will be within the temporary monitoring network at this time but will remain outside of any landfill cells. Site development after Cell A1 will continue with Cell H1 and move northeast to Cell I2. As required in 30 TAC §330.61(l)(1), written certification will be provided to the executive director within 30 days prior to construction of Cell H1, that these wells have been capped, plugged, and closed in accordance with all applicable rules and regulations, as part of the compost facility relocation. Compost facility relocation to a new parcel will occur prior to affected expansion development through the TCEQ registration process for composting operations.

14.0 LOCATION RESTRICTIONS

14.1 Easements and Buffer Zones

There are no easements for drainage or pipelines within the permitted area for waste disposal. There is one utility easement adjacent to the permit boundary, an easement for a CPL Utilities overhead electric utility line with American Electric Power (AEP) electric delivery company, shown in Drawing I/II.B.2 in Appendix I/II-B. As part of the proposed lateral expansion, the CPL Utilities line would be rerouted along FM 1686. Coordination with AEP which would relocate the line has been ongoing since prior to 2014. Documentation of this reroute coordination is provided in Appendix I/II-F– Coordination Letters. Consistent with the requirements of 30 TAC §330.543(a), no solid waste disposal will occur within 25 ft. of the center line of any utility or pipeline easements but no closer than the easement, unless otherwise authorized by the executive director.

A 50-foot buffer is required between feedstock or final product storage areas; solid waste storage, processing, Type IAE landfill units, Type IV landfill units, and Type IVAE landfill units. An existing composting facility (operating under a separate registration) is operating within the planned expansion area, as shown in Drawing I/II.B.2 in Appendix I/II-B. As shown in Drawing I/II.B.4 in Appendix I/II-B, the cell phasing is such that the composting area can continue operating until the construction of Cell H2. The composting site would maintain that facility's separate entrance and a buffer between the composting operation and Landfill activities in excess of 50 feet as Cell H1 would remain undeveloped during compost facility operations in the current location (Cell H1 has a total cell width of 360 feet).

The current Landfill footprint and disposal airspace were permitted prior to 125-foot buffer requirement, and as such the facility will establish and maintain a minimum 50-foot buffer from the previously permitted waste. For the vertical expansion over the currently permitted Trenches 7 and 8, the facility will establish and maintain a minimum 125-foot buffer from outermost edge of the new airspace associated with the vertical expansion as required by 30 TAC §330.543(b)(2)(B). This newly permitted solid waste disposal airspace begins at elevation 130 ft amsl, with approximately 300 feet between the outermost edge of new airspace and the property boundary. The proposed lateral expansion fill area will maintain a buffer of at least 125 feet between the limits of waste and the property boundary, as shown in Drawing I/II.B.2 in Appendix I/II-B, with additional buffers of 736 feet along the western extent and 1891 feet along the eastern extent of the lateral expansion to conform to the FEMA-approved limit of fill for the CLOMR (Appendix I/II-H).

14.2 Airport Safety

The Landfill site meets the requirements of 30 TAC §330.545 for airport safety. As presented in the attached FAA map (see Appendix I/II-A, Figure A-8), the Landfill is more than 10,000 feet from any airport runway. There are no airports within 6 miles of the site. The nearest public-use airport runway to the site is the Victoria Regional Airport, which is approximately 10 miles from the site. More detail on facility impacts related to airports is included in Section 10.2 above.

14.3 Floodplain and Wetlands Statement [30 TAC 330.61(m)]

The facility's construction & operations shall not cause or contribute to violations of state water quality standards, violation of any applicable toxic effluent standard or prohibition under the Clean Water Act §307; jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, or violate any requirement under the Marine protection, Research, & Sanctuaries Act. More information on floodplains, wetlands, and threatened and endangered species is provided in Sections 14.3.1, 14.3.2, and 14.7 below.

14.3.1 Floodplain Statement

As presented in the Flood Insurance Rate Map (FIRM) map for Victoria County, Texas, which was included in the approved existing permit, the existing Landfill is not located in the 100-year floodplain.

A portion of the property containing the lateral expansion area is located within a FEMA Zone A 100-year floodplain, as shown in Appendix I/II-H. As required by 30 TAC §330.547(c), a Conditional Letter of Map Revision (CLOMR) has been obtained for the proposed lateral expansion area (see Appendix I/II-H). Appendix I/II-H also includes a copy of the Victoria County Floodplain Permit. The CLOMR reflects FEMA's comment and decision that, if a project is built as proposed, a post-construction Letter of Map Revision (LOMR) request would be recognized by FEMA to revise the effective floodplain map. Therefore, through receipt of the CLOMR, FEMA has made the decision that once built to its entirety the effective map can be revised. Consistent with 30 TAC §330.547, the Landfill is designed such that it will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to post a hazard to human health and the environment. Prior to placing and waste in a cell within the 100-year floodplain, the relevant berms will be constructed and a LOMR will be obtained. The pre-opening inspection will be requested before waste is accepted into any of the expansion cells as required by 330.73(f). If those expansion cells are in the floodplain (as identified), the LOMR will be provided to the TCEQ in advance of the pre-opening inspection.

As described in detail in Part III of this application, the proposed Landfill design includes the following elements to address the 100-year floodplain and to comply with the CLOMR and obtain approval of the LOMR from FEMA:

- relocating the tributary ditch outside of the Landfill boundary to maintain flood flows around the Landfill expansion,
- constructing the perimeter berm at a height of at least 3 feet above the 100-year flood elevation (minimum berm elevation of 66.4 feet) around the entire Landfill expansion to divert the floodplain around the Landfill extents, and
- compensatory grading buffer area to mitigate tributary ditch floodplain constriction.

The process of filling the expansion area over its lifespan will then effectively raise the ground containing the permitted Landfill above the 100-year floodplain elevation of both the Chocolate Bayou and Tributary Ditch. The perimeter berm will be owned by the Landfill owner (City of Victoria) and may be maintained by the City directly or through contract with the designated site operator.

14.3.2 Wetlands Statement

The Landfill is not located in any wetlands. As described in the wetland delineation report in Part III (SDP), the on-site investigation identified a potential Palustrine Emergent (PEM) wetland totaling 0.10 acres within the proposed lateral expansion area, in a location that was excavated in 2009 adjacent to an unpaved road used for site operations. A jurisdictional determination was sought from the U.S. Army Corps of Engineers (USACE), which confirmed the identified feature is a man-made excavation not subject to USACE jurisdiction by Section 404 of the Clean Water Act. This determination is included in Appendix I/II-G.

14.4 Fault Areas

As presented in Section 11.1, there are no fault areas within 200 feet of the site, and the site complies with 30 TAC §330.555 criteria.

14.5 Unstable Area

As presented in Section 11.3, the Landfill area is geologically stable. The soil profile consists of highly plastic clays, stiff clays and silty sand which provide a stable foundation for the site. The investigation does not suggest the area is unstable as defined in 30 TAC §330.559.

14.6 Seismic Impact Zones

Based upon the U.S. Department of the Interior Geological Survey "Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the contiguous United States" (1982), the Landfill is not located in a seismic impact zone.

14.7 Endangered or Threatened Species [30 TAC 330.61(n)]

An assessment of the potential effects of the proposed Landfill on threatened and/or endangered species was conducted based upon data available from the US Fish and Wildlife Service's Information for Planning and Conservation and the Texas Parks and Wildlife Department's Texas Natural Heritage Program. The existing Landfill permit demonstrated "no presently known occurrences of special species or natural communities in the general vicinity of the landfill." The September 2018 Protected Species Report (updated in February 2021) targeted to the lateral expansion area is provided in Appendix I/II-F. The evaluation shows that potential occurrence of federally listed species is unlikely, and a determination of "No Effect" to federally listed threatened and endangered species is appropriate. Suitable habitat for bald and golden eagles were not present within the Landfill area; therefore, a determination of "No Impact" for the bald and golden eagles is appropriate. As such, the construction and operation of the facility shall not result in the destruction or adverse modification of the critical habitat or cause or contribute to the taking of endangered or threatened species.

14.8 Texas Historical Commission Review [30 TAC 330.61(o)]

A background review and archaeological survey were performed under Texas Antiquities Permit #8492. Findings are of "no effect" on archaeological sites. See Appendix I/II-F for the Texas Historical Commission review letter documenting compliance with the NRC, Chapter 191, Texas Antiquities Code.

14.9 Groundwater and Surface Water

According to information and maps provided by the Texas Water Development Board, the Landfill site is not located over the Edwards Aquifer recharge zone. The facility is located in the Gulf Coast Aquifer.

14.9.1 Class 1 Material Acceptance

The option to accept Class 1 material for below-grade disposal in cells designed to meet Class 1 requirements is included in the proposed lateral expansion area. As such, these cells must meet the restrictions in 30 TAC §335.584 related to groundwater protection. As shown in Attachment III-1 – Drawing III.A1.4, all cells in the lateral expansion area (A1-I2) are designated to be used for below-grade Class 1 disposal. Cells in the lateral expansion area that share a sump (i.e., A1 and A2, B1 and B2, etc.) will be constructed to accept the same type of below-grade waste type (i.e., MSW-only or Class 1). Prior to developing a cell in the lateral expansion area for MSW-only disposal, a permit modification will be filed and approved by TCEQ to change the cells' designation from Class 1 to MSW-only.

The expansion meets the requirements of §335.584(b)(3) and (4), as the facility is not located on a barrier island, peninsula, or within 1,000 feet of an area subject to active shoreline coastal erosion.

The facility is located in the Gulf Coast aquifer. As such, the underlying subgrade of the standard Class 1 landfill cell base liner has been designed using an alternative soil permeability and thickness to conform with the 30 TAC §335.584(b)(2) requirement. The proposed alternative subgrade areas will require a minimum of 18 inches of engineered subgrade (prepared to a maximum hydraulic conductivity of $1x10^{-8}$ centimeters per second [cm/sec]) prior to placement of the compacted soil liner. The prepared subgrade will be constructed under the entire liner system, including the bottom and the sideslopes of the landfill. Design details are provided in Part III SDP. Testing results for on-site soils are provided in Attachment III-5, Geology Report, Table 3-3. Hydraulic conductivity values for the upper (surficial) clay layer ranged from $1.3x10^{-8}$ to $1.3x10^{-9}$ cm/s. Quality assurance/quality control (QA/QC) procedures for subgrade installation are discussed in Attachment III-4, Sections 2.0 and 4.0.

Additionally, there are certain portions of the expansion area where compliance with 30 TAC §335.584(b)(1) cannot be documented and acceptance of Class 1 waste would require an alternative subgrade soil permeability and thickness to conform with the intent of the prescribed underlying soil unit in 30 TAC §335.584(b)(1). The equivalent constructable subgrade would be a minimum of 6 inches of engineered subgrade (that meets standard compacted soil liner requirements) prior to placement of the compacted soil liner. However, the proposed Class 1 cell design already includes a minimum of 18 inches of engineered subgrade (prepared to a maximum hydraulic conductivity of $1x10^{-8}$ cm/sec) prior to placement of the compacted soil liner as described above. The 18 inches of engineered subgrade demonstrate confinement equivalency in excess of 30 TAC §335.584(b)(1). Design details are provided in Part III SDP.

The methodology for the equivalency demonstration is from the publication Comparison of Leachate Flow through Compacted Clay Liners and Geosynthetic Clay Liners in Landfill Liner Systems, a technical paper by J.P. Giroud, K Badu-Tweneboah, and K.L. Soderman (Giroud). Equation 18 from this paper provides the steady-state travel time for leachate to flow via advection through a liner. This equation is as follows:

$$t_{sst} = \frac{\mathrm{nT}}{\mathrm{k}(1 + h/T)}$$

t_{sst} = steady state travel time (sec)
n = effective porosity (%)
T = soil layer thickness (cm)
k = hydraulic conductivity (cm/sec)
h = head (cm)

The following assumptions were made:

- The effective porosity of the prescribed and alternative underlying soil units is assumed at 30%. This is within the recommended range provided in Giroud and is believed to be reasonable based on the soils found on site. The 30% assumption has also been utilized in a similar TCEQ landfill application that is available for public review online. Given this value is assumed, the equivalency demonstration is also performed based on flux through the liner (below).
- The assumed pressure from liquid on top of the soil column (head) used for all calculations was 30.48 cm (1 foot). This is a conservative assumption, as the head is expected to be lower (1 foot of head is the maximum allowed on top of the landfill liner in TCEQ's solid waste regulations).

The travel time for fluid through 10 feet of soil with a hydraulic conductivity of 1×10^{-7} cm/sec (i.e., the prescribed underlying soil unit in 30 TAC §335.584(b)(2)) is 26 years. The proposed alternative is: 1.5 feet of soil with a hydraulic conductivity of 1×10^{-8} cm/sec, which gives a travel time of 26 years, equivalent to the travel time of the prescribed underlying soil unit.

The travel time for fluid through 5 feet of soil with a hydraulic conductivity of 1×10^{-5} cm/sec (i.e., the prescribed underlying soil unit in 30 TAC §335.584(b)(1)) is 0.12 years. The constructible equivalency: 6 inches of prepared subgrade soil with a hydraulic conductivity of 1×10^{-7} cm/sec, which gives a travel time of 0.48 years, exceeding the travel time of the prescribed underlying soil unit.

The sufficiency of 1.5 feet of soil with a hydraulic conductivity of 1×10^{-8} (determined by travel time method above) is further demonstrated by a comparison of the travel time method with the flow rate over a unit area (or flux) for the prescribed underlying soil layer and the proposed engineered subgrade. The methodology for the demonstration of flow rate over a unit area is from the publication Technical Equivalency Assessment of GCLs to CCLs, a technical paper by R.M. Koerner and D.E. Daniel (Koerner and Daniel). Equation 1 from this paper is as follows:

$$v = \mathrm{k}\frac{\mathrm{h} + \mathrm{T}}{\mathrm{T}}$$

v = steady downward flux of water through the layer
T = soil layer thickness (cm)
k = hydraulic conductivity (cm/sec)
h = head (cm), conservatively assumed as 30.48 cm (1 foot)

Equation 4 from Koerner and Daniel describes the required hydraulic conductivity to ensure equivalent performance in terms of steady flux of water, and is as follows:

$$(\mathrm{k}_{Subgrade})_{Required} = \mathrm{k}_{Soil}\frac{\mathrm{T}_{Subgrade}}{\mathrm{T}_{Soil}}\frac{\mathrm{h} + \mathrm{T}_{Soil}}{\mathrm{h} + \mathrm{T}_{Subgrade}}$$

k_{Soil} = hydraulic conductivity (cm/sec) of prescribed soil layer ($1\mathrm{x}10^{-7}$ cm/sec)
T_{Soil} = thickness (cm) of prescribed soil layer (10 ft; 304.8 cm)
$\mathrm{T}_{Subgrade}$ = thickness (cm) of proposed engineered subgrade (1.5 ft; 45.72 cm)
h = head (cm), conservatively assumed as 30.48 cm (1 foot)
$(\mathrm{k}_{Subgrade})_{Required}$ = required hydraulic conductivity (cm/sec) of 1.5 ft of engineered subgrade for equivalent flux to the prescribed soil layer

The calculated flux (v) through 10 feet of soil with a hydraulic conductivity of $1\mathrm{x}10^{-7}$ cm/sec (i.e., the prescribed underlying soil unit in 30 TAC §335.584(b)(2)) is 6.6 times greater than the calculated flux through the proposed 1.5 feet of engineered subgrade with a hydraulic conductivity of $1\mathrm{x}10^{-8}$ cm/sec.

This is confirmed by calculating the hydraulic conductivity ($\mathrm{k}_{(Subgrade)Required}$) needed for 1.5 feet of engineered subgrade to be equivalent to the prescribed soil is proposed alternative, which is $6.6\mathrm{x}10^{-8}$ cm/sec. Therefore the proposed hydraulic conductivity of the engineered subgrade ($1\mathrm{x}10^{-8}$ cm/sec) is more protective than the minimal required for an equivalent 1.5-foot protective layer. This comparison based on equivalent flux confirms the proposed engineered subgrade will meet or exceed the groundwater protection resulting from the prescribed soil layer requirements of 30 TAC §335.584(b)(2).

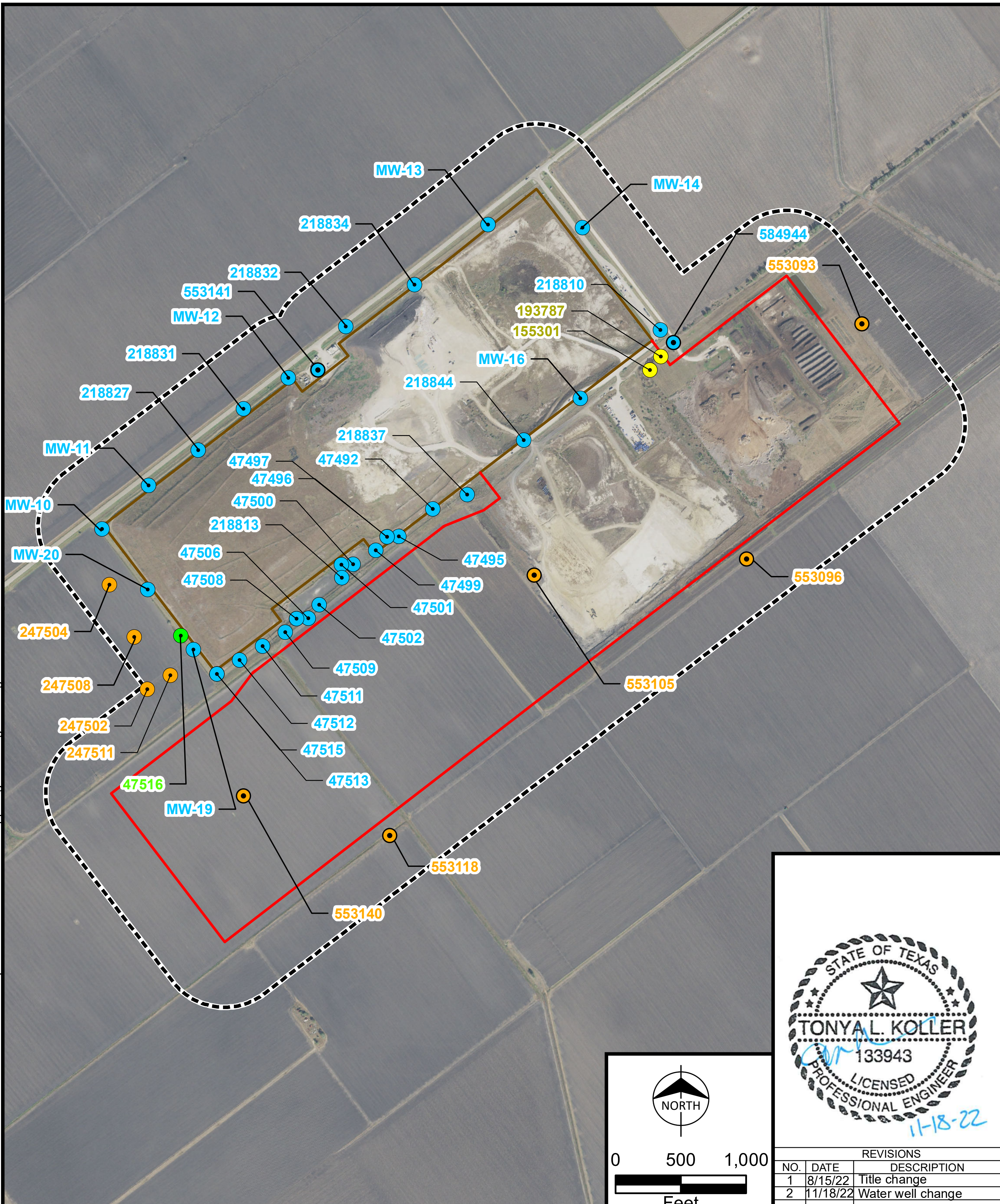
A discussion on verifying the density of the subgrade is provided in Section 4.6 of Attachment III-4 in Part III, and a discussion on verifying the thickness of the subgrade is provided in Section 4.9 of Attachment III-4 in Part III.

15.0 COUNCIL OF GOVERNMENTS AND LOCAL GOVERNMENT REVIEW REQUEST

[30 TAC 330.61(p)]

The applicable council of governments for this facility location is the Golden Crescent Regional Planning Council (GCRPC). Documentation that Parts I and II of this application were submitted to GCRPC for their review for compliance with regional solid waste plans is provided in Appendix I/II-F. The response from the Executive Director of the GCRPC communicating full support of this application is also provided in Appendix I/II-F.

APPENDIX I/II-A – MAPS & PHOTOGRAPHS



REVISIONS		
NO.	DATE	DESCRIPTION
1	8/15/22	Title change
2	11/18/22	Water well change

Environmental Soil Boring Well
Industrial Well
Monitoring Well
Test Well

Permitted Landfill Boundary
Proposed Landfill Expansion Boundary
500-Foot Project Radius

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Figure I/II.A.5
Well Locations
Victoria Landfill Permit
City of Victoria
Victoria County, TX

Service Layer Credit
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Source: ESRI; TWDB; USDA NAIP 2020; Burns & McDonnell Engineering Company, Inc.
Issued: 11/28/2022

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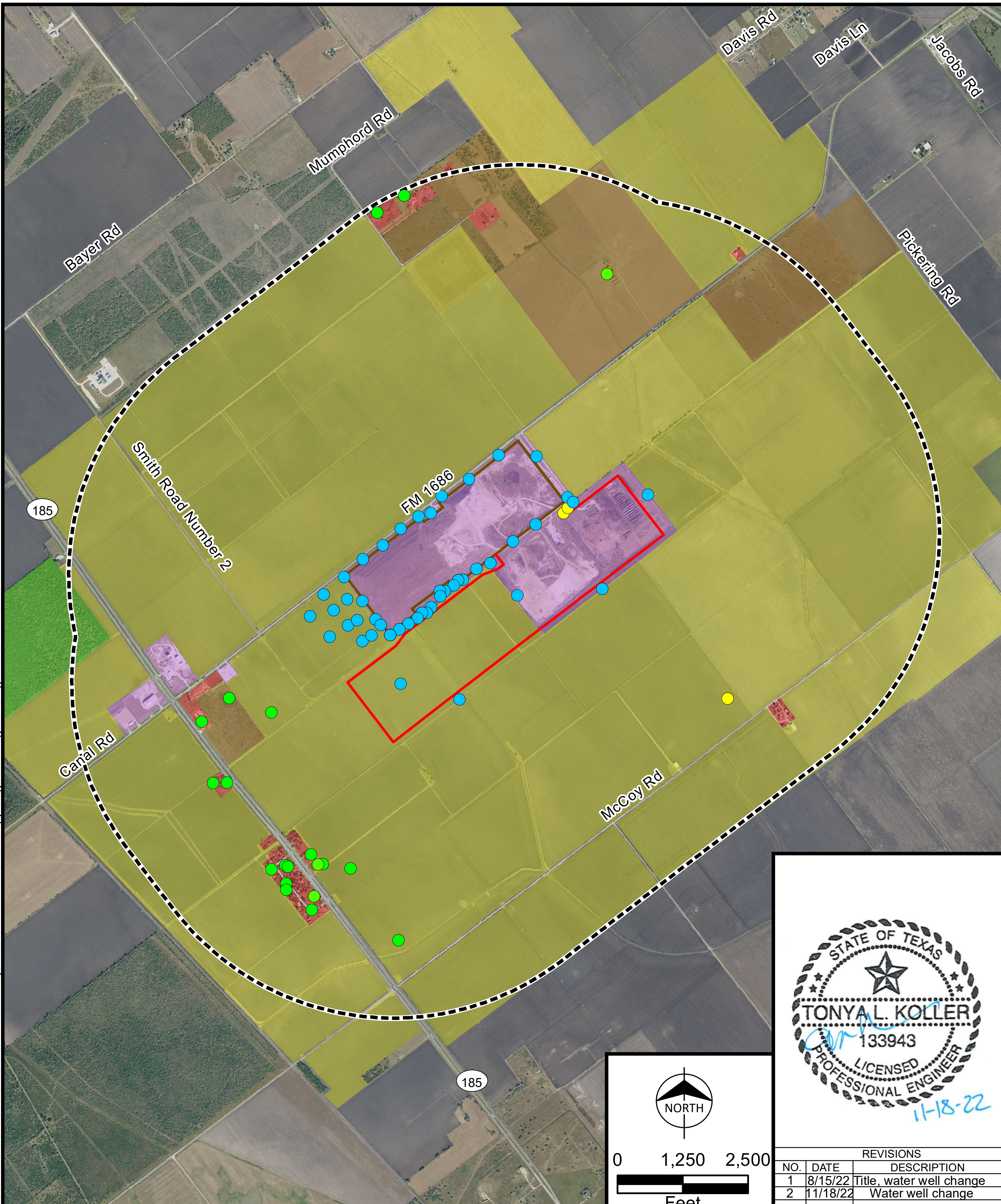

REVISIONS

NO.	DATE	DESCRIPTION
1	8/15/22	Title, water well change
2	11/18/22	Water well change

Permitted Landfill Boundary
Proposed Landfill Expansion Boundary
1-Mile Project Radius
Monitoring Well
Potable Water Well
Non-potable Water Well

Land Use

Agricultural Cropland
Agricultural Rangeland
Commercial / Industrial
Forested
Residential

BURNS McDONNELL

Figure I/II.A.7
Land Use
Victoria Landfill Permit
City of Victoria
Victoria County, TX

Source: ESRI; TWDB; USDA NAIP (2019); MRLC NLCD 2019; Burns & McDonnell Engineering Company, Inc.

Issued: 11/28/2022

APPENDIX I/II-B – FACILITY LAYOUT DRAWINGS

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. VICTORIA LANDFILL SITE TOPOGRAPHY (NORTHERN PROPERTY AND EXISTING LANDFILL GRADES) PROVIDED BY COOPER AERIAL SURVEYS CO. DATE OF AERIAL SURVEY: NOVEMBER 24, 2019. SURVEY LIMITS SHOWN ON DRAWING C001.
2. EXPANSION PROPERTY SITE TOPOGRAPHY PROVIDED BY CIVIL CORP. DATE OF GROUND SURVEY: OCTOBER 2, 2018. SURVEY LIMITS SHOWN ON DRAWING C001.
3. TOPOGRAPHY OUTSIDE OF THE AREA DESCRIBED IN NOTES 1 AND 2 WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 1999.
4. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
5. IN ADDITION TO THE LIST BELOW, THE FOLLOWING ABBREVIATIONS AND SHORTENED TERMS ARE USED IN THIS DRAWING SET:
   - WEST BASIN = FIRST FLUSH DETENTION BASIN WEST
   - EAST BASIN = DETENTION BASIN EAST

ABBREVIATIONS

AC	ACRE
AMSL	HEIGHT ABOVE MEAN SEA LEVEL
BMcD	BURNS & MCDONNELL
CM	CENTIMETER
DWG	DRAWING
E	EAST/EASTING
EB	EXISTING BORING
EL.	ELEVATION
EX.	EXISTING
FM1686	FARM-TO-MARKET ROAD 1686
FT.	FEET
GCCS	GAS COLLECTION AND CONTROL SYSTEM
GCL	GEOSYNTHETIC CLAY LINER
GMP	GAS MONITORING PROBE
HDPE	HIGH-DENSITY POLYETHYLENE
IN.	INCH
INV.	INVERT

ABBREVIATIONS CONT.

K	HYDRAULIC CONDUCTIVITY
LFG	LANDFILL GAS
MIL	1/1,000-INCH
MIN	MINIMUM
MW	MONITORING WELL
N	NORTH / NORTHING
NO.	NUMBER
OZ	OUNCE
OW	OBSERVATION WELL
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
S	SOUTH
SEC	SECOND
TBC	TO BE CONSTRUCTED
TYP.	TYPICAL
W	WEST
YD	YARD

SEE NOTE 5 FOR ADDITIONAL ABBREVIATIONS

PLAN LEGEND

- PROPERTY BOUNDARY
- EXISTING PAVED ROAD
- EXISTING GRAVEL ROAD
- EXISTING/PERMITTED WASTE LIMITS
- SURVEY LIMITS
- ADJACENT PARCEL LIMIT
- EXISTING 2' CONTOUR
- 120 EXISTING 10' CONTOUR
- EXISTING DRAINAGE PATH
- EXISTING POND
- EXISTING CHOCOLATE BAYOU FLOOD ZONE
- GROUNDWATER SURFACE CONTOUR
- EXISTING STRUCTURE
- EXISTING FENCE
- OH EXISTING OVERHEAD ELECTRICAL
- EXISTING EASEMENT
- FM EXISTING LEACHATE/CONDENSATE FORCE MAIN
- AIR EXISTING AIR SUPPLY LINE
- EXISTING LFG HEADER/LATERAL
- EXISTING LFG EXTRACTION WELL
- SURVEY CONTROL POINT
- EXISTING GAS MONITORING PROBE
- EXISTING GROUNDWATER MONITORING WELL
- EXISTING GEOTECHNICAL BORING LOCATION
- EXISTING CULVERT
- EXISTING VALVE
- EXISTING CONDENSATE SUMP
- EXISTING LIGHT POLE
- 120 EXISTING TBC DESIGN 10' CONTOUR
- EXISTING TBC DESIGN 2' CONTOUR
- 2 PROPOSED 2' CONTOUR
- 10 PROPOSED 10' CONTOUR
- PROPOSED PAVED ROAD
- PROPOSED GRAVEL ROAD
- PROPOSED LIMIT OF FILL
- PROPOSED PERMIT BOUNDARY/PROJECT LIMIT
- PROPOSED WASTE LIMITS
- PROPOSED CELL BOUNDARY
- LCP LCP PROPOSED LEACHATE PIPE COLLECTION SYSTEM
- FM PROPOSED LEACHATE/CONDENSATE FORCE MAIN
- AIR EXISTING AIR SUPPLY LINE
- PROPOSED LFG HEADER
- PROPOSED LFG LATERAL
- PROPOSED LFG JUMPER LINE
- POINT OF COMPLIANCE

PLAN LEGEND (CONT.)

- PROPOSED CONDENSATE SUMP
- PROPOSED LFG EXTRACTION WELL
- PROPOSED GROUNDWATER MONITORING WELL
- PROPOSED LFG MONITORING PROBE
- PROPOSED VALVE
- MAXIMUM SEASONAL HIGH GROUNDWATER
- LETDOWN CHUTE
- STORMAWATER CHANNEL/DIVERSION BERM
- PROPOSED BARBED WIRE FENCE
- PROPOSED SUMP
- EXISTING SUMP

DETAIL LEGEND

- GEOMEMBRANE
- xxxxxxxxxxxxxxxxxxxxxxxxx GEOCOMPOSITE
- GEOTEXTILE
- COMPACTED SOIL LINER
- COMPACTED SOIL FINAL COVER/ GENERAL COMPACTED SOIL
- GEOSYNTHETIC CLAY LINER (GCL)
- PROTECTIVE COVER
- PERFORATED PIPE
- CHIMINEY DRAIN/SUMP DRAINAGE ROCK
- SUBGRADE
- VEGETATIVE SOIL
- STORMWATER DETENTION POND AREA

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
LICENSE NO. 133943

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816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

project	contract
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drawing I/II.B.1	rev. 2
sheet 2 of 25 sheets	
file 107608III.A1.1.dwg	

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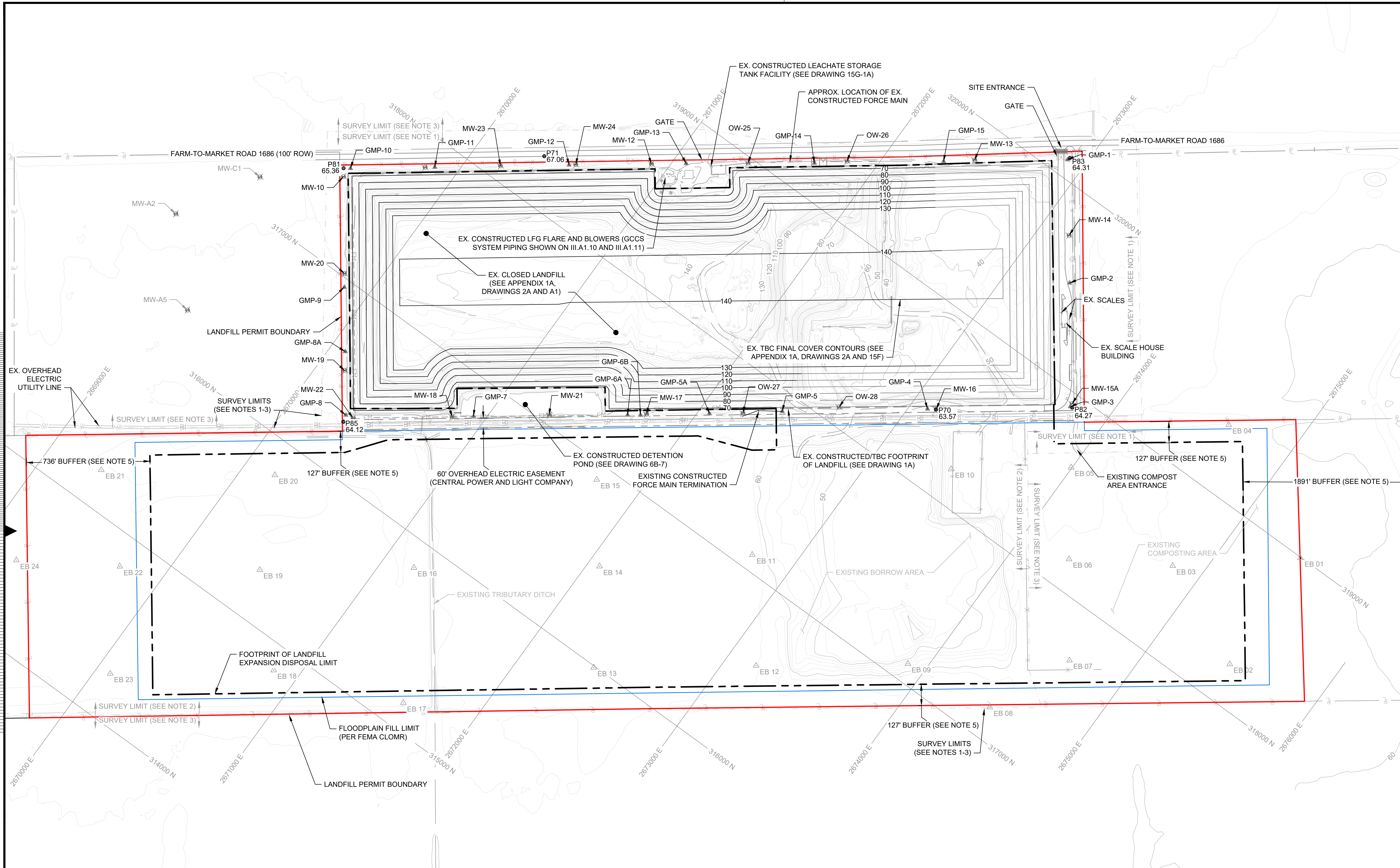
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD



NOTE:

1. VICTORIA LANDFILL SITE TOPOGRAPHY (NORTHERN PROPERTY AND EXISTING LANDFILL GRADES) PROVIDED BY COOPER AERIAL SURVEYS CO. DATE OF AERIAL SURVEY: NOVEMBER 24, 2019. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
2. EXPANSION PROPERTY SITE TOPOGRAPHY PROVIDED BY CIVIL CORP. DATE OF GROUND SURVEY: OCTOBER 2, 2018. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
3. TOPOGRAPHY OUTSIDE OF THE AREA DESCRIBED IN NOTES 1 AND 2 WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 1999.
4. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
5. BUFFERS SHOWN REPRESENT DISTANCE BETWEEN LIMITS OF WASTE AND THE PROPERTY BOUNDARIES.
6. DESIGN CONTOURS REPRESENT TOP OF PREVIOUSLY PERMITTED FINAL COVER. CONTOUR INTERVAL IS 10-FEET.

SITE CONTROL POINTS

POINT ID	NORTHING	EASTING	ELEVATION (FT AMSL)
70	318435.19	2673139.67	63.57
71	318285.02	2670362.64	67.06
81	317523.31	2669436.40	65.36
82	318921.55	2673790.18	64.27
83	320118.09	2672904.15	64.31
85	316299.10	2670324.48	64.12

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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

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1522B PERMIT AMENDMENT

EXISTING CONDITIONS WITH EXPANSION FOOTPRINT

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sheet 3 of 25 sheets

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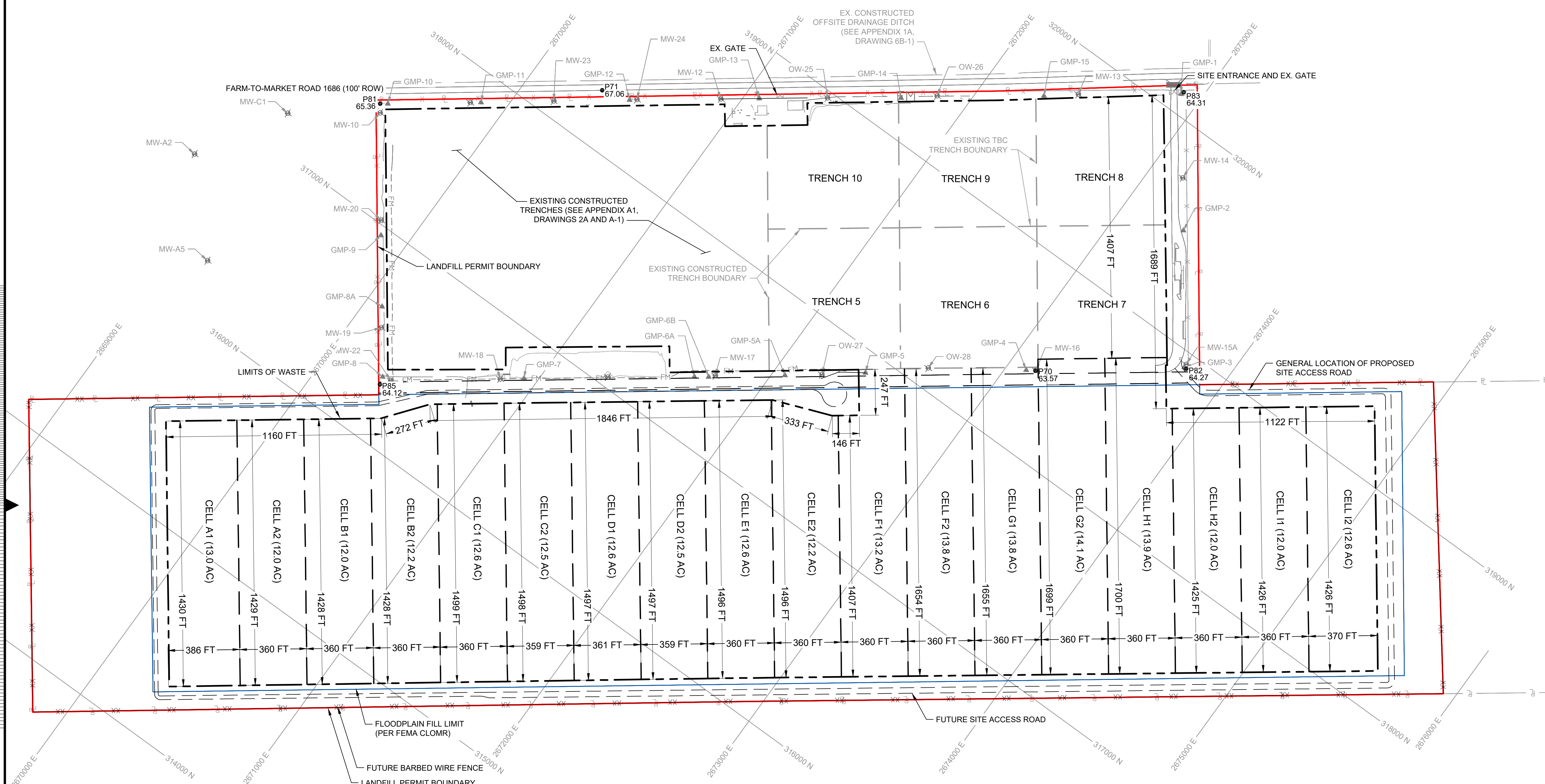

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
2. THE CELLS OF THE LANDFILL LATERAL EXPANSION MAY BE DESIGNATED FOR THE PLACEMENT OF CLASS 1 WASTE. SEE DRAWING III.A1.4 FOR FURTHER INFORMATION ON WHICH CELLS ARE DESIGNATED FOR BELOW-GRADE CLASS 1 PLACEMENT.

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designed	checked
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LANDFILL CELL EXPANSION PLAN

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drawing I/II.B.3 | rev. 2

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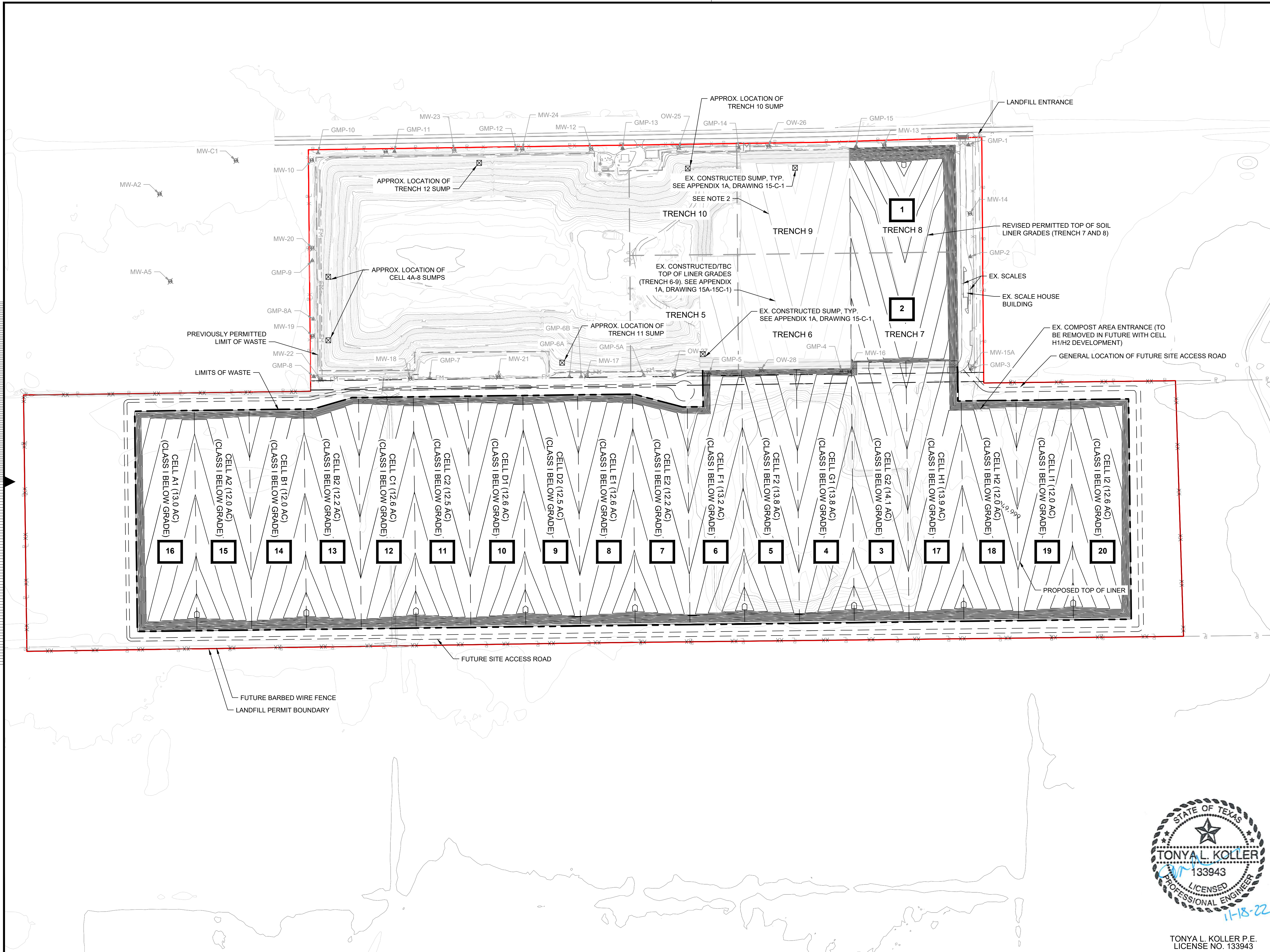

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NOTES:

1. CELLS A1-I2 ARE SUITABLE FOR DISPOSAL OF BOTH MSW AND CLASS 1 WASTE. CLASS 1 WASTE SHALL BE DISPOSED BELOW THE EXTERIOR BERM ELEVATION (66.4' AMSL), AND COVERED BY A 4-FOOT CLAY RICH SOIL BARRIER, IF CELL IS DESIGNATED AS CLASS 1 IN THIS DRAWING. MSW WASTE MAY BE DISPOSED OF BELOW THE EXTERIOR BERM ELEVATION AND/OR ABOVE THE CLASS 1 WASTE CLAY BARRIER. A PERMIT MODIFICATION SHALL BE FILED TO CHANGE THE BELOW-GRADE WASTE DESIGNATION OF ANY CELL.
2. THE WESTERN HALF OF TRENCH 9 AND THE NORTHERN 250 FEET OF TRENCH 6 WEST IS CONSTRUCTED AND IN SERVICE AS OF MAY 2019.
3. DESIGN CONTOURS REPRESENT TOP OF SOIL LINER. CONTOUR INTERVAL IS 2-FEET. BACKGROUND CONTOURS REPRESENT EXISTING GROUND, EXCEPT WITHIN THE TRENCH 6-9 BOUNDARIES AND EASTERN PORTION OF TRENCH 5, WHERE CONTOURS REPRESENT THE PREVIOUSLY PERMITTED TOP OF SOIL LINER.

LEGEND

1 ORDER OF CELL CONSTRUCTION

NORTH

0 300' 600'
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

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1522B PERMIT AMENDMENT

WASTE PLACEMENT PHASING PLAN

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11-18-22

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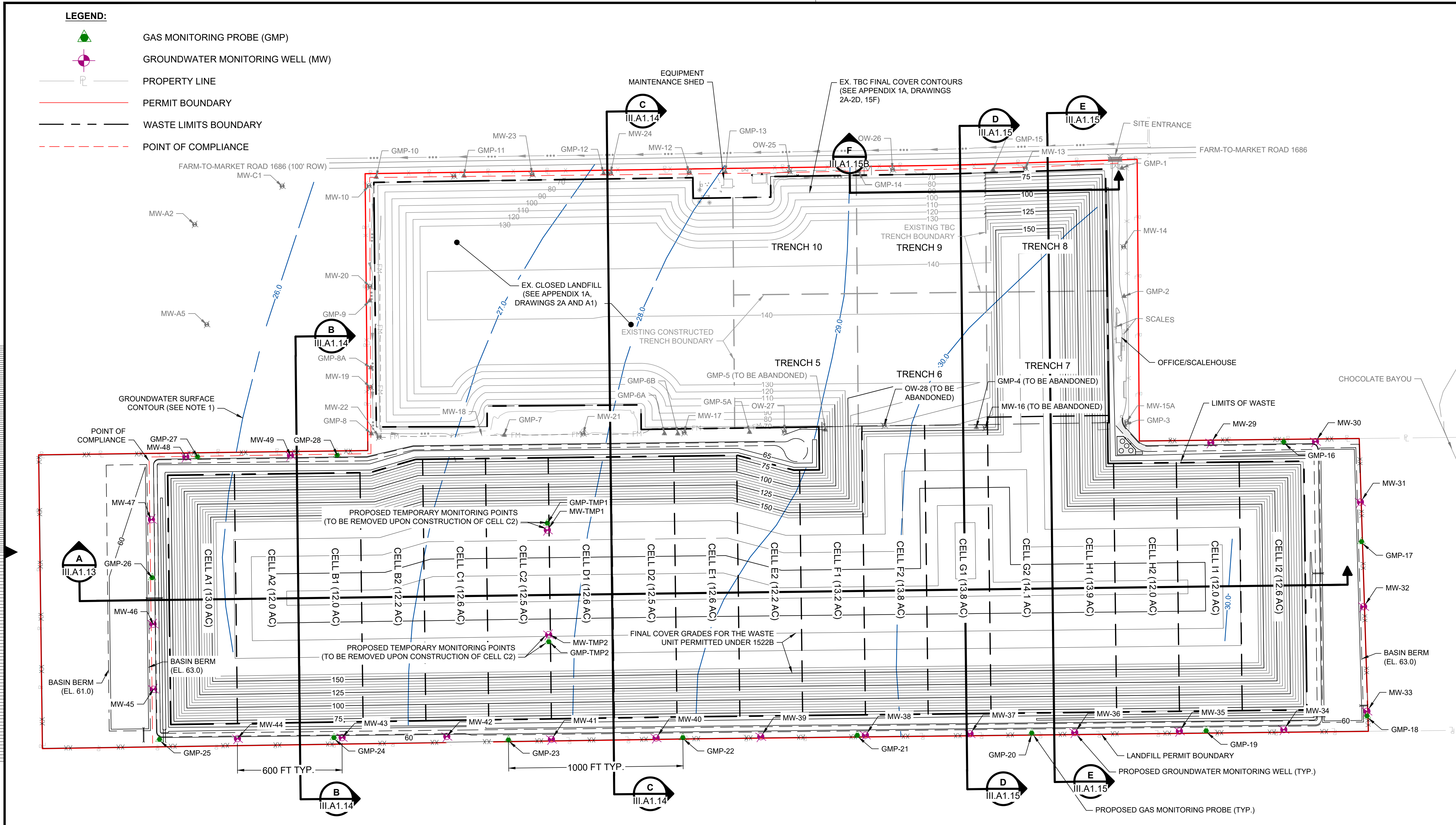
1 2 3 4 5 6 7 8 9 10 11 12 13



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1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. GROUNDWATER CONTOUR LINES SHOWN WERE OBTAINED FROM THE SEPTEMBER 2021 GROUNDWATER ELEVATION MAP IN THE 2021 GEOLOGY REPORT, PREPARED BY BURNS & MCDONNELL ENGINEERING COMPANY INC.
2. PROPOSED POINT OF COMPLIANCE MONITORING WELLS FOR THE EXPANSION AREA INCLUDE MONITORING WELLS MW-17, MW-21, MW-37 THROUGH MW-41, MW-TMP-1, MW-TMP-2, AND OW-27 DURING OPERATION OF CELLS D1 THROUGH G2. UPON CONSTRUCTION OF CELLS A1 THROUGH C2, POINT OF COMPLIANCE MONITORING WELLS WILL ALSO INCLUDE MW-18, MW-22, AND MW-42 THROUGH MW-49. UPON CONSTRUCTION OF CELLS H1 THROUGH I2, MONITORING WELLS MW-15A, MW-29, MW-35, AND MW-36 WILL BE CONVERTED FROM UPGRADIENT MONITORING WELLS TO POINT OF COMPLIANCE MONITORING WELLS.
3. SAMPLE RESULTS FROM THE MARCH 2021 SEMIANNUAL MONITORING EVENT INDICATED ARSENIC EXCEEDED ITS GROUNDWATER PROTECTION STANDARD IN FOUR MONITORING WELLS (MW-18, MW-19, MW-20, AND MW-21). PREVIOUS FINDINGS INDICATE LANDFILL GAS, NOT A RELEASE OF LEACHATE, IS THE CAUSE OF ARSENIC CONCENTRATIONS REPORTED FOR THE CITY OF VICTORIA LANDFILL.

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-16	EXISTING	CELL G2
GMP-4	EXISTING	CELL G2
OW-28	EXISTING	CELL F2
GMP-5	EXISTING	CELL F1
MW-29	CELL G2	N/A
MW-30	CELL G2	N/A
MW-31	CELL G2	N/A
MW-32	CELL G2	N/A
MW-33	CELL G2	N/A
MW-34	CELL G2	N/A
MW-35	CELL G2	N/A
MW-36	CELL G2	N/A
MW-37	CELL G2	N/A
MW-38	CELL G2	N/A

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-39	CELL G2	N/A
MW-40	CELL G2	N/A
MW-41	CELL G2	N/A
GMP-16	CELL G2	N/A
GMP-17	CELL G2	N/A
GMP-18	CELL G2	N/A
GMP-19	CELL G2	N/A
GMP-20	CELL G2	N/A
GMP-21	CELL G2	N/A
GMP-22	CELL G2	N/A
GMP-TMP1	CELL G2	CELL D1
GMP-TMP2	CELL G2	CELL D1
MW-TMP1	CELL G2	CELL D1
MW-TMP2	CELL G2	CELL D1

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-42	CELL D1	N/A
MW-43	CELL D1	N/A
MW-44	CELL D1	N/A
MW-45	CELL D1	N/A
MW-46	CELL D1	N/A
MW-47	CELL D1	N/A
MW-48	CELL D1	N/A
MW-49	CELL D1	N/A
GMP-23	CELL D1	N/A
GMP-24	CELL D1	N/A
GMP-25	CELL D1	N/A
GMP-26	CELL D1	N/A
GMP-27	CELL D1	N/A
GMP-28	CELL D1	N/A

STATE OF TEXAS
AMANDA K. BREITLING
GEOLOGY
11071
LICENSED
PROFESSIONAL GEOSCIENTIST

11/18/22

AMANDA BREITLING P.G.
LICENSE NO. 11071

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER

11-18-22

TONYA L. KOLLER P.E.
LICENSE NO. 133943

FOR PERMITTING PURPOSES ONLY

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Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT
FINAL ENVIRONMENTAL MONITORING PLAN

project 107608 contract -
drawing I/II.B.5 rev. 2
sheet 13 of 25 sheets
file 107608III.A1.12.dwg

APPENDIX I/II-C – WASTE ACCEPTANCE PLAN

2. Types of Waste to be Accepted for Disposal at the Facility

a. Indicate whether the following wastes will be accepted for disposal (check "Yes" for will accept or "No" for will not accept).

i.	☑ Yes ☐ No	Municipal solid waste [§330.3(88)]
ii.	☑ Yes ☐ No	Construction or demolition waste [§330.3(33)]
iii.	☑ Yes ☐ No	Brush [§330.3(18)]
iv.	☑ Yes ☐ No	Rubbish [§330.3(130)]
v.	☑ Yes ☐ No	Used or scrap tires that have been processed (such as by splitting, shredding, quartering or sidewall removal) in a manner acceptable to the executive director [§330.3(130)]
vi.	☑ Yes ☐ No	Class 2 nonhazardous industrial solid waste [§330.3(22), §330.173(i)]
vii.	☑ Yes ☐ No	Class 3 nonhazardous industrial solid waste [§330.3(23), §330.173(j)]

b. Indicate whether the following special wastes will be accepted for disposal. These wastes must have been or are to be treated and the treated materials have been tested and are certified to contain no free liquids.

i.	☑ Yes ☐ No	Municipal wastewater treatment plant sludge. [§330.3(148)(D), §330.171(c)(7)]
ii.	☑ Yes ☐ No	Other types of domestic sewage treatment plant sludge [§330.3(148)(D), §330.171(c)(7)]
iii.	☑ Yes ☐ No	Municipal water-supply treatment plant sludge. [§330.3(148)(D), §330.171(c)(7)]
iv.	☑ Yes ☐ No	Septic tank pumping waste [§330.171(c)(7)]
v.	☑ Yes ☐ No	Grease trap waste. [§330.3(59), §330.171(c)(7)]
vi.	☑ Yes ☐ No	Grit trap waste [TAC §330.3(60), §330.171(c)(7)]
vii.	☑ Yes ☐ No	Waste from commercial or industrial wastewater treatment plants [§330.3(148)(G), §330.171(b)]
viii.	☐ Yes ☑ No	Other liquid waste. Explain ____________ [§330.171(c)(7)]

ix. Specify other special wastes to be accepted for disposal that are not listed above and for which free liquids may be an issue.

____

____

c. Indicate whether the following Special Wastes will be accepted for disposal.

i.	☑ Yes ☐ No	Municipal hazardous waste from conditionally exempt small quantity generators [§330.171(c)(6), §330.3(32)].
ii.	☑ Yes ☐ No	Class 1 industrial nonhazardous solid waste (excluding waste that is Class 1 only because of asbestos content). May be accepted only at Type I landfills with a Class 1 cell [§330.3(21), §330.171(b), §330.3(148)(B), §330.173]; may not be accepted at arid exempt [AE] landfills [330.173(a)].
iii.	☑ Yes ☐ No	Waste that is Class 1 only because of asbestos content [§330.3(21), §330.171(b), §330.3(148)(B), §330.171(c)(3)(I), 30 TAC §330.171(c)(3)]

Specify any other wastes to be prohibited for storage or processing that are not listed above.

I. Special Waste Acceptance Plan [§330.171(b)(2)]

Does this application include an **optional** Special Waste Acceptance Plan?
☑ Yes ☐ No

If yes, please provide its location in the application.
Part IV Site Operating Plan (SOP) Attachment IV-B

J. Limiting Parameters [§330.61(b)(1)]

1. Regulated Hazardous Waste
   MSW landfills may not accept regulated hazardous waste [§330.3(127)] for processing or disposal. The presence or characteristic of any material meeting the definition of a regulated hazardous waste is a limiting parameter for waste disposal or processing.
2. Free Liquids
   The presence of free liquids, as defined by the Paint Filter Test, EPA Method 9095, in waste, but not household waste and not liquid in containers similar in size to those found in household waste, is a limiting parameter for waste disposal. [§330.15(e)(6), §330.3(81)]
3. PCBs
   The presence of polychlorinated biphenyls (PCB) wastes [40 CFR Part 761] unless authorized by the United States Environmental Protection Agency is a limiting parameter for waste disposal or processing. [§330.15(e)(8)]
4. Radioactive Materials
   The presence of radioactive materials [Chapter 336], except as authorized in Chapter 336 or that are subject to an exemption of the Department of State Health Services, is a limiting parameter for waste disposal or processing. [§330.15(e)(9)]
5. Class 1 Solid Waste
   For all Type I AE landfills and for Type I landfills that do not have a Class 1 cell [330.331(e)] or have chosen to excluded Class 1 industrial nonhazardous solid waste, 1,500 mg/kg TPH and the concentrations in 30 TAC §335.521(a)(1) are limiting parameters for waste disposal.
6. Other limitations:

Part III Landfill Permit Amendment
Site Development Plan
TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part III Landfill Permit Amendment
Site Development Plan
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

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8911 N Capital of Texas Hwy, Building 3, Suite 3100
Austin, Texas 78759
Texas Firm Registration No. F-845

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
amsl	Above mean sea level
ASD	Alternative source demonstration
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
COG	Golden Crescent Regional Planning Commission
CP&L	Central Power and Light Company
Existing Area	Previously permitted landfill area including closed (Pre-Subtitle D and Subtitle D), constructed, and To Be Constructed (TBC) cells.
Expansion Area	Design area comprised of the lateral expansion south of the existing area and the vertical expansion over the entire footprint of Trenches #7 and #8 and portions of Trenches #5 and #6.
FM	Farm to Market Road
FML	Flexible membrane liner
FMLER	Flexible Membrane Liner Evaluation Report
HDPE	High density polyethylene
LQCP	Liner Quality Control Plan
NHIW	Non-Hazardous Industrial Waste
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly Owned Treatment Works
SLER	Soil Liner Evaluation Report
SLQCP	Soil Liner Quality Control Plan
SOP	Site Operating Plan
SSI	Statistically significant increase
TBC	To Be Constructed
TCEQ	Texas Commission on Environmental Quality

Abbreviation	Term/Phrase/Name
TPWD	Texas Parks and Wildlife Department
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

The City of Victoria, Texas is operating a Type I municipal solid waste facility approximately six miles south of Victoria on Farm to Market Road (FM) 1686. This document is an application for a permit amendment to increase the height of fill in a portion of the existing permitted waste footprint, expand the waste footprint laterally into the adjacent property, and allow for the option of below-grade Class 1 non-hazardous industrial waste (NHIW) within the lateral expansion area.

2.0 GENERAL FACILITY DESIGN

30 TAC §330.63(b)

Facility design, construction, and operation must comply with this permit and Commission Rules, including 30 TAC §330.121 through §330.179.

2.1 Facility Access [30 TAC §330.63(b)(1)]

Access control at the currently permitted landfill area (Existing Area) includes a perimeter barbed wire fence and locking gates located at the entrance road and across the driveway to the landfill gas flare, building and leachate storage tank. As part of this permit amendment, the perimeter fence will be extended to provide access control to the expansion area (Cells A1 through I2) as shown in Attachment III-1 – Drawing III.A1.2. Access gates will be locked after normal hours of operation to prevent the entry of livestock onto the site, control unauthorized entry and uncontrolled dumping. Any waste material illegally dumped at the gate will be promptly removed by the City or its appointed operator and placed in an authorized disposal area. The City will pursue legal action against anyone found to engage in illegal dumping activity.

Consistent with 30 TAC §330.131 and the Part IV Site Operating Plan (SOP), the perimeter fence and gate will be inspected periodically as specified in the SOP and maintenance will be performed as necessary to prevent uncontrolled access. In the event of a breach, the Commission’s regional office, and any local pollution agency with jurisdiction that has requested to be notified, will be notified of the breach within 24 hours of detection. The breach must be temporarily repaired within 24 hours of detection and must be permanently repaired by the time specified to the commission’s regional office when it was reported in the initial breach report. If a permanent repair can be made within eight hours of detection, no notice to the commission’s regional office is required.

Currently, the site is in a rural area with two residential areas and two industrial areas within one mile of the facility. As the site is developed, the visual effect of the disposal activities will be minimized by all-weather disposal facilities and internal roads which will reduce the possibility of unsightly dirt and mud accumulation on FM 1686.

2.2 Waste Movement [30 TAC §330.63(b)(2)]

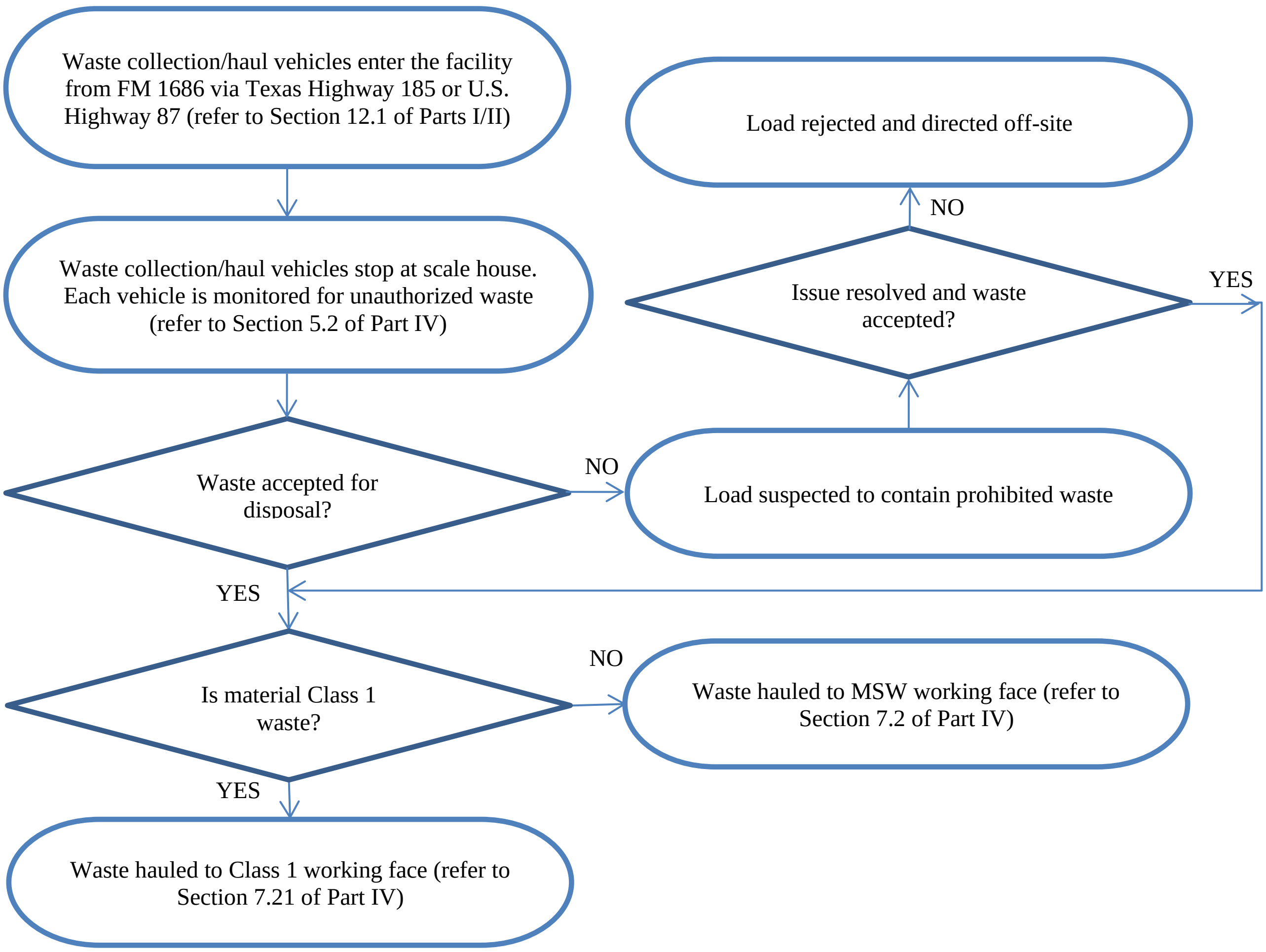
The major classifications of solid waste to be accepted at the Victoria Landfill include municipal solid waste, construction and demolition waste, Class 1, 2, and 3 non-hazardous industrial wastes (NHIW), and other and special wastes authorized by 30 TAC §330.171(c) and described in Part I/II Waste Acceptance Plan.

Waste disposal facilities located at the facility include the previously permitted municipal solid waste disposal area and the lateral expansion area (Cells A1 – I2). The lateral expansion area includes the option for below-grade Class 1 NHIW disposal consistent with 30 TAC §330.179.

The only storage facilities at the Landfill are leachate storage tanks. Storage and processing areas will be located outside of the 100-year floodplain or within the landfill footprint to be protected by perimeter berms.

A waste flow diagram describing the storage, processing, and disposal sequences for each type of waste accepted at the facility can be found in Figure 2-1.

Figure 2-1: Waste Flow Diagram



As shown in the drawings in Attachment III-1, waste enters the facility via the site entrance road and passes through the scalehouse where the scalehouse attendant conducts screening, weighing, and documentation of incoming waste loads. The gate attendant will be familiar with the types of waste that can or cannot be accepted at the Landfill and will direct the hauler to the appropriate area for MSW or

Class 1 disposal or load inspection. If prohibited loads are discovered, the scalehouse attendant can reject the load and require the hauler or transporter to remove the load immediately upon discovery. At the working face, trained personnel will observe unloading and will have the authority and responsibility to reject loads that contain any prohibited wastes. Accepted loads will be directed to the working face for landfill disposal. Generalized construction details of the leachate storage tanks and sumps showing approximate dimensions and capacities, construction materials, vents, covers, enclosures, protective coatings of surfaces, etc. are provided in Attachment III-1 – Drawing III.A1.17. Ventilation and odor control measures are discussed in greater detail in Part IV, the Site Operating Plan, Section 7.0.

Locations and engineering design details of all containment dikes or walls (with indicated freeboard) proposed to enclose all storage and processing components are shown in Attachment III-1 - Drawings III.A1.5, III.A1.6, III.A1.13, III.A1.14, III.A1.15.

2.2.1 Waste Disposal Approach

Waste is disposed using the area fill method. The fill sequence is shown in Attachment III-1 – Drawing III.A1.4, starting with the Trenches previously permitted within the Existing Area (Trench 9, 6, 8, and 7, respectively). Fill sequence in the lateral expansion area begins with Cell G2 and proceeds west through Cell A1, followed by construction and fill of Cell H1 and proceeding east through Cell I2. Waste other than Class 1 NHIW and special wastes accepted for disposal will be directed to the active working face to be unloaded, spread in layers, and compacted. Daily cover will be applied to control for odors, windblown waste, disease vectors, fires, scavenging, and to promote runoff from the fill area. Daily cover may consist of a minimum of six inches of soil or an approved alternative daily cover.

Within the lateral expansion area (Cells A1 – I2), there is the option for cells to be constructed for below-grade Class 1 NHIW disposal in accordance with the requirements of 30 TAC §330 and 30 TAC §335 related to disposal of Class 1 industrial solid waste in Type I MSW landfill units. If the option for below-grade Class 1 disposal is exercised, then both cells sharing a sump will be constructed to meet Class 1 requirements and Class 1 wastes will be accepted at the facility and directed to the working face for below-grade disposal. Section 4.3 provides details on the transitions between cell liner systems, including the transition between cells containing only MSW waste and cells with both Class 1 and MSW waste. Consistent with 30 TAC §330.173(e), Class 1 NHIW will not be disposed in excess of 20 percent of the total amount of waste accepted during the current or previous year. Class 1 NHIW will not be accepted for above-grade disposal in any cells or below-grade disposal in cells not designed and constructed in accordance with the requirements of 30 TAC §330 and 30 TAC §335 related to disposal of Class 1 industrial solid waste in Type I MSW landfill units, and as described herein.

Stormwater runoff from the active portion of the landfill shall be managed in accordance with 30 TAC §§330.55(b)(3), and 330.133(b). Contaminated water shall be managed in accordance with 30 TAC §330.56(0), and as described in Attachment III-3.

2.3 Storage and Processing Units [30 TAC §330.63(b)(4)]

The only storage units at the Landfill are the leachate storage tanks. In accordance with 30 TAC §330.63(b)(2)(D), construction details for the leachate storage tanks are provided on Drawing III.A1.5 (Base Grading Plan – West) and Drawing III.A1.6 (Base Grading Plan – East) in Attachment III-1. Leachate storage facilities will be maintained and operated to manage run-on and direct rainfall during the peak discharge from the 25-year, 24-hour storm event. The secondary containment facilities and initial buildout of the leachate storage tanks located southeast of the existing landfill scale in the Expansion Area will be installed as part of the Cell G2 cell construction project and will be designed to prevent run-on from the 100-year, 24-hour storm event. Secondary containment design information is included in Attachment III-3, Section 2.2.6 and the layout of the containment facility is shown on Attachment III-1 – Drawing III.A1.6. Leachate storage tank secondary containment facilities will feature a low point where water collected during storm events, or leachate accumulated from a potential release inside the tank area can be removed with a portable or dedicated pump. If the water is suspected to be leachate from a release, it will be managed in accordance with Attachment III-3. No solid waste processing units are included in this permit.

2.4 Protection of Endangered Species [30 TAC §330.63(b)(5)]

Consistent with 30 TAC §330.63, endangered species were investigated at the site to inform a facility design that protects endangered species. In a September 2018 Protected Species Report (updated February 2021), a “no effect” determination was found for all federally listed endangered, threatened, or candidate species and “no impact” findings for all state listed threatened and endangered species (including bald and golden eagles) that may occur within Victoria County, Texas.

A coordination letter was submitted to the United States Fish and Wildlife Service (USFWS) in April 2019. The letter was updated and submitted to USFWS and to the Texas Parks & Wildlife Department (TPWD) in February 2021. The endangered species report targeted to the lateral expansion area (Cells A1-I2) is provided in Part I/II as Appendix G.

3.0 FACILITY SURFACE WATER DRAINAGE REPORT

30 TAC §330.63(c)

The Surface Water Drainage Report is provided in Attachment III-2. This Facility Surface Water Drainage Report is intended to meet the requirements of 30 TAC §330.303(a) and §330.303(b).

3.1 Water Discharge Considerations

The site operator will monitor the activities of the site to ensure that no pollutants, solid wastes, dredged or fill material, or non-point source pollution of the waters of the United States occurs at any time. The Landfill will maintain coverage under the Texas Pollution Discharge Elimination System (TPDES) multi-sector general permit (MSGP) for industrial activity (Permit No. TXR05EI73) included in Appendix I/II - I. All discharges will follow the requirements of this permit, as well as the requirements of the Texas Water Code §26.121, the Federal Clean Water Act 404, as amended, and the Federal Clean Water Act §208 or §319, as amended. All water that has encountered waste will be contained and tested prior to discharge from the site in accordance with Attachment III-3 - Leachate and Contaminated Water Plan.

3.2 Run-on Control [330.305(b)]

Existing surface drainage in the site vicinity runs generally north to south. FM 1686, which borders the site to the north, diverts water from the north to a drainage ditch west of the site and to Chocolate Bayou east of the site. These structures are sufficient to prevent the run-on of water to the active portion of the landfill from the 25-year, 24-hour storm event.

In accordance with 30 TAC §301.34(6), the landfill perimeter berm for Cells A1-I2 is designed to provide three feet of freeboard above the 100-year flood elevation. The 100-year flood elevation has been determined to be 63.4 ft amsl, according to a floodplain analysis completed for FEMA Conditional Letter of Map Revision (CLOMR) Case No.: 20-06-2477R. Thus, the top of the berm will be 66.4 ft amsl. The Landfill is outside of the 100-year floodway, thus in accordance with Texas Water Code §16.236(h)(6) the perimeter berm is not subject to §16.236(a) levee requirements.

3.3 Run-off Control [330.305(c)]

Stormwater runoff from the active portion of the landfill shall be managed in accordance with 30 TAC §330.303 and §330.305. Contaminated water shall be managed in accordance with Attachment III-3 - Leachate and Contaminated Water Plan.

Internal drainage on the site will segregate stormwater from stormwater that has encountered solid waste. All contaminated water will be contained by permanent and/or temporary dikes in the active fill areas, or pumped to the leachate storage tanks. Stormwater will flow, by a series of ditches, into the existing Victoria County Drainage District #2 maintained ditch which is located in the CP&L easement near the southwest corner of the site (see Attachment III-1). Temporary dikes or berms will be constructed as necessary to divert or contain stormwater around the active working area. Temporary containment structures will be a minimum of 24 inches in height, which is sufficient to contain the volume of stormwater generated from the working face and the area between the working face and the temporary dikes by the 25-year, 24-hour storm event, as demonstrated in Attachment III-3 – Leachate and Contaminated Water Plan.

The entire waste management facility shall be designed, constructed, operated, and maintained to prevent the release and migration of any waste, contaminant, or pollutant beyond the point of compliance as defined in 30 TAC §330.3 and to prevent inundation or discharge from the areas surrounding the facility components. Each receiving, storage, processing, and disposal area shall have a containment system that will collect spills and incidental precipitation in such a manner as to:

- Preclude the release of any contaminated runoff, or spills;
- Prevent washout of any waste by a 100-year storm; and
- Prevent run-on into the disposal areas from off-site areas.

The site shall be designed and operated so as not to cause a violation of:

- The requirements of the Texas Water Code §26.121;
- Any requirements of the Federal Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements §402 as amended;
- The requirements under the Federal Clean Water Act §404, as amended; and
- 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.

All leachate, gas condensate, and working-face contaminated water shall be handled, stored, treated disposed of, and managed in accordance with 30 TAC §330.177, §330.207, and with Attachment III-3 – Leachate and Contaminated Water Plan and/or by one or more of the following methods:

- Discharge to an authorized Publicly Owned Treatment Works (POTW) or commercial treatment facility in accordance with existing TPDES permits and other required discharge permits.
- Discharge from an on-site treatment facility in accordance with TPDES permits and other required permit.

4.0 WASTE MANAGEMENT UNIT DESIGN

30 TAC §330.63(d)

4.1 All Weather Operation [330.63(d)(4)(A)]

Sufficient all-weather roads will be continually maintained to permit operation of the site during periods of wet weather. A paved entrance road provides access to the site from FM 1686. Internal all-weather roads, as discussed in the Part IV Site Operating Plan (SOP), provide access to designated unloading areas used during wet weather. The internal access roads are maintained to minimize the tracking of mud onto publicly accessed roads. This road will vary as the fill progresses and the remaining portion of the site is developed. Additionally, roads will be inspected, and mud removed from the entrance roads by scraping with appropriate equipment, swept with a mechanical sweeper, or washed with a water truck.

4.2 Landfilling Methods [330.63(d)(4)(B)]

The area fill method will be used at the site, with a systematic, phased development plan shown in Attachment III-1 – Drawing III.A1.4 (Waste Placement Phasing Plan). Typical cross sections through the completed site and proposed southern expansion area are shown in Attachment III-1. The final contours of the completed landfill and proposed expansion area are also shown in Attachment III-1.

Excavations will be performed with appropriate equipment. Waste will be placed in lifts and will be compacted with a compactor or other suitable equipment prior to the application of daily cover.

4.3 Landfill Design Parameters [330.63(d)(4)(C)]

The 454.5 permitted acres will include 359.7 acres for waste disposal and 94.8 acres of buffer area. The maximum elevation of final cover will be 187.9 feet amsl. Accounting for the total final cover thickness including geosynthetic components, the maximum waste elevation will be 185.4 ft amsl.

Based on review of historical permit documents *Permit Modification Request - Waste Footprint, Final Grade, Base Grade and Drainage Modification, SCS Engineers, Approved 2009* and *Amendment for Increased Height of Fill, JFK Group, Inc., Approved 1997*, the elevation of the deepest existing elevation is 31.0 ft amsl and corresponds to the sumps that drain Trenches 5, 6, 9, and 10.

Constructed cell excavation sideslopes are generally 3H:1V. The uppermost portion of the final cover over cells that have been constructed (Trench 5, Trench 6, areas denoted as “Previously Filled Waste Area”, and the western portions of Trench 9, and Trench 10) will have slopes varying from 2.5 percent to 3.4 percent as indicated, side slopes will be installed at 4H:1V slopes.

Refer to Attachment III-1, Attachments 1B (excavation grades), 2A (for extent of “Previously Filled Waste Area”), 15C (leachate collection sump), and 2B through 2D (final cover slopes and elevations west of the vertical expansion over Trenches 7 and 8)).

The elevation of the deepest proposed excavation will be 31.5 ft amsl at the sump that drains future Trench 7 and future Trench 8, within the existing permitted landfill footprint. The elevation of deepest proposed excavation in the southern expansion area (Cells A1 through I2) will be 34.0 feet amsl to account for potential for Class 1 waste being disposed of in each cell and the associated Class 1 engineered subgrade and liner profile. Excavation depths where Class 1 waste will not be disposed will be 36.5 feet amsl. As shown in Part III, Attachment III-1 – Drawing III.A1.4, all cells in the lateral expansion area (A1-I2) are designated to be used for below-grade Class 1 waste disposal. Cells in the lateral expansion area that share a sump (i.e., A1 and A2, B1 and B2, etc.) will be constructed to accept the same type of below-grade waste type (i.e., MSW-only or Class 1). Prior to developing a cell in the lateral expansion area for MSW-only disposal, a permit modification will be filed and approved by TCEQ to change the cells’ designation from Class 1 to MSW-only. Discussion of groundwater separation and liner design requirements are presented later in this Section.

Proposed cell excavation side slopes will be installed at 3H:1V (Horizontal:Vertical). Final cover side slopes for the lateral and vertical expansion area will be 3H:1V, with the exception of the north slope of Trench 8 and Trench 9 which will be installed at a 4H:1V to match final cover elevations along the north slope. The uppermost portion of the final cover will be constructed with 5 percent slopes.

Individual cells will be constructed for the disposal of MSW waste, which will include the option for Class 1 disposal below existing grade. Section 4.6 provides details on the liner systems that shall be constructed for cells containing MSW only and cells with below-grade Class 1 and MSW. Adjacent cells shall incorporate tie-ins such that that the integrity of the liner system is maintained throughout construction and life of the cell; the liner system shall be protected during the construction of the tie-in and the components of the liner systems shall meet or exceed the thickness and permeability requirements according to Table 4-1. Detail 4 of Drawing III.A1.18 shows the termination of MSW-only cells and cells with the option for Class 1 disposal. This detail also contains construction methods to be used for the tie-ins to future adjacent cells, regardless of the liner system type. Detail 4 of Drawing III.A1.19 provides additional detail for the transition between the two different liner types (MSW-only liner and Class 1-optional liner), and includes the 50-foot typical overlap of MSW into Class 1 cells. There are several options for waste placement that will allow the MSW setback to meet or exceed 50 feet, depending on whether MSW and Class 1 are placed concurrently or at different times.

Refer to Attachment III-1, Drawing III.A1.5 and III.A1.6 for proposed top of liner grades, Drawing III.A1.16 for leachate sump details, Drawing III.A1.7 and III.A1.8 for proposed final cover elevations and slopes.

4.4 Site Life Projection [330.63(d)(4)(D)]

The Landfill currently receives approximately 155,000 tons per year of waste. As of FY 2020 annual reporting to TCEQ, there are 6,073,335 cubic yards of volume available for fill at the landfill. The vertical and lateral expansion in this permit amendment will add an additional 35.9 million cubic yards of air space. Based on the assumptions as outlined below, the City of Victoria Landfill is expected to have a total site life of approximately 147 years (as of January 2022).

Assuming:

Annual average of 155,000 tons of waste = 465,465 cubic yards in trucks at gate (666 pounds/cubic yard in trucks); Landfill volume is used 80% for waste placement and 20% for daily and final cover; 2.0 cubic yards of waste in garbage trucks occupies one cubic yard of space in the landfill; (465,465 gate yards = 232,733 cubic yards per year in place) Waste growth is assumed limited to near zero due to implementation of waste reduction and recycling.

Summary of Calculations:

36,922,849 (expansion volume) + 6,073,335 (remaining volume) = 42,996,184 cubic yards remaining

42,996,184 • 80% = 34,396,947 cubic yards remaining for waste placement

34,396,947 cubic yards remaining for waste placement / 232,733 cubic yards waste in place per year = 148 years site life remaining as of the end of FY 2020.

If additional volumes of waste are received at the landfill, site life will be reduced.

4.5 Landfill Cross Sections and Perimeter Details [330.63(d)(4)(E) and (F)]

Landfill cross sections are provided in Attachment III-1 – Drawings III.A1.13, III.A1.14, and III.A1.15. The location of each section was chosen to represent proposed conditions across the entire site. The Landfill cross sections show the top of the perimeter berm, top of fill, top of waste, maximum elevation of proposed fill, existing ground, bottom of the excavations, and side slopes of trenches and fill areas. In addition, the cross sections show gas monitoring wells, groundwater monitoring wells, and the seasonal high static water level. Cross sections accurately depict the Existing Area and Expansion Area depths of all fill areas within the site. The fill cross sections go through or very near the soil borings to show boring logs on the soil profile. Lastly, the cross sections show construction and design details of proposed compacted perimeter and toe berms and aerial-fill waste disposal areas. The disposal area will be excavated with side slopes no steeper than 3H:1V.

4.6 Liner Design [330.331]

A composite liner is included as part of the landfill design to meet the requirements of 30 TAC §330.331(a)(2) and §330.331(e). The landfill liner and leachate collection system design is provided in Table 4-1. The currently permitted leachate collection system consists of one of two options:

1. 12 inches of granular drainage sand material with minimum hydraulic conductivity of $1x10^{-2}$ cm/sec and 12 inches of protective cover soil, or
2. 200-mil double-sided geocomposite drainage layer overlain with 24 inches of protective cover soil.

The proposed composite liner system featuring a 200-mil double-sided geocomposite drainage layer overlain with 24 inches of protective cover soil is shown in Attachment III-1 - Drawing III.A1.16. Chimneys (areas of higher hydraulic conductivity) will be employed at a maximum spacing of every 200 feet if protective cover permeability is less than 1×10^{-4} cm/sec.

As detailed in Table I/II-1 in Part I/II, the liner system has been partially installed in Trenches 6 and 9. For Trenches 7 and 8 and the lateral expansion area (Cells A1-I2), these areas are currently undeveloped and a composite liner shall be constructed as provided in Table 4-1 consisting of a constructed clay liner and flexible membrane liner installed over the entire bottom and sidewalls of the landfill excavation in accordance with procedures described in Attachment III-4. The vertical expansion will not involve the installation of a piggyback liner system as there are no Pre-Subtitle D cells are overlain by the vertical expansion. As shown in Drawing III.A1.4, after waste placement is completed in Trenches 6 and 9 (which are currently partially developed), Trench 8 will be constructed with composite liner and filled to the new limits of waste (vertical expansion), followed by the construction and fill of Trench 7. Next, waste placement will commence in the lateral expansion area beginning with Cell G2 and will continue west through Cell A1. During this time, the current operating contract for the composting facility will expire and the facility will be relocated off-site prior to the final phase of Landfill development. The final phase of waste placement will begin with Cell H1 and continue east through the final lateral expansion cell (Cell I2).

Table 4-1: Liner System Components for Landfill Areas

Liner System Component (top to bottom)	Existing Area Pre-Subtitle D	Existing Area Subtitle D Option 1	Existing Area Subtitle D Option 2	Expansion Area Trenches 7 and 8 and Cells A1-I2 (if MSW Only)	Expansion Area Cells A1-I2 (Below-Grade Class 1)
Protective Cover	NA	12-inch protective cover	24-inch protective soil layer	24-inch protective soil layer	24-inch protective soil layer
Leachate Collection System		12-inch granular drainage sand (minimum of $1x10^{-2}$ cm/sec)	Drainage Geocomposite	Drainage Geocomposite	Drainage Geocomposite
Geomembrane	NA	60-mil HDPE Geomembrane	60-mil HDPE Textured Geomembrane	60-mil HDPE Textured Geomembrane	60-mil HDPE Textured Geomembrane
Compacted Soil Liner	24-inch (minimum) compacted clay liner	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)	24-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)[1]	36-inch compacted clay liner (max of $1x10^{-7}$ cm/sec)[1]
Subgrade	Prepared Subgrade	Prepared Subgrade	Prepared Subgrade	Prepared Subgrade	18-inch engineered subgrade (max of $1x10^{-8}$ cm/sec)[2]

[1] Leachate collection system sumps will also include a GCL underneath the primary liner and a secondary geomembrane for additional protection against contaminant migration.
[2] There will be a minimum of 18 inches of engineered subgrade (prepared to a maximum hydraulic conductivity of $1x10^{-8}$ centimeters per second [cm/sec]) placed prior to placement of the compacted soil liner to conform with the intent of 30 TAC §335.584(b)(2).

Historical groundwater elevations from past groundwater monitoring reports were reviewed for the period of December 2007 to September 2021 to assess the seasonal high groundwater elevation for the existing site. The maximum observed groundwater elevation during the period of review was 32.26 feet amsl in March 2011 at observation well OW-28. In the lateral expansion area, the maximum observed groundwater elevation of 33.50 feet amsl occurred in August 2020 at the EB-11 piezometer. The EB-11 piezometer is located near an existing sedimentation basin in the current borrow soil excavation area, which may influence groundwater elevations via increased infiltration and recharge due the removal of surficial, low permeability, clay material and accumulation/ponding of water in the soil borrow source area.

Burns & McDonnell developed a spreadsheet that tabulated groundwater water level data from December 2007 through September 2021. A summary table with this data is provided in Appendix 4A of Attachment III-4, and will be updated based on new monitoring data. While approximately 99 percent of the reported groundwater level data was below the elevation of 32 feet amsl, 33.5 feet amsl is being referenced as the seasonal high static water level to be conservatively protective of groundwater.

There are 5 feet of soil and liner materials that separate the seasonal high static water level (33.5 feet amsl) from the base of the planned leachate sumps in the lateral expansion area (38.5 feet amsl). Accounting for protective cover thickness, the minimum elevation of waste disposal shall be approximately 43 feet amsl for Cells A1-I2 as shown in Attachment III-1 – Drawing III.A1.16. The base geomembrane liner elevation beyond the sump extent is 41 feet amsl, or 7.5 feet above the seasonal high static water level.

The maximum observed groundwater level (33.5 feet amsl) is 0.4 feet higher than the base of the proposed leachate sump in Trench 7/8 (33.1 feet amsl). The base geomembrane liner elevation beyond the sump extent is 35.6 feet amsl, or 3.6 feet above the seasonal high static water level. To demonstrate that the sump is properly ballasted by the aggregate within the sump, the following calculation was performed:

If (Weight of Ballast) > (Buoyant Force of Groundwater), Then Sump is Properly Ballasted

Weight of Ballast = (Density of Aggregate) x (Aggregate Thickness per Square Foot)
= (150 lb/cf) x (2.5 ft) = 375 lbs/sf

Buoyant Force = (Density of Water) x (Groundwater Depth per Square Foot)
= (62.4 lb/cf) x (0.4 ft) = 24.96 lbs/sf

375 lb/sf > 24.96 lb/sf, (Ok)

Accounting for protective cover thickness, the minimum elevation of waste disposal shall be approximately 37.6 feet amsl in Trench 8 as shown in Attachment III-1 – Drawing III.A1.16.

As noted in Table 4-1, a GCL will be installed underneath the primary liner and a secondary geomembrane will also be installed within the Expansion Area (including Trench 7, Trench 8, and Cells A1-I2) for additional protection against contaminant migration in proposed leachate sumps. Based on Darcy's Law, the added GCL (equivalent to two feet of compacted soil liner) and Geomembrane (effective hydraulic conductivity of 2×10^{-13} cm/sec based on Hydrologic Evaluation of Landfill Performance Version 4.0 defaults), will be at least as protective of the liner system requirements stated in the referenced regulations. Using Darcy's Law, the secondary geomembrane alone is equivalent to 2,500 feet of clay. A sample calculation is provided herein:

$$0.06\text{-inches (geomembrane thickness)} \quad \times \quad \frac{1\times10^{-7}\ \text{cm/sec}}{2\times10^{-13}\ \text{cm/sec}} \quad \times \quad \frac{1\ \text{foot}}{12\ \text{inches}} = 2{,}500\ \text{feet}$$

Consistent with 30 TAC §330.331, the liner design ensures that concentration values will not be exceeded in the uppermost aquifer at the point of compliance. The liner design includes a composite liner and a leachate collection system that is designed and constructed to maintain less than a 30-centimeter (approximately one-foot) depth of leachate over the liner throughout the landfill life and post-closure care period, and considers the following:

- The hydrogeologic characteristics of the facility and surrounding land
- The climatic factors of the area
- The volume and physical and chemical characteristics of the leachate
- The quantity, quality, and direction of flow of groundwater
- The public health, safety, and welfare effects
- The practicable capability of the owner or operator

4.6.1 Class 1 Waste Landfill Cells Liner Design [330.331, 330.335 and 335.590]

The composite liner design is consistent with 30 TAC §330.331(e)(1) and 30 TAC §335.590(24)(A)(ii) requirements for Class 1 cells and consists of three feet of compacted soil liner with a maximum hydraulic conductivity of 1 x 10^{-7} cm/sec overlain with a 60-mil HDPE geomembrane. In addition, the liner design includes an alternative liner system in accordance with 30 TAC §330.335. The liner profile can be found on Attachment III-1 - Drawing III.A1.16. As noted in Table 4-1, Cells in the lateral expansion area (A1-I2) are designated to be used for below-grade Class 1 disposal. Cells in the lateral expansion area that share a sump (i.e., A1 and A2, B1 and B2, etc.) will be constructed to accept the same type of below-grade waste type (i.e., MSW-only or Class 1). Prior to developing a cell in the lateral expansion area for MSW-only disposal, a permit modification will be filed and approved by TCEQ to change the cells' designation from Class 1 to MSW-only.

Base excavation grades are designed to maintain separation from the seasonal high groundwater level to eliminate the need for design and installation of a liner ballast system and minimize the potential of having to manage groundwater during cell construction activities. There are additional potentially applicable restrictions for Class 1 cells related to groundwater protection based on existing soil types (30 TAC §335.584(b)(1)) and protected regional aquifers (30 TAC §335.584(b)(2)).

There are certain portions of the expansion area where compliance with 30 TAC §335.584(b)(1) can be documented; however, there are also portions of the expansion area that would need to be designed using an alternative subgrade soil permeability and thickness to conform with 30 TAC §335.584(b)(1) requirements. Based on initial feedback from TCEQ during the planning stages of the preparation of this Permit Amendment, the alternative subgrade areas would require a minimum of 6 inches of engineered subgrade (that meets standard compacted soil liner requirements) prior to placement of the compacted soil liner to conform with the intent of §335.584(b)(1); however, additional protection is necessary based on requirements provided in 30 TAC §335.584(b)(2) and is discussed in the next series of paragraphs.

According to the Texas Water Development Board Report 380, *Aquifers of Texas*, the Site overlies formations belonging to the Gulf Coast Aquifer. A review of regional aquifer conditions was conducted as part of the preparation of the Geology Report. In general, confined conditions were not encountered during the field investigation, which is corroborated by historical hydrogeologic information discussed in Attachment III-5 – Geology Report. Please refer to Section 2.3 and Section 4.0 of the Geology Report.

Based on the 30 TAC §335.584(b)(2) siting requirements, the underlying subgrade of the standard Class 1 landfill cell base liner has been designed using an alternative soil permeability and thickness equivalent to the 30 TAC §335.584(b)(2) requirements. As shown in Table 4-1, the alternative subgrade in Class 1 cells shall have a minimum of 18 inches of engineered subgrade (prepared to a maximum hydraulic conductivity of 1×10^{-8} centimeters per second [cm/sec]) prior to placement of the compacted soil liner.

To demonstrate equivalency to the regional aquifer siting requirement of 30 TAC §335.584(b)(2), Burns & McDonnell calculated the steady-state travel time for fluid to flow through the prescribed underlying soil unit and compared this travel time to that of alternative soil barriers of different thicknesses and hydraulic conductivities. If the alternative soil barrier produces a travel time of equal-to or greater-than the prescribed travel time, the alternative soil barrier is acceptable.

The methodology for the equivalency demonstration is from the publication <u>Comparison of Leachate Flow through Compacted Clay Liners and Geosynthetic Clay Liners in Landfill Liner Systems</u>, a technical paper by J.P. Giroud, K Badu-Tweneboah, and K.L. Soderman (Giroud). Equation 18 from this paper provides the steady-state travel time for leachate to adjectively flow through a liner. This equation is as follows:

$$t_{sst} = \frac{\mathrm{nT}}{\mathrm{k}(1 + h/T)}$$

t_{sst} = steady state travel time (sec)
n = effective porosity (%)
T = soil layer thickness (cm)
k = hydraulic conductivity (cm/sec)
h = head (cm)

The following assumptions were made:

- The effective porosity of the prescribed and alternative underlying soil units is assumed at 30%. This is within the recommended range provided in Giroud and is believed to be reasonable based on the soils found on site. The 30% assumption has also been utilized in a similar TCEQ landfill application that is available for public review online. Given this value is assumed, the equivalency demonstration is also performed based on flux through the liner (below).
- The assumed pressure from liquid on top of the soil column (head) used for all calculations was 30.48 cm (1 foot). This is a conservative assumption, as the head is expected to be lower (30 cm of head is the maximum allowed on top of the landfill liner in TCEQ's solid waste regulations).

The travel time for fluid through 10 feet of soil with a hydraulic conductivity of $1\text{x}10^{-7}$ cm/sec (i.e., the prescribed underlying soil unit in 30 TAC §335.584(b)(2)) is <u>26 years</u>. The selected alternative is: 1.5 feet of soil with a hydraulic conductivity of $1\text{x}10^{-8}$ cm/sec, which gives a travel time of 26 years, equivalent to the travel time of the prescribed underlying soil unit.

The sufficiency of 1.5 feet of soil with a hydraulic conductivity of $1\text{x}10^{-8}$ (determined by travel time method above) is further demonstrated by a comparison of the travel time method with the flow rate over a unit area (or flux) for the prescribed underlying soil layer and the proposed engineered subgrade. The methodology for the demonstration of flow rate over a unit area is from the publication <u>Technical Equivalency Assessment of GCLs to CCLs</u>, a technical paper by R.M. Koerner and D.E. Daniel (Koerner and Daniel). Equation 1 from this paper is as follows:

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$$v = \mathrm{k}\frac{\mathrm{h} + \mathrm{T}}{\mathrm{T}}$$

v = steady downward flux of water through the layer
T = soil layer thickness (cm)
k = hydraulic conductivity (cm/sec)
h = head (cm), conservatively assumed as 30.48 cm (1 foot)

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Equation 4 from Koerner and Daniel describes the required hydraulic conductivity to ensure equivalent performance in terms of steady flux of water, and is as follows:

$$(\mathrm{k}_{Subgrade})_{Required} = \mathrm{k}_{Soil}\frac{\mathrm{T}_{Subgrade}}{\mathrm{T}_{Soil}}\frac{\mathrm{h} + \mathrm{T}_{Soil}}{\mathrm{h} + \mathrm{T}_{Subgrade}}$$

$\mathrm{k}_{\mathrm{Soil}}$ = hydraulic conductivity (cm/sec) of prescribed soil layer ($1\text{x}10^{-7}$ cm/sec)
T_{Soil} = thickness (cm) of prescribed soil layer (10 ft; 304.8 cm)
$\mathrm{T}_{Subgrade}$ = thickness (cm) of proposed engineered subgrade (1.5 ft; 45.72 cm)
h = head (cm), conservatively assumed as 30.48 cm (1 foot)
$(\mathrm{k}_{Subgrade})_{Required}$ = required hydraulic conductivity (cm/sec) of 1.5 ft of engineered subgrade for equivalent flux to the prescribed soil layer

The calculated flux (v) through 10 feet of soil with a hydraulic conductivity of $1\text{x}10^{-7}$ cm/sec (i.e., the prescribed underlying soil unit in 30 TAC §335.584(b)(2)) is 6.6 times greater than the calculated flux through the proposed 1.5 feet of engineered subgrade with a hydraulic conductivity of $1\text{x}10^{-8}$ cm/sec.

This is confirmed by calculating the hydraulic conductivity ($\mathrm{k}_{(Subgrade)Required}$) needed for 1.5 feet of engineered subgrade to be equivalent to the prescribed soil is proposed alternative, which is $6.6\text{x}10^{-8}$ cm/sec. Therefore the proposed hydraulic conductivity of the engineered subgrade ($1\text{x}10^{-8}$ cm/sec) is more protective than the minimal required for an equivalent 1.5-foot protective layer. This comparison based on equivalent flux confirms the proposed engineered subgrade will meet or exceed the groundwater protection resulting from the prescribed soil layer requirements of 30 TAC §335.584(b)(2).

A discussion on verifying the density of the subgrade is provided in Section 4.6 of Attachment III-4 in Part III, and a discussion on verifying the thickness of the subgrade is provided in Section 4.9 of Attachment III-4 in Part III.

4.6.2 Cell Drainage / Settlement Analysis

The base grades and leachate drainage approach follows the TCEQ requirements and industry best practices for the protection of groundwater and human health. Geomembrane liner grades have been designed to maintain separation from the seasonal high groundwater level (32 feet amsl) to eliminate the need for design and installation of a geomembrane liner ballast system.

The base grades have been designed with a two percent minimum slope toward the leachate collection system piping and leachate collection piping at 0.5 percent minimum slope will be used to facilitate leachate drainage to sumps along the South side of Cells A1-I2 and to the sump along the north side of Trenches 7 and 8. The slopes toward the leachate collection system piping generally mirror the design of Trenches 6 and 10 in the Existing Area footprint. The leachate collection system piping increases in slope from 0.5 percent to 1 percent approximately 250 feet from the limits of the sump in Trench 7/8 and Cells A1-I2 to account for potential settlement of the subgrade soils. Trenches 7 and 8 each will be approximately 11 acres (22.2 acres total) and share a common sump in Trench 8. Cells A1-I2 will be 11-14.5 acres with every two cells sharing a common sump (~25 acres per sump).

4.6.2.1 Landfill Settlement

Based on site specific data obtained during the planned geotechnical investigation, the maximum total liner settlement is expected to be 33 inches, occurring at the base of the landfill directly below the maximum landfill elevation in the expansion area. A settlement analysis was conducted through two critical cross sections: one along the leachate pipe invert through the maximum landfill elevation and another along the leachate pipe invert of Trench 7/8. The maximum settlement of Trench 7/8 is expected to be 25 inches. Settlement calculations are provided in Attachment III-7.

The settlement analysis results necessitate the increased slope of the leachate pipe invert as discussed in the previous section. A continuous slope of 0.5% at construction, if used, would be inadequate to convey leachate in the span between the sump and the top of the final cover side slope, after settlement had occurred. To counteract this effect, the typical 0.5% slope was increased to 1.0% along the South extent of the lateral expansion area (Cells A1-I2) and along the North extent of Trench 7.

The settlement analysis results constrained the areas of Trench 6 and 9 that could accommodate increased waste depth resulting from the vertical expansion. Portions of the landfill base grades of Trench 6 and 9 including the leachate pipe invert are constructed (or anticipated to be constructed prior to the issuance of this Amendment), therefore are unable to be modified as discussed above. No fill was added over the leachate collection system line within Trench 9 and limited fill was added in the southern extent of

Trench 6. A vertical expansion was only feasible in Trench 7 and 8 (where base grades can be revised with greater slopes) and on the final southern exterior slopes of Trench 6.

4.6.3 Soil and Liner Quality Control Plan [330.339]

Consistent with 30 TAC §330.339, a Soil and Liner Quality Control Plan (LQCP) has been prepared under the direction of a licensed professional engineer in Attachment III-4. The LQCP includes procedures for the installation and testing of both soil and geomembrane liners. The constructed liner details, showing slope, widths, and thicknesses of compaction lifts, can be found on Drawings III.A1.16 to III.A1.18. The soil and liner quality-control testing procedures will include sampling frequency in addition to all field sampling and testing during construction and after completion. The professional of record who has signed the soil liner evaluation report, or his representative will be on site during all liner construction. In addition, quality control of construction and quality assurance of sampling and testing procedures shall follow the latest technical guidelines of the Executive Director. Excavated waste will be returned to another location in a constructed cell.

4.6.4 Liner Evaluation Reports [330.339 and 330.341]

Soil Liner Evaluation Reports (SLERs) and Flexible Membrane Liner Evaluation Reports (FMLERs) shall be submitted to the TCEQ for evaluation and approval in accordance with 30 TAC §330.339 – Liner Quality Control Plan and 30 TAC §330.341 – Soil Liner Evaluation Report and Geomembrane Liner Evaluation Report.

4.7 Leachate Collection System and Leachate Recirculation [330.333]

The leachate collection system (LCS) shall be designed, constructed, and maintained in accordance with 30 TAC §330.331 and §330.333 – Leachate Collection System, and in accordance with Attachment III-2 – Surface Water Drainage Report, Attachment III-3 – Leachate and Contaminated Water Plan, Attachment III-4 – Soil and Liner Quality Control Plan (SLQCP), and Part IV – Site Operating Plan.

As detailed in Attachment III-3– Leachate and Contaminated Water Plan, the leachate collection system has been designed to maintain less than a 30 centimeter depth of leachate over the liner throughout the landfill life and postclosure period. The LCS has been designed according to the requirements as specified in 30 TAC §330.333:

- Constructed of materials that are chemically resistant to the leachate expected to be generated
- Constructed of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill

- Designed and operated to function through the scheduled closure and post-closure care period of the landfill considering the factors specified in 30 TAC 330.333(A) through (G).

As shown in Table 4-1, the leachate collection layer within the Expansion Area will consist of a double-sided geocomposite drainage layer, which consists of a geosynthetic drainage net with a geotextile bonded to both sides. Constructed Subtitle D cells within the Existing Area were permitted with two options: the use of 12 inches of granular drainage sand of a minimum $1x10^{-2}$ cm/sec or the drainage geocomposite. Leachate collection chimney drains will be used where needed for leachate collection, including in the option of below-grade Class 1 disposal in the lateral expansion. In the Class 1 option, chimney drains will have a maximum spacing of 200 ft, and will be used to facilitate leachate collection from MSW placed above-grade and over the four-foot layer of compacted clay-rich soil required by §330.457(b).

Drainage is facilitated as described in Section 4.6.2 toward the LCS piping, which has been sized based on leachate generation estimates using the Hydraulic Evaluation of Landfill Performance (HELP) Model Version 4.0.1. The HELP model is a hydrologic model of water movement across, into, through, and out of landfills. Landfill leachate generation was estimated based on local climatic factors, soil, and design data in a daily sequential analysis that accounts for the effects of surface storage, runoff, infiltration, evapotranspiration, percolation, soil moisture storage, and lateral drainage. A description of the HELP modeling is provided in Attachment III-3– Leachate and Contaminated Water Plan.

Leachate will be collected in the sumps (located as described in Section 4.6.2), to be pumped to leachate storage tanks. Leachate collected in the Existing Area is conveyed to the on-site leachate storage tank area in the north of the site. This area was designed and previously permitted for two storage tanks. Currently, one 64,000-gallon tank has been constructed. Leachate in the Expansion Area that encompasses Cells A1-I2 will be conveyed to a storage tank area on the east portion of the site, with four 64,000-gallon tanks based on estimated leachate generation.

Leachate is currently trucked off-site for treatment and disposal through the publicly-owned treatment network. Consistent with §330.177, recirculation of leachate and gas condensate may occur only on areas designed and constructed with a leachate collection system and composite liner. HELP modeling of the Expansion Area (Attachment III-3– Leachate and Contaminated Water Plan) indicates that up to 100 percent of leachate could be recirculated while cells are active and maintain less than a 30 centimeter depth of leachate over the liner. If utilized, procedures for recirculation may include:

- Discharge to trenches containing perforated pipes or prefabricated infiltration units spaced at regular horizontal and vertical intervals throughout the waste;
- Discharge to open trenches temporarily excavated into the waste which are then backfilled with waste and covered in accordance with §330.133; and
- Spray application of leachate to working face.

Refer to Section 10 of Part IV for operating procedures for recirculation of leachate and gas condensate.

4.8 Above-Grade Waste Placement

Above-grade waste placement design is presented in the following locations:

- All waste deposited above grade shall be limited to the grades and elevations shown in Attachment III-1 – Drawing III.A1.7 (Final Closure Plan West), Drawing III.A1.8 (Final Closure Plan East), Drawings III.A1.13 to III.A1.15 (Cross Sections-1 to Cross Sections-3), and III.A1.17 (Detail Sheet 2).
- As a part of the lateral expansion, the maximum elevation of the final cover shall be 187.8 feet amsl, as shown in Attachment III-1 – Drawing III.A1.7 (Final Closure Plan West), Drawing III.A1.8 (Final Closure Plan East).
- Top of cover and side embankment slopes of all above-grade waste disposal portions of the landfill shall be constructed to the grades and elevations as shown in Attachment III-1 – Drawing III.A1.7 (Final Closure Plan West), Drawing III.A1.8 (Final Closure Plan East).
- Landfill development and construction sequencing of below-grade, aerial fill areas, and site appurtenances shall be performed as shown in Attachment III-1 – Drawing III.A1.3 (Landfill Expansion Plan), Attachment III-1 – Drawing III.A1.4 (Waste Placement Phasing Plan). Compost facility relocation to a new parcel is planned to occur prior to affected expansion development (i.e., Cells H1 through I2) through the TCEQ registration process for composting operations.

Prior to above-grade waste placement in the lateral expansion areas, any cells receiving below-grade Class 1 waste will be covered with a four-foot clay-rich soil barrier, above which MSW will be placed for above-grade aerial fill. No Class 1 waste will be placed above-grade. Class 1 cell design is shown in Attachment III-1.

The four-foot clay-rich soil barriers between Class 1 waste and MSW will be constructed with geocomposite chimney drains to facilitate the leachate from above the barrier to be collected in the leachate collection layer, below the barrier. Detail 1 on Drawing III.A1.18 shows this particular type of chimney drain. The following calculations demonstrate that the double-layer of 200-mil geocomposite is adequate to convey the expected leachate flow. The flow rate used in this calculation is from the highest flow situation in the leachate modeling presented in in Attachment 3 (Intermediate conditions with 100% leachate recirculation).

If (Chimney Horizontal Length Required) > (Design Chimney Horizontal Length), then the geocomposite portion of the chimney drain is adequate to convey the maximum daily leachate flow.

Leachate Flow Rate = (Peak Daily Flow per Acre) x (Largest Expected Tributary Area)
= (8,334 gal/acre/day) x (14.1 acres—area of largest cell) = 117,509 gal/day
=81.6 gal/min

This flow will be distributed among “X” ft of 200-mil double-sided geocomposite. The transmissivity of two stacked panels is equal to approximately 1.0 gal/min/ft.

Chimney Horizontal Length Required = (Leachate Flow Rate) ÷ (Transmissivity)
= (81.6 gal/min) x 1.0 gal/min/ft) = 81.6 ft.

350 ft* > 81.6 ft., (Ok)

*350 ft is the approximate length of the short edge of the largest cell. This calculation conservatively assumes the leachate generation of the entire largest cell area is directed to the shortest edge.

4.9 Final Cover

The final cover shall serve as a barrier to waste, leachate, and gas migration and shall also limit the infiltration of rainfall and provide methane oxidation benefits.

The final cover system shall be constructed in accordance with 30 TAC §330.457 - Closure Requirements for MSWLF Units That Receive Waste on or after October 9, 1993, and Attachment III-1 – Drawing III.A1.2 (Existing and Permitted Conditions with Proposed Expansion Footprint), Drawing III.A1.7 (Final Closure Plan West), Drawing III.A1.8 (Final Closure Plan East), Attachment III-9 – Final Closure Plan, and Attachment III-10 - Final Cover Quality Control Plan.

Temporary erosion and sedimentation control measures shall remain functional until the permanent vegetative cover has become established or as required to control erosion on areas having completed final cover throughout the post-closure care period in accordance with Attachment III-2 – Surface Water Drainage Report and Attachment III-3 – Leachate and Contaminated Water Plan.

The footprint of the vertical expansion permitted under the Expansion Area extends above portions of Trench 5, 6, 7 and 8. In these areas of the Existing Area waste unit directly below the Expansion Area waste unit, only the final cover system of the Expansion Area waste unit will be installed, at the design elevations provided in Attachment III-1– Drawings III.A1.7 and III.A1.8.

The final cover system for Cells A1 – I2, Trench 7/8 as well as the final cover to be constructed over Subtitle D cells that have not been closed follows the prescriptive final cover profile. Consistent with 30 TAC §330.457(a), the final cover system design for all future Subtitle D cell closure activities will include the following layers from bottom to top:

- A 6-inch protective soil layer
- A 40-mil LLDPE geomembrane (textured both sides)
- A 200-mil geocomposite drainage layer
- 18 inches of clay-rich soil with a coefficient of permeability no greater than 1 x 10^{-5} cm/sec
- A 6-inch soil layer capable of sustaining native plant growth

Table 4-2 details the final cover system scenario for each disposal cell type.

Table 4-2: Final Cover System Components for Landfill Areas

<table>
<tr><th>Cover System</th><th>Pre-Subtitle D</th><th>Historic Prescribed Composite</th><th>Future Prescribed Composite[1]</th></tr>
<tr><td>Final Cover System Component</td><td>Existing Area – Pre-Subtitle D (CLOSED and To Be Closed)</td><td>Existing Area – Subtitle D (CLOSED)
&
Existing Area – Trench 11</td><td>Existing Area – Trenches 5 through 10 & Expansion Area – Cells A1 through I2</td></tr>
<tr><td rowspan="2">Erosion Control Layer</td><td rowspan="2">6-inch protective soil layer</td><td rowspan="2">24-inch erosion layer capable of sustaining native plant growth</td><td>6-inch protective soil layer capable of sustaining native plant growth</td></tr>
<tr><td>18-inch compacted clay-rich soil with permeability no greater than 1×10^{-5} cm/sec</td></tr>
<tr><td>Drainage Geocomposite</td><td>None</td><td>200-mil double-sided drainage geocomposite (side slopes) and cushion geotextile (top deck)</td><td>200-mil double-sided drainage geocomposite</td></tr>
<tr><td>Geomembrane</td><td>None</td><td>40-mil LLDPE geomembrane (smooth on top deck and textured on sides)</td><td>40-mil LLDPE Textured Geomembrane[1]</td></tr>
<tr><td>Compacted Clay Layer</td><td>18-inch compacted clay-rich soil with permeability no greater than 1×10^{-7} cm/sec</td><td>18-inch compacted clay-rich soil with permeability no greater than 1×10^{-5} cm/sec</td><td>(Placed above drainage composite in accordance with prescribed cover system)</td></tr>
</table>

[1] A 6-inch soil layer will be placed below the geomembrane to improve constructability and maintain the integrity of the geomembrane.

5.0 GEOLOGY REPORT

30 TAC §330.63(e)

The Geology Report was prepared consistent with 30 TAC §330.63(e). See Attachment III-5 for the complete Geology Report.

6.0 GROUNDWATER SAMPLING AND ANALYSIS PLAN

30 TAC §330.63(f)

A Groundwater Sampling and Analysis Plan (GWSAP) and Groundwater Monitoring Plan (GMP) has been prepared to address the requirements in 30 TAC Subpart J – Groundwater Monitoring and Corrective Action. The GWSAP/GMP is provided in Attachment III-6.

The groundwater monitoring system has been designed in conjunction with the Geology Report in Attachment III-5 and GWSAP/GMP. The groundwater monitoring system shall be used to monitor the quality of groundwater in the uppermost aquifer in accordance with 30 TAC §330.403.

Monitoring wells shall be sampled in accordance with a monitoring program defined in the GWSAP/GMP, 30 TAC §330.405, and 30 TAC §330.407.

Any monitoring well that is no longer used shall be properly plugged and abandoned in accordance with 30 TAC §330.421.

7.0 LANDFILL GAS MANAGEMENT PLAN

30 TAC §330.63(g)

An active landfill gas (LFG) extraction system has been constructed and will be used to reduce the potential for off-site subsurface migration of LFG. The landfill gas system is designed and operated in accordance with 30 TAC §330.371, and as described in the Landfill Gas Management Plan (Attachment III-8).

A LFG monitoring system will be installed to detect off-site subsurface LFG migration and to detect any LFG within facility structures. This shall be accomplished by a perimeter network of LFG monitoring probes and building detectors and non-dedicated monitoring in buildings, where applicable. The design, location, and operation of the LFG probes and detectors shall be as described in the Landfill Gas Management Plan (Attachment III-8). At a minimum, the probes shall be sampled quarterly by appropriately trained persons.

Further information regarding design, LFG monitoring procedures, and regulatory applicability is included in the Landfill Gas Management Plan (Attachment III-8).

8.0 CLOSURE PLAN

30 TAC §330.63(h)

The Landfill shall be completed and closed in accordance with 30 TAC §330.63(h) – Closure Plan and 30 TAC Subpart K – Closure and Post-Closure, as laid out in the Final Closure Plan (Attachment III-9). Upon closure, the permittee shall submit to the Executive Director documentation of closure as prescribed in 30 TAC §330.457 – Closure Requirements for Municipal Solid Waste Landfill Units that Receive Waste on or after October 9, 1993.

8.1 Existing – Closed Area Final Cover System

In 2015, final cover was constructed over approximately 51.6-acres along the western portion (top and deck slopes) of the pre-Subtitle D (29.2) acres and Subtitle D (22.4 acres) fill areas. Additional discussion of the Existing – Closed Area final cover systems can be found in Attachment III-9. The relevant drawings indicating the extent of the constructed final cover can be found in Attachment III-1, Appendix 1A. The Existing Area – Closed final cover system profiles are defined in Table 4-2 and Attachment III-10 – Final Closure Plan.

8.2 Final Cover System

The final cover system is designed and shall be constructed to minimize infiltration and erosion. For MSW units with a synthetic bottom liner, a synthetic membrane that has permeability less than or equal to the permeability of any bottom liner system overlain by clay-rich soil cover layer. The final cover profile and design details are described in Table 4-2 and Attachment III-9 – Final Closure Plan. The topmost portion of the final cover will be installed at a five percent slope, while the side slopes will be installed at 33 percent and 25 percent, as indicated in Attachment III-1 – Drawings III.A1.7 and III.A1.8.

Design calculations demonstrating the acceptability of the sideslopes greater than 25 percent can be found in the Slope Stability and Settlement Analysis Report (Attachment III-7), inclusive of slopes to accommodate stormwater drainage features.

8.3 Final Cover – Soil Erosion Loss Calculations

The following calculations were completed using the Revised Universal Soil Loss Equations, Version 2 (RUSLE2) program which is developed and maintained by the Natural Resources Conservation Service (NRCS). RUSLE2 uses six factors, including climatic erosivity, soil erodibility, slope length, slope steepness, cover-management, and support practices to compute soil loss.

As this project takes place in Victoria County, TX, the following databases were imported within the program:

- CMZ58 (Crop Management Zone Database encompassing Site area)
- TX clim011603 (Climate Database that encompassing Site area)
- SSURGO (Soil Database for USA)

The NRCS Web Soil Survey was used to identify the soil type for the site. Laewest clay (LaA), 0 to 1 percent slopes was identified as the soil type for the site (see Attachment III-14, Appendix 14A) and was chosen from the SSURGO soil database.

As multiple stormwater diversion berms (also referred to as "terraces") are planned for the landfill from top to bottom of slope, the Compare Field Alternatives option was chosen to calculate the soil loss from each typical section of the landfill between terraces. Two typical sections are identified in the RUSLE2 report and figures (included in Attachment III-14) as Field 1 (Scenarios 1A-1F) and Field 2 (Scenarios 2A – 2E). The soil loss results from the RUSLE2 program are shown in Table 8-1 (Intermediate Cover Phase) and Table 8-2 (90 percent Cover) as well as the weighted soil loss calculations for each landfill section analyzed.

The calculations showed weighted soil loss values of less than 50 tons/acre/year per TCEQ guideline RG-417 for both sections analyzed for the intermediate cover scenario. The calculations represent a condition immediately following the completion of final cover, where seeding and mulching BMPs are used to decrease erosion.

The calculations showed weighted soil loss values of less than 3 tons/acre/year, per TCEQ guideline RG-417 soil loss regulation for both sections analyzed for the 90 percent vegetation scenario. The calculations represent a condition of vegetative growth with approximately 90 percent coverage over the entire landfill, which has been successfully achieved at other regional facilities. Until such coverage is achieved, all slopes will be inspected and managed per Attachment III-9 – Final Closure Plan and Attachment III-11 – Post-Closure Plan. If any areas demonstrate a need for corrective action as laid out in Attachment III-11 – Post-Closure Plan, they will receive immediate corrective action. Regular inspections and maintenance will continue throughout the post-closure care period to maintain.

Table 8-1: RUSLE 2 Soil Loss Results – Intermediate Cover Phase

Sub-Scenario	Section Length (feet)	Soil Loss (tons/acre/yr)	% Total Length	Weighted Soil Loss (tons/acre/yr)
1A	250	23	35.2	8.1
1B	180	20	25.3	5.1
1C	60	48	8.4	4.1
1D	80	56	11.3	6.3
1E	80	56	11.3	6.3
1F	61	20	8.6	1.7
Total Length	711		**Total Soil Loss**	**31.5**
2A	180	20	32.0	6.4
2B	100	47	17.2	8.1
2C	110	51	19.5	10.0
2D	110	54	19.5	10.6
2E	66	18	11.7	2.1
Total Length	563		**Total Soil Loss**	**37.1**

Table 8-2: RUSLE 2 Soil Loss Results – Final Cover Phase

Sub-Scenario	Section Length (feet)	Soil Loss (tons/acre/yr)	% Total Length	Weighted Soil Loss (tons/acre/yr)
1A	250	1	35.2	0.4
1B	180	1	25.3	0.3
1C	60	3	8.4	0.3
1D	80	3	11.3	0.3
1E	80	3	11.3	0.3
1F	61	1	8.6	0.1
Total Length	711		**Total Soil Loss**	**1.6**
2A	180	1	32.0	0.3
2B	100	2	17.2	0.3
2C	110	2	19.5	0.4
2D	110	2	19.5	0.4
2E	66	1	11.7	0.1
Total Length	563		**Total Soil Loss**	**1.6**

9.0 POST-CLOSURE PLAN

30 TAC §330.63(i)

Consistent with 30 TAC §330.63(i), a post-closure plan has been prepared under the direction of a licensed professional engineer and is provided in Attachment III-11. Post-closure construction and maintenance shall be conducted in accordance with the plan for a period of 30 years or as otherwise determined by the Executive Director pursuant to 30 TAC §330.463.

10.0 COST ESTIMATE FOR CLOSURE AND POST-CLOSURE CARE

30 TAC §330.63(j)

Authorization to operate the facility is contingent upon compliance with provisions contained within the permit and maintenance of financial assurance in accordance with 30 TAC Chapter 330, Subchapter K – Financial Assurance.

10.1 Closure Cost Estimate

Consistent with 30 TAC §330.503(a), a cost estimate of hiring a third party to close the largest waste fill area that could potentially be open in the year to follow and those areas that have not received final cover is provided in Attachment III-12. The Closure Cost estimate in 2021 dollars is $7,357,403. A review of facility's permit conditions, current active areas, and cost estimates will be provided annually in accordance with 30 TAC §330.503(a)(1).

The City shall establish financial assurance for closure in accordance with 30 TAC Chapter 37, Subchapter R (relating to Financial Assurance for Municipal Solid Waste Facilities). Continuous financial assurance coverage for closure shall be provided until the facility is officially placed under the post-closure maintenance period and all requirements of the final closure plan have been approved as evidenced in writing by the TCEQ.

10.2 Post-Closure Cost Estimates

Consistent with 30 TAC §330.507(a), a cost estimate of hiring a third party to conduct post-closure care activities is provided in Attachment III-13. The-Post Closure Cost estimate in 2021 dollars is $11,139,083.

The City shall establish financial assurance for the costs of post-closure care of the unit in accordance with 30 TAC Chapter 37, Subchapter R (relating to Financial Assurance for Municipal Solid Waste Facilities). Continuous financial assurance coverage for post-closure care shall be provided until the facility is officially released in writing by the TCEQ from the post-closure care period in accordance with all requirements of the post-closure care plan.

10.3 Corrective Action Cost Estimate

Consistent with 30 TAC §330.509, a corrective action program and a detailed written cost estimate of the cost of hiring a third party to perform the corrective action program is required if requested by the TCEQ. Currently a corrective action cost estimate for the site has not been requested by the TCEQ but will be provided if required.

ATTACHMENT III-1 – PERMIT AMENDMENT DRAWINGS

City of Victoria Landfill

Landfill Expansion Permit Amendment

City of Victoria, TX

TCEQ Permit No. 1522B

THE CITY OF VICTORIA TEXAS

MARCH 2022

BMcD Project No. 107608

ONE OR TWO CHARACTER DISCIPLINE DESIGNATOR (MAY NOT BE PRESENT IF CALLOUT AND TITLE ARE ON DRAWINGS WITHIN THE SAME DISCIPLINE)

LETTER OR NUMBER DESIGNATOR

A
FP001

DRAWING SEQUENCE NUMBER INDICATES WHERE TITLE IS LOCATED (MAY NOT BE PRESENT IF CALLOUT AND TITLE ARE ON THE SAME DRAWING)

SECTION, DETAIL, AND ELEVATION SYMBOL IDENTIFIERS

A FP001 A FP001

SECTION CALLOUT EXAMPLE

7 FP001

DETAIL CALLOUT EXAMPLE

B A001

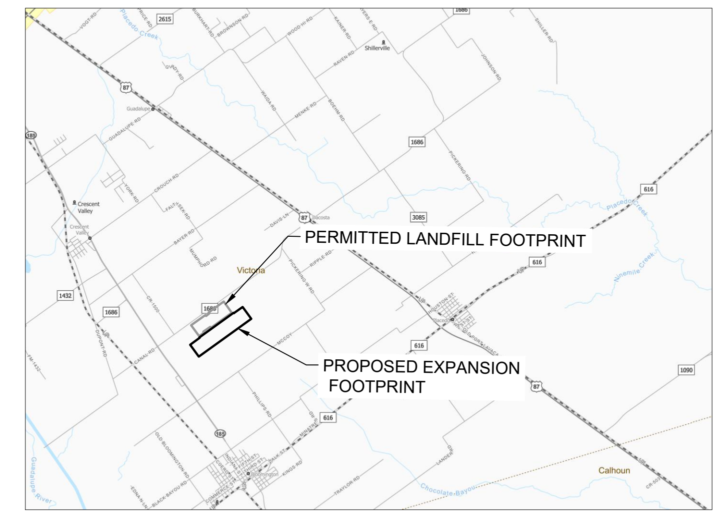
ELEVATION CALLOUT EXAMPLE

THE WORD "SECTION" MAY BE REPLACED WITH "ELEVATION" OR "DETAIL"

SECTION A 001

SECTION, DETAIL, OR ELEVATION TITLE EXAMPLE

SECTION, DETAIL, AND ELEVATION IDENTIFICATION SYSTEM



GENERAL LOCATION MAP

0 10000' 20000'
SCALE IN FEET
N

List of Drawings

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

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BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

COVER - INDEX

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1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. VICTORIA LANDFILL SITE TOPOGRAPHY (NORTHERN PROPERTY AND EXISTING LANDFILL GRADES) PROVIDED BY COOPER AERIAL SURVEYS CO. DATE OF AERIAL SURVEY: NOVEMBER 24, 2019. SURVEY LIMITS SHOWN ON DRAWING C001.
2. EXPANSION PROPERTY SITE TOPOGRAPHY PROVIDED BY CIVIL CORP. DATE OF GROUND SURVEY: OCTOBER 2, 2018. SURVEY LIMITS SHOWN ON DRAWING C001.
3. TOPOGRAPHY OUTSIDE OF THE AREA DESCRIBED IN NOTES 1 AND 2 WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 1999.
4. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
5. IN ADDITION TO THE LIST BELOW, THE FOLLOWING ABBREVIATIONS AND SHORTENED TERMS ARE USED IN THIS DRAWING SET:
   - WEST BASIN = FIRST FLUSH DETENTION BASIN WEST
   - EAST BASIN = DETENTION BASIN EAST

ABBREVIATIONS

AC	ACRE
AMSL	HEIGHT ABOVE MEAN SEA LEVEL
BMcD	BURNS & MCDONNELL
CM	CENTIMETER
DWG	DRAWING
E	EAST/EASTING
EB	EXISTING BORING
EL.	ELEVATION
EX.	EXISTING
FM1686	FARM-TO-MARKET ROAD 1686
FT.	FEET
GCCS	GAS COLLECTION AND CONTROL SYSTEM
GCL	GEOSYNTHETIC CLAY LINER
GMP	GAS MONITORING PROBE
HDPE	HIGH-DENSITY POLYETHYLENE
IN.	INCH
INV.	INVERT

ABBREVIATIONS CONT.

K	HYDRAULIC CONDUCTIVITY
LFG	LANDFILL GAS
MIL	1/1,000-INCH
MIN	MINIMUM
MW	MONITORING WELL
N	NORTH / NORTHING
NO.	NUMBER
OZ	OUNCE
OW	OBSERVATION WELL
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
S	SOUTH
SEC	SECOND
TBC	TO BE CONSTRUCTED
TYP.	TYPICAL
W	WEST
YD	YARD

SEE NOTE 5 FOR ADDITIONAL ABBREVIATIONS

PLAN LEGEND

- PROPERTY BOUNDARY
- EXISTING PAVED ROAD
- EXISTING GRAVEL ROAD
- EXISTING/PERMITTED WASTE LIMITS
- SURVEY LIMITS
- ADJACENT PARCEL LIMIT
- EXISTING 2' CONTOUR
- 120 — EXISTING 10' CONTOUR
- EXISTING DRAINAGE PATH
- EXISTING POND
- EXISTING CHOCOLATE BAYOU FLOOD ZONE
- GROUNDWATER SURFACE CONTOUR
- EXISTING STRUCTURE
- EXISTING FENCE
- OH — EXISTING OVERHEAD ELECTRICAL
- EXISTING EASEMENT
- FM — EXISTING LEACHATE/CONDENSATE FORCE MAIN
- AIR — EXISTING AIR SUPPLY LINE
- EXISTING LFG HEADER/LATERAL
- EXISTING LFG EXTRACTION WELL
- SURVEY CONTROL POINT
- EXISTING GAS MONITORING PROBE
- EXISTING GROUNDWATER MONITORING WELL
- EXISTING GEOTECHNICAL BORING LOCATION
- EXISTING CULVERT
- EXISTING VALVE
- EXISTING CONDENSATE SUMP
- EXISTING LIGHT POLE
- 120 — EXISTING TBC DESIGN 10' CONTOUR
- EXISTING TBC DESIGN 2' CONTOUR
- 2 — PROPOSED 2' CONTOUR
- 10 — PROPOSED 10' CONTOUR
- PROPOSED PAVED ROAD
- PROPOSED GRAVEL ROAD
- PROPOSED LIMIT OF FILL
- PROPOSED PERMIT BOUNDARY/PROJECT LIMIT
- PROPOSED WASTE LIMITS
- PROPOSED CELL BOUNDARY
- LCP — PROPOSED LEACHATE PIPE COLLECTION SYSTEM
- FM — PROPOSED LEACHATE/CONDENSATE FORCE MAIN
- AIR — EXISTING AIR SUPPLY LINE
- PROPOSED LFG HEADER
- PROPOSED LFG LATERAL
- PROPOSED LFG JUMPER LINE
- POINT OF COMPLIANCE

PLAN LEGEND (CONT.)

- PROPOSED CONDENSATE SUMP
- PROPOSED LFG EXTRACTION WELL
- PROPOSED GROUNDWATER MONITORING WELL
- PROPOSED LFG MONITORING PROBE
- PROPOSED VALVE
- MAXIMUM SEASONAL HIGH GROUNDWATER
- LETDOWN CHUTE
- STORMAWATER CHANNEL/DIVERSION BERM
- PROPOSED BARBED WIRE FENCE
- PROPOSED SUMP
- EXISTING SUMP

DETAIL LEGEND

- GEOMEMBRANE
- XXXXXXXXXXXXXXXXXXXXXXXX GEOCOMPOSITE
- GEOTEXTILE
- COMPACTED SOIL LINER
- COMPACTED SOIL FINAL COVER/ GENERAL COMPACTED SOIL
- GEOSYNTHETIC CLAY LINER (GCL)
- PROTECTIVE COVER
- PERFORATED PIPE
- CHIMINEY DRAIN/SUMP DRAINAGE ROCK
- SUBGRADE
- VEGETATIVE SOIL
- STORMWATER DETENTION POND AREA

STATE OF TEXAS
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816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

project	contract
107608	-

drawing III.A1.1 — rev. 2

sheet 2 of 25 sheets

file 107608III.A1.1.dwg

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0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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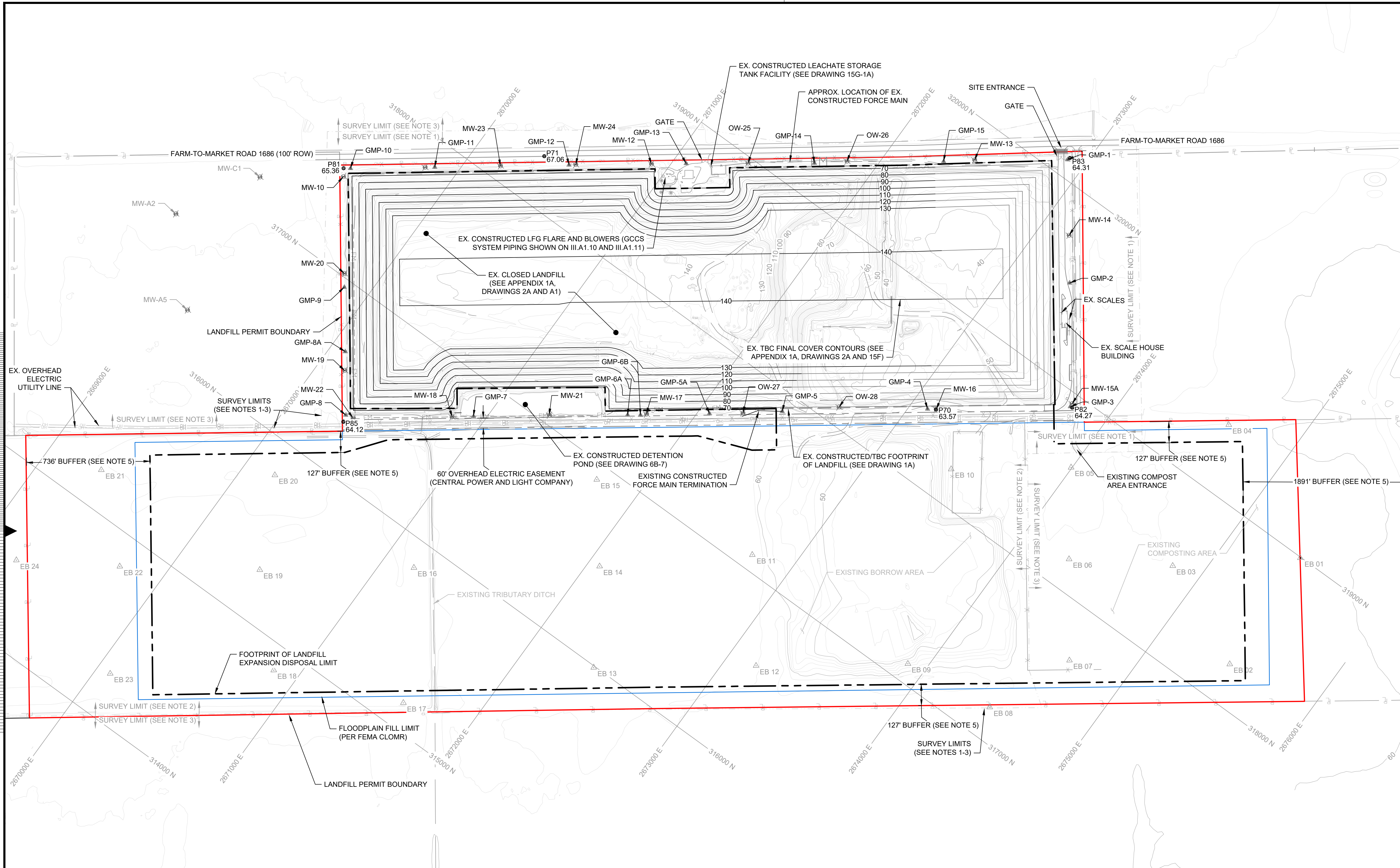
NOTE:

1. VICTORIA LANDFILL SITE TOPOGRAPHY (NORTHERN PROPERTY AND EXISTING LANDFILL GRADES) PROVIDED BY COOPER AERIAL SURVEYS CO. DATE OF AERIAL SURVEY: NOVEMBER 24, 2019. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
2. EXPANSION PROPERTY SITE TOPOGRAPHY PROVIDED BY CIVIL CORP. DATE OF GROUND SURVEY: OCTOBER 2, 2018. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
3. TOPOGRAPHY OUTSIDE OF THE AREA DESCRIBED IN NOTES 1 AND 2 WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 1999.
4. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
5. BUFFERS SHOWN REPRESENT DISTANCE BETWEEN LIMITS OF WASTE AND THE PROPERTY BOUNDARIES.
6. DESIGN CONTOURS REPRESENT TOP OF PREVIOUSLY PERMITTED FINAL COVER. CONTOUR INTERVAL IS 10-FEET.



SITE CONTROL POINTS

POINT ID	NORTHING	EASTING	ELEVATION (FT AMSL)
70	318435.19	2673139.67	63.57
71	318285.02	2670362.64	67.06
81	317523.31	2669436.40	65.36
82	318921.55	2673790.18	64.27
83	320118.09	2672904.15	64.31
85	316299.10	2670324.48	64.12

STATE OF TEXAS
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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

EXISTING CONDITIONS WITH EXPANSION FOOTPRINT

project 107608 contract -

drawing III.A1.2 – rev. 2

sheet 3 of 25 sheets

file 107608III.A1.2.dwg

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0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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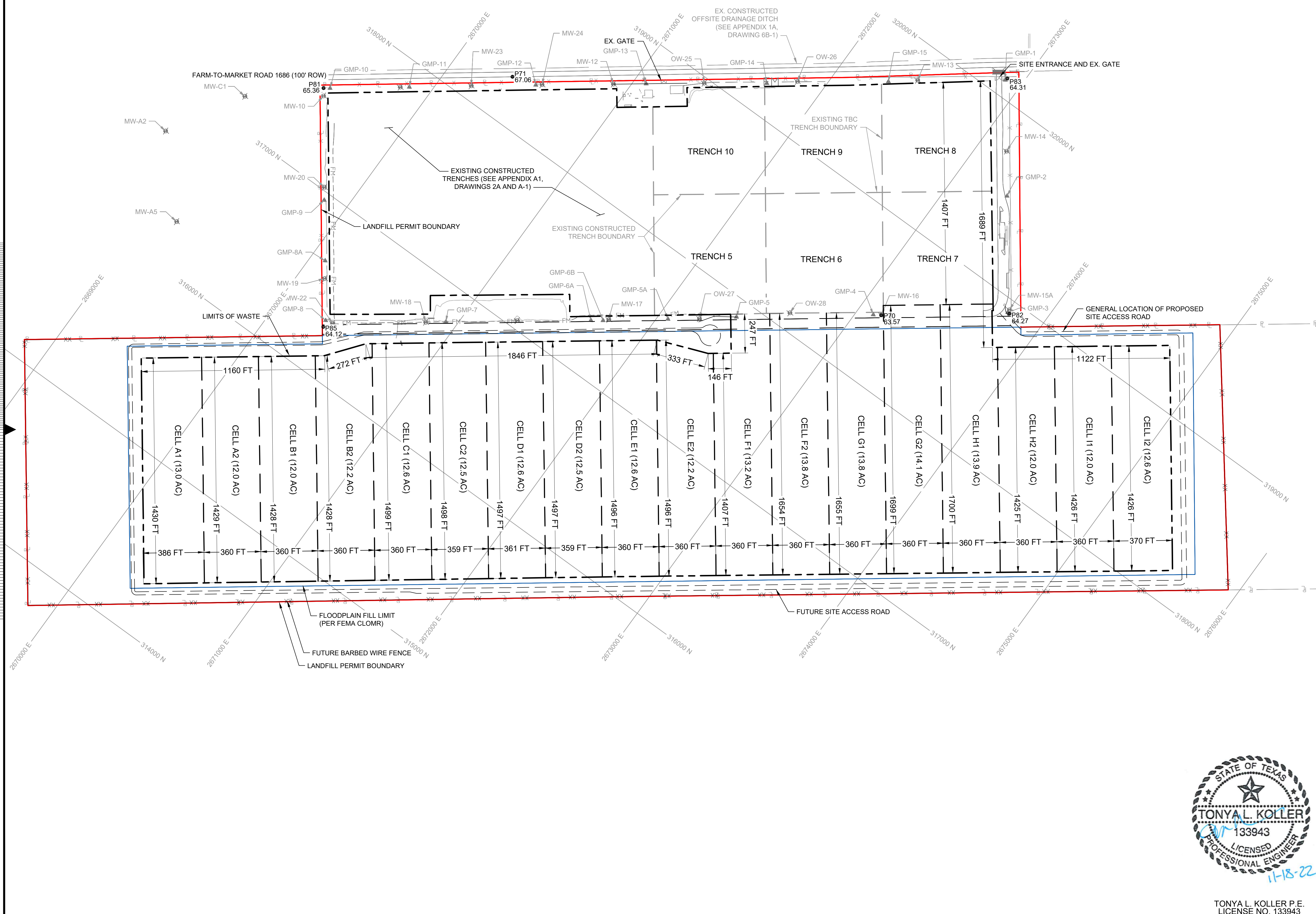
NOTES:

1. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
2. THE CELLS OF THE LANDFILL LATERAL EXPANSION MAY BE DESIGNATED FOR THE PLACEMENT OF CLASS 1 WASTE. SEE DRAWING III.A1.4 FOR FURTHER INFORMATION ON WHICH CELLS ARE DESIGNATED FOR BELOW-GRADE CLASS 1 PLACEMENT.



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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

LANDFILL CELL EXPANSION PLAN

project	contract
107608	-

drawing III.A1.3 — rev. 2

sheet 4 of 25 sheets

file 107608III.A1.3.dwg

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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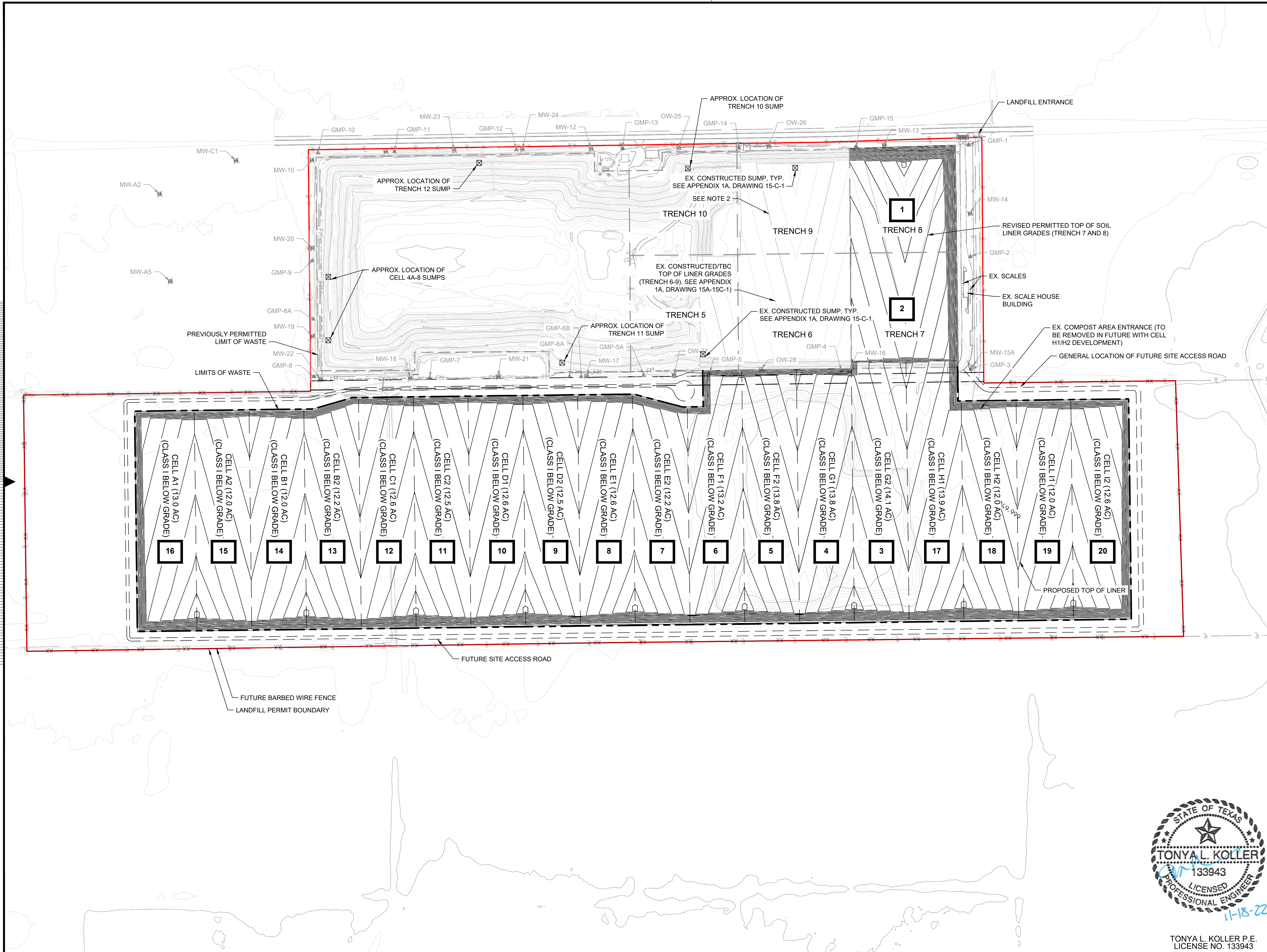

NOTES:

1. CELLS A1-I2 ARE SUITABLE FOR DISPOSAL OF BOTH MSW AND CLASS 1 WASTE. CLASS 1 WASTE SHALL BE DISPOSED BELOW THE EXTERIOR BERM ELEVATION (66.4' AMSL), AND COVERED BY A 4-FOOT CLAY RICH SOIL BARRIER, IF CELL IS DESIGNATED AS CLASS 1 IN THIS DRAWING. MSW WASTE MAY BE DISPOSED OF BELOW THE EXTERIOR BERM ELEVATION AND/OR ABOVE THE CLASS 1 WASTE CLAY BARRIER. A PERMIT MODIFICATION SHALL BE FILED TO CHANGE THE BELOW-GRADE WASTE DESIGNATION OF ANY CELL.
2. THE WESTERN HALF OF TRENCH 9 AND THE NORTHERN 250 FEET OF TRENCH 6 WEST IS CONSTRUCTED AND IN SERVICE AS OF MAY 2019.
3. DESIGN CONTOURS REPRESENT TOP OF SOIL LINER. CONTOUR INTERVAL IS 2-FEET. BACKGROUND CONTOURS REPRESENT EXISTING GROUND, EXCEPT WITHIN THE TRENCH 6-9 BOUNDARIES AND EASTERN PORTION OF TRENCH 5, WHERE CONTOURS REPRESENT THE PREVIOUSLY PERMITTED TOP OF SOIL LINER.

LEGEND

1 ORDER OF CELL CONSTRUCTION

NORTH

0 300' 600'
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date MARCH 2022 | detailed T. CAMMACK
designed T. SCHMIDT | checked T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

WASTE PLACEMENT PHASING PLAN

project 107608 | contract -

drawing III.A1.4 – rev. 2

sheet 5 of 25 sheets

file 107608III.A1.4.dwg

STATE OF TEXAS
TONYA L. KOLLER
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11-18-22

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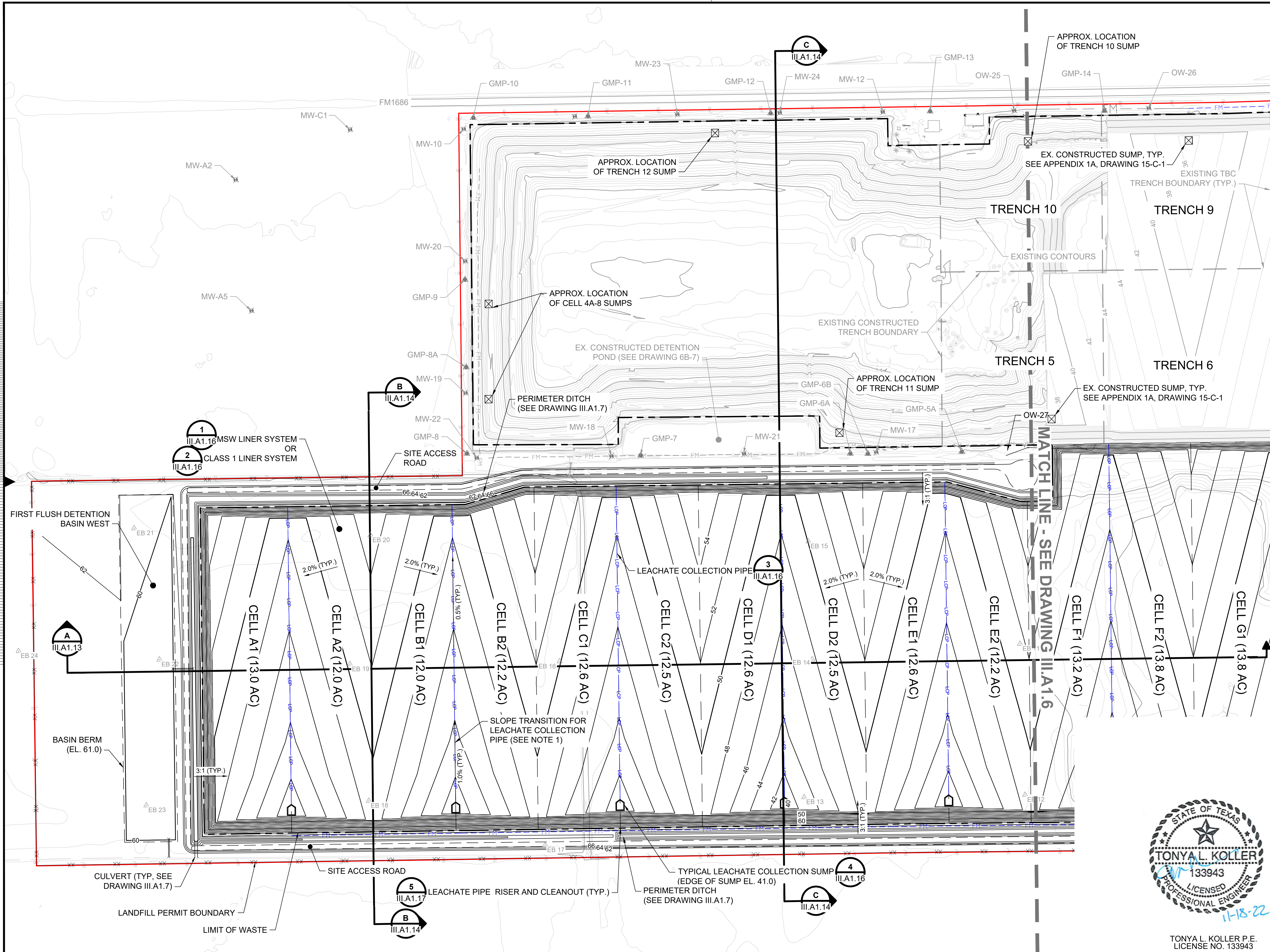
NOTES:

1. LINER GRADING THROUGH THE FLOWLINE TRANSITIONS FROM 0.5% TO 1.0% AT 250' FROM THE NORTH EDGE OF EACH SUMP. THE TRANSITION IS NECESSARY TO MAINTAIN 0.5% SLOPE THROUGHOUT THE LEACHATE COLLECTION PIPE AFTER LANDFILL SETTLEMENT.
2. DESIGN CONTOURS REPRESENT TOP OF SOIL LINER. CONTOUR INTERVAL IS 2-FEET. BACKGROUND CONTOURS REPRESENT EXISTING GROUND, EXCEPT WITHIN THE TRENCH 6-9 BOUNDARIES AND EASTERN PORTION OF TRENCH 5, WHERE CONTOURS REPRESENT THE PREVIOUSLY PERMITTED TOP OF SOIL LINER.



PRELIMINARY - NOT FOR CONSTRUCTION

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED PROFESSIONAL ENGINEER
11-18-22

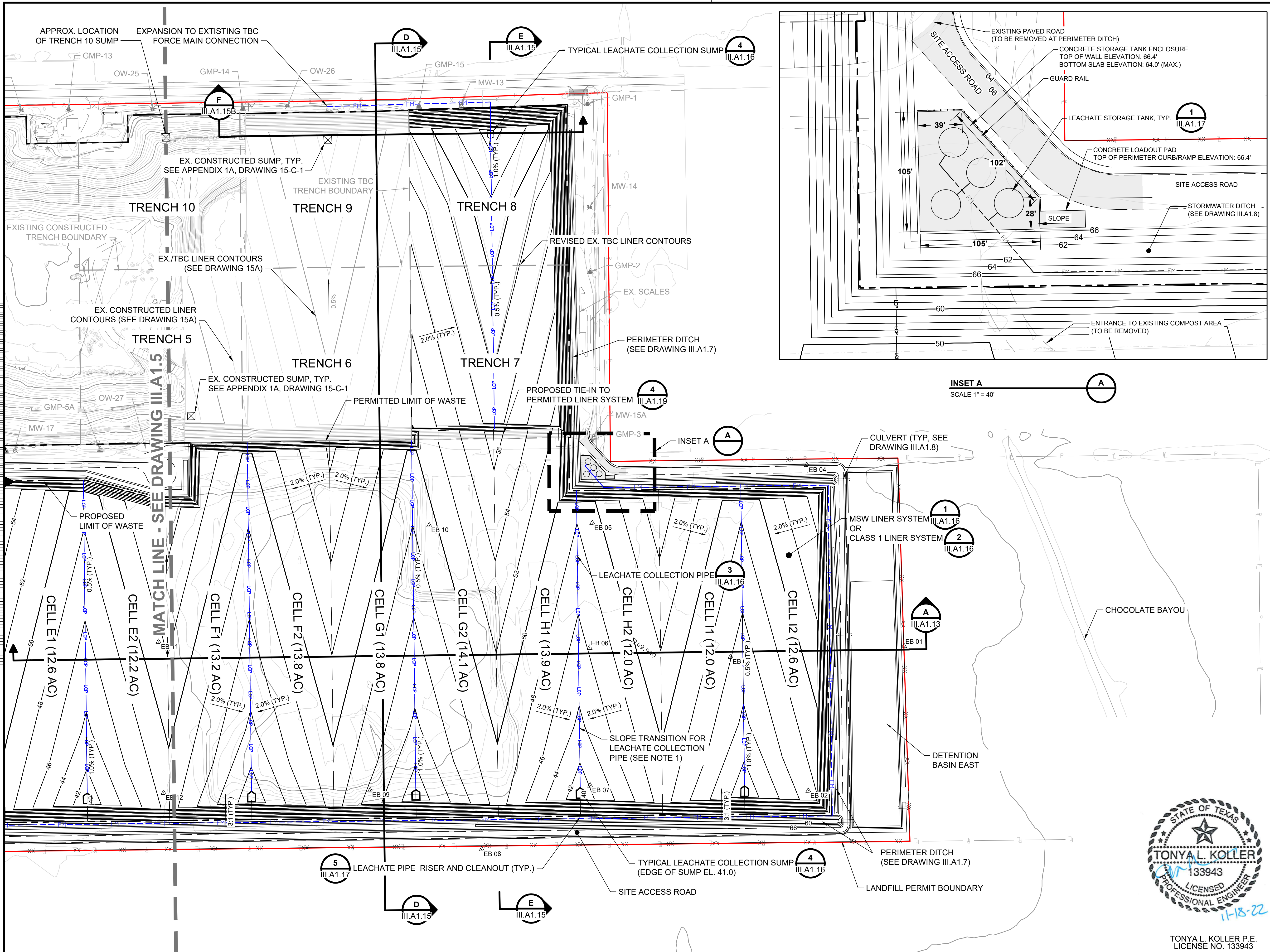
TONYA L. KOLLER P.E.
LICENSE NO. 133943

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

BASE GRADING PLAN - WEST

project 107608 contract -
drawing III.A1.5 – rev. 2
sheet 6 of 25 sheets
file 107608III.A1.5.dwg



no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. LINER GRADING THROUGH THE FLOWLINE TRANSITIONS FROM 0.5% TO 1.0% AT 200' FROM THE NORTH EDGE OF EACH SUMP. THE TRANSITION IS NECESSARY TO MAINTAIN 0.5% SLOPE THROUGHOUT THE LEACHATE COLLECTION PIPE AFTER LANDFILL SETTLEMENT.
2. DESIGN CONTOURS REPRESENT TOP OF SOIL LINER. CONTOUR INTERVAL IS 2-FEET. BACKGROUND CONTOURS REPRESENT EXISTING GROUND, EXCEPT WITHIN THE TRENCH 6-9 BOUNDARIES AND EASTERN PORTION OF TRENCH 5, WHERE CONTOURS REPRESENT THE PREVIOUSLY PERMITTED TOP OF SOIL LINER.

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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

BASE GRADING PLAN - EAST

project 107608 contract -

drawing III.A1.6 – rev. 2

sheet 7 of 25 sheets

file 107608III.A1.6.dwg

STATE OF TEXAS
TONYA L. KOLLER
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LICENSED PROFESSIONAL ENGINEER
11-18-22

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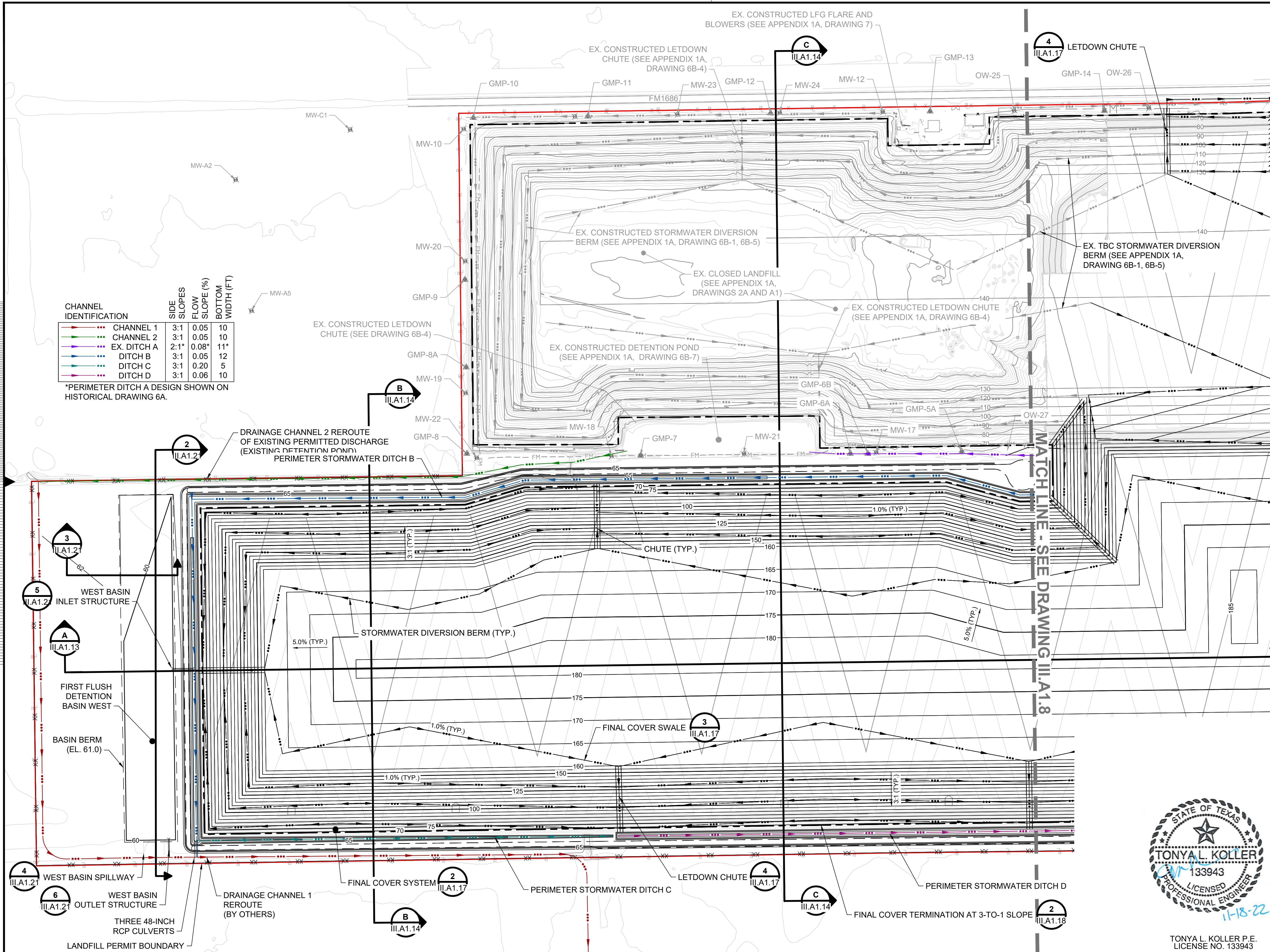
no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD



CHANNEL IDENTIFICATION	SIDE SLOPES	FLOW SLOPE (%)	BOTTOM WIDTH (FT)
CHANNEL 1	3:1	0.05	10
CHANNEL 2	3:1	0.05	10
EX. DITCH A	2:1*	0.08*	11*
DITCH B	3:1	0.05	12
DITCH C	3:1	0.20	5
DITCH D	3:1	0.06	10

*PERIMETER DITCH A DESIGN SHOWN ON HISTORICAL DRAWING 6A.

NOTES:

1. DESIGN CONTOURS REPRESENT TOP OF FINAL COVER. DESIGN CONTOUR INTERVAL IS 5-FEET. BACKGROUND CONTOURS REPRESENT TOP OF SOIL LINER AND EXISTING GROUND (OUTSIDE OF TRENCHES 6-9, EASTERN PORTION OF TRENCH 5 AND CELLS A1-I2). BACKGROUND CONTOUR INTERVAL IS 2-FEET.
2. PERIMETER DITCH CROSS SECTIONS SHOWING DIMENSIONS, FLOW DEPTHS, ETC. ARE PROVIDED ON DRAWINGS III.A1.19 AND III.A1.20.

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detailed: T. CAMMACK
designed: T. SCHMIDT
checked: T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

STATE OF TEXAS
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11-18-22

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1522B PERMIT AMENDMENT

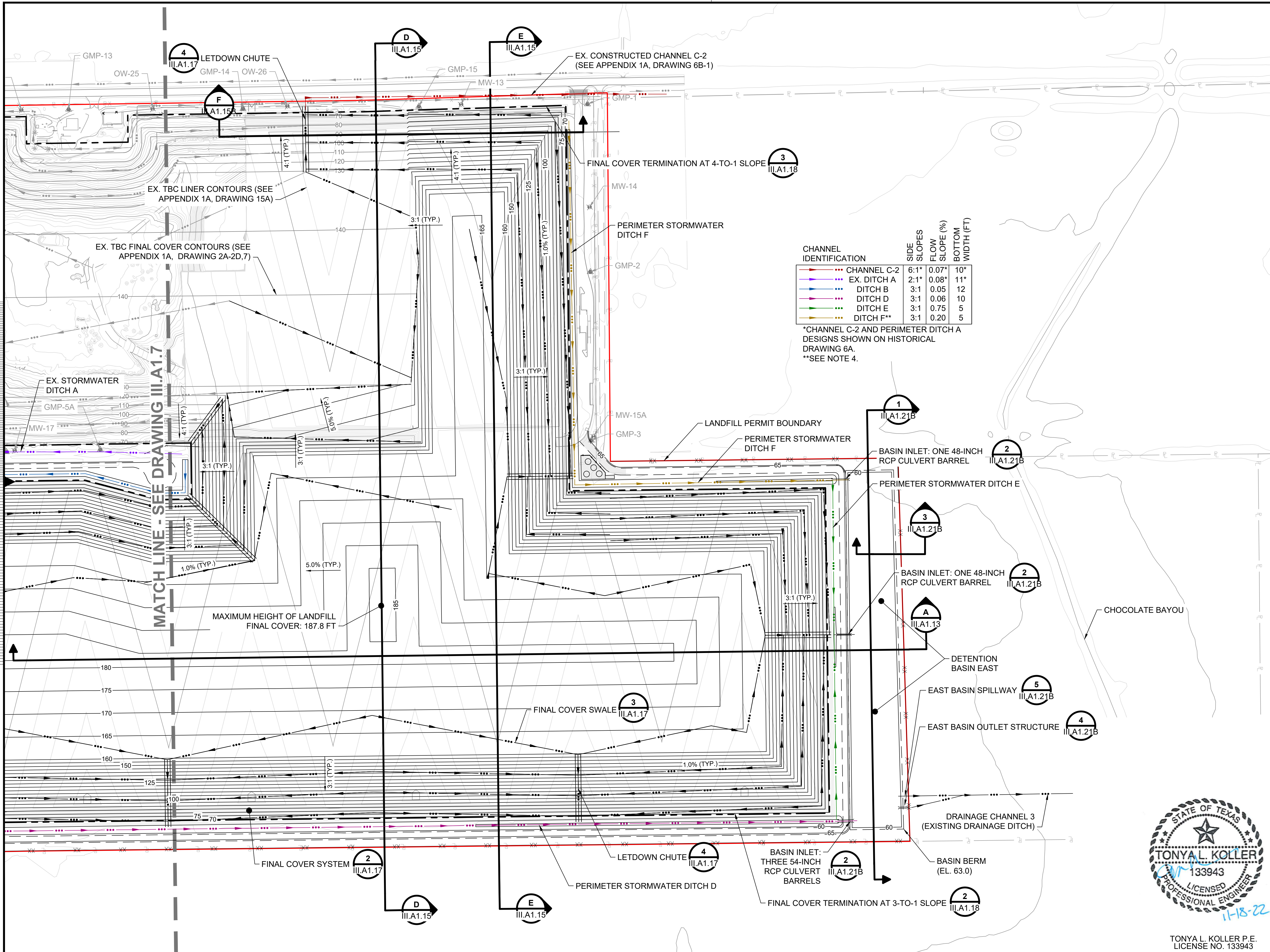
FINAL GRADING PLAN - WEST

project: 107608
contract: -
drawing: III.A1.7 — rev. 2
sheet 8 of 25 sheets
file 107608III.A1.7.dwg

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. THE EAST BASIN DISCHARGES INTO AN EXISTING DITCH NOT SHOWN IN THE EXISTING TOPOGRAPHY.
2. DESIGN CONTOURS REPRESENT TOP OF FINAL COVER. DESIGN CONTOUR INTERVAL IS 5-FEET. BACKGROUND CONTOURS REPRESENT TOP OF SOIL LINER AND EXISTING GROUND (OUTSIDE OF TRENCHES 6-9, EASTERN PORTION OF TRENCH 5 AND CELLS A1-I2). BACKGROUND CONTOUR INTERVAL IS 2-FEET.
3. PERIMETER DITCH CROSS SECTIONS SHOWING DIMENSIONS, FLOW DEPTHS, ETC. ARE PROVIDED ON DRAWINGS III.A1.19 AND III.A1.20.
4. PERIMETER DITCH F IS NOT REPRESENTED IN CROSS SECTIONS. 25-YEAR STORM DEPTH IS 1.1 FT AND 100-YEAR STORM DEPTH IS 1.5 FT.



CHANNEL IDENTIFICATION	SIDE SLOPES	FLOW SLOPE (%)	BOTTOM WIDTH (FT)
CHANNEL C-2	6:1*	0.07*	10*
EX. DITCH A	2:1*	0.08*	11*
DITCH B	3:1	0.05	12
DITCH D	3:1	0.06	10
DITCH E	3:1	0.75	5
DITCH F**	3:1	0.20	5

*CHANNEL C-2 AND PERIMETER DITCH A DESIGNS SHOWN ON HISTORICAL DRAWING 6A.
**SEE NOTE 4.

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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

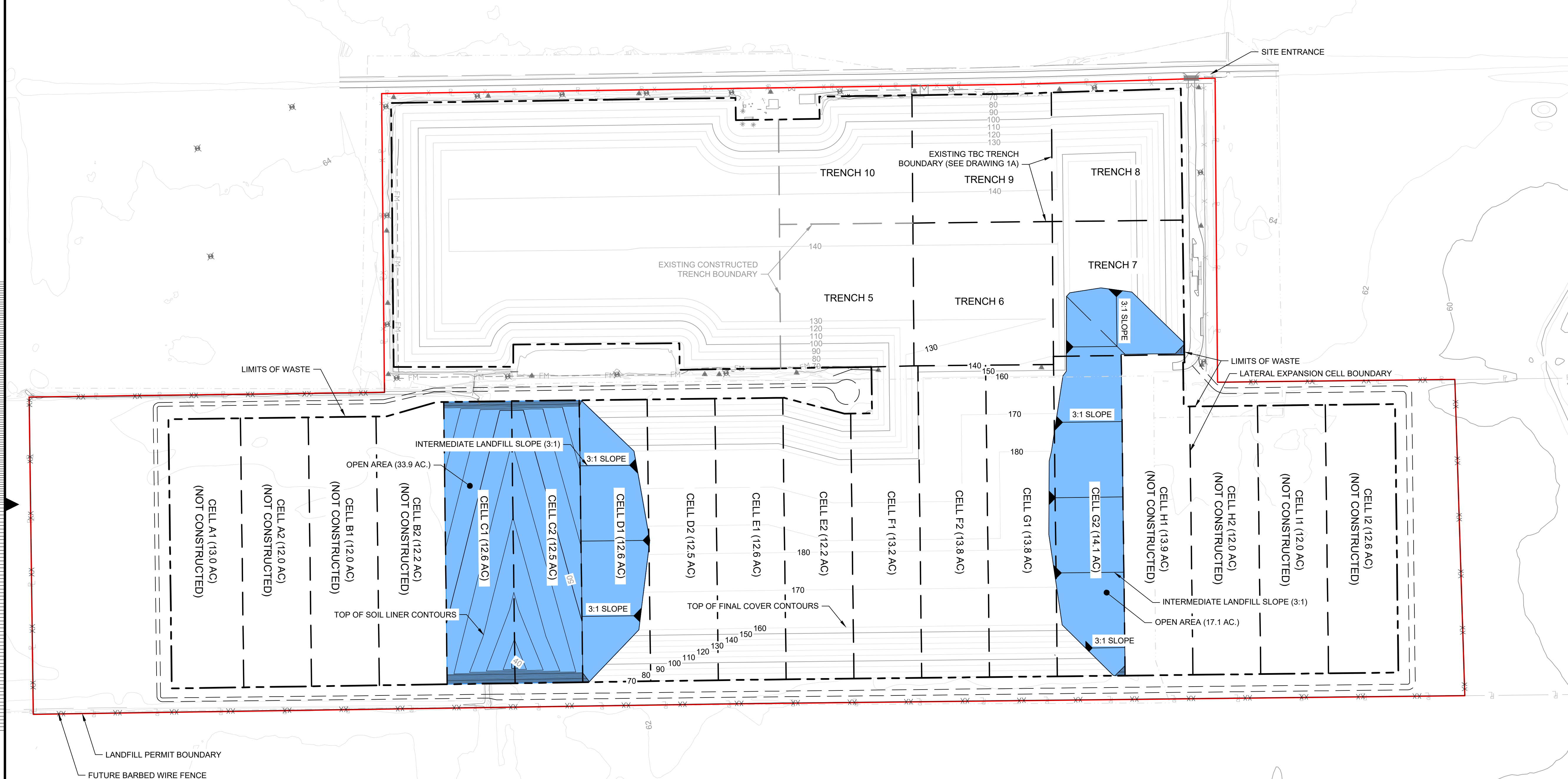
FINAL GRADING PLAN - EAST

project 107608 contract -
drawing III.A1.8 – rev. 2
sheet 9 of 25 sheets
file 107608III.A1.8.dwg

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. VICTORIA LANDFILL SITE TOPOGRAPHY (NORTHERN PROPERTY AND EXISTING LANDFILL GRADES) PROVIDED BY COOPER AERIAL SURVEYS CO. DATE OF AERIAL SURVEY: NOVEMBER 24, 2019. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
2. EXPANSION PROPERTY SITE TOPOGRAPHY PROVIDED BY CIVIL CORP. DATE OF GROUND SURVEY: OCTOBER 2, 2018. SURVEY LIMITS SHOWN ON DRAWING III.A1.2.
3. TOPOGRAPHY OUTSIDE OF THE AREA DESCRIBED IN NOTES 1 AND 2 WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 1999.
4. THE SURVEY COORDINATES ARE ON THE TEXAS SOUTH CENTRAL STATE PLANE '83, COORDINATE SYSTEM. HORIZONTAL DATUM IS NAVD 1983. VERTICAL DATUM IS NAVD 1988.
5. DESIGN CONTOURS REPRESENT TOP OF SOIL LINER. CONTOUR INTERVAL IS 2-FEET. BACKGROUND CONTOURS REPRESENT EXISTING GROUND, EXCEPT WITHIN THE CONSTRUCTED LANDFILL BOUNDARY, WHERE 10-FT CONTOURS REPRESENT TOP OF FINAL COVER.
6. CONDITIONS REPRESENT PHASE 12 (SEE III.A1.4).



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date	detailed
MARCH 2022	T. CAMMACK
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THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

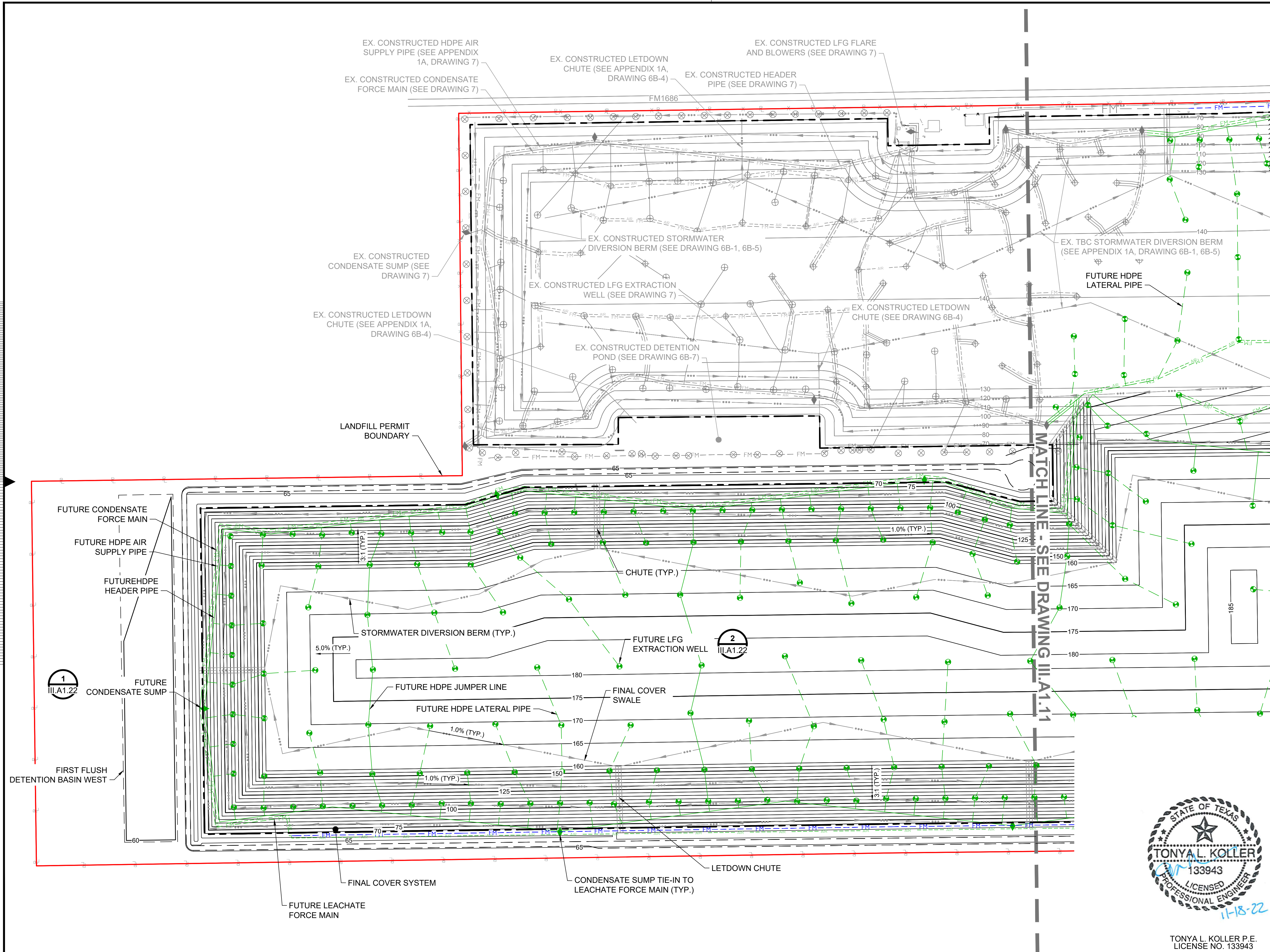
LARGEST OPEN AREA

project 107608 | contract -

drawing **III.A1.9** – rev. **2**

sheet 10 of 25 sheets

file 107608III.A1.9.dwg



no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. FUTURE GCCS COLLECTION PIPING, AIR LINES, AND FORCE MAIN TIE IN TO EXISTING FLARE SYSTEM. EXPANSION OF FLARE AND BLOWER CAPACITY TO BE EVALUATED THROUGHOUT LANDFILL LIFE.

NORTH

0 200' 400'
SCALE IN FEET

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FIRM REG. NO. F-845

date: MARCH 2022
detailed: T. CAMMACK
designed: T. SCHMIDT
checked: T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

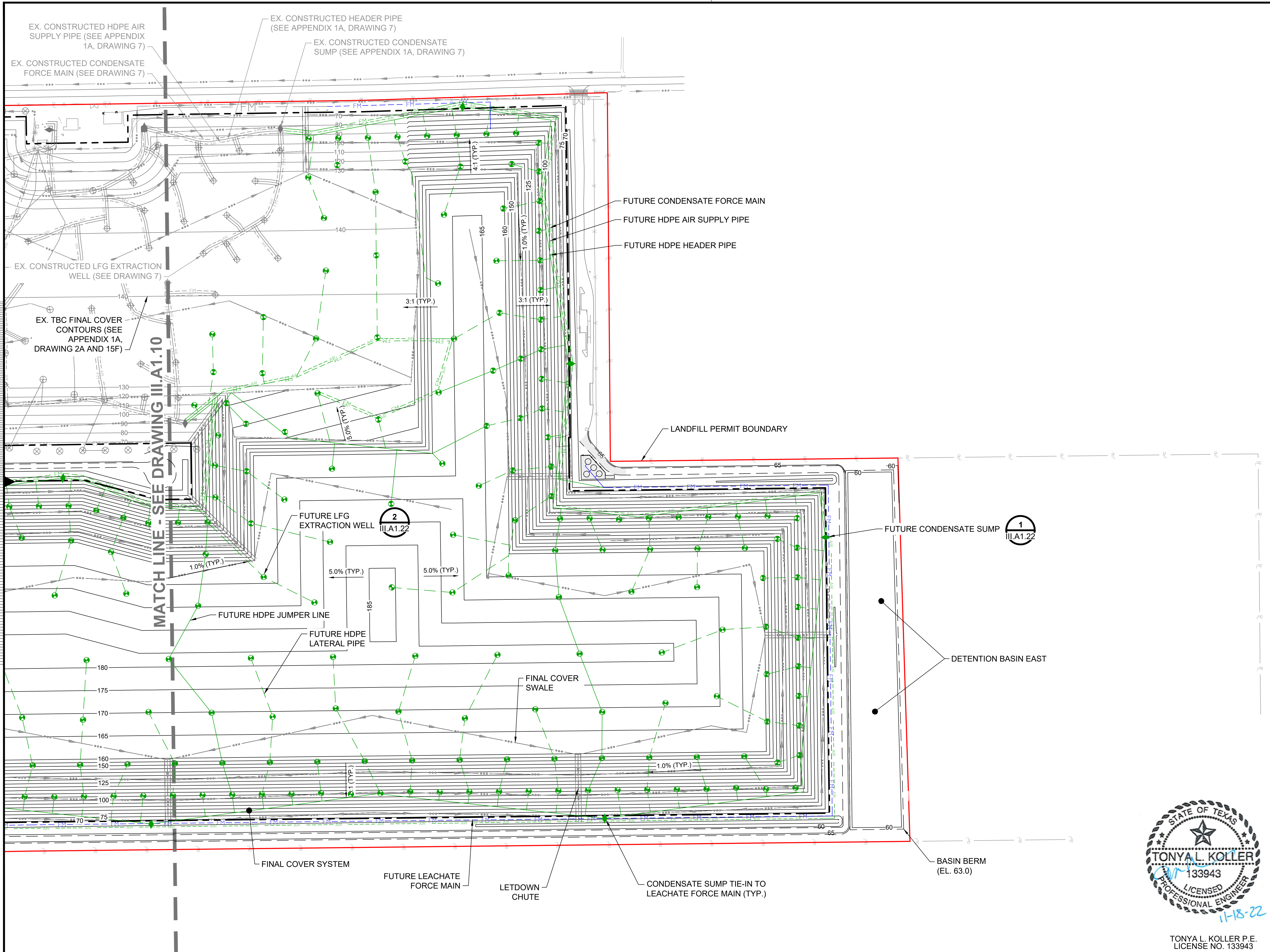
LFG COLLECTION SYSTEM PLAN - WEST

project: 107608
contract: -

drawing: **III.A1.10**
rev.: **2**

sheet 11 of 25 sheets

file 107608III.A1.10.dwg



STATE OF TEXAS
TONYA L. KOLLER
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TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
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1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. FUTURE GCCS COLLECTION PIPING, AIR LINES, AND FORCE MAIN TIE IN TO EXISTING FLARE SYSTEM. EXPANSION OF FLARE AND BLOWER CAPACITY TO BE EVALUATED THROUGHOUT LANDFILL LIFE.

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date: MARCH 2022	detailed: T. CAMMACK
designed: T. SCHMIDT	checked: T. KOLLER

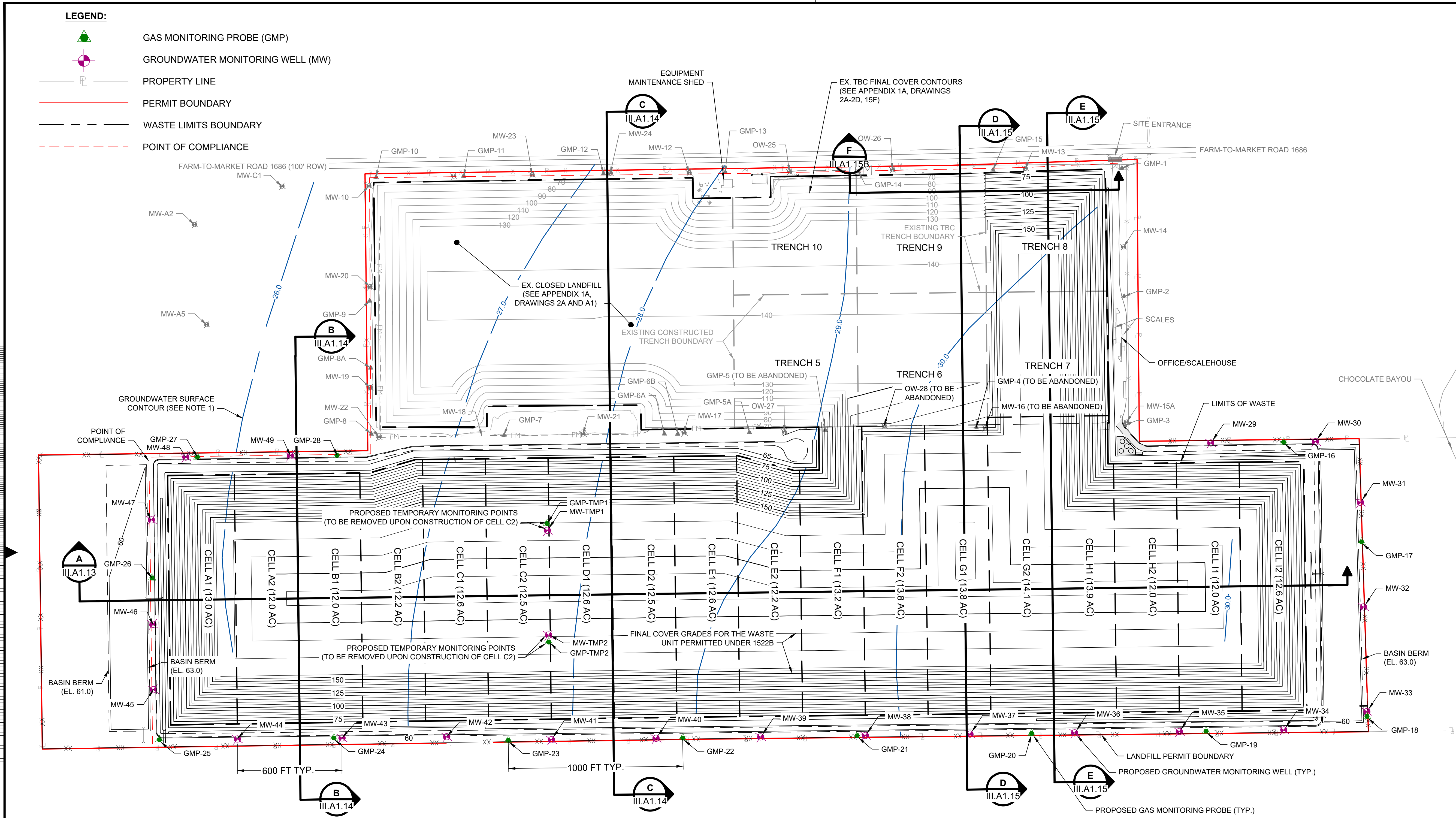
THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

LFG COLLECTION SYSTEM PLAN - EAST

project: 107608	contract: -
drawing: III.A1.11	rev.: 2
sheet 12 of 25 sheets	

file 107608III.A1.11.dwg



no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. GROUNDWATER CONTOUR LINES SHOWN WERE OBTAINED FROM THE SEPTEMBER 2021 GROUNDWATER ELEVATION MAP IN THE 2021 GEOLOGY REPORT, PREPARED BY BURNS & MCDONNELL ENGINEERING COMPANY INC.
2. PROPOSED POINT OF COMPLIANCE MONITORING WELLS FOR THE EXPANSION AREA INCLUDE MONITORING WELLS MW-17, MW-21, MW-37 THROUGH MW-41, MW-TMP-1, MW-TMP-2, AND OW-27 DURING OPERATION OF CELLS D1 THROUGH G2. UPON CONSTRUCTION OF CELLS A1 THROUGH C2, POINT OF COMPLIANCE MONITORING WELLS WILL ALSO INCLUDE MW-18, MW-22, AND MW-42 THROUGH MW-49. UPON CONSTRUCTION OF CELLS H1 THROUGH I2, MONITORING WELLS MW-15A, MW-29, MW-35, AND MW-36 WILL BE CONVERTED FROM UPGRADIENT MONITORING WELLS TO POINT OF COMPLIANCE MONITORING WELLS.
3. SAMPLE RESULTS FROM THE MARCH 2021 SEMIANNUAL MONITORING EVENT INDICATED ARSENIC EXCEEDED ITS GROUNDWATER PROTECTION STANDARD IN FOUR MONITORING WELLS (MW-18, MW-19, MW-20, AND MW-21). PREVIOUS FINDINGS INDICATE LANDFILL GAS, NOT A RELEASE OF LEACHATE, IS THE CAUSE OF ARSENIC CONCENTRATIONS REPORTED FOR THE CITY OF VICTORIA LANDFILL.

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-16	EXISTING	CELL G2
GMP-4	EXISTING	CELL G2
OW-28	EXISTING	CELL F2
GMP-5	EXISTING	CELL F1
MW-29	CELL G2	N/A
MW-30	CELL G2	N/A
MW-31	CELL G2	N/A
MW-32	CELL G2	N/A
MW-33	CELL G2	N/A
MW-34	CELL G2	N/A
MW-35	CELL G2	N/A
MW-36	CELL G2	N/A
MW-37	CELL G2	N/A
MW-38	CELL G2	N/A

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-39	CELL G2	N/A
MW-40	CELL G2	N/A
MW-41	CELL G2	N/A
GMP-16	CELL G2	N/A
GMP-17	CELL G2	N/A
GMP-18	CELL G2	N/A
GMP-19	CELL G2	N/A
GMP-20	CELL G2	N/A
GMP-21	CELL G2	N/A
GMP-22	CELL G2	N/A
GMP-TMP1	CELL G2	CELL D1
GMP-TMP2	CELL G2	CELL D1
MW-TMP1	CELL G2	CELL D1
MW-TMP2	CELL G2	CELL D1

INSTALLATION/ABANDONMENT TABLE

WELL/PROBE ID	INSTALL DURING CONSTRUCTION OF	ABANDON DURING CONSTRUCTION OF
MW-42	CELL D1	N/A
MW-43	CELL D1	N/A
MW-44	CELL D1	N/A
MW-45	CELL D1	N/A
MW-46	CELL D1	N/A
MW-47	CELL D1	N/A
MW-48	CELL D1	N/A
MW-49	CELL D1	N/A
GMP-23	CELL D1	N/A
GMP-24	CELL D1	N/A
GMP-25	CELL D1	N/A
GMP-26	CELL D1	N/A
GMP-27	CELL D1	N/A
GMP-28	CELL D1	N/A

STATE OF TEXAS
AMANDA K. BREITLING
GEOLOGY
11071
LICENSED
PROFESSIONAL GEOSCIENTIST
11/18/22

AMANDA BREITLING P.G.
LICENSE NO. 11071

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TONYA L. KOLLER
133943
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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT
FINAL ENVIRONMENTAL MONITORING PLAN

project 107608 | contract -
drawing III.A1.12 — rev. 2
sheet 13 of 25 sheets
file 107608III.A1.12.dwg

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
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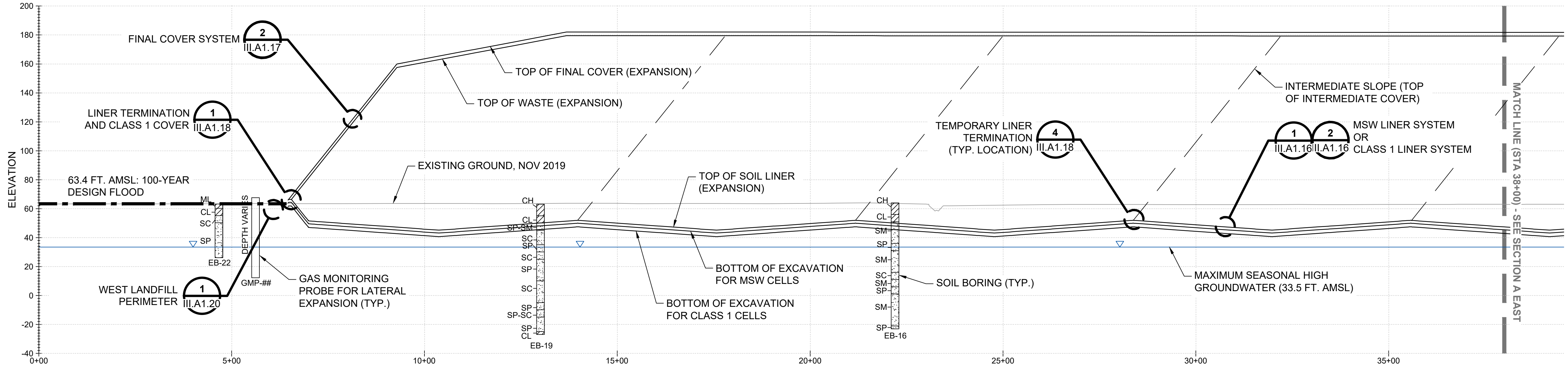
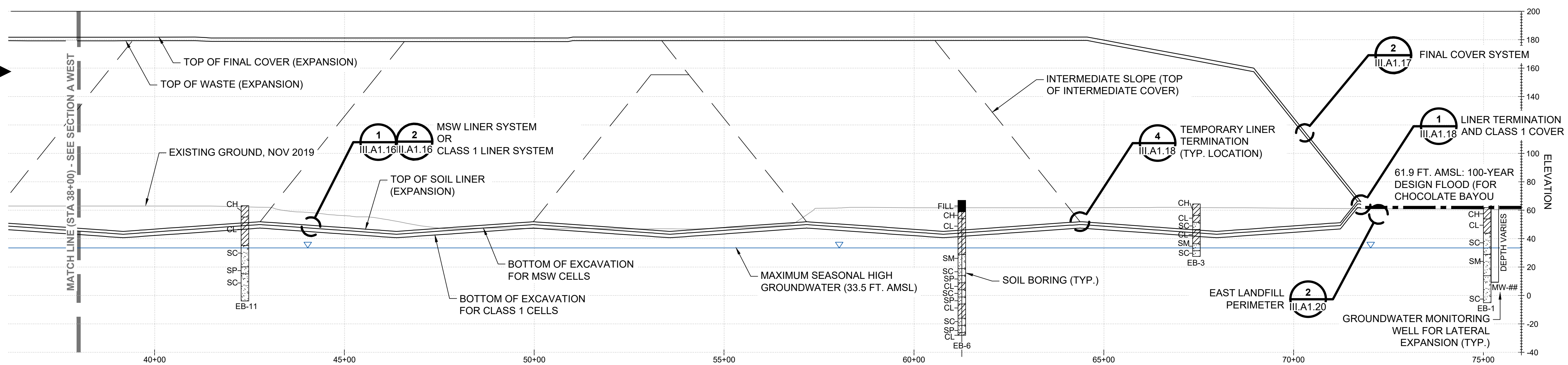


SECTION (WEST) A III.A1.5 III.A1.6, III.A1.7, III.A1.8, III.A1.12

0 150' 300' HORIZONTAL SCALE IN FEET

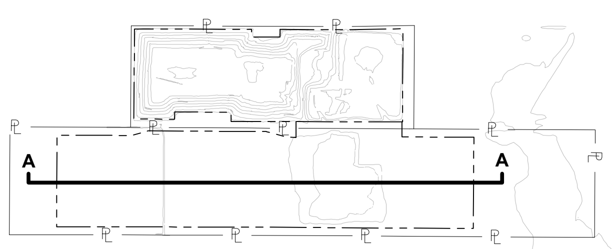
0 20' 40' 80' VERTICAL SCALE IN FEET



SECTION (EAST) A III.A1.5 III.A1.6, III.A1.7, III.A1.8, III.A1.12

0 150' 300' HORIZONTAL SCALE IN FEET

0 20' 40' 80' VERTICAL SCALE IN FEET



KEY MAP
(SCALE 1" = 1500')

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
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FIRM REG. NO. F-845

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designed: T. SCHMIDT
checked: T. KOLLER

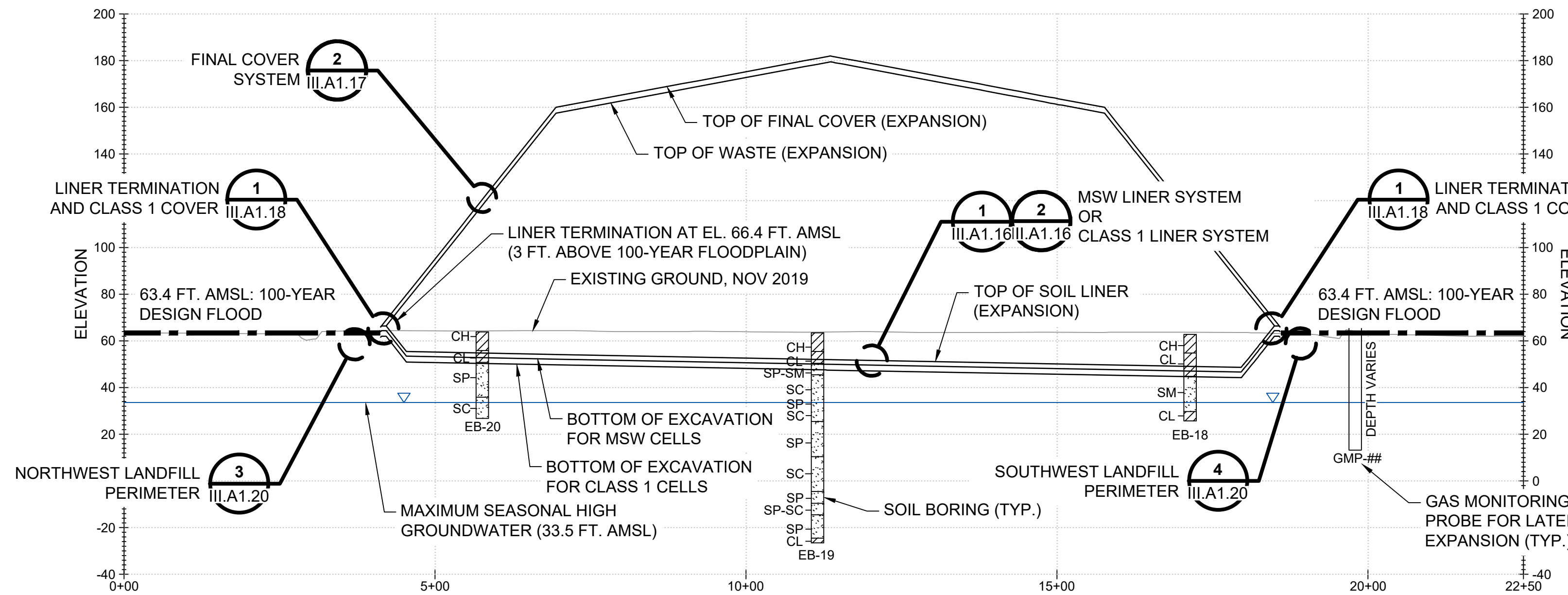
THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

CROSS SECTIONS - 1

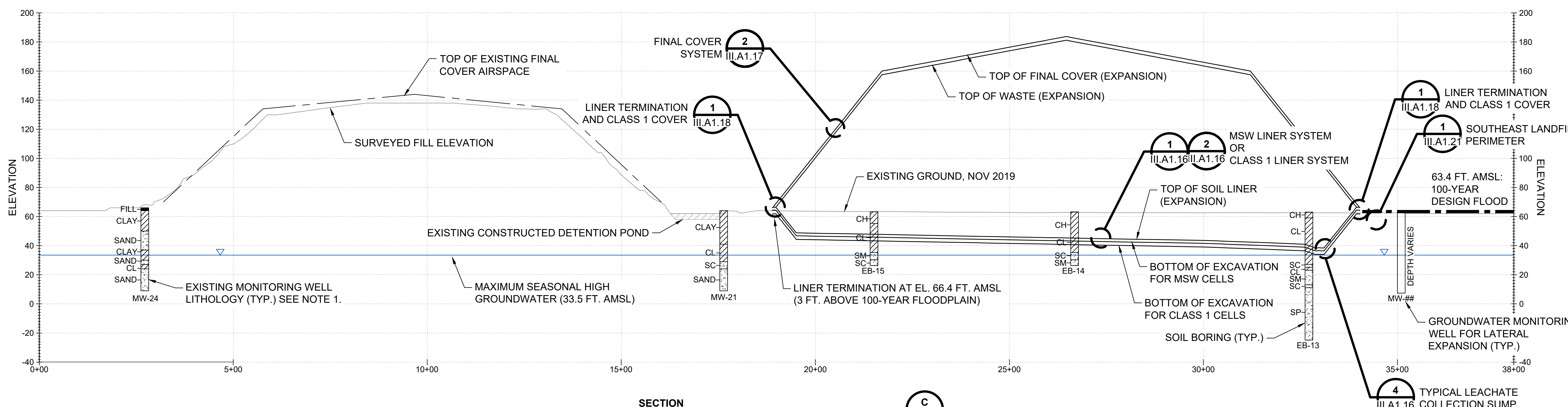
project: 107608
contract: -
drawing: **III.A1.13**
rev.: **2**
sheet 14 of 25 sheets
file 107608III.A1.13.dwg



SECTION B III.A1.5 — III.A1.7, III.A1.12

0 150' 300' HORIZONTAL SCALE IN FEET

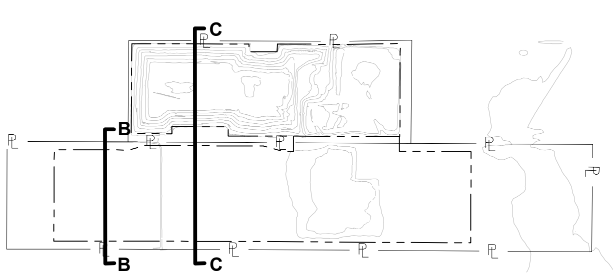
0 20' 40' 80' VERTICAL SCALE IN FEET



SECTION C III.A1.5 — III.A1.7, III.A1.12

0 150' 300' HORIZONTAL SCALE IN FEET

0 20' 40' 80' VERTICAL SCALE IN FEET



KEY MAP
(SCALE 1" = 1500')

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. MW-21 AND MW-24 LITHOLOGY OBTAINED FROM STATE OF TEXAS WELL REPORTS.

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FIRM REG. NO. F-845

date MARCH 2022 | detailed T. CAMMACK
designed T. SCHMIDT | checked T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

CROSS SECTIONS - 2

project 107608 | contract -

drawing III.A1.14 – rev. 2

sheet 15 of 25 sheets

file 107608III.A1.14.dwg

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11-18-22

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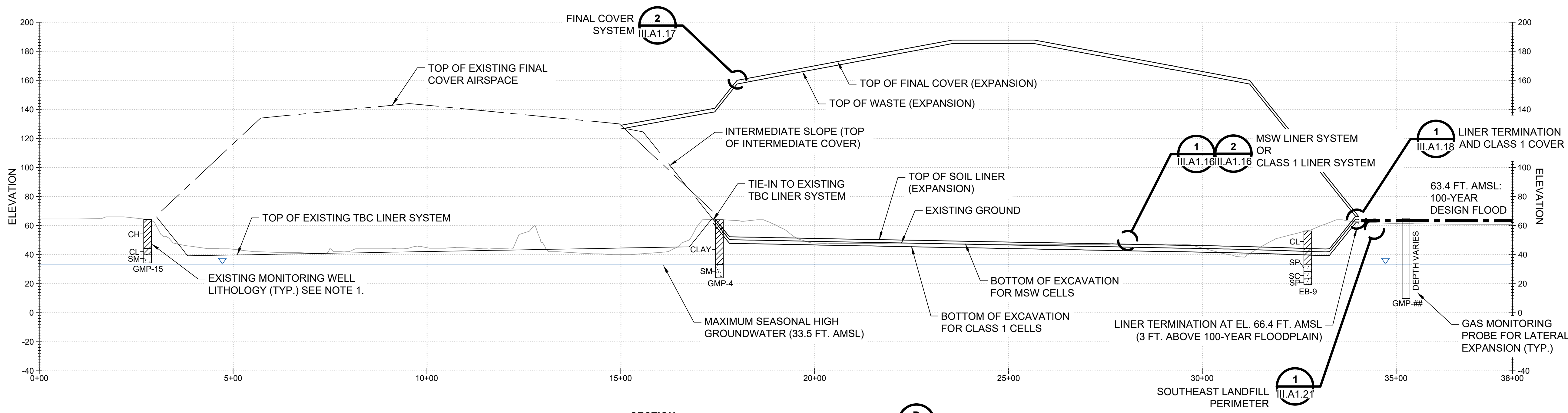
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

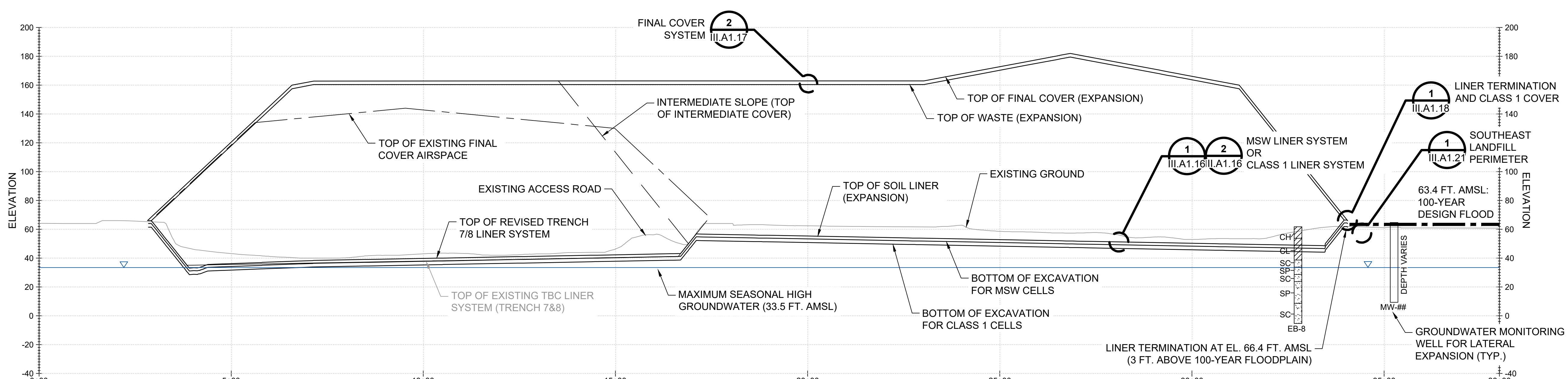
NOTES:

1. GMP-4 AND GMP-15 LITHOLOGY OBTAINED FROM BORING LOGS PREPARED BY MORRIS-KNUDSEN.



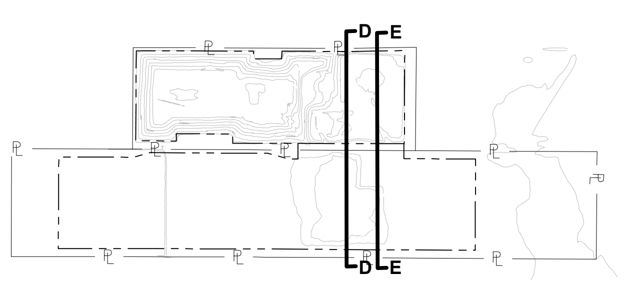
SECTION D III.A1.6 — III.A1.8, III.A1.12

HORIZONTAL SCALE IN FEET 0 150' 300' — VERTICAL SCALE IN FEET 0 20' 40' 80'



SECTION E III.A1.6 — III.A1.8, III.A1.12

HORIZONTAL SCALE IN FEET 0 150' 300' — VERTICAL SCALE IN FEET 0 20' 40' 80'



KEY MAP
(SCALE 1" = 1500')

STATE OF TEXAS — TONYA L. KOLLER — 133943 — LICENSED PROFESSIONAL ENGINEER — 11-18-22

TONYA L. KOLLER P.E.
LICENSE NO. 133943

PRELIMINARY - NOT FOR CONSTRUCTION

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

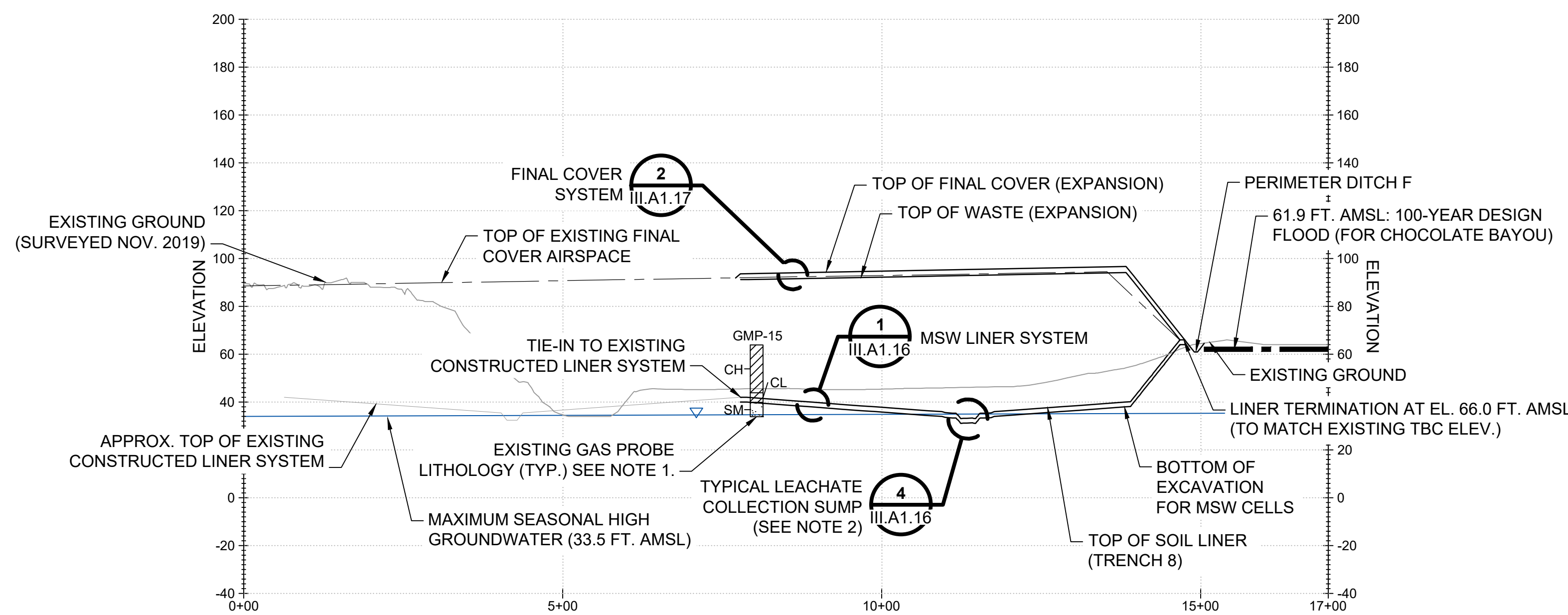
CROSS SECTIONS - 3

project 107608 — contract -
drawing **III.A1.15** — rev. **2**
sheet 16 of 25 sheets
file 107608III.A1.15.dwg

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. GMP-15 LITHOLOGY OBTAINED FROM BORING LOGS PREPARED BY MORRIS-KNUDSEN.
2. THE SEASONAL HIGH GROUNDWATER ELEVATION IS HIGHER THAN THE DESIGN LINER SYSTEM WITHIN THE TRENCH 8 SUMP. SECTION 4.6 OF THE PART III LANDFILL PERMIT AMENDMENT SITE DEVELOPMENT PLAN - TCEQ MSW PERMIT NO. 1522B, PREPARED BY BMcD, DISCUSSES THE INTERFACE BETWEEN THE SUMP AND GROUNDWATER.

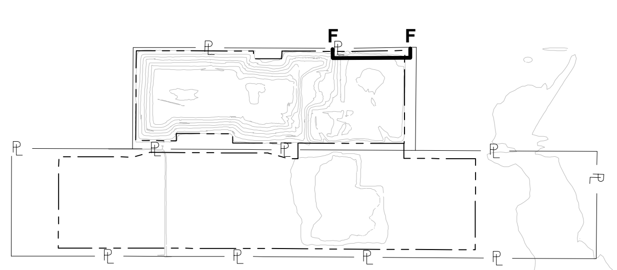


SECTION

F
III.A1.6
III.A1.8, III.A1.12

0 150' 300'
HORIZONTAL SCALE IN FEET

0 20' 40' 80'
VERTICAL SCALE IN FEET



KEY MAP
(SCALE 1" = 1500')

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
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THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

CROSS SECTIONS - 4

project	contract
107608	-

drawing III.A1.15B rev. 2

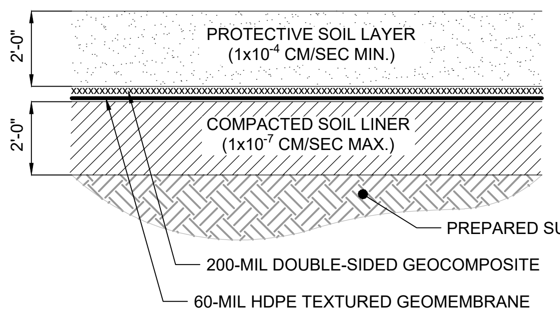
sheet 17 of 23 sheets

file 107608III.A1.15B.dwg

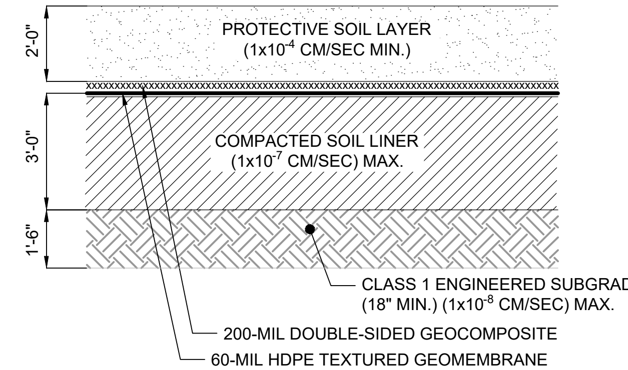
no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTE:

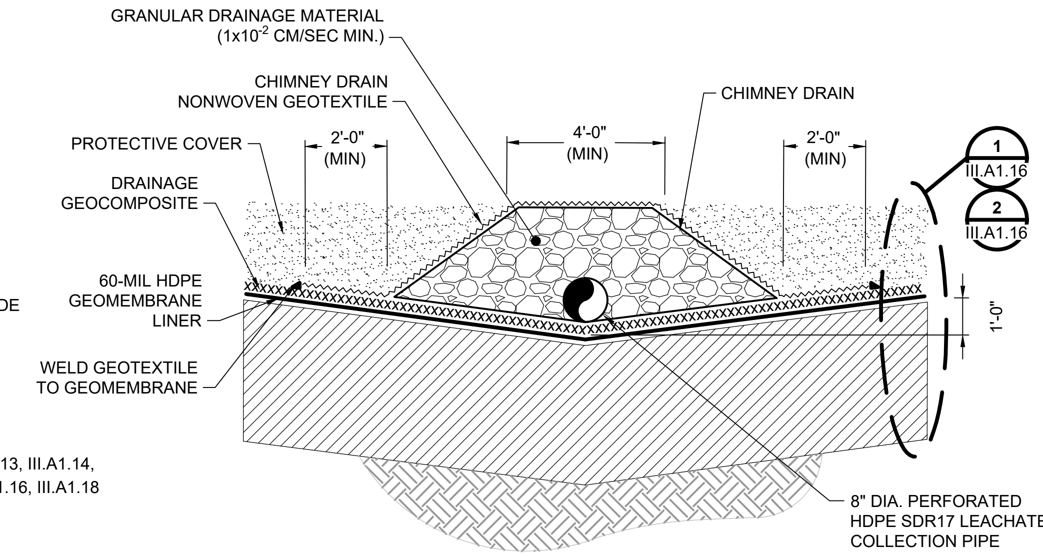
1. CHIMNEY DRAINS (AREAS OF HIGHER HYDRAULIC CONDUCTIVITY) WILL BE EMPLOYED AT A MAXIMUM SPACING OF EVERY 200-FT IF PROTECTIVE COVER PERMEABILITY IS LESS THAN $1x10^{-4}$ CM/SEC (SEE DETAIL 6).



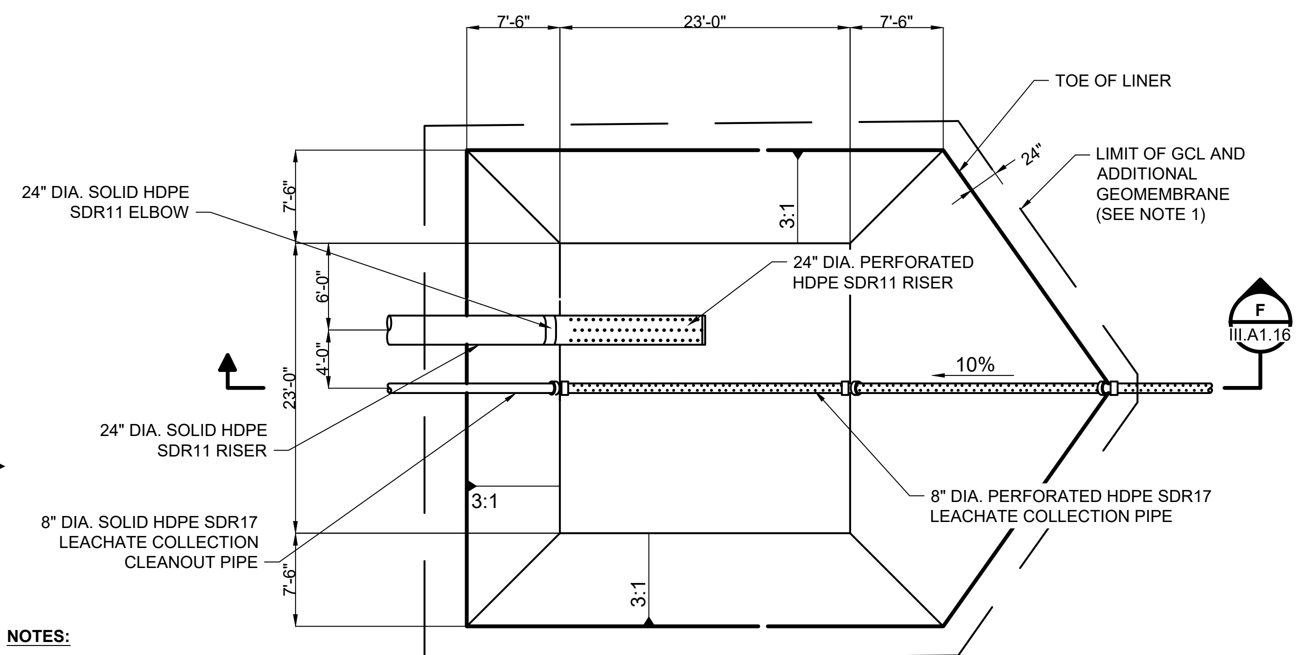
MSW LINER SYSTEM 1 / III.A1.5
NOT TO SCALE
III.A1.6, III.A1.13, III.A1.14, III.A1.15B, III.A1.16, III.A1.18



CLASS 1 LINER SYSTEM 2 / III.A1.5
NOT TO SCALE
III.A1.6, III.A1.13, III.A1.14, III.A1.15, III.A1.16, III.A1.18



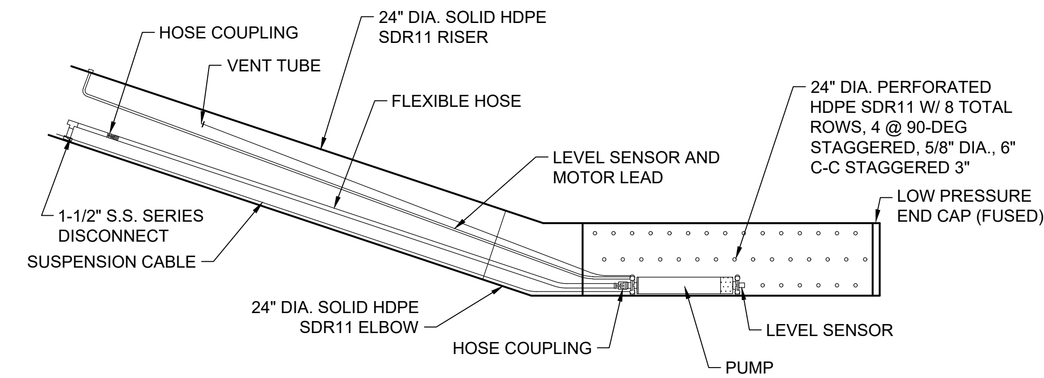
LEACHATE COLLECTION PIPE 3 / III.A1.5
NOT TO SCALE
III.A1.6, III.A1.18



NOTES:

1. GCL SHALL HAVE 6 NEEDLE-PUNCHED NON-WOVEN GEOTEXTILE FABRIC ON BOTH SIDES OR ENGINEER APPROVED EQUIVALENT.

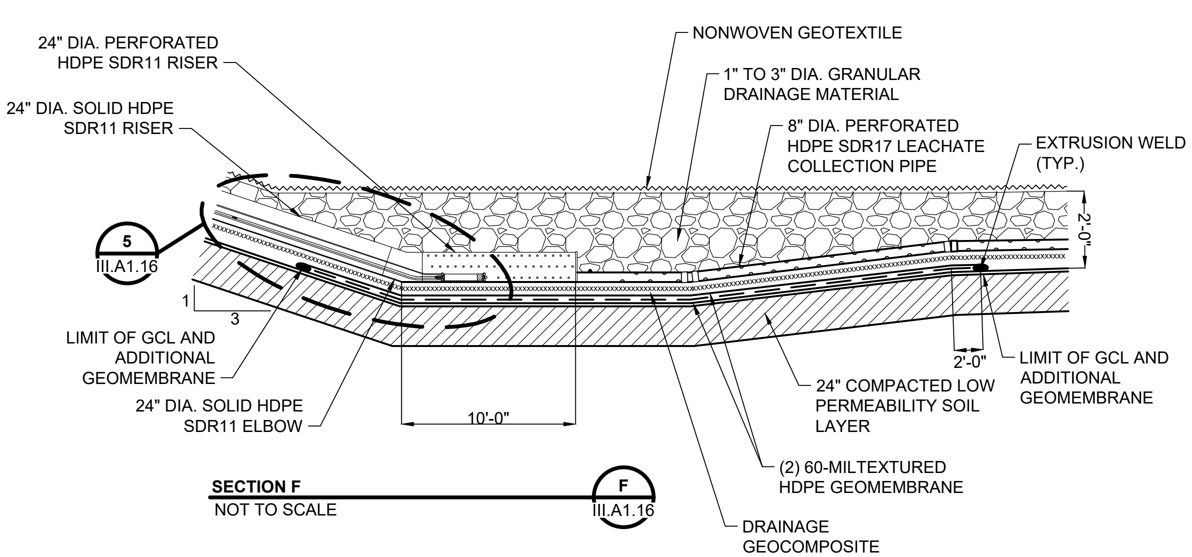
TYPICAL LEACHATE COLLECTION SUMP 4 / III.A1.5
NOT TO SCALE
III.A1.6, III.A1.14



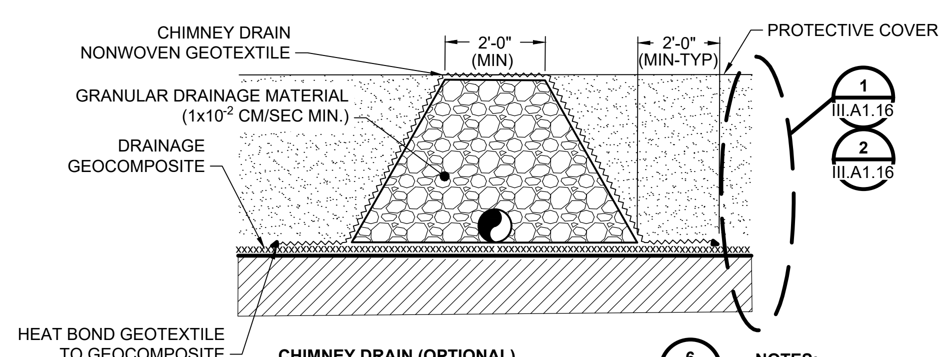
SUMP PUMP SCHEMATIC 5 / III.A1.16
NOT TO SCALE

ELEVATION TABLE: SOUTHERN EXPANSION AREA (CELLS A1 THROUGH I2)				
WASTE TYPE	EXCAVATION GRADE	TOP OF ENGINEERED SUBGRADE (CLASS 1 ONLY)	TOP OF COMPACTED SOIL LINER	TOP OF PROTECTIVE COVER/BASE OF WASTE PLACEMENT
MSW ONLY	36.5 FT AMSL	N/A	38.5 FT AMSL	43 FT AMSL
CLASS 1	34 FT AMSL	35.5 FT AMSL	38.5 FT AMSL	43 FT AMSL

ELEVATION TABLE: TRENCH 7/8			
WASTE TYPE	EXCAVATION GRADE	TOP OF COMPACTED SOIL LINER	TOP OF PROTECTIVE COVER/BASE OF WASTE PLACEMENT
MSW ONLY	31.1 FT AMSL	33.1 FT AMSL	37.6 FT AMSL



SECTION F F / III.A1.16
NOT TO SCALE



CHIMNEY DRAIN (OPTIONAL) 6 / III.A1.16
NOT TO SCALE

NOTES:

1. NOTE: CHIMNEY DRAINS SHALL BE PLACED AT 200-FT INTERVALS.

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designed	checked
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THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

DETAIL SHEET 1

project 107608 | contract -

drawing **III.A1.16** – rev. **2**

sheet 18 of 25 sheets

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no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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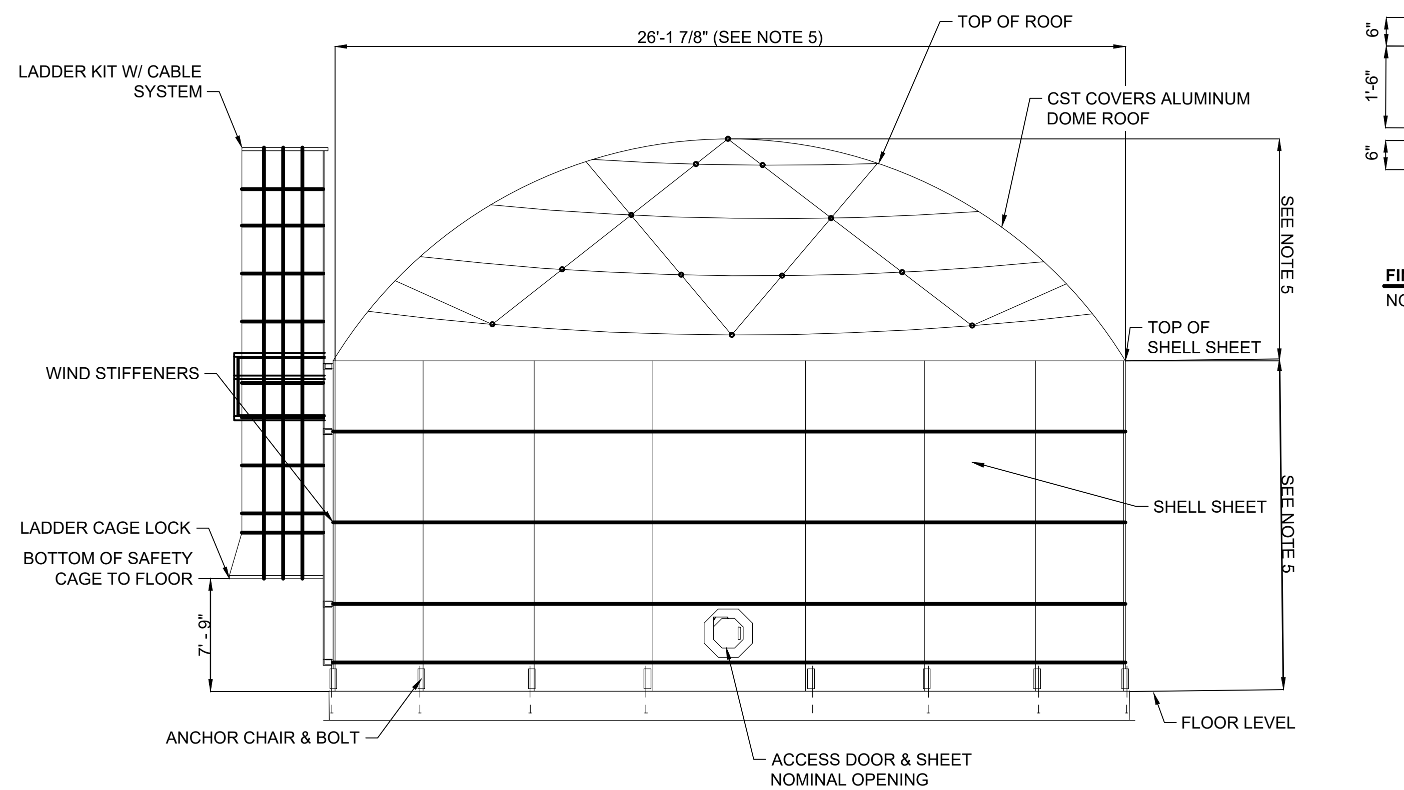
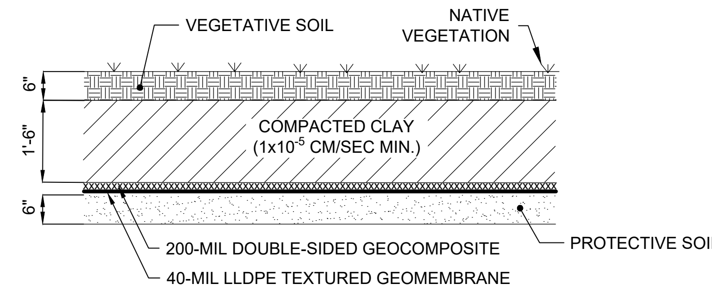


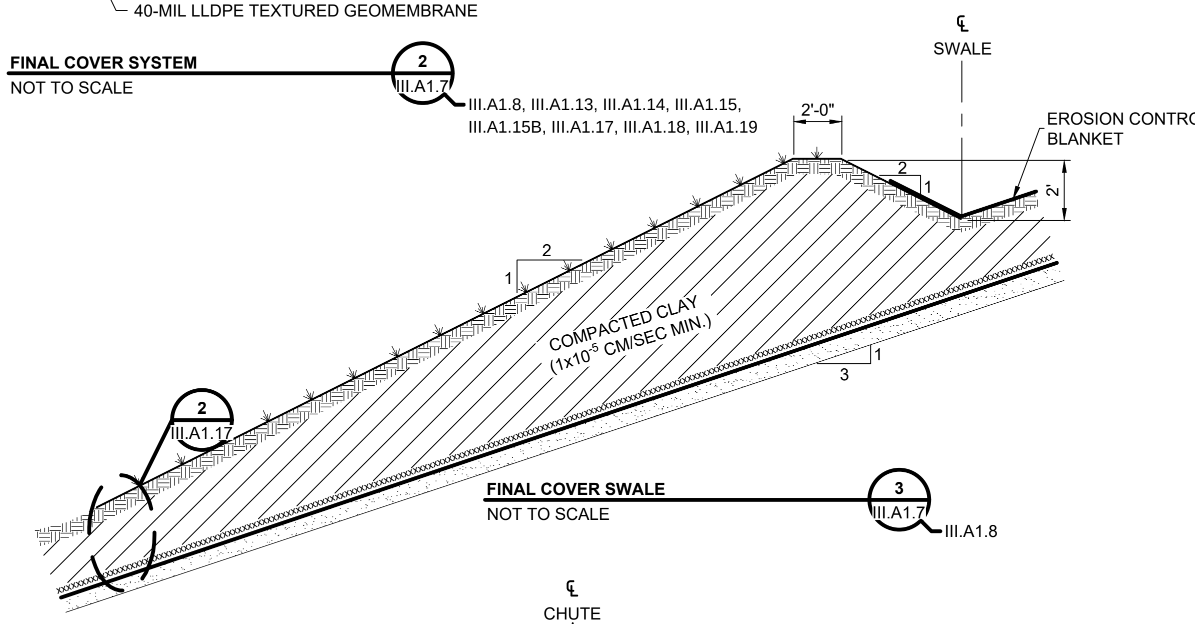
LEACHATE STORAGE TANK (1 / III.A1.6)
NOT TO SCALE

NOTES:

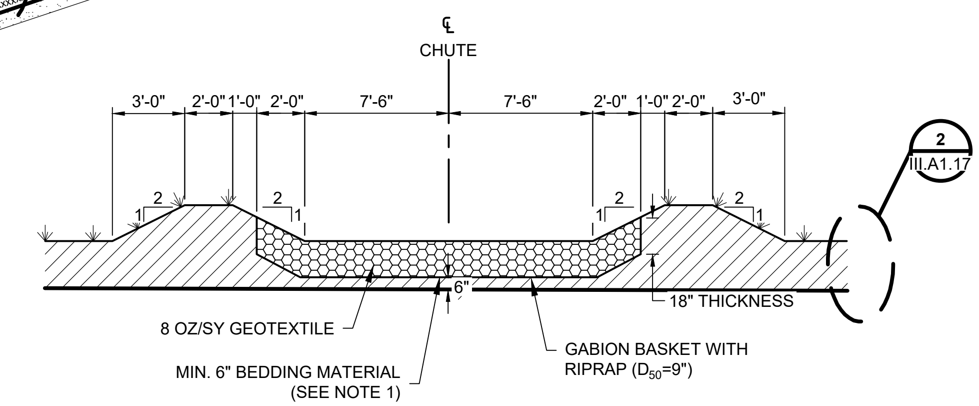
1. PANEL INTERIOR COATING IS WHITE GLASS 97 FUSED GLASS WITH EDGECOAT PROCESS.
2. PANEL EXTERIOR COATING IS FUSED GLASS.
3. FINAL DESIGN DIMENSIONS TO BE PROVIDED TO TCEQ AT DESIGN STAGES.
4. TANKS SHALL BE CAPABLE OF HOLDING 64,000 GALLONS OF LEACHATE.
5. TANK DIMENSIONS SHALL MATCH EXISTING CONSTRUCTED TANK DIMENSIONS, AS SHOWN IN DRAWING 15G-1B (OR EQUIVALENT).
6. THE SECONDARY CONTAINMENT FACILITIES ASSOCIATED WITH THE LEACHATE STORAGE TANKS THAT WILL BE INSTALLED WILL BE DESIGNED TO PREVENT RUN-ON FROM THE 100-YEAR, 24-HOUR STORM EVENT.
7. LEACHATE STORAGE TANK SECONDARY CONTAINMENT WILL BE MAINTAINED AND OPERATED TO MANAGE STORMWATER FROM THE 25-YEAR, 24-HOUR STORM EVENT.



FINAL COVER SYSTEM (2 / III.A1.7)
NOT TO SCALE
III.A1.8, III.A1.13, III.A1.14, III.A1.15, III.A1.15B, III.A1.17, III.A1.18, III.A1.19



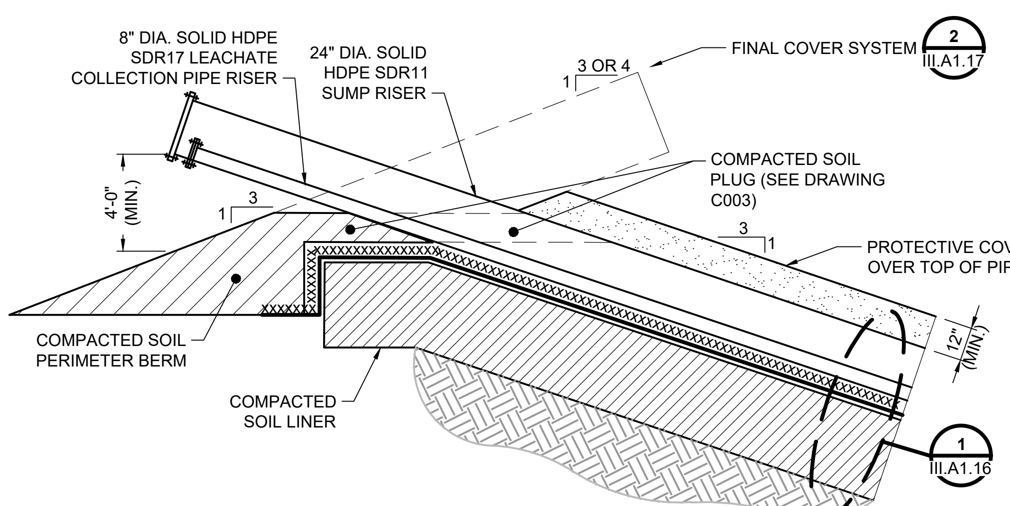
FINAL COVER SWALE (3 / III.A1.7)
NOT TO SCALE
III.A1.8



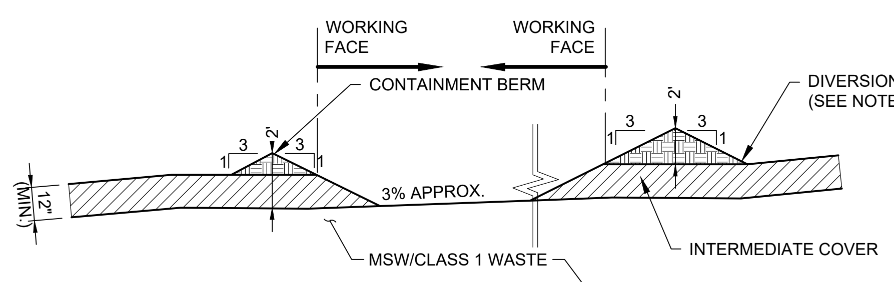
LETDOWN CHUTE (4 / III.A1.7)
NOT TO SCALE
III.A1.8

NOTES:

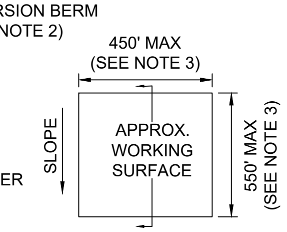
1. BEDDING MATERIAL WILL CONSIST OF CLAYEY SOILS OVERLAIN BY 8 OZ/SY GEOTEXTILE PRIOR TO PLACEMENT OF GABIONS.
2. CHANNEL ARMORING SHALL BE INCISED INTO FINAL COVER. TOP OF ARMORING SHALL MATCH FINAL GRADE ELEVATION AT ALL TERMINATION EDGES. EROSION CONTROL BLANKET IN TERRACE SHALL OVERLAP A MINIMUM OF 1 FOOT AT CONFLUENCE OF TERRACE AND ARMORING.
3. LINER ELEVATIONS SHALL BE LOWERED AS SHOWN TO ACCOUNT FOR 18" GABION BASKET AND BEDDING MATERIAL.
4. GABION KEYWAYS SHALL BE INSTALLED ALONG THE WIDTH OF THE CHUTE AT EVERY TERRACE INTERSECTION. DIMENSIONS SHALL BE 3' THICK X 3' DEEP. FINAL COVER GEOMEMBRANE ELEVATIONS SHALL BE LOWERED IN THESE LOCATIONS TO ACCOUNT FOR ADDITIONAL GABION DEPTH.



LEACHATE PIPE RISER AND CLEANOUT (5 / III.A1.5)
NOT TO SCALE
III.A1.6



WORKING FACE DIVERSION AND CONTAINMENT BERM (6 / III.A1.7)
NOT TO SCALE



DETAIL 6 KEY

NOTES:

1. WORKING FACE WILL RELOCATE IN CONJUNCTION WITH CURRENT WASTE FILLING PATTERNS.
2. DIVERSION BERM FLOWLINE SHALL BE 0.5% MINIMUM TO CONVEY UNCONTAMINATED WATER AROUND WORKING FACE.
3. MAXIMUM WORKING FACE DIMENSIONS ARE DEPENDENT UPON WASTE QUANTITY. SEE SITE OPERATING PLAN.

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FIRM REG. NO. F-845

date: MARCH 2022	detailed: T. CAMMACK
designed: T. SCHMIDT	checked: T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

DETAIL SHEET 2

project: 107608	contract: -
drawing: III.A1.17	rev.: 2
sheet 19 of 25 sheets	

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no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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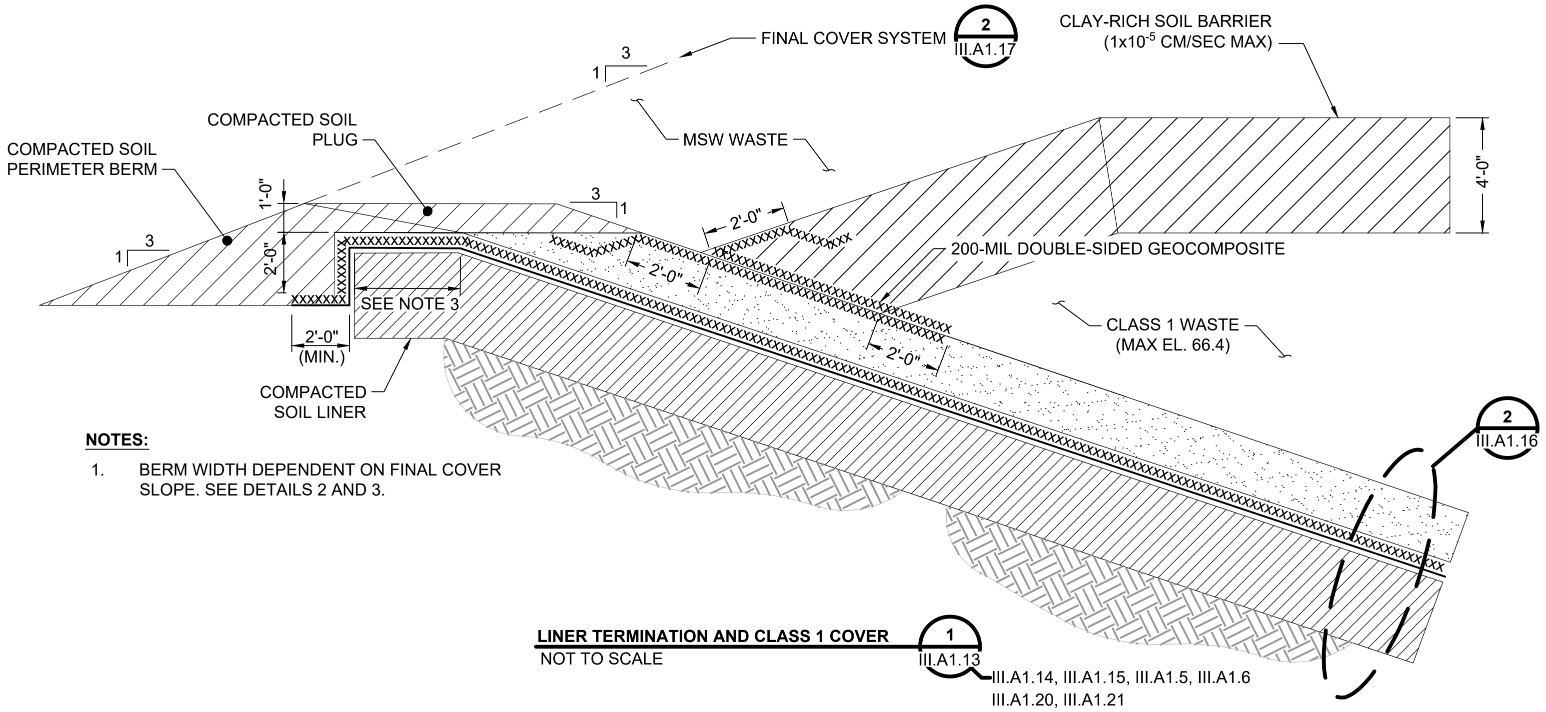
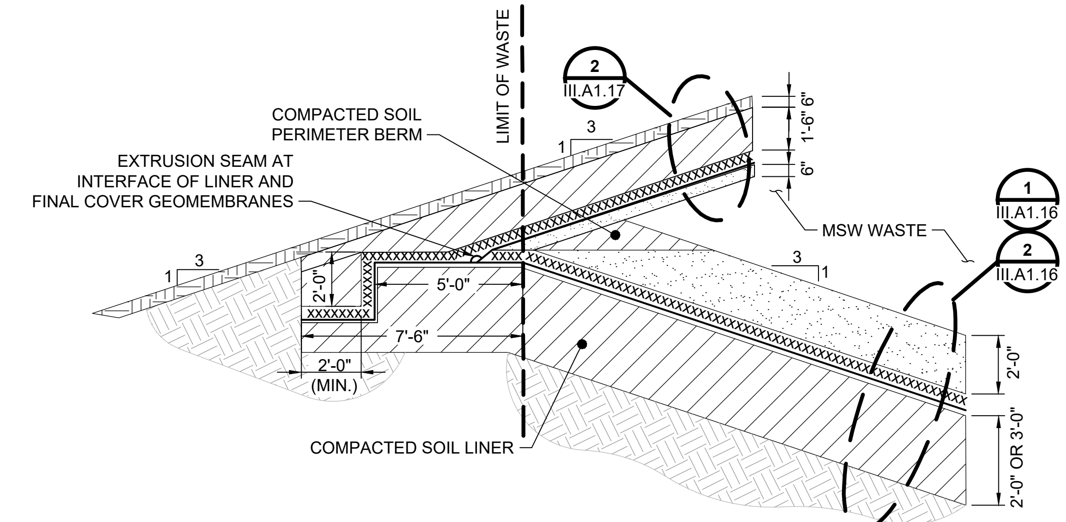


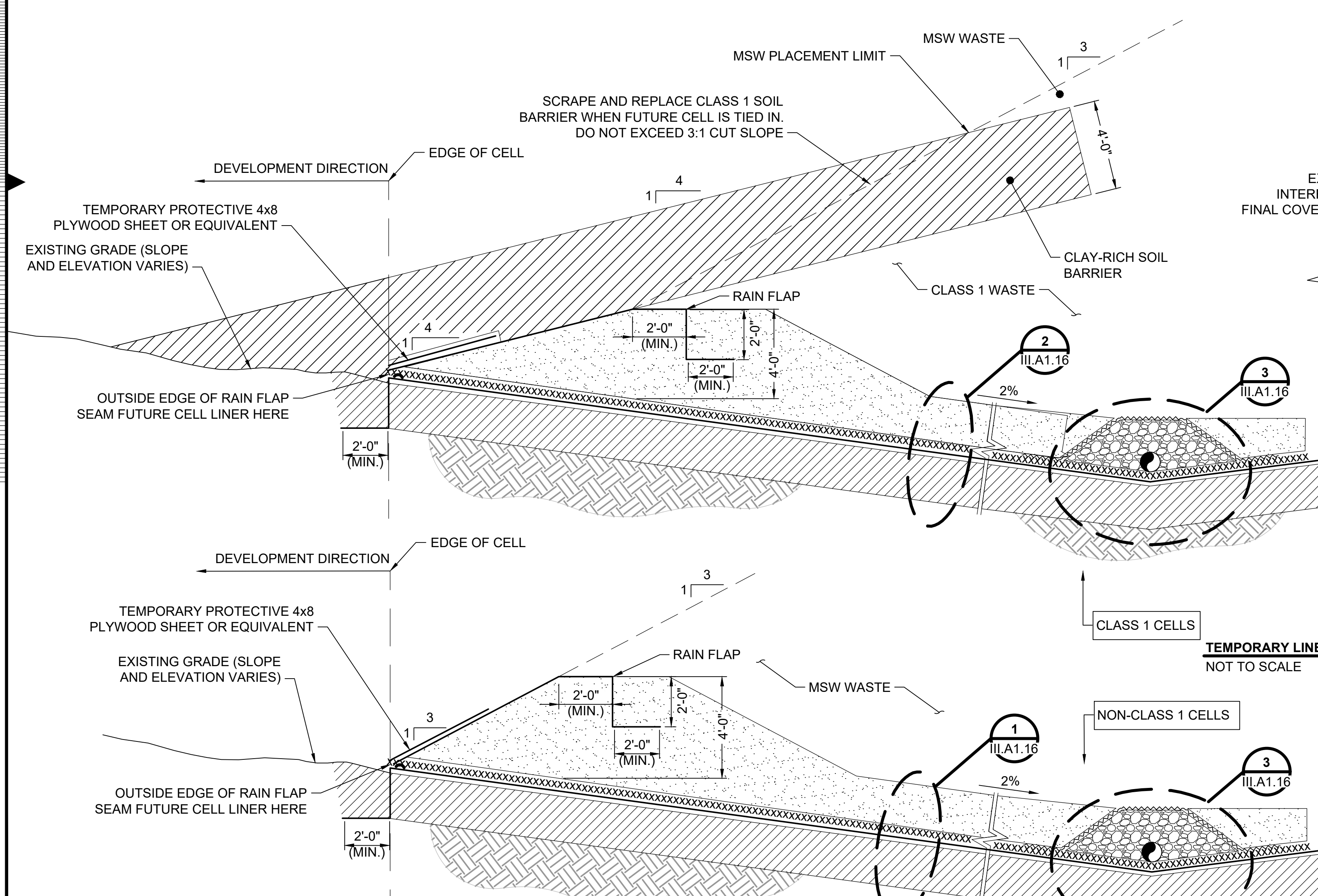
NOTES:

1. BERM WIDTH DEPENDENT ON FINAL COVER SLOPE. SEE DETAILS 2 AND 3.

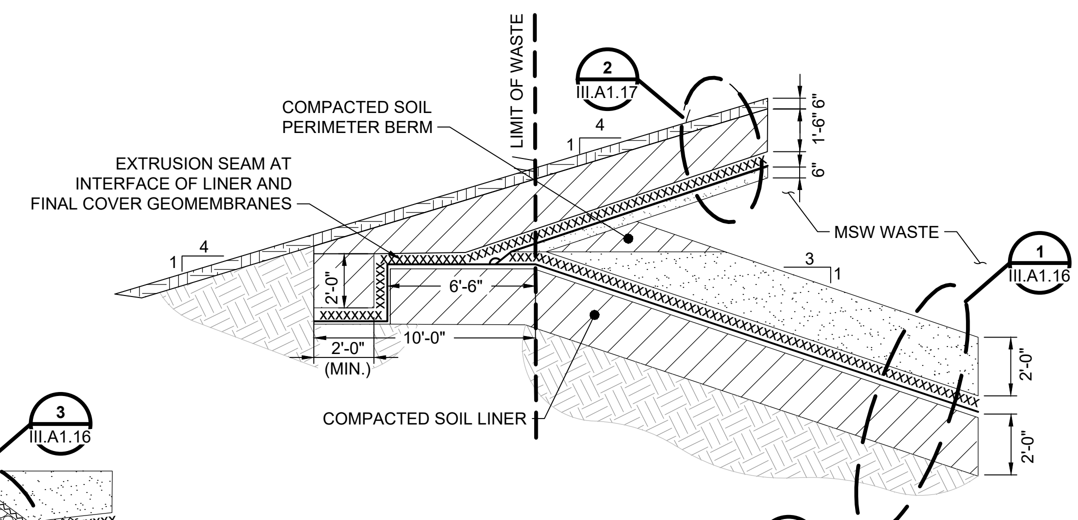
LINER TERMINATION AND CLASS 1 COVER 1 III.A1.13
NOT TO SCALE
III.A1.14, III.A1.15, III.A1.5, III.A1.6
III.A1.20, III.A1.21



FINAL COVER TERMINATION AT 3-TO-1 SLOPE 2 III.A1.13
NOT TO SCALE
III.A1.14, III.A1.15, III.A1.7, III.A1.8



TEMPORARY LINER TERMINATION 4 III.A1.13
NOT TO SCALE
III.A1.14, III.A1.15



FINAL COVER TERMINATION AT 4-TO-1 SLOPE 3 III.A1.13
NOT TO SCALE
III.A1.14, III.A1.15, III.A1.5, III.A1.6

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THE CITY OF VICTORIA TEXAS
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1522B PERMIT AMENDMENT

DETAIL SHEET 3

project 107608 | contract -

drawing **III.A1.18** rev. **2**

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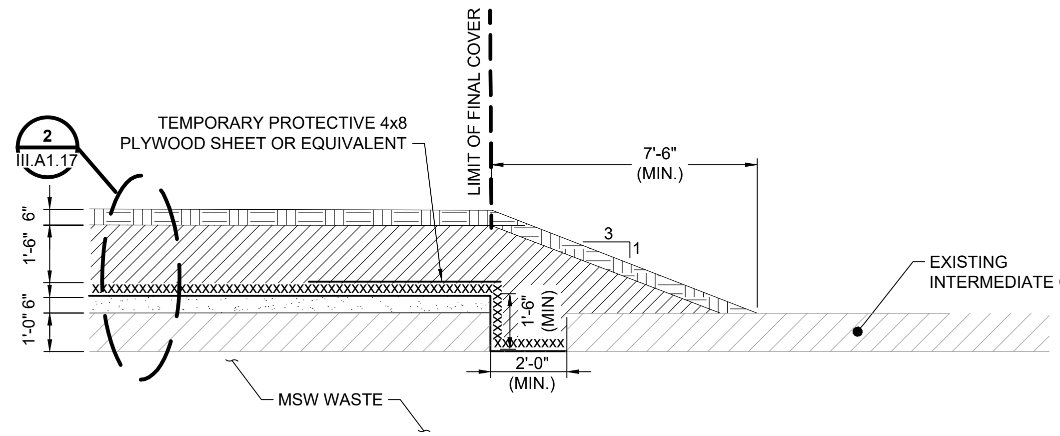
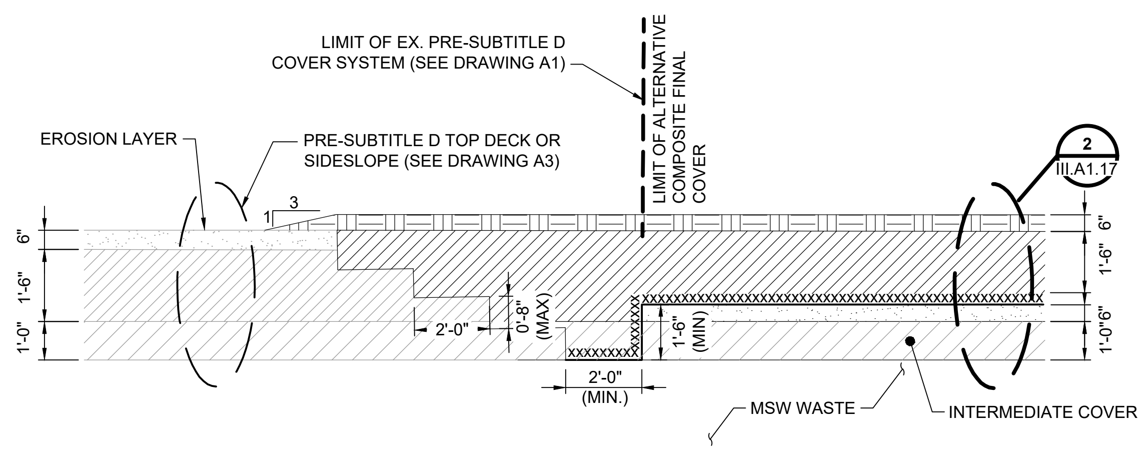
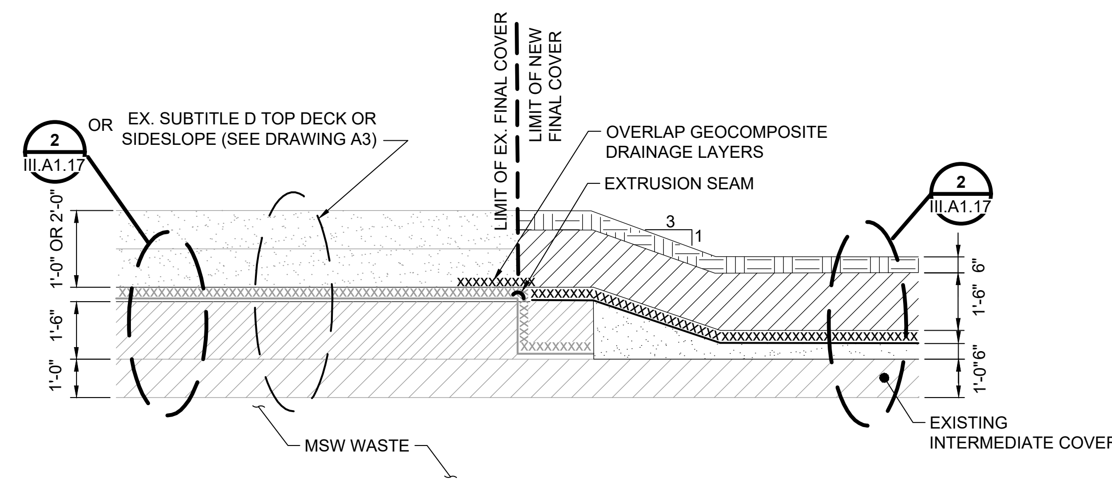


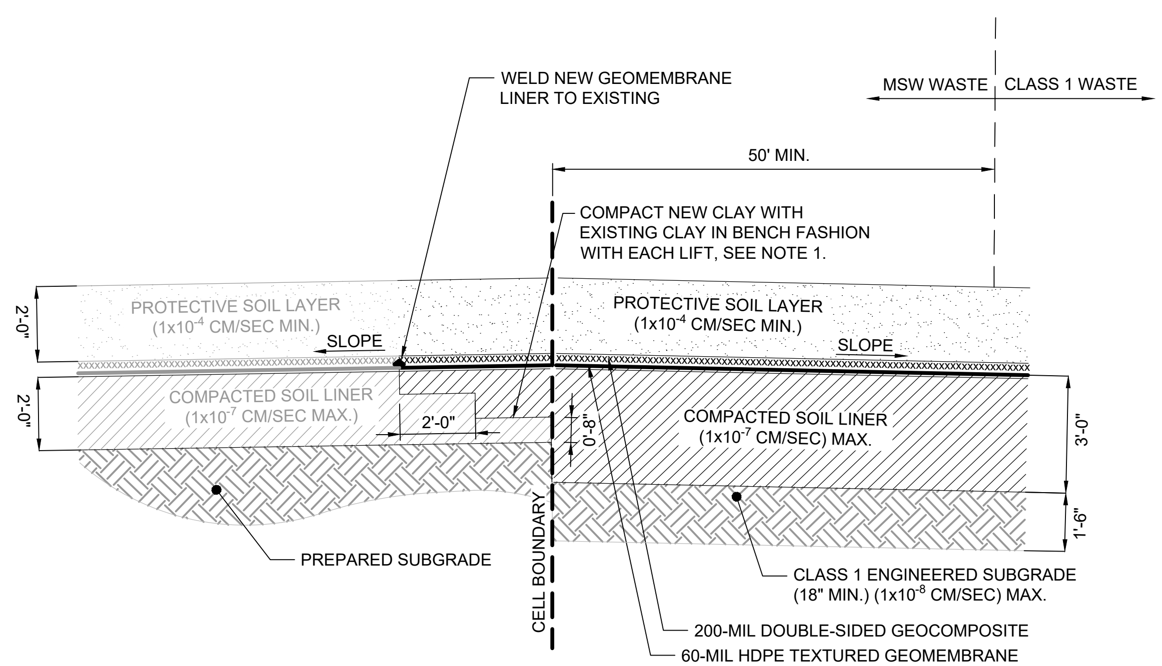
ALTERNATIVE COMPOSITE COVER TERMINATION FOR FUTURE TIE-IN
NOT TO SCALE
1 III.A1.13 III.A1.14, III.A1.15



ALT. COMPOSITE COVER TIE-IN TO PRE-SUBTITLE D COVER
NOT TO SCALE
2 III.A1.19



ALT. COMPOSITE COVER TIE-IN TO VARIOUS SUBTITLE D COVERS
NOT TO SCALE
3 III.A1.19



MSW LINER TIE-IN TO CLASS 1 LINER
NOT TO SCALE
4 III.A1.6

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
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NOTES:

1. EXISTING LOW PERMEABILITY MATERIAL SHALL BE STAIR-STEP CUT INTO TO FORM CONTINUOUS LOW PERMEABILITY MATERIAL LAYER FOR CELL CONSTRUCTION. EACH STEP IN EXISTING LOW PERMEABILITY MATERIAL SHALL HAVE THE SURFACE SCARIFIED TO PROVIDE MAXIMUM BONDING BETWEEN OLD AND NEW SECTIONS.

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THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

DETAIL SHEET 4

project: 107608	contract: -
drawing: III.A1.19	rev. 2
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STATE OF TEXAS
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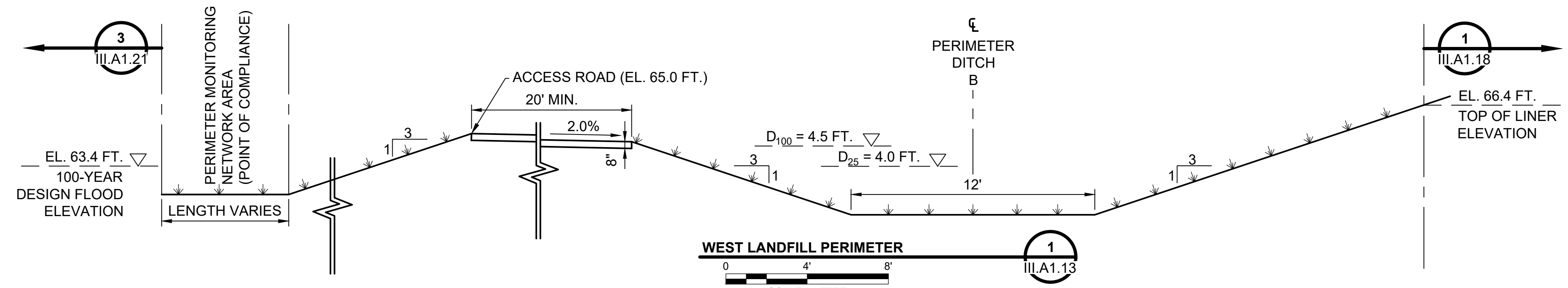
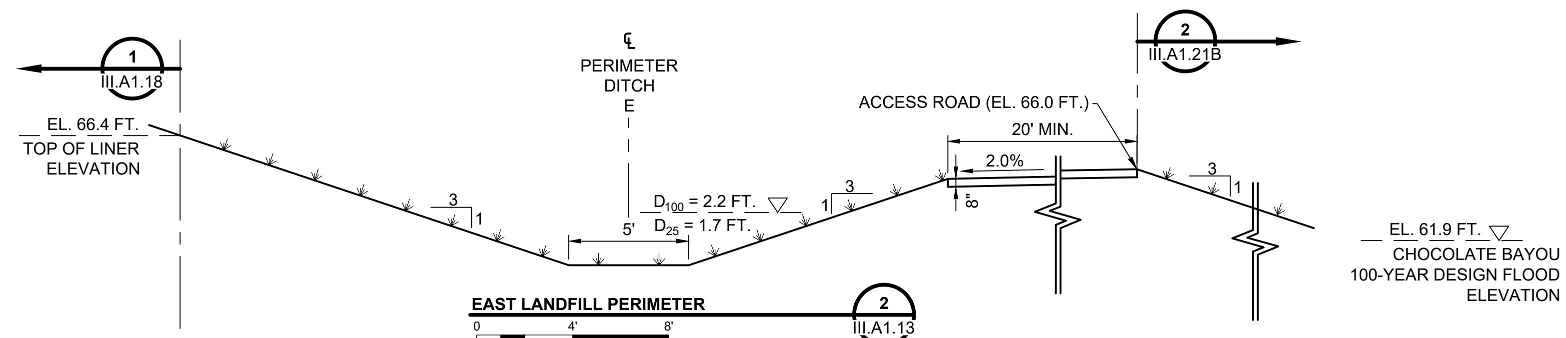


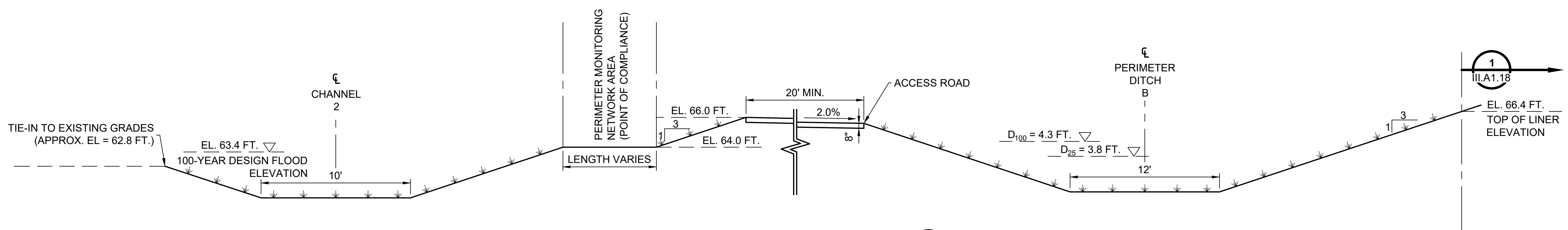
WEST LANDFILL PERIMETER (1, III.A1.13)

0 4' 8' SCALE IN FEET



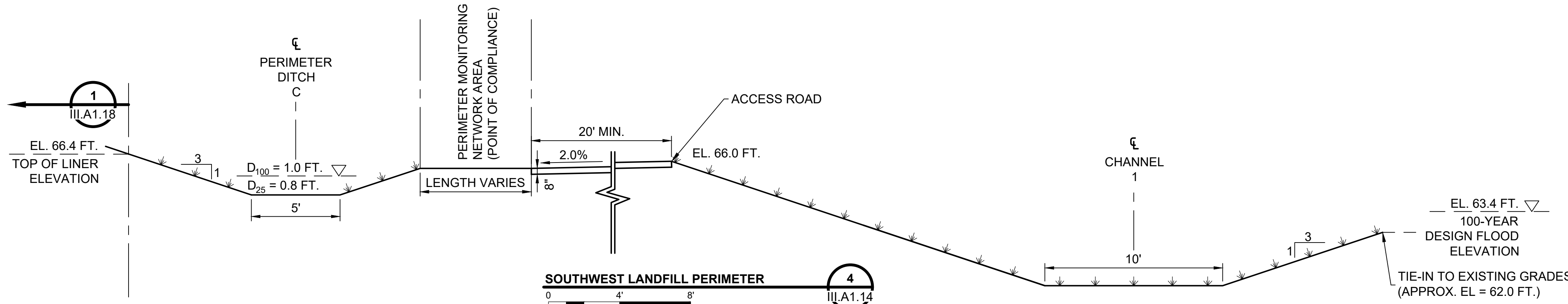
EAST LANDFILL PERIMETER (2, III.A1.13)

0 4' 8' SCALE IN FEET



NORTHWEST LANDFILL PERIMETER (3, III.A1.14)

0 4' 8' SCALE IN FEET



SOUTHWEST LANDFILL PERIMETER (4, III.A1.14)

0 4' 8' SCALE IN FEET

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0 4' 8' SCALE IN FEET

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1522B PERMIT AMENDMENT

DETAIL SHEET 5

project 107608 | contract -

drawing **III.A1.20** rev. **2**

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no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
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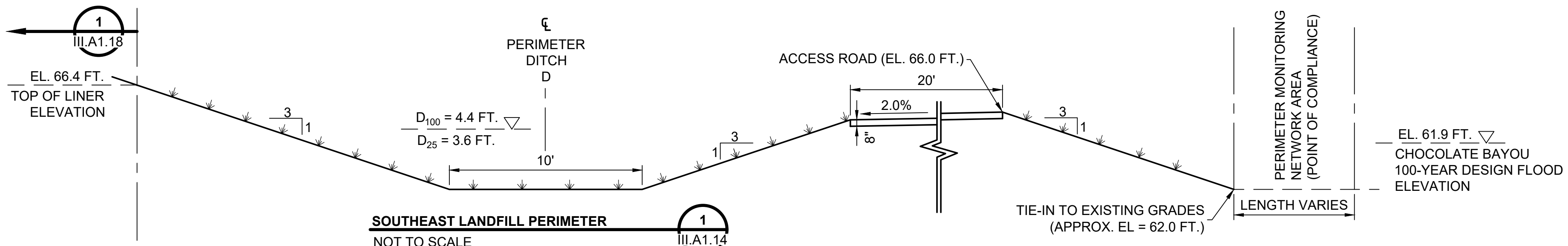
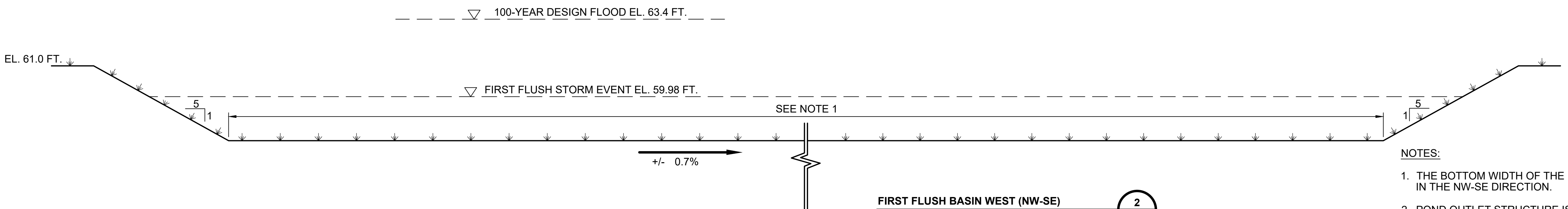


SOUTHEAST LANDFILL PERIMETER (1, III.A1.14, III.A1.15)

NOT TO SCALE

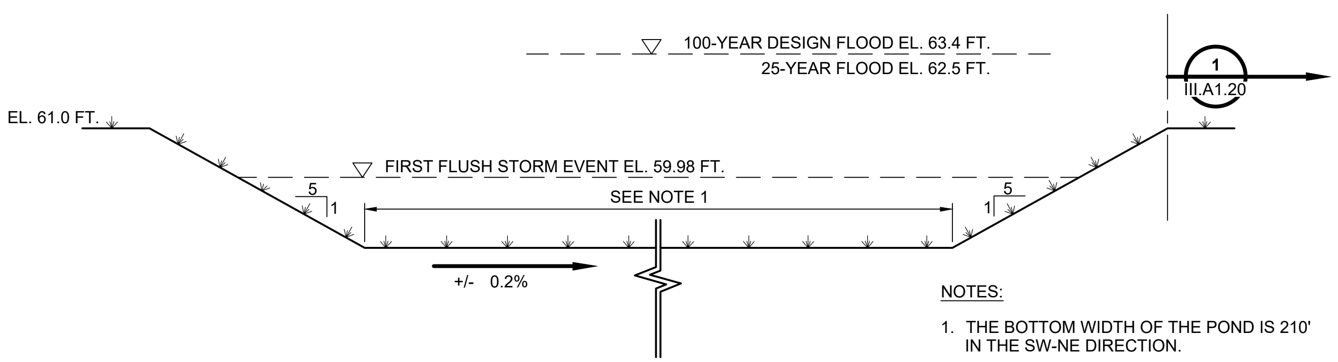


FIRST FLUSH BASIN WEST (NW-SE) (2, III.A1.7)

NOT TO SCALE

NOTES:

1. THE BOTTOM WIDTH OF THE POND IS 1500' IN THE NW-SE DIRECTION.
2. POND OUTLET STRUCTURE IS THREE 15-INCH (ID) CONCRETE PIPES WITH AN INVERT AT 59.0' AND AN 85' SPILLWAY AT ELEV. 60.0'.

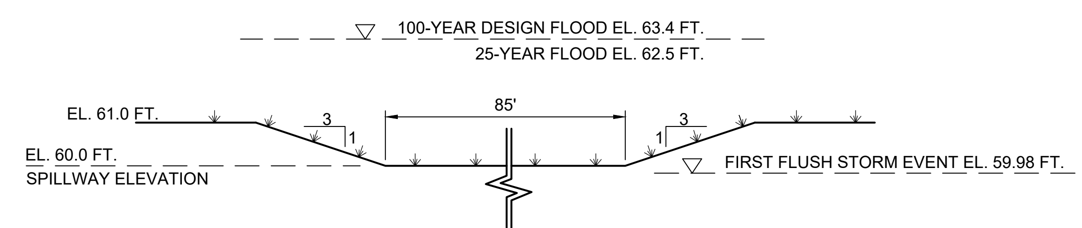


NOTES:

1. THE BOTTOM WIDTH OF THE POND IS 210' IN THE SW-NE DIRECTION.

FIRST FLUSH BASIN WEST (SW-NE) (3, III.A1.7, III.A1.20)

NOT TO SCALE



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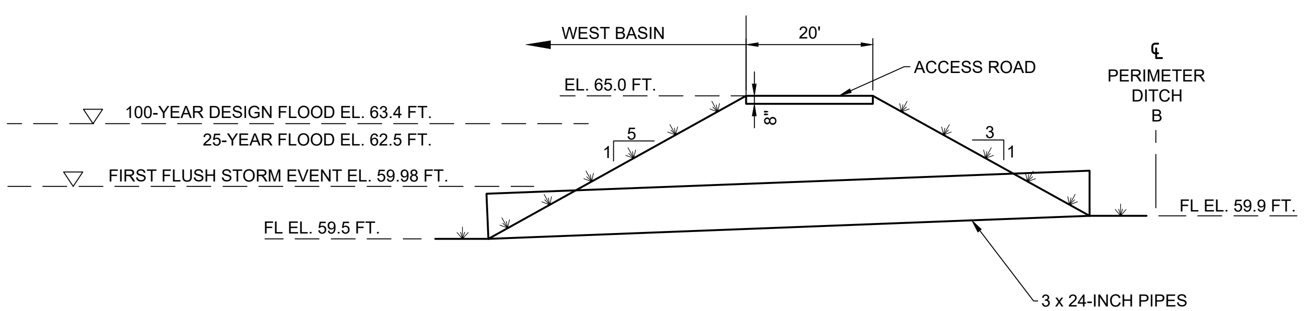

WEST BASIN INLET STRUCTURE (5, III.A1.7)

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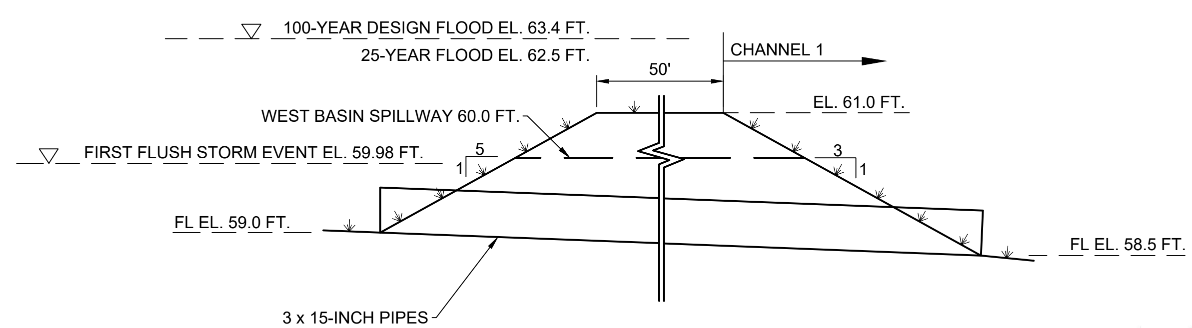

WEST BASIN OUTLET STRUCTURE (6, III.A1.7)

NOT TO SCALE

STATE OF TEXAS
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133943
LICENSED
PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
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KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

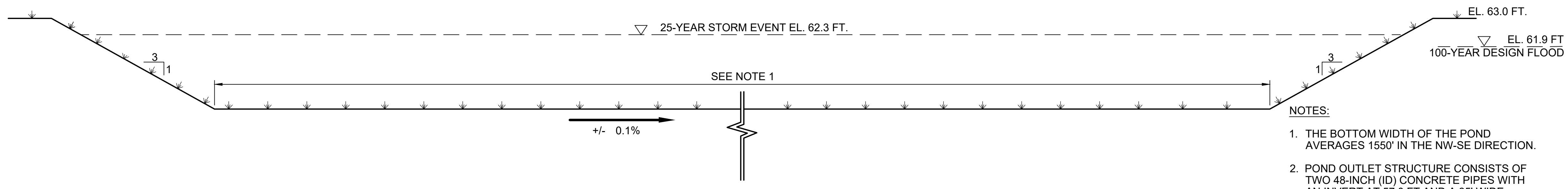
DETAIL SHEET 6

project	contract
107608	-

drawing III.A1.21 — rev. 2

sheet 23 of 25 sheets

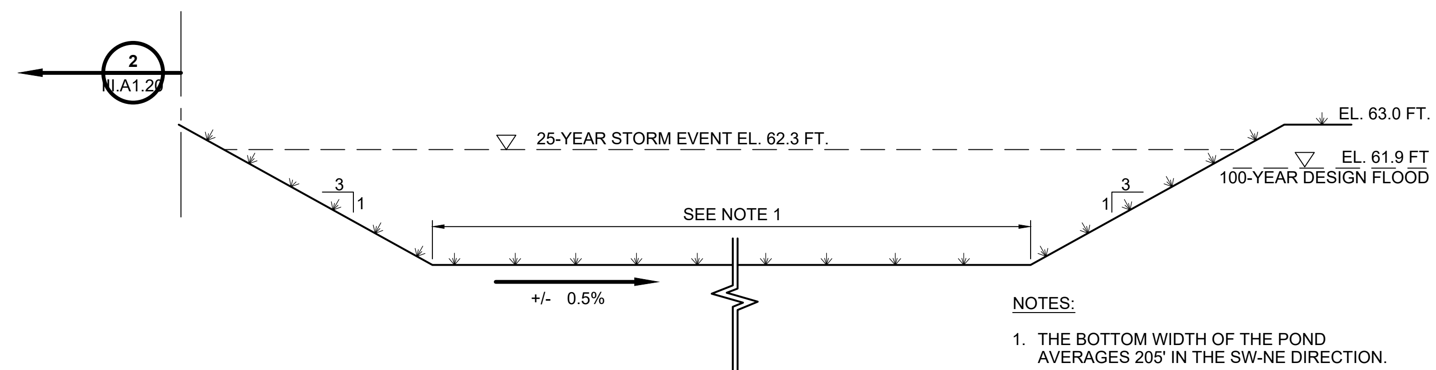
file 107608III.A1.21.dwg



NOTES:

1. THE BOTTOM WIDTH OF THE POND AVERAGES 1550' IN THE NW-SE DIRECTION.
2. POND OUTLET STRUCTURE CONSISTS OF TWO 48-INCH (ID) CONCRETE PIPES WITH AN INVERT AT 57.0 FT AND A 35' WIDE SPILLWAY AT ELEV. 61.0'.

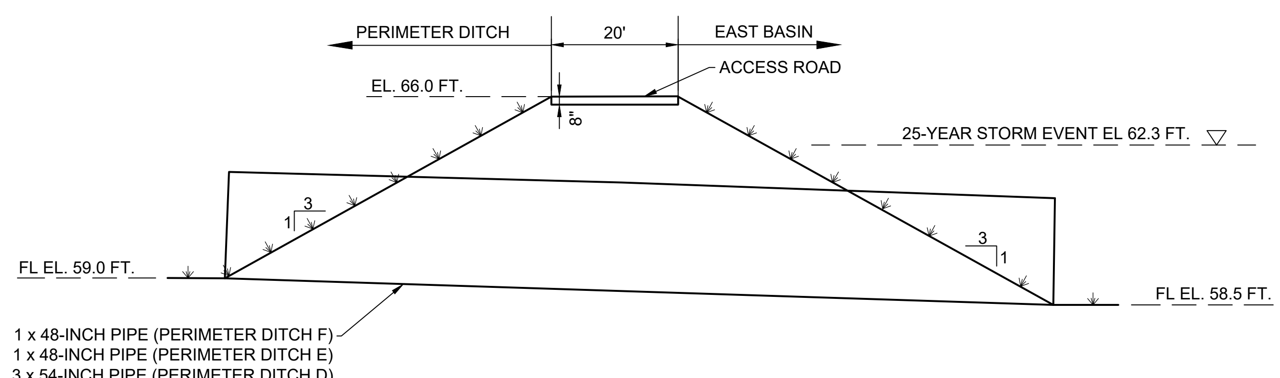
DETENTION BASIN EAST (NW-SE) 1 / III.A1.8
NOT TO SCALE



NOTES:

1. THE BOTTOM WIDTH OF THE POND AVERAGES 205' IN THE SW-NE DIRECTION.

DETENTION BASIN EAST (SW-NE) 3 / III.A1.8 — III.A1.20
NOT TO SCALE



EAST BASIN INLET STRUCTURE (MULTIPLE) 2 / III.A1.8
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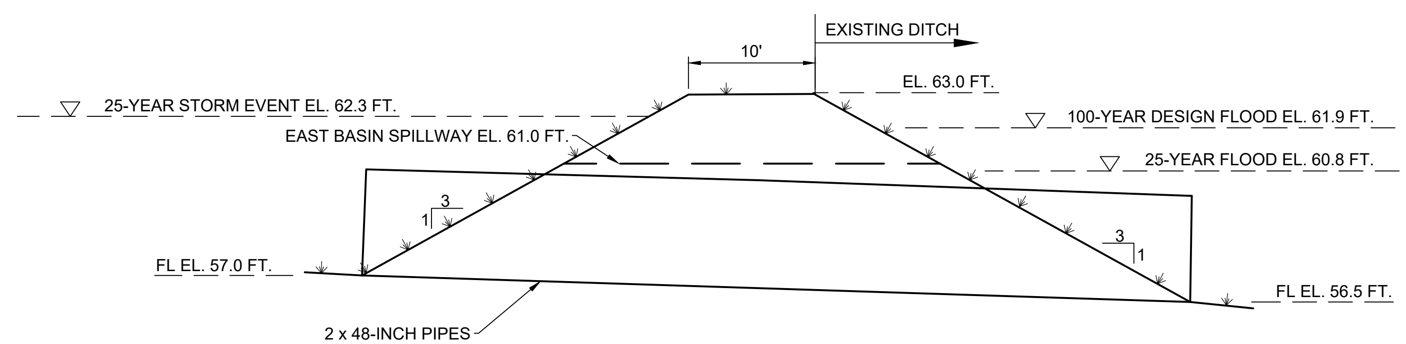
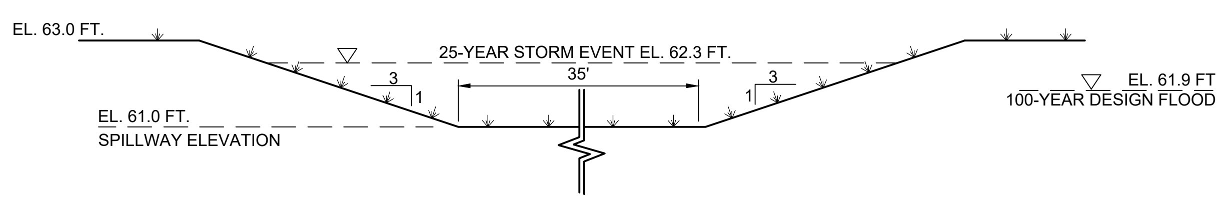


EAST BASIN OUTLET STRUCTURE 4 / III.A1.8
NOT TO SCALE



EAST BASIN SPILLWAY 5 / III.A1.8
NOT TO SCALE

TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

PRELIMINARY - NOT FOR CONSTRUCTION

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Burns & McDonnell Engineering Co, Inc.
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date: MARCH 2022	detailed: T. CAMMACK
designed: T. SCHMIDT	checked: T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

1522B PERMIT AMENDMENT

DETAIL SHEET 7

project: 107608 | contract: -

drawing: **III.A1.21B** — rev. **2**

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file 107608III.A1.21B.dwg

no.	date	by	ckd	description
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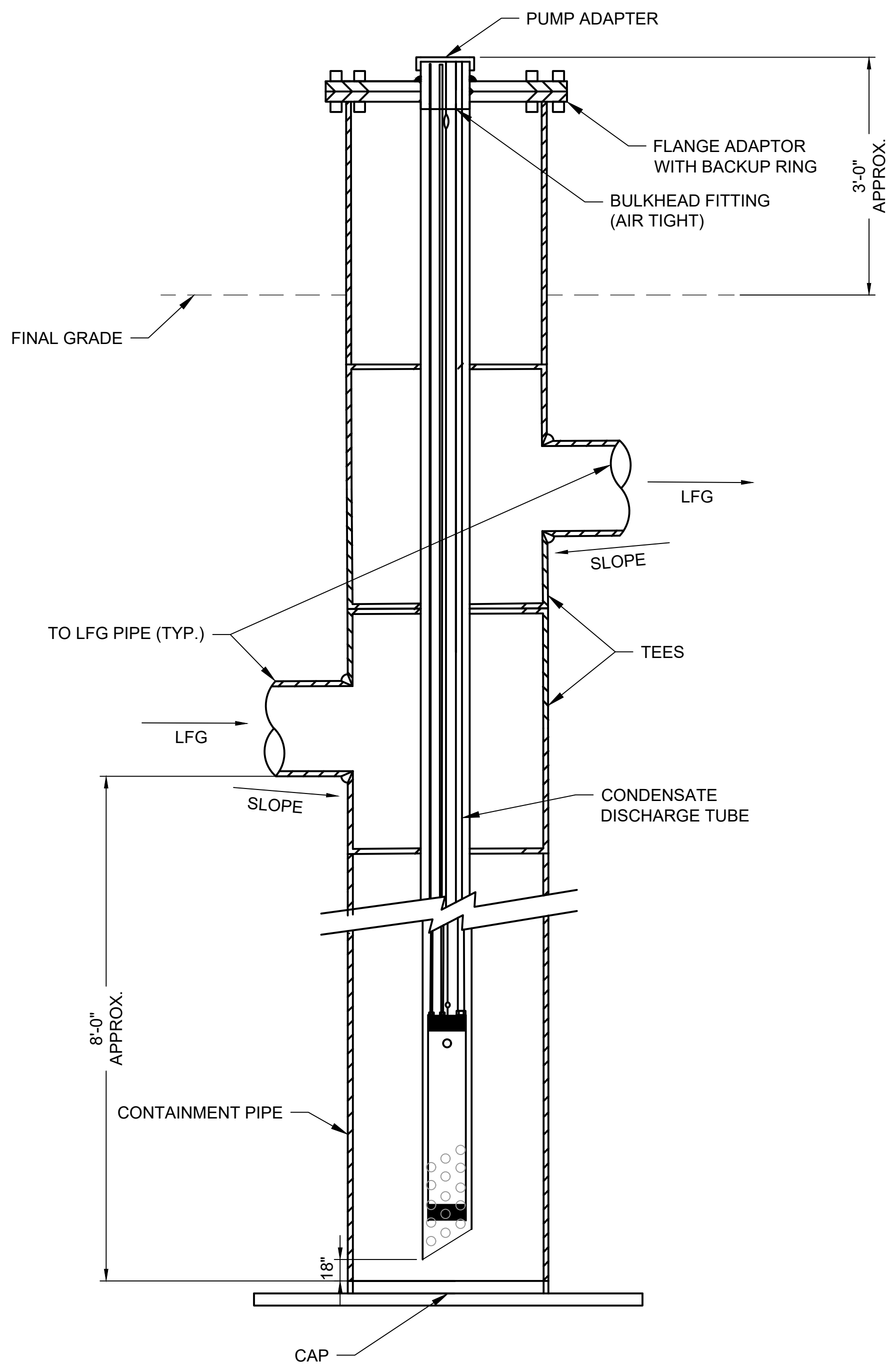
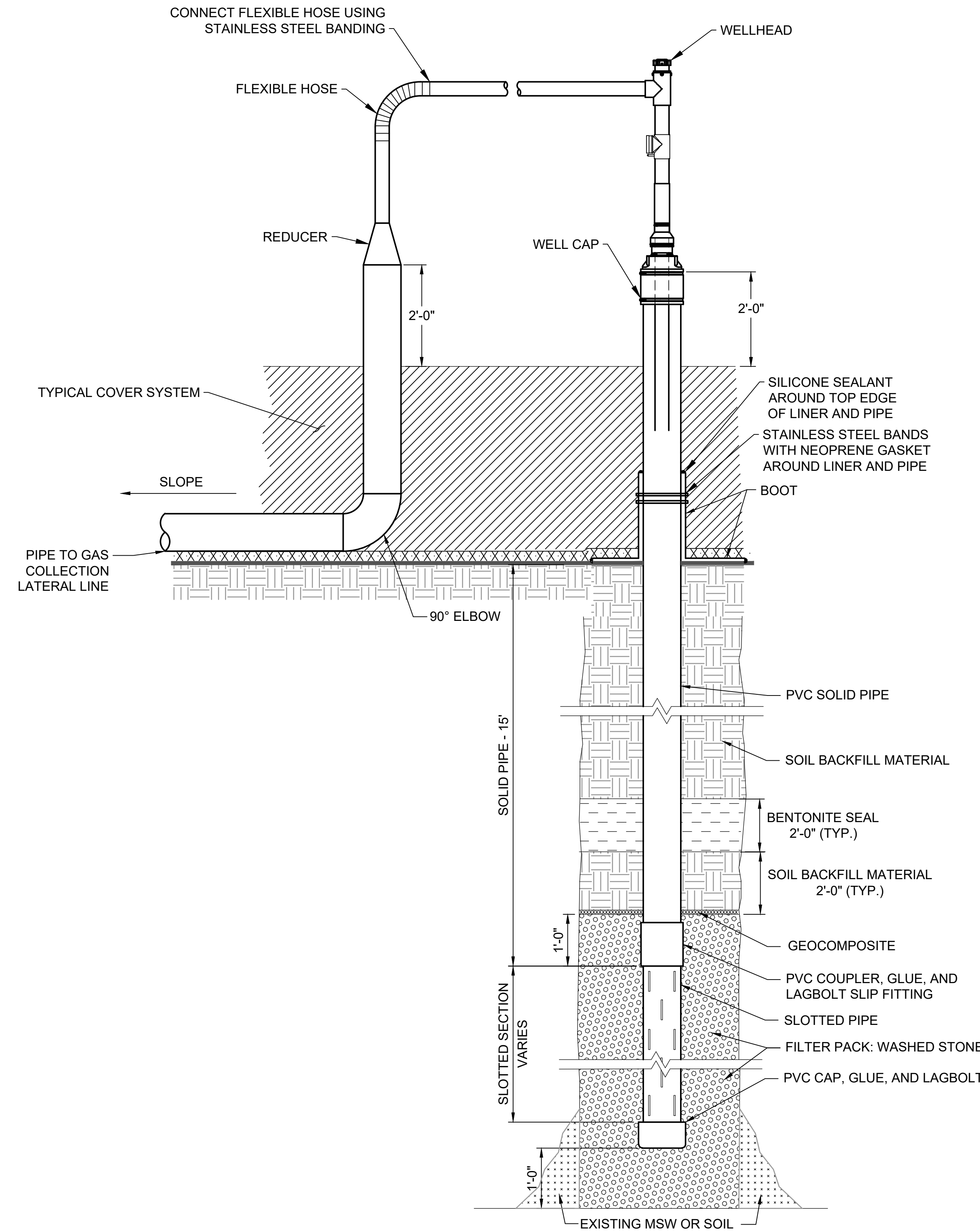
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD



TYPICAL CONDENSATE SUMP
NOT TO SCALE
1 III.A1.10 III.A1.11

NOTES:

1. AIR/FORCEMAIN AND PUMP HOSES ARE NOT SHOWN IN THIS VIEW.
2. ALL SIZES AND DIMENSIONS ARE APPROXIMATE.



TYPICAL GAS WELL
NOT TO SCALE
2 III.A1.10 III.A1.11

STATE OF TEXAS
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11-18-22

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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

1522B PERMIT AMENDMENT

DETAIL SHEET 8

project 107608 | contract -

drawing **III.A1.22** rev. **2**

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APPENDIX 1A - HISTORIC DRAWINGS

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	11/18/22	TJS	TLK	REV. PER TCEQ NOD

DRAWING ID	**DRAWING NAME**
1C	EXCAVATION PLAN
1D	SITE DRIVEWAY DETAIL
2A	TYPICAL CROSS SECTIONS
2B	CROSS SECTION 1-1
2C	CROSS SECTION 2-2
2D	CROSS SECTION 3-3
2E	CROSS SECTION 4-4
2E-2	CROSS SECTION 5-5
2H	CROSS SECTION 3-3 & 4-4
2I	CROSS SECTION 5-5 & 6-6
2J	CROSS SECTION 7-7
6B-1	DRAINAGE DESIGN
6B-2	CROSS SECTIONS
6B-4	DRAINAGE DETAILS
6B-5	DRAINAGE DETAILS
6B-7	DETENTION POND PLAN
7	FINAL CONTOUR MAP
15A	EXCAVATION PLAN
15B	LINER DETAIL

DRAWING ID	**DRAWING NAME**
15B-1	LINER DETAIL (WITH GEOCOMPOSITE)
15C	DETAILED LEACHATE COLLECTION DETAILS
15C-1	DETAILED LEACHATE COLLECTION DETAILS (WITH GEOCOMPOSITE)
15F	SLOPE STABILITY CROSS SECTION LOCATION MAP
15G-1A	LEACHATE STORAGE FACILITY
15G-1B	LEACHATE STORAGE TANK
"DRAWING 7"	LFG TREATMENT FACILITY LAYOUT
6 OF 11	SOIL PROFILE
7 OF 11	SECTIONS 1-1 & 2-2
8 OF 11	SECTIONS 3-3 & 4-4
9 OF 11	SECTIONS 5-5 & 6-6
10 OF 11	SECTION 7-7
11 OF 11	SECTIONS 8-8 & 9-9
A1	FINAL COVER SYSTEM EVALUATION REPORT SITE PLAN
A2	FINAL COVER SYSTEM EVALUATION REPORT TOP OF FINAL COVER PLAN
A3	FINAL COVER SYSTEM EVALUATION REPORT FINAL COVER DETAILS
A4	FINAL COVER SYSTEM EVALUATION REPORT FINAL COVER DETAILS
A5	FINAL COVER SYSTEM EVALUATION REPORT FINAL COVER DETAILS
PAGE 27	CROSS-SECTION A-A TIE-IN TO EXISTING TRENCH 4 - SECTION 6
DRAWING A3	TRENCH 6W-9W2 LINER AND LEACHATE COLLECTION SYSTEM DETAILS

FOR PERMITTING PURPOSES ONLY

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KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date: March 2022
detailed: T. SCHMIDT
designed: T. SCHMIDT
checked: T. KOLLER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

EXPANSION PERMIT DESIGN

HISTORICAL PERMIT DRAWINGS
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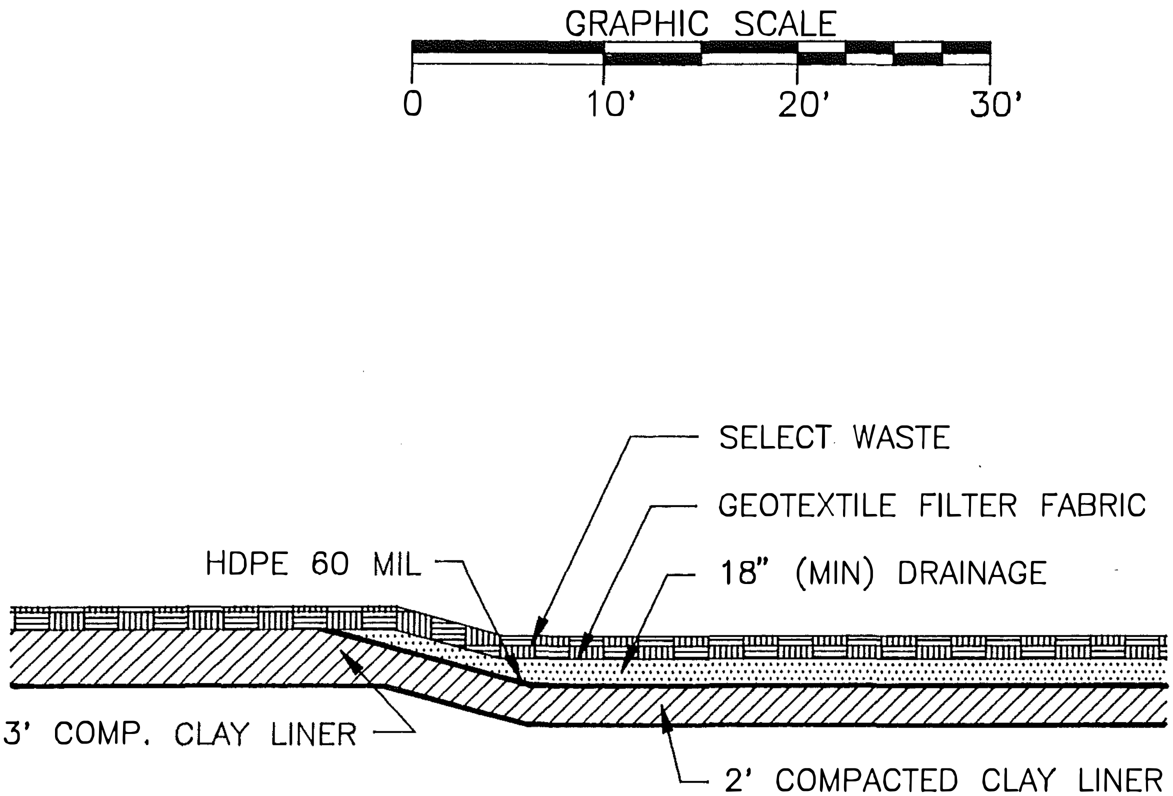
STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER
11-18-22

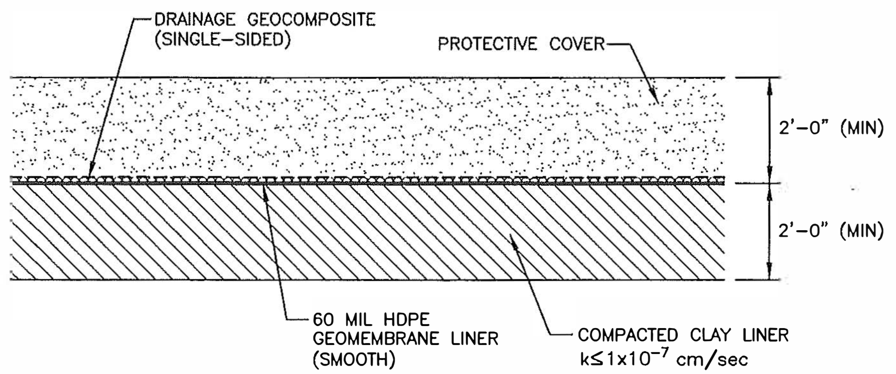
TONYA L. KOLLER P.E.
LICENSE NO. 133943

CROSS-SECTION A-A
TIE-IN TO EXISTING
TRENCH 4 - SECTION 6



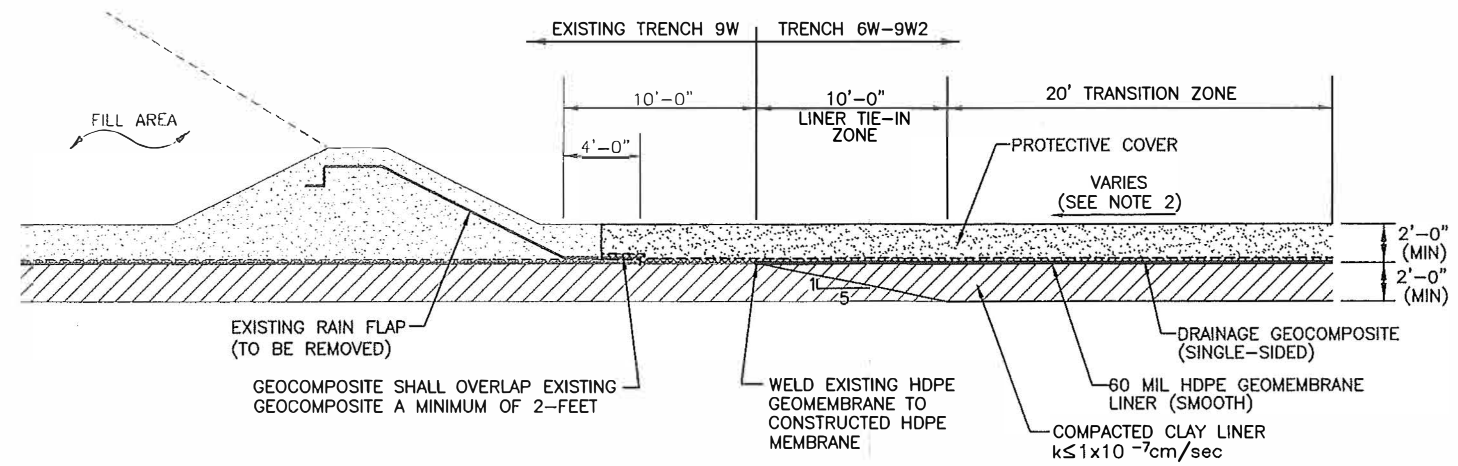
4-8-94

Prepared By: JFK GROUP, INC. April 1,,1994 Revised: April 5, 1994	BFI-Victoria Landfill - TWC Permit # 1522	Page 27



LINER SYSTEM (L1 A2 A3)

0 2 4 SCALE IN FEET



EXISTING LINER TIE–IN (TRENCH 9W) (L4 A2 A3)

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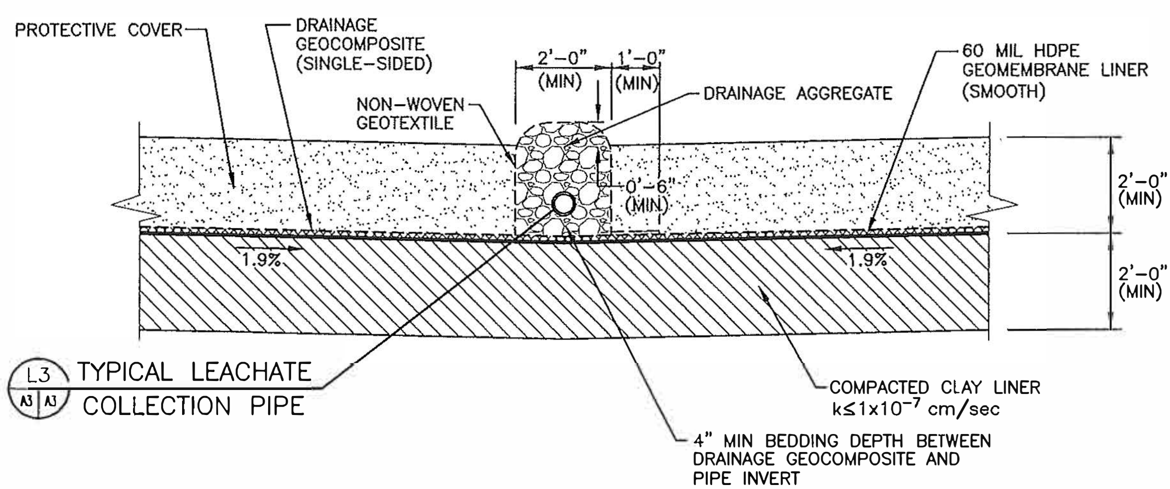

LEACHATE COLLECTION TRENCH (L2 A2 A3)

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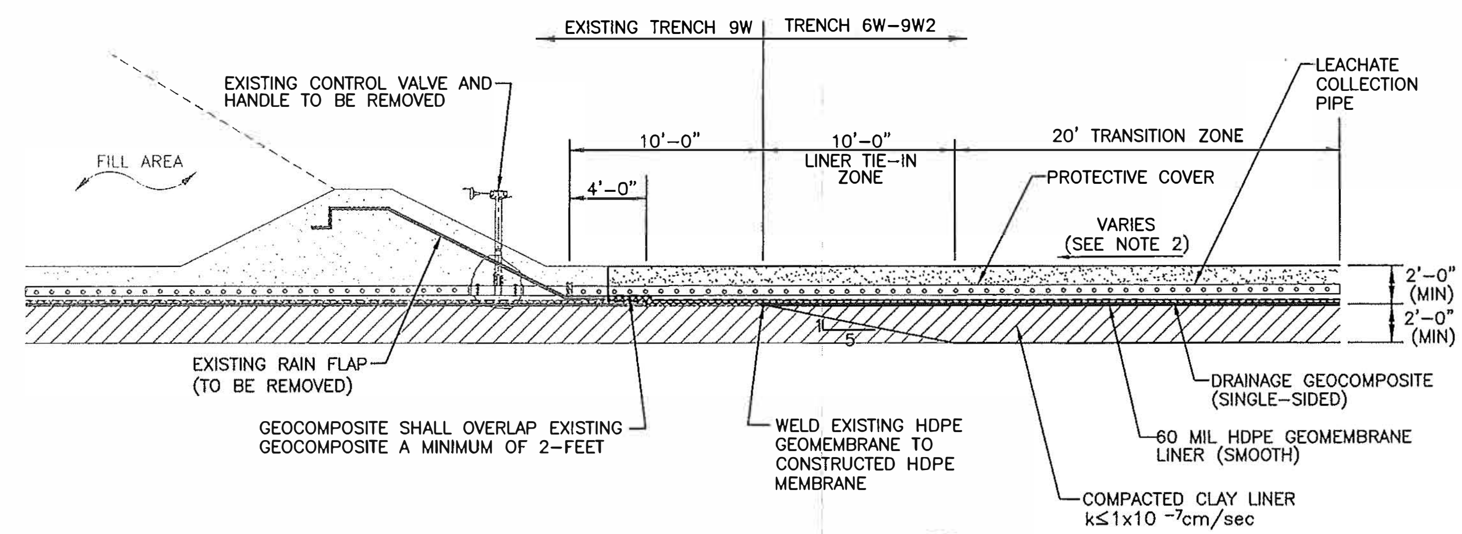
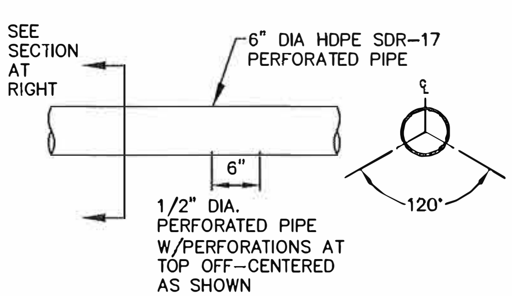


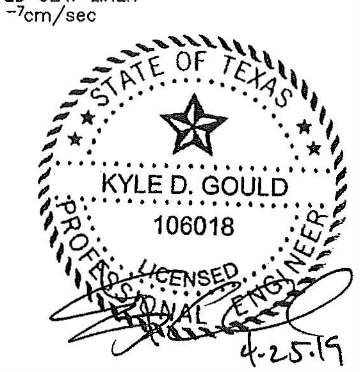
EXISTING LINER TIE–IN WITH LEACHATE COLLECTION PIPE (TRENCH 9W) (L5 A2 A3)

0 5 10 SCALE IN FEET



TYPICAL LEACHATE COLLECTION PIPE (L3 A3 A3)

0 1 2 SCALE IN SCALE



☐ DRAFT
☒ FOR INFORMATIONAL PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 04/2019
FILE: 0120–074–17
CAD: A3–LINER AND LEACHATE DETS.DWG

DRAWN BY: SRF
DESIGN BY: CM
REVIEWED BY: KDG

PREPARED FOR
REPUBLIC SERVICES

REVISIONS

NO.	DATE	DESCRIPTION

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

TRENCH 6W–9W2
SOIL LINER EVALUATION REPORT
LINER AND LEACHATE COLLECTION SYSTEM DETAILS

CITY OF VICTORIA LANDFILL
VICTORIA COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING A3

O:\0120\74\TP 6W–9W2\SLER\A3–LINER AND LEACHATE DETAILS.dwg, sford, 1:2

ATTACHMENT III-2 – SURFACE WATER DRAINAGE REPORT

Part III, Attachment 2
Surface Water Drainage Report
TCEQ MSW Permit No.1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part III, Attachment 2
Surface Water Drainage Report
TCEQ MSW Permit No.1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

Burns & McDonnell Engineering Company, Inc.
8911 N Capital of Texas Hwy, Building 3, Suite 3100
Austin, Texas 78759 Austin, Texas
Texas Firm Registration No. F-845

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STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER
11-18-22

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
BMP	Best Management Practice
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CLOMR	Conditional Letter of Map Revision
CMZ	Crop Management Zone
DS	Downstream
East Basin	Detention Basin East
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HEC	Hydraulic Engineering Circular
HEC-RAS	Hydrologic Engineering Center – River Analysis System
LOMR	Letter of Map Revision
MSW	Municipal Solid Waste
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Service
RUSLE	Revised Universal Soil Loss Equation
SCS	Soil Conservation Service
SFHA	Special Flood Hazard Area
SSURGO	Soil Survey Geographic Database
SWPPP	Storm Water Pollution Prevention Plan
TAC	Texas Administrative Code
TBC	To Be Constructed
TCEQ	Texas Commission on Environmental Quality
TDPES	Texas Pollutant Discharge Elimination System
US	Upstream
USGS	United States Geological Survey
West Basin	First Flush Detention Basin West

1.0 INTRODUCTION

The facility was designed to manage peak flows and erosion potential resulting from a 25-year storm, to comply with Texas Administrative Code 30 (TAC) §330.303. This Surface Water Drainage Report (Report) includes the locations, details and supporting design methodology for the site's stormwater control features, which include erosion and sediment control best management practices (BMPs), final cover swales, letdown chutes, drainage channels, perimeter ditches, swales, culverts, and detention basins. The facilities were also designed to provide protection from 100-year frequency flooding to comply with TAC §330.307. The project's impact on Federal Emergency Management Agency (FEMA) floodplains and existing properties is evaluated further in this report.

As of the date of this Report, the existing landfill contains constructed and to-be-constructed (TBC) stormwater features that have been permitted by the Texas Commission on Environmental Quality (TCEQ). This Report includes the surface water drainage and design basis for the landfill expansion area and the ancillary expansion of the Facility, found in Sections 2-5 of this Report. Features and drainage of the existing TBC landfill that are not superseded by the expansion will also be included in Sections 2-5. The extent of the landfill expansion is provided in Attachment III-1 – Permit Drawings. In addition to these permit drawings, exhibits and drawings to illustrate the calculations and design methods presented herein are included in Appendix 2A. Further details and design calculations for the surface water drainage corresponding to the Existing Constructed Area can be found in Appendix 2B. Historic calculations were verified and discussed in Section 6.0 of this Report.

2.0 EROSION CONTROL

2.1 Erosional Stability of Landfill Slopes

In accordance with TAC §330.305(d), the landfill top dome and side slopes are designed to provide long term erosional stability during landfill operation, closure, and post-closure care. The soil erodibility calculations for final (vegetated) and interim scenarios are provided in Attachment III-14. These calculations were completed using the Revised Universal Soil Loss Equations, Version 2 (RUSLE2) program which is developed and maintained by the Natural Resources Conservation Service (NRCS).

The soil erodibility results for intermediate and final cover conditions are presented in the Part III Landfill Permit Amendment Site Development Plan, Section 8.3. These calculations showed weighted soil loss values of less than 3 tons/acre/year for final cover conditions and less than 50 tons/acre for interim conditions, which complies with the recommendation set forth in TCEQ RG-417: Surface Water Drainage and Erosional Stability Guidelines for a Municipal Solid Waste Landfill.

The interim external embankment slopes of the landfill shall be no greater than 3:1. These slopes shall be equipped with semi-permanent swales, as discussed in Section 2.2. These swales shall be installed along the slopes with a minimum spacing of 30 vertical feet (90 horizontal feet on 3:1 slopes, 120 feet on 4:1 slopes), which is consistent with the final cover design. This spacing will the limit runoff type to sheet flow with negligible velocity before being collected in the armored swales. Swale spacing throughout the site is shown in Attachment III-1 – Drawing III.A1.7 and III.A1.8. All interim landfill slopes (including the top dome) shall be graded with uniform slopes, roughened using dozer tracking, and seeded or covered using blankets and matting, discussed in Section 2.3 of this Report.

2.2 Permanent Erosion and Sediment Controls

Interim and final landfill slopes will consist of permanent or semi-permanent structural controls to manage the velocity of runoff such that erosional stability is not compromised. The permanent controls are shown in Drawings III.A1.7 and III.A1.8 of Attachment III-1. These controls consist of final cover swales and letdown chutes, which are discussed in Sections 3.3 and 3.4 of this Report. Semi-permanent controls shall refer to these same controls, but which are used during interim conditions, therefore shown in locations other than those depicted in Attachment III-1. The semi-permanent controls shall not be removed except at the time of final closure or in the case that landfill operation renders them unfeasible (such as the installation of a temporary access road or the waste placement for an adjacent cell). Semi-permanent swales and letdown chutes, controlling runoff of interim slopes, shall be installed in accordance with the final cover designs for these controls (including the applicable temporary erosion and sediment controls discussed in Section 2.3).

Landfill and facility ground surfaces shall be stabilized with vegetation or non-vegetative surfaces. Seeding shall be performed on all landfill final cover surfaces and perimeter surfaces that have reached design grades according to the practices discussed in Section 2.4. Non-vegetative surfaces include:

- Gravel: This material shall be installed within limits of permanent access roads, as depicted in Attachment III-1.
- Riprap: This material shall be installed as the lining of letdown chutes and around culvert outlets, as depicted in Attachment III-1. Details and specifications for riprap outlet protection is provided in Section 1.3.5 of Appendix 2C.
- Gabions: This shall be installed within letdown chutes, as depicted in Attachment III-1.

2.3 Temporary Erosion and Sediment Controls

Best Management Practices (BMPs) shall be utilized during site operation and construction. Exposed ground surfaces shall be temporarily stabilized with the BMPs discussed in this Section. Appendix 2C, provides specifications for the following BMPs (Note: The site is not in the Edwards Aquifer, but this guidance document was selected for being a TCEQ publication with the required controls). These BMPs shall be maintained until final stabilization is achieved.

Blankets and Matting: A temporary armoring of fiber blankets, plastic nets, or equivalent will be installed as necessary over areas receiving vegetative cover and 3:1 interim landfill slopes. In most cases, landfill slopes may be stabilized by seeding and mulching alone. Section 1.3.9 of Appendix 2C provides installation methods, standard details, and products for blankets and matting. Various locations and structures shall require different products. Detention basins and general soil slopes shall require a Type A or B product (depending on the sand/clay content of the soil). The inside of final cover swales and perimeter ditches shall require a Type E or F product with an unvegetated velocity specification of 9 ft/s or higher. This will accommodate the peak velocity calculated in Section 5.3.

Dust Control: This BMP shall be implemented near areas of construction and in areas with exposed soil in accordance with specifications in Section 1.3.12 of Appendix 2C.

Silt Fence: Perimeter sediment controls shall be established along the downgradient edge of any areas undergoing soil disturbance, where there is a potential for sediment to be transported offsite. Silt fences are a type of perimeter barrier for long-term construction activities. This BMP shall be implemented in accordance with the details and specifications in Section 1.4.3 of Appendix 2C. The maximum drainage area to the fence should not exceed the manufacturer's specification and must not be greater than 0.5 acre per 100 feet of fence.

Check Dams: This BMP shall be implemented along the flowline of the perimeter ditches in accordance with specifications in Section 1.4.8 of Appendix 2C.

Sediment Basins: The footprint of the east and west detention basins serving the waste unit, depicted in Attachment III-1, shall serve as sediment basins when receiving flow from unstabilized areas. Temporary sediment basins within the footprint of undeveloped landfill cells shall be used to manage sediment during interim conditions. Temporary outlet structures and interim basin grading may be used as needed. Section 1.4.13 of Appendix 2C provides installation methods, standard details, and products for this BMP.

Fiber Rolls: Perimeter sediment controls shall be established along the downgradient edge of any areas undergoing soil disturbance, where there is a potential for sediment to be transported offsite. Fiber rolls are preferable to silt fences when the earthwork boundary is prone to move throughout construction. This BMP shall be implemented in accordance with the details and specifications in Section 1.4.14 of Appendix 2C.

2.4 Maintenance and Nonstructural Controls

BMPs shall be inspected and maintained in accordance with the current Storm Water Pollution Prevention Plan (SWPPP) for the City of Victoria Landfill. Inspection and maintenance procedures for post-closure conditions are discussed in Attachment III-11: Post Closure Plan.

Seeding shall be performed on all landfill final cover surfaces and perimeter surfaces that have reached design grades in accordance with Attachment III-9. The installation of vegetation shall incorporate native seed mixes suitable for erosion control. Interim surfaces to be undisturbed for more than one year shall also be seeded with a goal of 60% vegetation.

To minimize the potential for soil erosion, construction activities involving ground disturbance shall occur, when practical, during dry seasons. The application of seed shall typically occur during growing season. The use of dormant seeding is also acceptable for late-season planting.

3.0 DRAINAGE DESIGN

3.1 Pre-Development and Post-Development Conditions

The landfill expansion was designed to utilize drainage features of the existing landfill and take advantage of the natural drainage patterns that existed at the site prior to expansion. The original, natural topography of the site allows water to drain generally north to south, separated into two watersheds, east and west. All discharge of water will be in accordance with the site's U.S. Environmental Protection Agency TPDES Multi-Sector Stormwater Permit, a copy of which is included in Appendix I of the Part I/II Application.

The existing landfill consists of three permitted outfalls; Northwest, Northeast, and Southwest. Final cover is completed to the Northwest Outfall with no changes required and will continue to function as-such. Outfall Northeast consists mainly of TBC landfill, but will continue to function as designed and permitted with no changes required to the outfall. Outfall Southwest consists of partial final cover and partial TBC landfill, with stormwater discharging Outfall Southwest from an existing detention pond. This outfall will continue to function as designed and permitted post-expansion with no changes required to the drainage design or detention pond. Drainage areas to Outfall Northeast and Outfall Southwest are equal to or less than the existing permitted drainage area to each outfall, therefore post-expansion, both outfalls will continue to function as previously designed (under MSW 1522A), discharging the site in the same manner and to the same location as permitted. Revised drainage calculations at the three existing outfalls were not updated with or updated for this Report, but have been checked for consistency. Historic drainage reports identifying calculations for these outfalls can be found in Appendix 2B.

The pre-development and post-development drainage basin layouts are provided in Drawings III.A2.1 and III.A2.2 included in Appendix 2A. FM 1686, which borders the existing permitted landfill to the north, acts to divert runoff from the north around the existing landfill in a series of drainage ditches. In the west watershed existing condition, upstream channelized run-on flow enters the expansion site’s requested permit boundary from offsite in a man-made tributary drainage ditch at the northwest corner, turns to follow the north expansion boundary, then turns south bisecting the expansion site, exiting along the south boundary. In the proposed condition this ditch will be re-routed along the west expansion permit boundary, but will be directed to keep run-on flow outside of the permitted limits of waste. The re-routed ditch will then turn to follow the south property line and exit the site at the same location as the existing condition. To the east, the Chocolate Bayou routes offsite channelized flow north to south through City of Victoria-owned property. However, this drainageway is already outside of the proposed landfill expansion permit boundary and therefore will remain intact. No other offsite run-on enters the east watershed in the existing or proposed condition. Discharge from the east portion of the landfill expansion will be conveyed to the Chocolate Bayou by an existing west-to-east drainage ditch at the Outfall East site discharge comparison point at the Permit Boundary. Due to the natural terrain features, existing ditch network, and existing permitted landfill, no other significant flow or run-on enters the expansion site than described above in the west and east watersheds.

Stormwater from the landfill expansion site will flow, by a series of perimeter ditches, into the existing conveyance channels that eventually flow to Chocolate Bayou and then to Lavaca Bay. The route to Chocolate Bayou is split into east and west watersheds. The east drainage path discharges the site to an existing conveyance channel located near the southeast corner of the proposed landfill boundary that parallels the south property boundary until tying in directly to Chocolate Bayou. The west portion of the site discharges to an existing conveyance channel located along the west half of the south proposed landfill boundary, continuing southeast until tying into Chocolate Bayou further to the south. These drainage paths were essential in the design of the stormwater management system as pre-development condition flows to these conveyance channels set the maximum allowable peak flow for the proposed conditions, as shown in Table 5-1.

For pre-to-post comparison purposes, two site discharge points (East and West) have been established along the Landfill Permit Boundary at the locations described above. Runoff discharges the site generally in the same locations as the pre-development conditions, although due to perimeter berms and ditches, sheet flow that left the permit boundary in the pre-development condition generally leaves the post-developed site as a point discharge at the site discharge comparison points, but to the same location as an existing point discharge ditch. However, due to the project design of perimeter ditches and detention basins, the east and west drainage patterns have not adversely affected offsite drainage, as shown in Table 5-1. It should be noted that the total Cumulative Catchment Area for both Outfalls (East and West) has increased by approximately 15 acres. This is due to Outfall East picking up a portion of Existing TBC landfill to the north that was originally to be routed to the existing landfill detention pond at the southwest corner. See Drawings III.A2.1 and III.A2.2 for a graphical representation of pre vs. post development watershed areas.

All drainage and run-off calculations for “pre-development conditions” are based on the configuration of the property prior to landfill development, i.e., cultivated farmland. All post-development drainage and runoff design is based on the final full closure configuration of the landfill. As shown in Table 5-1, existing drainage patterns will not be adversely altered.

3.2 Stormwater Management Overview

The conveyance of stormwater is accomplished through a series of swales, chutes, ditches, channels, and detention basins. The overall routing of stormwater can be seen in the Drawings in Appendix 2A. Rainfall data was obtained from the NOAA Atlas 14, Volume 11 (version 2) precipitation frequency tables for the project location in Victoria County, Texas. A 25-year recurrence interval and 24-hour storm duration were selected for both the Pre-Development and Post-Development Conditions model. A NOAA Atlas 14 first quartile temporal distribution, 20% occurrence interval was selected for 24-hour unit hydrograph rainfall distribution.

3.3 Final Cover Swales

Runoff from the final cover system will be collected by swales located along the landfill slopes. Spacing of the swales will not exceed 30 vertical feet, as discussed in Section 2.1 of this report. Swales will consist of a 24” deep, V-shaped channel with a nominally compacted soil berm extending vertically beyond the final cover system. The invert flowline of these features will be constructed at a 1% slope, except for certain existing TBC swales designed with a 0.5% invert. Swales will be lined for erosion prevention as discussed in Section 2.3 of this report. Swales will be vegetated. Stormwater collected by these features will be conveyed to letdown chutes. Design methodologies are discussed in Section 5.3 and 5.4 of this report.

The existing permitted to-be-constructed swales are also 24” deep and spaced at a maximum of approximately 30 vertical feet. The existing permitted to-be-constructed swales are designed with a 0.5% minimum flowline.

3.4 Letdown Chutes

A total of nine (9) letdown chutes will be constructed within the vertical expansion design, each serving as the drainage outlet for several final cover swales (discussed in Section 3.3). The letdown chutes shall be oriented directly downslope, with a maximum flowline slope of 3:1, and shall discharge into the perimeter ditches (discussed in Section 3.5). A trapezoidal geometry shall be used for the chutes, with a depth of 12 inches and a bottom width of 12 feet. The chutes will be lined with riprap contained within 18-inch-deep gabion baskets. The mean rock size shall be 9 inches. Design methodologies are discussed in Section 3.2 and 3.3 of this report.

Two types of letdown chutes are permitted for the existing to-be-constructed waste unit. Both have a trapezoidal geometry with a depth of 24 inches and bottom widths of 8-10 feet. One type utilizes a 6” tri-lock concrete lining material and the other type utilizes a 6” gabion with 5-inch (mean diameter) riprap.

Due to the maximum landfill slope of 4:1 for this waste unit, the maximum flowline of these chutes is lower than that which is to be permitted under the vertical expansion.

3.5 Perimeter Ditches

The routing of surface runoff from the permitted waste boundary via perimeter ditches is shown in Drawing III.A2.3. The perimeter ditches are located between the proposed perimeter access road and landfill liner boundary (perimeter berms). All ditches are trapezoidal in shape with 3:1 side slopes and varying longitudinal slopes, with bottom widths from 5 feet to 12 feet. Each ditch was sized to convey the 25-year storm event with capacity to allow approximately 1 ft. of freeboard to both the perimeter access road and landfill liner. Each ditch has also been sized to not overtop in the 100-year storm event and remain below the elevation of the landfill liner. Perimeter ditches and perimeter berms have also been located and designed to not be inundated by the surrounding 100-year floodplain but have been sized to account for submerged outlet conditions due to backwater from the floodplain at landfill permit boundaries and the site discharge points where ditches discharge offsite. Drainage ditch methodologies and calculations can be found in Table 5-2 and Section 5.1.2.1. Further Perimeter Ditch details can be found in the Attachment III-1 - Permit Drawings, including 25-year storm ditch depths and perimeter ditch relationship to the external 100-year floodplain.

Table 3-1 provides a summary of the landfill's stormwater conveyance structures that discharge into each perimeter ditch. The IDs of the perimeter ditches can be found in Appendix 2A on Drawing III.A2.3 and Section 5.1.2.

Table 3-1: Perimeter Ditch Tributaries

Perimeter Ditch ID	Tributaries
A (Existing TBC design)	Basin No. 4 Letdown Chute*
B-1	Basin No. 3 Letdown Chute* Basin No. 2 Letdown Chute*
B-2	Basin No. 1 Letdown Chute*
B-3	Perimeter Ditch B-2
C	Sheet flow only
D	Basin No. 9 Letdown Chute* Basin No. 8 Letdown Chute* Basin No. 7 Letdown Chute*
E	Basin No. 6 Letdown Chute*
F	Basin No. 5 Letdown Chute*

*See Drawing III.A2.4 in Appendix 2A for letdown chute drainage basins.

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3.6 Conveyance Channel Reroute

The current expansion site includes an existing conveyance channel that bisects the west half of the proposed landfill expansion, routing offsite flow from the north through the landfill boundary. This channel (labeled Drainage Channel 1 on Drawing III.A2.1 in Appendix 2A) will be re-routed along the west and south property lines to keep external runoff and flood flows outside of the permitted landfill boundary, tying back into the existing drainage channel at the southern property boundary. A second channel (labeled Drainage Channel 2) which collects a significant portion of the existing landfill discharge to the southwest corner, will also be re-routed along the north property boundary to convey flow from the existing landfill detention pond to the west property boundary, discharging to Drainage Channel 1 at the northwest corner of landfill property. The new routing of the two conveyance channels can be seen on Drawing III.A2.1 in Appendix 2A. Re-routed Drainage Channel 1 will also function as the downstream Outlet West discharge point for Perimeter Ditches B and C, and the proposed First Flush Detention Basin West.

3.7 Culverts

Concrete culverts are used throughout the site for both perimeter drainage ditches and detention basin outlet structures. Perimeter Ditch B utilized culverts as inlets (labeled Culvert B-2 on Drawing III.A2.1 in Appendix 2A) into the First Flush Detention Basin West (herein also referred to as West Basin) sized to control the first flush storm depth. Perimeter Ditches D, E, and F each use culverts to route flow from ditches Detention Basin East (herein also referred to as East Basin) on the east side of the landfill. Culvert information can be found in Table 5-3 in Section 5.1.2.2.

3.8 First Flush Detention Basin West

The west portion of the site in both pre-development and post-development conditions discharges to the tributary ditch (Channel 1) described in Section 3.6 at the site discharge comparison point near the southwest corner of the proposed landfill expansion boundary. As shown in Table 5-1, Outfall West does not require detention of the 25-year storm event as post-development conditions peak runoff to the drainage channel is less than pre-development conditions peak runoff. This can be attributed to changes in drainage boundaries due to landfill grading plan, including a reduction in overall drainage area and minimal changes in runoff Curve Numbers. However, as a local stormwater best management practice for filtering sediment and slowing the discharge of site flow from more frequent storm events to the downstream system, a first flush detention basin is proposed along the west side of the expansion permit boundary. Runoff from the first flush storm event, defined as the runoff conveyed from the first 1.5-inches of rainfall, will be routed to the First Flush Detention Basin West.

The unlined, grass-bottom dry basin was sized to capture and detain the first flush storm event, defined as the first 1.5-inches of rainfall over a 24-hour time span. The basin outlet structure has been designed and sized to account for a submerged outlet condition due to backwater from the surrounding floodplain. The First Flush Detention Basin West is located on the west side of the proposed landfill expansion boundary and discharges to the re-routed Drainage Channel 1 through an outlet structure as shown on Drawing III.A2.2 in Appendix 2A. With the basin's sole purpose of capturing the 1.5-inch first flush storm with no additional detention requirements necessary, the basin has been located within the floodplain and is designed to be inundated by the 25 and 100-year floodplain. Inundation by these events will have no adverse impact on the intended function of the West Basin. Basin design and outlet structure details can be found in Attachment III-1. Further design information and details can be found in Section 5.1.2.3. Further design details and basin routing modeling results summary reports for the pre and post development runoff conditions can be found in Appendix 2D and Appendix 2E.

3.9 Detention Basin East

Post-development runoff to the east side of the landfill expansion exceeded the pre-development conditions peak runoff, so detention is required to decrease the peak flow for the 25-year event. The Detention Basin East is located on the east side of the proposed landfill expansion boundary. The East Basin was designed as an unlined, grass-bottom dry basin to detain the 25-year storm event and serve as a central collection point for Perimeter Ditches D, E & F before discharging through a two-stage outlet structure located on the east side of the basin to the existing Drainage Channel 3 routed towards Chocolate Bayou. The outlet structure has been designed and sized to account for a submerged outlet condition due to backwater from the Chocolate Bayou floodplain.

The detention basin embankment has been set above the 100-year floodplain water surface elevation. However, with the basin's sole purpose of providing detention for the 25-year storm event with no additional 100-year design requirements necessary, the potential exists for the 100-year flood to back up through the proposed outlet structure weir, which has been accounted for in the design. Inundation by the 100-year flood will have no adverse impact on the intended function of the East Basin or on drainage within the landfill permit boundary, as a Perimeter Berm will still hold floodwater from inundation of the permitted waste boundary and remain below the top of liner elevation. The Detention Basin East design information can be found in Section 5.1.2.4. Further basin and outlet structure details can be found in the Attachment III-1 – Permit Drawings, and basin routing modeling results summary reports for the pre and post development runoff conditions can be found in Appendix 2D and Appendix 2E.

3.10 Stormwater Drainage During Phased Construction of the Landfill

The landfill cells will be constructed in the order presented in Drawing III.A1.4 of Attachment III-1 (Waste Placement Phasing Plan). The Phases presented herein refer to the Phases presented in Drawing III.A1.4. Phased construction of the drainage system will accommodate drainage and run-off control during interim construction periods. Final cover swales and letdown chutes will be constructed with the installation of the final cover system. Intermediate swales and letdowns shall be installed as necessary. Below is a list of the numerical phases presented in Drawing III.A1.4 and descriptions of the corresponding surface water drainage conditions. Each perimeter drainage feature (perimeter ditches, culverts, and detention basins) may be installed before but not after the Phase below where each feature is initially planned for construction.

Phase 1/2: The north slopes of Trenches 8-10 drain to the channel along Farm-to-Market 1686 and leave site. The slopes of Trenches 6-9 of the Existing TBC Area (except those mentioned previously) will drain into the south-sloping perimeter ditch before reaching the existing detention pond, as originally permitted. Landfill slopes and final cover swales on the north slopes of Trenches 8/9 and the east slopes of Trenches 7/8 shall be constructed in accordance with Attachment III-1. The south slope of Trench 7 will contain a temporary letdown chute, as shown in Appendix 2B to receive the drainage from the swales along the east slope.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 3/4: The construction of Cell G2 will cause the perimeter ditch east of Trenches 7/8 to be unable to flow into the existing detention pond, per Existing TBC conditions in Appendix 2B. Therefore, the perimeter ditch shall be terminated at the SE corner of Trench 7 and Perimeter Ditch F shall be extended to convey flows east to the East Basin, which shall be constructed fully or partially at this phase (if constructed partially, it shall be progressively constructed and fully constructed by Phase 5/6. The new portion of Perimeter Ditch F shall be adjacent to the northeast perimeter of future Cell H1 and northern perimeter of future Cells H2, I1 and I2. The temporary letdown chute in the Trench 7 footprint shall remain, as it is located east of Cell G2 and able to discharge into Perimeter Ditch F.

The portion of Perimeter Ditch D to be constructed at this time shall be from the SW corner of Cell G1 to the discharge point of the East Basin to convey flows from the north and south slopes of the constructed expansion area. A temporary sediment basin shall be constructed at the west edge of Cell G1 to capture flow from the west slope of Cell G1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch D).

The north and south culverts discharging into the East Basin shall be constructed at this time.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 5/6: The portion of Perimeter Ditch D to be constructed at this time shall be from the SW corner of Cell F1 to west extent of the previously constructed portion (SW corner of Cell G1). A small portion of Perimeter Ditch B shall be constructed at this time, along the North edge of Cell F1. A temporary sediment basin shall be constructed at the west edge of Cell F1 to capture flow from the west slope of Cell F1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch B/D). Perimeter Ditch B, running east-west will also discharge into this sediment basin. It is assumed that Perimeter Ditch A (design information in Appendix 2B) has already been constructed at this time.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 7/8: The portion of Perimeter Ditch D to be constructed at this time shall be from the SW corner of Cell E1 to west extent of the previously constructed portion (SW corner of Cell F1). The portion of Perimeter Ditch B shall be constructed at this time shall be from the NW corner of Cell E1 to west extent of the previously constructed portion (NW corner of Cell F1). A temporary sediment basin shall be constructed at the west edge of Cell F1 to capture flow from the west slope of Cell E1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch B/D). Perimeter Ditch B shall continue to discharge into the temporary sediment basin.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 9/10: At this time, the remaining portions of Perimeter Ditches B and D shall be constructed, along with the West Basin and Drainage Channels 1 and 2. A temporary sediment basin shall be constructed at the west edge of Cell D1 to capture flow from the west slope of Cell E1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch B/D).

At this time, the route of discharge from the existing north detention pond will no longer be active. Flow will instead pass through the regraded Drainage Channel 2 and around the West Basin (via Drainage Channel 1).

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 11/12: A temporary sediment basin shall be constructed at the west edge of Cell C1 to capture flow from the west slope of Cell C1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch B/D). Perimeter Ditch C shall be installed in its entirety at this point.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control

- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 13/14: A temporary sediment basin shall be constructed at the west edge of Cell C1 to capture flow from the west slope of Cell C1 (and all areas below the elevation, or otherwise unable to flow into the Perimeter Ditch B/D).

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 15/16: No temporary channel shall be installed at this time, due to permanent perimeter controls being in place to handle flows from Cells A1 and A2.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 17/18: The temporary letdown chute in Trench 7 shall be abandoned at this time, to prevent stormwater discharge into Cells H1 and H2. A temporary sediment basin shall be constructed at the east edge of Cell H2 to capture flow from the east slope of Cell H2 (and all areas below the elevation, or otherwise unable to flow out of the new cells).

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams

- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

Phase 19/20: No temporary channel shall be installed at this time. Perimeter Ditch E (along with the third culvert discharging into the East Basin) shall be installed along the east edge of Cell I2. This shall complete the permanent perimeter ditch construction at the Facility.

During the construction of these phases, the following temporary erosion and sediment controls shall be used, in addition to the stormwater diversion features discussed above:

- Dust control
- Check dams
- Blankets and matting (to stabilize slopes at final grade)
- Silt fences and fiber rolls (where runoff from slopes has the potential to leave the property)

4.0 CONTAMINATED WATER

The handling, storage, treatment, and disposal of contaminated surface or groundwater shall be in accordance with TAC Rule §330.207. Rainfall that shall come in contact and percolate through the working face of the waste unit shall be considered leachate, which is discussed in Attachment III-3 – Leachate and Contaminated Water Plan.

The working face shall be maintained to prevent run on flow and to prevent runoff from leaving the landfill boundary after contacting exposed waste. Furthermore, the working face shall be enclosed within a soil diversion berm and will typically have minimal slopes, as to limit runoff and provide means for rainfall to percolate through the waste. Calculations are provided in Attachment III-3 – Leachate and Contaminated Water Plan.

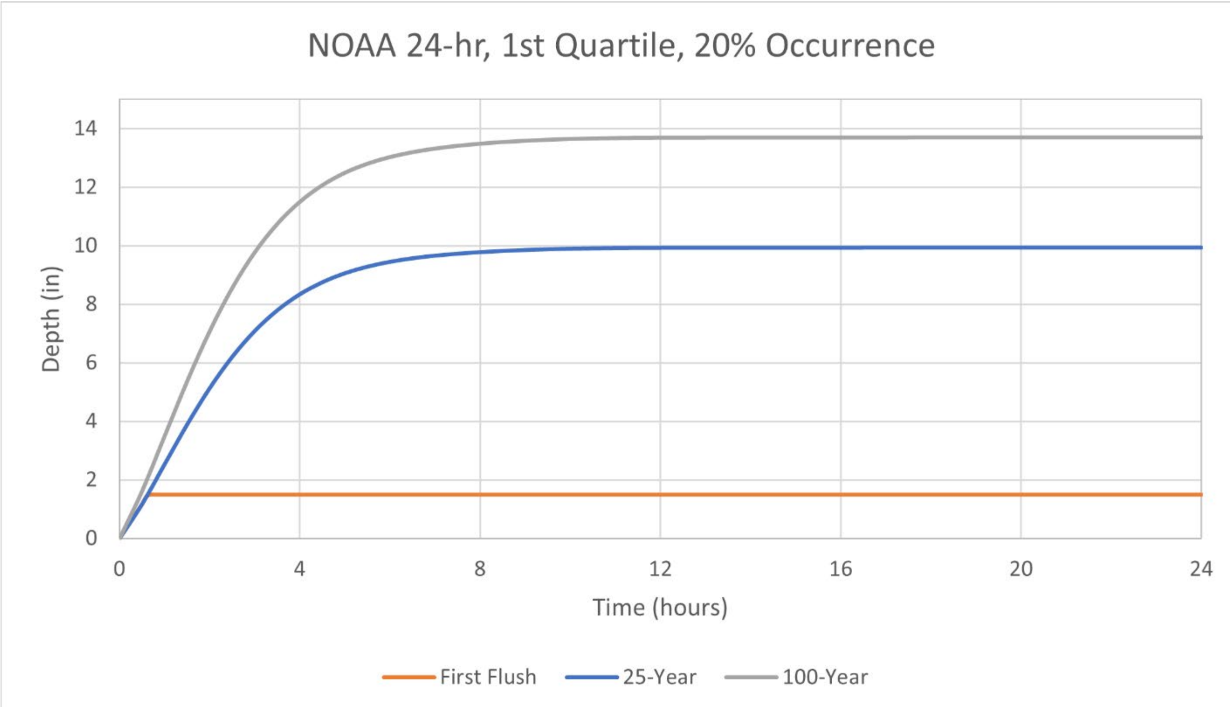
The leachate management system shall convey leachate collected from the bottom of each cell to storage tanks within the Facility. Drawing III.A1.6 and III.A1.17 of Attachment III-1 provide information on these storage units. Additional discussion is also provided in Attachment III-3 – Leachate and Contaminated Water Plan. Further information on the containment structure and the storage units of the Existing Constructed Area can be found in previous permit amendments.

5.0 METHODS AND CALCULATIONS

5.1 Storm Drainage Modeling Introduction

Storm drainage modeling for pre and post development site discharges and drainage components external to the permitted waste limits, including and the design of perimeter ditches, detention basins, and drainage culverts utilize Bentley Systems CivilStorm v10.3 software. Two models were developed using the unit hydrograph runoff method and SCS Curve Number methodology for calculating peak flows and runoff volumes. The first model is the Pre-Development Conditions Model used to establish pre-development peak rates of runoff at site discharge comparison points corresponding to the Tributary Ditch to the west and Chocolate Bayou to the east. Second is the Post-Development Conditions Model which includes the final stormwater elements identified in Section 3.0 and to route the 1.5-inch first flush storm event, 25-year storm event, and 100-year storm event through perimeter ditch channel routing, culvert sizing, and detention basin design. See Figure 5-1 for cumulative rainfall distributions used in the storm drainage modeling. Rainfall data was obtained from the NOAA Atlas 14, Volume 11 (version 2) precipitation frequency tables for the project location. A 25-year recurrence interval and 24-hour duration storm event were selected giving a cumulative depth of 9.93-inches for both the Pre-Development and Post-Development Conditions Model. NOAA Atlas 14 temporal distribution of first quartile, 20% occurrence interval was selected for the 9.93-inch cumulative 25-year depth and 13.70-inches for the 100-year event depth. The First Flush rainfall event was also modeled with a cumulative depth of 1.5-inches, designed to match the distribution curve of the 20% occurrence interval until reaching the cumulative 1.5-inch depth.

Figure 5-1: NOAA Atlas 14 Cumulative Rainfall Distribution



5.1.1 Pre-Development Conditions Model

The Pre-Development Conditions Model was created to identify corresponding watershed peak runoff leaving the site to understand the maximum flow rates to each site discharge point. The watershed boundary splits the pre-development site runoff into two directions. The west portion of the site is approximately 147 acres draining to the rerouted Tributary Ditch drainage channel (referenced Drainage Channel 1 in Section 3.6) in the middle of the subarea and south off the property. The east portion of the site contains 3 subareas all eventually flowing into the Chocolate Bayou. The east subareas make up approximately 146 cumulative acres. Subarea catchment attributes can be seen in Table 5-1.

A single west drainage subarea is classified as Cultivated Agricultural Lands with Straight Row Crops in good condition. For USGS Soil D classification, the SCS Curve Number used was 89.

The east watershed has been split into three subareas, all falling under USGS Soil D Classification. From west to east the three subareas current landuse is as follows: borrow pit for existing landfill operations, compost storage, and agricultural row crops. However, for this analysis to use “pre-development” conditions, based on historical aerial imagery the entire east watershed has also been classified as Cultivated Agricultural Lands with Straight Row Crops in good condition. For USGS Soil D classification, the SCS Curve Number used was 89.

5.1.2 Post-Development Conditions Model

The Post-Development Conditions Model shows the integrated network of subarea catchments with proposed perimeter ditches and detention basins. Table 5-1 shows a high-level comparison between cumulative catchment area and corresponding peak runoff, reflecting changes in catchment area due to proposed landfill grading and channel capacity. With more area now contributing to Chocolate Bayou (Outfall East), the Detention Basin East is required to decrease peak discharge below the pre-development conditions peak flow as seen in Table 5-1. No detention is required on the west side of the site as a reduction in drainage area and changes in landcover SCS Curve Numbers and time of concentrations resulted in lower peak flows in post-development conditions compared to pre-development conditions for the 25-year storm event.

Table 5-1: Pre-Development vs. Post-Development Model Comparison for 25-Year Rain Event

Area	Attribute	Pre-Development Condition Model	Post-Development Condition Model*
Outfall West	Peak Runoff [cfs]	359.81	290.04
	Total Runoff Volume (ac-ft)	104.94	89.40
	Cumulative Catchment Area [acre]	146.65	136.57
Outfall East	Peak Runoff [cfs]	360.88	354.66
	Total Runoff Volume (ac-ft)	104.63	113.99
	Cumulative Catchment Area [acre]	146.23	172.05

*Runoff results are presented with detention provided.

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The post-development conditions catchments were relatively consistent with SCS Curve Number selection. Catchment areas that will be converted from pre-development conditions to landfill were given the classification Fully Developed Urban Areas with Open Space in fair condition (grass cover 50%-75%). This area was defined to have USGS Soil D classification, which provided an SCS Curve Number of 84 for the disturbed areas. The remaining area within the property boundary were assumed to match the pre-development conditions land use classifications.

5.1.2.1 Perimeter Ditch Design

Proposed Perimeter Ditch design attributes can be seen in Table 5-2. All ditches are trapezoidal in shape with 3:1 side slopes. Reference Drawing III.A2.3 in Appendix 2A for Ditch ID’s.

Table 5-2: Perimeter Ditch Attributes

Ditch ID	Bottom Width [ft]	US Invert El [ft]	DS Invert El [ft]	Length1 [ft]	Ditch Top Width (max) [ft]	Rise(max)/ Depth[2] [%]	Side Slopes	Manning's n	Slope1 [%]	Velocity [fps]	Discharge [cfs]
B-1	12	62.20	60.28	3,920	48.7	88.3	3:1	0.03	0.05	1.76	162.40
B-2	12	60.28	59.90	750	45.3	66.1	3:1	0.03	0.05	1.66	162.25
B-3	12	62.0	59.2	740	45	46.9	3:1	0.03	0.40	2.75	150.79
C	5	65.00	61.40	1,800	31.4	55.6	3:1	0.03	0.20	1.48	8.44
D	10	61.90	59.00	4,740	49.4	60.7	3:1	0.03	0.06	2.59	212.66
E[1]	5	65.00	59.00	810	49.4	26.0	3:1	0.03	0.75	0.23	0.58
F	4	64.00	59.00	2,760	49.4	66.1	3:1	0.03	0.20	1.57	74.89

[1]Length and slope listed are from the beginning of the ditch to the outfall as shown with flowline on Drawing III.A2.3 in Appendix 2A.
[2]Rise(max)/Depth percent is reflected as the maximum water level depth divided by the total available depth in the ditch.

5.1.2.2 Culvert Design

Culverts are used where necessary to cross storm drainage infrastructure throughout the proposed site. Drawing III.A2.3 in Appendix 2A shows the location and naming convention for the culverts with corresponding attributes listed in Table 5-3. All culverts used for stormwater conveyance have been sized as reinforced concrete pipe. However, upon approval by Engineer, corrugated dual wall, smooth interior HDPE pipe may also be used.

Table 5-3: Perimeter Ditch Culvert Attributes (25-year Storm)

Culvert ID	Diameter [in]	# of Barrels	US Invert El [ft]	DS Invert El [ft]	Length [ft]	Manning's n	Slope [%]	Velocity [fps]	Discharge [cfs]
B-2	24	3	59.90	59.50	100	0.013	0.4	7.87	74.13
B-3	48	3	59.20	58.70	90	0.013	0.6	4.27	159.02
D	54	3	59.00	58.50	80	0.013	0.6	5.26	212.39
E	48	1	59.00	58.50	80	0.013	0.6	5.05	54.71
F	48	1	59.00	58.50	80	0.013	0.6	6.29	74.42

5.1.2.3 First Flush Detention Basin West Design

The elevation-area storage data for the First Flush Detention Basin West (West Basin) can be found in Table 5-4. The West Basin has one inlet point through culvert B-2 (see Table 5-3). The inverts of the culverts were placed at the bottom depth of Perimeter Ditch B and were sized to divert runoff from the first flush storm event to the basin. Runoff exceeding the first flush will bypass these culverts and flow will continue through Perimeter Ditch B to discharge at Culvert B-3. The basin was sized to capture the 1.5-inch first flush storm event volume with up to 1 ft of depth in the basin (i.e., the volume difference between El. 60' and El. 59') before reaching an overflow spillway. A culvert pipe outlet structure was designed to control the outflow and allow for detention in the unlined, dry grass-bottom basin. The outlet structure consists of a triple 15-inch concrete culvert with upstream invert El. 59.00' and downstream invert El. 58.70'. The pipe size and invert are set to control the outflow from the basin during the first flush event without utilizing the emergency overflow weir set to El. 60.00'. The weir crest is 85.00 ft. wide then slopes up to elevation El. 61.00' for a top width of 91 ft.

Table 5-4: First Flush Detention Basin West Elevation-Area

Elevation [ft]	Areas [acres]
59.00	0
59.50	2.135
60.00	5.864
61.00	7.813

5.1.2.4 Detention Basin East Design

The elevation-area storage of Detention Basin East (East Basin) can be seen in Table 5-5. The basin has a similar two-stage outlet structure with concrete pipes and spillway weir design, both are activated to detain outflow from the basin during a 25-year storm event. Two 48-inch culverts are used to convey the flow from the basin from upstream invert El. 57.00' to downstream invert El. 56.50'. The weir crest is 35 ft. wide at El. 61.0', which is set above the 25-year floodplain elevation of 60.75. The basin embankment is set to El. 63.0', which is higher than both the 100-year floodplain and the 100-year storm event flowing through the basin outlet structure. This composite outlet structure discharges to an existing ditch (Drainage Channel 3) routed directly to Chocolate Bayou east of the project boundary.

Table 5-5: Detention Basin East Elevation-Area

Elevation [ft]	Area [acres]
57.00	0
58.00	4.836
59.00	7.064
60.00	7.305
61.00	7.599
62.00	7.846
63.00	8.094

5.2 Rational Method Calculations

The Rational Method was used to calculate the peak flows for nine (9) drainage basins that contribute runoff to the letdown chutes in the expansion area, as all these drainage basins were less than 200 acres. The nine drainage basins were delineated by landfill slopes and the orientation of the final cover swales. The drainage basins are shown on Drawing III.A2.4 in Appendix 2A. The 25-year peak flows for drainage Basins 1-9 were calculated using unvegetated conditions, as to provide the most conservative scenario for sizing the letdown chutes. One additional drainage basin (D2/D6) was analyzed to support the re-design of the existing TBC swale on the north slope of the existing TBC area (Channel 3, shown on Drawing III.A1.8 of Attachment III-1). Drainage Basin D2/D6 has a unique nomenclature because it was originally a part of the previous permit design calculations for the Facility. More information for the review of historic calculations is provided in Section 6.0 of this Report.

Three sub-basins were identified for designing final cover swales, which are shown on Drawing III.A2.4 in Appendix 2A of this Report. Each sub-basin's 25-year peak flow was calculated for both vegetated and unvegetated conditions to provide the most conservative scenarios for swale design, which is discussed in Section 5.3 of this Report.

The Rational Method calculations can be found in Appendix 2F. The variables of the rational method equation (Q = CIA) were determined using the Texas Department of Transportation (TxDOT) Hydraulic Design Manual (September 2019 revision). The relevant pages of this manual are included as references within Appendix 2F. A summary of the rational method is provided in Table 5-6.

The Rational Methods assumptions unique to this design are as follows:

- The precipitation data was obtained using NOAA Atlas 14, Volume 11, Version 2 with a user-inputted location approximately 10 miles SE of Victoria, TX (Latitude: 28.7371°, Longitude: -96.9737°)
- The Relief Runoff Coefficient was determined by using a weighted average of areas within the drainage basin corresponding to certain slopes.
- The Soil Infiltration Coefficient of 0.08 was used, assuming the average soil type from the borrow area is a sandy clay.
- Two Vegetal Cover Coefficients (0.12 and 0.04) and two Manning n-values (0.024 and 0.011) were used, with the assumption that the critical cover scenarios are vegetated and unvegetated (bare soil). The intermediate condition was not considered.
- When calculating time of concentration, some situations did not reach shallow concentrated flow. For those situations, a flow length of zero was inputted into this portion of the spreadsheet.
- For time of concentration of shallow flow, the depth was rounded to the nearest foot when calculating the wetted perimeter.
- Areas and lengths were obtained using AutoCAD Civil 3D 2020.

Table 5-6: Rational Method Results Summary

Drainage Basin ID	Area (Ac)	Average Rainfall Intensity (in/hr)	Peak Discharge of 25-Year Storm (cfs)
Basin 1	23.8	6.72	86.3
Basin 2	34.3	6.35	117.6
Basin 3	30.5	7.04	115.9
Basin 4	24.1	6.83	88.7
Basin 5	27.7	6.03	90.1
Basin 6	21.2	6.88	78.7
Basin 7	25.9	6.71	93.6
Basin 8	29.4	6.71	106.3
Basin 9	32.1	6.33	109.7
Basin D2/D6 (Existing TBC nomenclature, used for chute redesign)	24.04	10.23	112.9
Sub-Basin ID	**Area (Ac)**	**Average Rainfall Intensity (in/hr)**	**Peak Discharge of 25-Year Storm (cfs)**
Sub-Basin 2-1	4.05	7.06 (vegetated) 12.6 (unvegetated)	10.9 (vegetated) 23.5 (unvegetated)
Sub-Basin 4-1	18.51	5.35 (vegetated) 10.6 (unvegetated)	33.7 (vegetated) 82.4 (unvegetated)
Sub-Basin 5-1	9.88	5.59 (vegetated) 9.13 (unvegetated)	17.7 (vegetated) 36.1 (unvegetated)

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5.3 Swale Sizing Methodology

Peak flows for sizing the final cover swales and the letdown chutes were obtained using the Rational Method, discussed in Section 5.2 of this Report. For methods and calculations for the landfill perimeter ditches and drainage channels, see Section 5.1.

Three critical swales were considered for sizing all swales withing the landfill expansion. Swale #1—receiving the runoff of Sub-Basin 2-1—is located on a 3:1 slope, thus representing the narrowest V-shaped cross section of all design swales, with the largest tributary area of these similar swales. Swale #2—receiving the runoff of Sub-Basin 5-1—is located on a 5% slope, thus representing a wider V-shaped cross section than Swale #1 but with a larger tributary area. Swale #3—receiving the runoff of Sub-Basin 4-1—is located between a 4:1 and a 5% slope, thus representing the widest V-shaped cross section of all swales but with the largest tributary area (18.5 acres). All three critical swales were analyzed using the

25-year peak flow for both vegetated and unvegetated conditions. All swales within the landfill expansion, using criteria outlined in Section 3.3 are adequately designed to provide approximately 1-foot of freeboard in a 25-year design storm, with a flow velocity not exceeding 4 ft/sec.

An analysis was also conducted to prove the adequacy of the existing TBC swales using the methodology stated above. More information is provided in Section 6.0 of this Report.

Three critical letdown chutes also were analyzed. LD-2 represents the typical chute running directly down the 3:1 slope, receiving the largest flow rate of similar features. LD-3 represents the typical chute running along the junction of two 3:1 slope (itself having a slope of approximately 24%), receiving the largest flow rate of similar features. EX-TBC Letdown represents the redesigned chute on the existing TBC area of the landfill, which has a tributary area affected by the landfill expansion. All letdown chutes provide at least 6 inches of freeboard to the top of the bedding material (12 inches to the top of the channel) in a 25-year design storm.

The swales were analyzed using Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. This program utilizes Mannings equation. Reports from this program are provided in Appendix 2G.

5.4 Swale Lining Calculations

Three critical letdown chutes (LD-2, LD-3, discussed in Section 5.3 of this Report) were analyzed for shear stress to assign adequate lining material to these structures. The method for determining swale lining is from Hydraulic Engineering Circular (HEC) No. 14, Third Edition Hydraulic Design of Energy Dissipators for Culverts and Channels. The relevant pages of this manual are included as references within Appendix 2H. The spreadsheet-generated calculations are provided within this Attachment.

Assumptions unique to this design are as follows:

- Design flow rates are taken from the Rational Method Calculations, discussed in Section 5.2.
- For constructability, gabion mattress thickness is available in increments of 6” and mean rock size is available in increments of 3”.

6.0 HISTORIC DRAINAGE DESIGN REVIEW

Engineering best practices required the review of calculations included in previous permits for the Facility. This was required to verify that the drainage design of the existing permitted landfill is still appropriate where design guidance may have changed.

Drainage Basins A-1, A-2, and A-3, as shown on Drawing 6B-1 of Appendix 2B, were analyzed to verify that the post-development discharge flow rates (using updated methodologies consistent with the Landfill expansion design) do not exceed the historic calculations. A summary of the results is included below:

- Drainage Basin A-1 (31.0 acres) was analyzed using the geometry shown in Drawing 6B-1. The flow rate at discharge point NW-HWY, using current methodologies (Rational Method, as described in Section 5.2 of this Report) does not exceed the result of the historic calculation. This calculation is included in Appendix 2F.
- Drainage Basin A-2's (32.3 acres) geometry has been altered as a result of the landfill expansion. Notable revisions include an increase of 0.8 acres and additional 4:1 and 3:1 slopes. Because the landfill expansion design utilizes the same discharge point, these revised post development conditions were compared to original drainage Basin A-2 conditions. The flow rate at discharge point NE-HWY, using current methodologies (Rational Method, as described in Section 5.2 of this Report) does not exceed the result of the historic calculation. This calculation is included in Appendix 2F.
    - The NE-HWY channel (Drawing III.A2.3, also on Historic Drawing 6B-1 as "Channel C-2") is adequate for conveyance of existing TBC areas associated with the landfill expansion.
- Drainage Basin A-3 (91.5 acres) is divided into 8 sub-basins, which are shown on Drawing 6H-6 of Appendix 2B. This drainage basin was analyzed using the Rational Method (as described in Section 5.2 of this report) and the HEC-1 results from previous permits were reviewed to verify that the existing detention pond is compatible with the new design. To summarize:
    - The discharge resulting from Sub-Basin P-1, C-4, C-5, and C-6 does not exceed the result of the historic calculation for each respective drainage basin. The Rational Method calculations are included in Appendix 2F.
    - Sub-Basin C-1 will be completely eliminated from the existing detention pond located in drainage basin A-3. This area, under the landfill expansion, will be routed to the East Basin and is therefore analyzed in Section 5.0 of this Report.
    - Sub-Basins C-2 and C-3 are significantly altered by the landfill expansion and the discharge was analyzed as a single drainage basin. Because the landfill expansion design utilizes the

same discharge point, these revised post development conditions were compared to the combined original Sub-Basin C-2/3 conditions. The discharge does not exceed the result of the historic calculation for the combined drainage basins. The Rational Method calculations are included in Appendix 2F.

- Sub-Basin "DP" HEC-1 and Detention Pond Design calculations from previous permits were reviewed to evaluate the existing detention basin release rate. The existing constructed detention basin is adequate for post development flows for the landfill expansion.

In summary, the review of historic calculations has determined that the post development offsite discharges are not adversely altered when current design methodologies are used. Furthermore, no adverse alterations result from the landfill expansion post-development conditions.

The existing constructed and TBC swales shown on Drawing 6H-24 of Appendix 2B were also analyzed for flow depth and velocity under peak vegetated and unvegetated flow conditions, to prove the adequacy of the Existing TBC design with methodologies consistent with the landfill expansion design. It was determined that the freeboard of these swales are a minimum of 6 inches and re-design is not required. Appendix 2F includes the Rational Method calculations and the results of Hydraflow Express for Civil 3D, for determining depth and velocity.

7.0 FLOODPLAIN EVALUATION

TCEQ guidelines defined in Title 30, Part 1, Chapter 330, Subchapter B, Rule 330.63 requires that municipal solid waste facilities be located outside of the 100-year floodplain or provide a Conditional Letter of Map Change from FEMA. The existing permitted landfill is not located with a FEMA regulatory floodplain. However, portions of the landfill expansion property are located in a FEMA Zone A Special Flood Hazard Area (SFHA 100-year floodplain), as shown on the currently regulated Flood Insurance Rate Map (FIRM) Panel number 4806370200B, effective September 18, 1987. The regulatory FIRM, depicting the landfill boundary is included in Appendix 2I. Site improvements including grading, excavation, ditch relocation, perimeter berms, and floodplain fill will be required for the landfill expansion to meet TCEQ requirements and keep floodwaters out of the landfill expansion limits of waste boundary.

Flooding of the landfill expansion property occurs from two sources, manmade drainageways identified as the Chocolate Bayou and a Tributary Ditch (an unnamed tributary of the Chocolate Bayou), both of which contain FEMA regulatory Zone A floodplain. The Chocolate Bayou bisects City of Victoria-owned property near the east property boundary. The proposed landfill expansion slightly encroaches into the edge of the Chocolate Bayou 100-year floodplain. A perimeter berm, with a top elevation that coincides with the top of the landfill liner will encroach upon the floodplain and redefine the 100-year floodplain on the east side of the landfill expansion.

On the west side the unnamed Tributary Ditch to the Chocolate Bayou follows the northern property boundary before turning south to bisect through the expansion site. Removing the Tributary Ditch floodplain from the proposed landfill expansion requires this ditch to be completely rerouted outside of the permitted landfill limits of waste and along the permit boundary. The tributary ditch will be rerouted beginning at the northwest corner of the expansion to follow the west property line, then turning east at the southwest corner to follow the south property line before discharging the site at the original Site Discharge Comparison Point. A perimeter berm with a top elevation that coincides with the top of the landfill liner will encroach upon the floodplain and redefine the 100-year floodplain on the west side of the landfill expansion.

FEMA Zone A is defined as a SFHA without base flood elevations determined, and typically is not accompanied by existing hydrologic or hydraulic modeling that would serve as Effective FEMA modeling. Additionally, a FEMA FIRM update is anticipated at some point in the future, as a Revised Preliminary FIRM Panel Number 48469C0450H was issued by FEMA dated April 30, 2020. This revised mapping is yet to be adopted by FEMA, but it's use is allowable for LOMC's as best available data. The preliminary mapping continues to show similar portions of the landfill expansion property within a FEMA Zone A floodplain. The revised preliminary FIRM depicting the fill boundary is included in Appendix 2J. Following discussions with City, County, and FEMA Region VI staff it was determined that the Zone A floodplain depicted on the Preliminary mapping was only re-delineated using more recent topographic contour/surface data and was confirmed that no hydraulic modeling existed that would accompany either the regulatory FIRM or preliminary FIRM. Preliminary FEMA mapping also maintains the floodplain as a Zone A with no base flood elevations determined.

Since the project site is within a Zone A floodplain and no existing hydrologic and hydraulic modeling has previously been prepared, following methods prescribed in FEMA 265, pre-development and post-project conditions hydrology and hydraulic modeling (HEC-RAS v5.0.6) have been created to determine the impact of the proposed landfill expansion on 100-year floodplain and water surface elevations to both flooding sources, the Chocolate Bayou and Tributary Ditch.

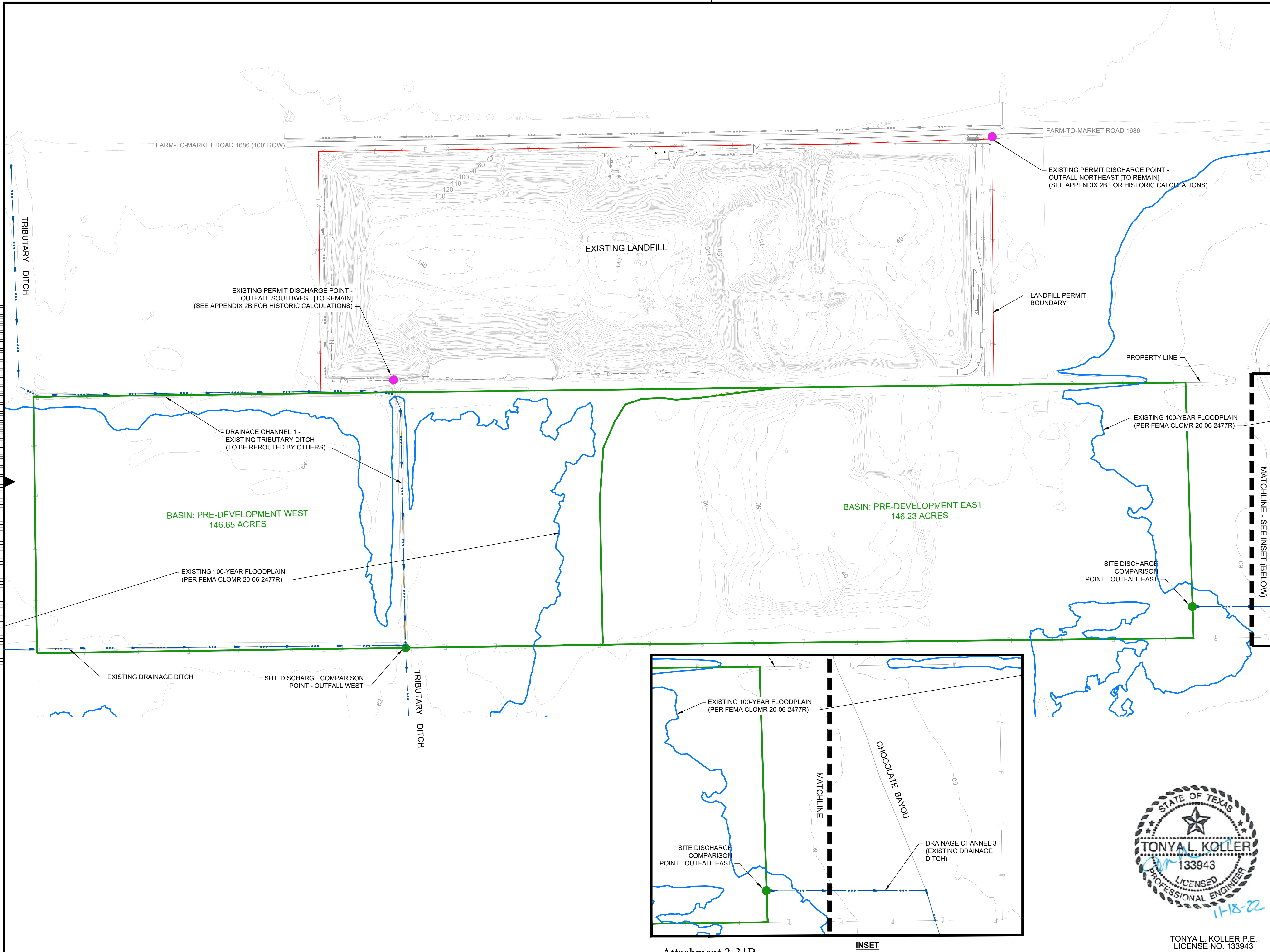
The hydraulic analysis determined the existing conditions flooding extents to be significantly different than the Zone A floodplain depicted on current FEMA FIRM mapping. However, while the proposed landfill boundary significantly encroaches into the 100-year floodplain determined through hydraulic modeling, the post-project analysis determined a no-rise condition resulting from compensatory grading to mitigate the proposed landfill encroachments. Mitigation resulted in no impact to 100-year water surface elevations to adjacent properties both upstream and downstream of the project. The post-project 100-year floodplain is included in Appendix 2K. These results were captured with endorsement of a Conditional Letter of Map Revision (CLOMR) from FEMA (Case No.: 20-06-2477R). The approved CLOMR is an acknowledgment by FEMA that, if built as proposed, the landfill expansion would officially be located outside of FEMA regulatory floodplain upon request of a Letter of Map Revision (LOMR). The hydraulic analysis does not model the floodplain along the entire Chocolate Bayou, only through the area of interest (i.e. project site). Therefore, the CLOMR maintains the floodplain through the landfill permit boundary as a Zone A and is not proposed to change to a Zone AE designation. This was decided due to the downstream floodplain along the Chocolate Bayou will still be shown as Zone A. FEMA's endorsement of the CLOMR and review of the hydraulic analysis establishes the 100-year floodplain water surface elevations at the landfill permit boundary. A copy of the CLOMR is included in Appendix 2L. A Victoria County Floodplain Development Permit has also obtained to meet local floodplain requirements, included as Appendix 2O.

As a stipulation of CLOMR endorsement, FEMA requires all adjacent property owners be notified that will experience a regulatory floodplain revision on their property due to the proposed project, whether the result includes widening, shifting, or increases in base flood elevations. As a result of the hydraulic analysis, twenty-five (25) properties surrounding the facility expansion received certified mailings that, if built and if requested through the LOMR process, the regulatory FEMA floodplain will officially be revised on their property. As previously noted, the hydraulic analysis did not reveal any increases in base flood elevations, however it did result in significant widening and shifting of the floodplain extents, even in the pre-development condition. A map of all properties contacted, copies of each notification letter sent, and USPS return receipts are included in Appendix 2N.

The FEMA CLOMR addresses the full buildout/final closure phase of the completed landfill expansion. However, this long-range plan does not address the interim condition during landfill operations to meet TAC Rule §330.307 requiring protecting the facility from flooding and providing protection from the 100-year frequency flood. To meet these criteria in the interim condition, a perimeter berm will be constructed around the expansion perimeter. This berm is consistent with the limit of fill established by the CLOMR and is set a minimum 3-feet above the 100-year flood elevation to protect the limits of waste from flooding. The outside slope of the perimeter berm begins to establish the limits of waste and the berm top elevation coincides with the elevation of the landfill liner, as the liner will be installed on the inside of the perimeter berm to the top of the perimeter berm. Therefore, while the landfill expansion will encroach upon and constrict the 100-year floodplain, according to the hydraulic analysis completed as part of the CLOMR, the landfill expansion will not restrict flow or have an adverse impact upon water surface elevations to the 100-year floodplain, meeting Rule 330.307. Refer to Attachment III-1 Permit Drawings for cross sections through the landfill expansion depicting the 100-year flood elevations and the perimeter berm sections. A FEMA LOMR will be obtained prior to requesting a TCEQ pre-opening inspection for any landfill cells that would be subject to 100-year floodplain according to the existing conditions floodplain limits established as part of the CLOMR.

APPENDIX 2A – DRAWINGS

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV PER TCEQ NOD
2	11/18/22	JPP	TJS	REV PER TCEQ NOD 2



Attachment 2-31B

LEGEND:

- BASIN BOUNDARY
- EXST PERMITTED DISCHARGE POINT
- EXPANSION SITE DISCHARGE POINT
- EXISTING FLOWLINE
- PROPERTY LINE
- PERMIT BOUNDARY
- 100-YEAR FLOODPLAIN

NORTH

0 300' 600'
SCALE IN FEET

FOR PERMITTING PURPOSES ONLY

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FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. SCHMIDT
designed	checked
T. SCHMIDT	J. PARKER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

EXPANSION PERMIT DESIGN

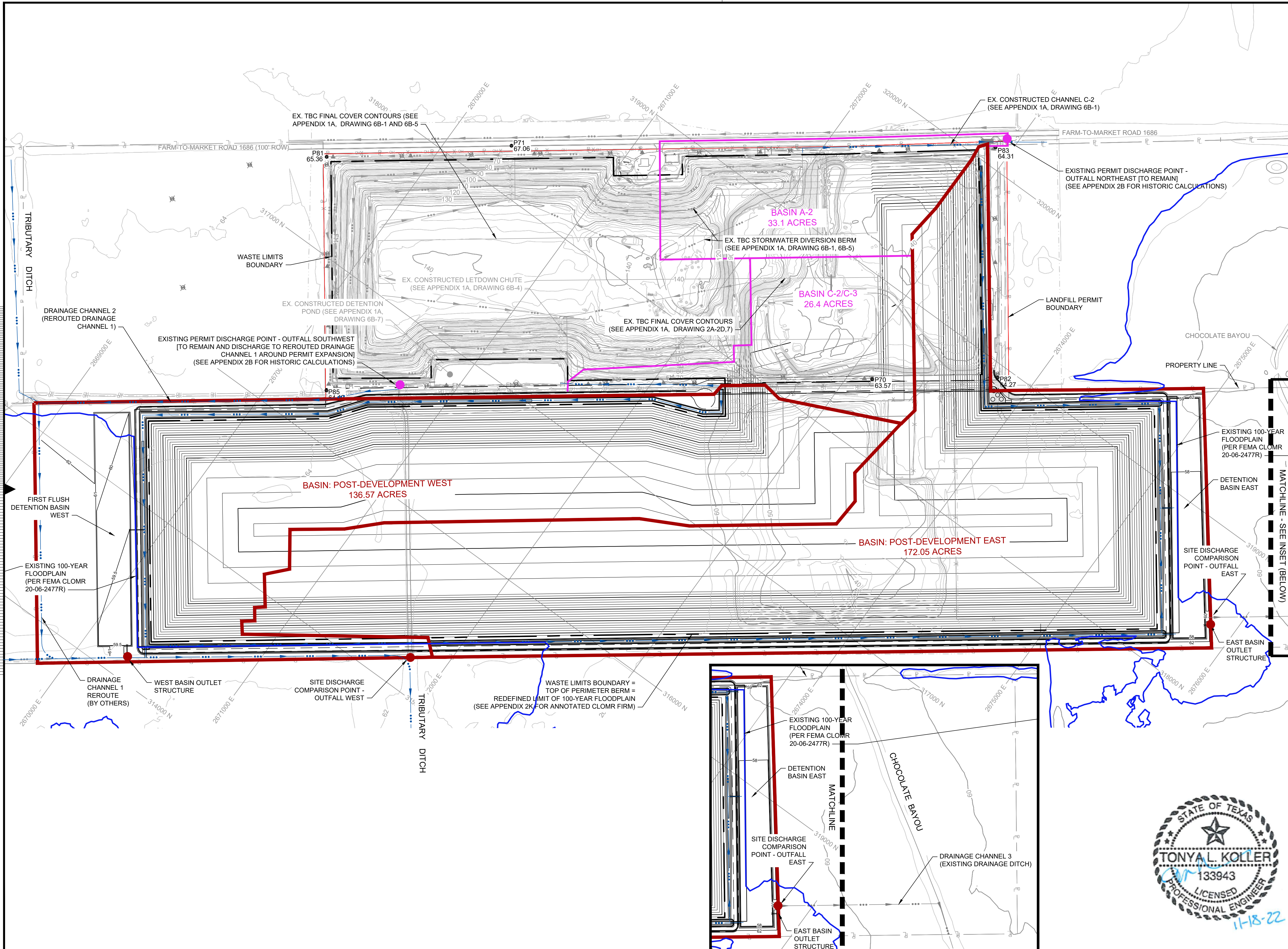
STORMWATER DESIGN FIGURE:
LANDFILL PRE-DEVELOPMENT BASINS

project	contract
107608	-

drawing III.A2.1 — rev. 2

sheet 1 of 4 sheets

file



Attachment 2-31C

no.	date	by	ckd	description
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1	8/15/22	TJS	TLK	REV PER TCEQ NOD
2	11/18/22	JPP	TJS	REV PER TCEQ NOD 2

NOTE:

1. THE MODIFIED EXISTING BASINS SHOWN ON THE EXISTING TO-BE-CONSTRUCTED LANDFILL SUPPORT THE HISTORIC DRAINAGE DESIGN REVIEW, WHICH CAN BE FOUND IN THE 1522B PERMIT AMENDMENT, ATTACHMENT 2. THESE HISTORIC BASIN AREAS WERE MODIFIED BY THE LANDFILL EXPANSION. THE ORIGINAL BASIN A-2 CAN BE FOUND ON DRAWING 6B-1 OF APPENDIX 2B. THE ORIGINAL BASINS C-2/C-3 CAN BE FOUND ON DRAWING 6H-6 OF APPENDIX 2B.

LEGEND:

- BASIN BOUNDARY
- DISCHARGE POINT
- PERIMETER DITCH (SEE FIGURE 3)
- MODIFIED EXISTING BASIN (SEE NOTE)
- EXISTING BASIN DISCHARGE POINT
- PROPERTY LINE
- PERMIT BOUNDARY
- WASTE LIMITS BOUNDARY
- 100-YEAR FLOODPLAIN

NORTH

0 300' 600'
SCALE IN FEET

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date	detailed
MARCH 2022	T. SCHMIDT
designed	checked
T. SCHMIDT	J. PARKER

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EXPANSION PERMIT DESIGN

STORMWATER DESIGN FIGURE:
LANDFILL POST-DEVELOPMENT BASINS

project	contract
107608	-

drawing III.A2.2 – rev. 2

sheet 2 of 4 sheets

file

no.	date	by	ckd	description
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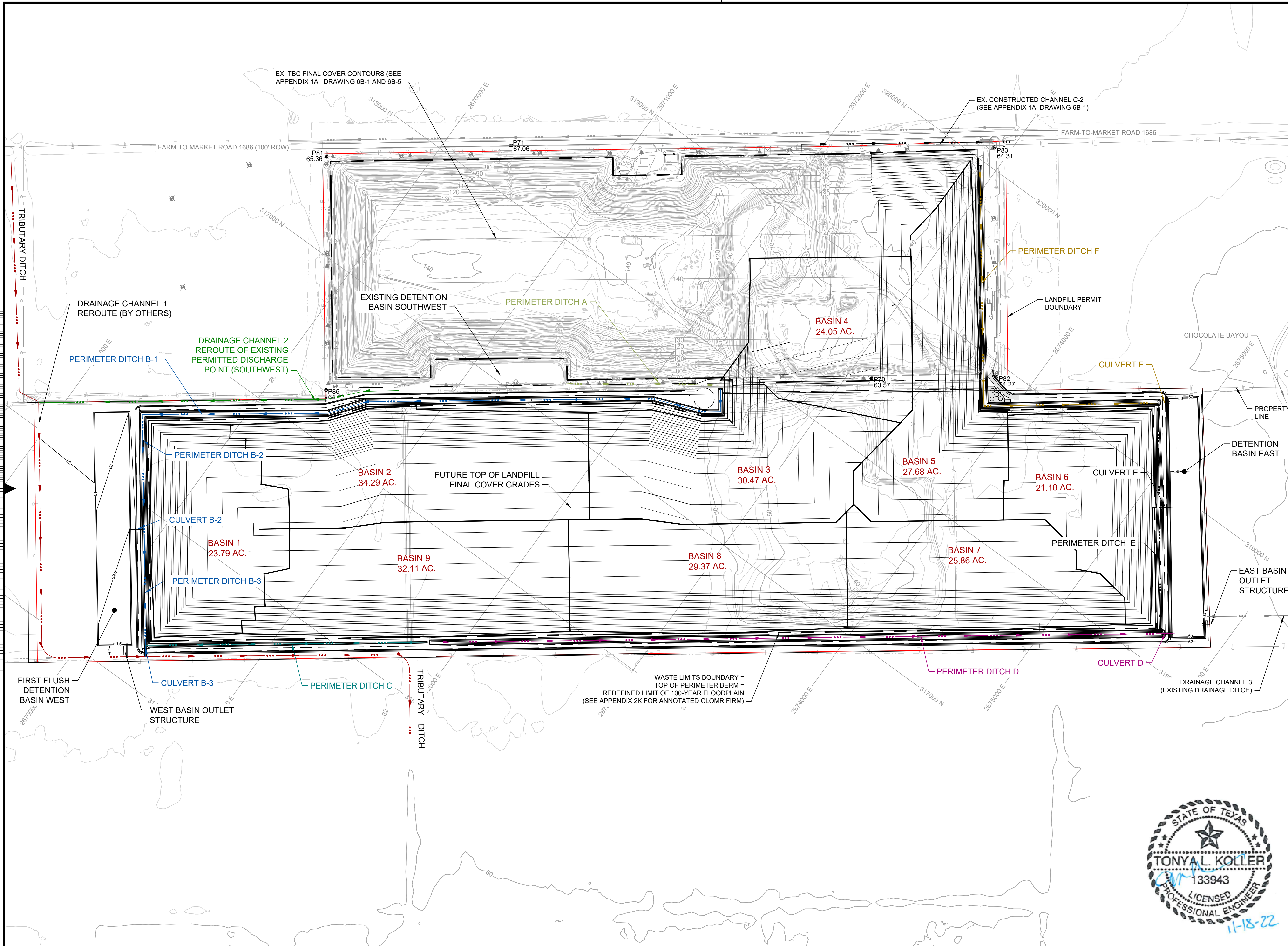
2	11/18/22	JPP	TJS	REV PER TCEQ NOD 2



Attachment 2-31D

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date	detailed
MARCH 2022	T. SCHMIDT
designed	checked
T. SCHMIDT	J. PARKER

THE CITY OF VICTORIA TEXAS

Victoria County, Texas

EXPANSION PERMIT DESIGN

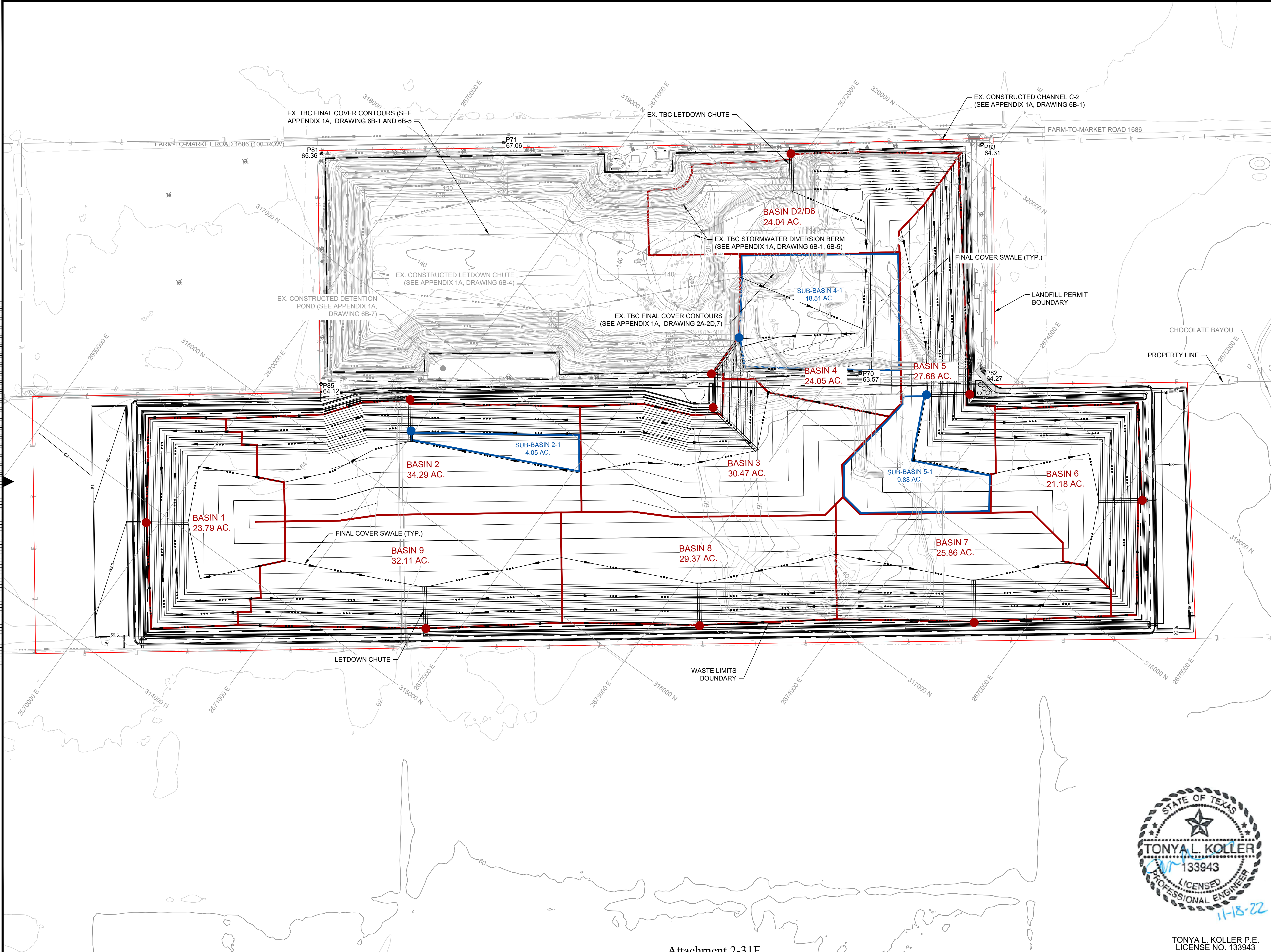
STORMWATER DESIGN FIGURE: PERIMETER DRAINAGE FEATURES

project	contract
107608	-

drawing III.A2.3 – rev. 1

sheet 3 of 4 sheets

file



no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV PER TCEQ NOD
2	11/18/22	JPP	TJS	REV PER TCEQ NOD 2

NOTES:

1. BASIN AREAS USED TO DESIGN LETDOWN CHUTES. SUB-BASIN AREAS USED TO DESIGN FINAL COVER SWALES.
2. BASIN D2/D6 IS THE ORIGINAL NAME OF THE TRIBUTARY AREA IN THE HISTORIC CALCULATION FOR THE EXISTING TBC LETDOWN CHUTE. THE BASIN SHOWN REFLECTS REVISIONS FROM THE LANDFILL EXPANSION GRADING.

LEGEND:

BASIN BOUNDARY
SUB-BASIN BOUNDARY
DISCHARGE POINT
PROPERTY LINE
PERMIT BOUNDARY
WASTE LIMITS BOUNDARY

NORTH

0 300' 600'
SCALE IN FEET

FOR PERMITTING PURPOSES ONLY

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FIRM REG. NO. F-845

date	detailed
MARCH 2022	T. SCHMIDT
designed	checked
T. SCHMIDT	J. PARKER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

STATE OF TEXAS
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EXPANSION PERMIT DESIGN

STORMWATER DESIGN FIGURE:
LANDFILL CHUTE/SWALE TRIBUTARY BASINS

project 107608
contract -
drawing III.A2.4 – rev. 1
sheet 4 of 4 sheets
file

APPENDIX 2E – POST-DEVELOPMENT MODEL SUMMARY

STATE OF TEXAS
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Proposed Condition

Hydraulic Model Properties

Title	City of Victoria Landfill Expansion
Engineer	Jon Parker
Company	Burns & McDonnell
Date	11/18/2022
Notes	

Proposed Condition

Channel Table - Time: 24.00 hours

ID	Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Has User Defined Length?	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Flow (Middle) (cfs)	Velocity (ft/s)	Depth (Middle) (ft)	Notes
63	CH-B(1)	WCD_3	62.20	WC_4	61.20	False	0.0	2,121.8	0.000	0.00	0.00	0.00	
76	CH-2		61.00	CS-13	60.00	False	0.0	2,658.3	0.000	(N/A)	(N/A)	(N/A)	
122	CH-A	WC_2	60.90	O-A	60.10	False	0.0	1,030.6	0.001	0.04	0.10	0.03	
164	CH-D(2)	SC_1	61.00	SC_2	60.10	False	0.0	1,805.5	0.000	0.05	0.02	0.23	
174	CH-D(1)	CS-22	61.90	SC_1	61.00	False	0.0	1,792.7	0.001	0.01	0.09	0.02	
259	CH-E(3)	CS-34	59.25	H-9	59.00	False	0.0	24.1	0.010	0.00	0.00	1.65	
266	CH-F(1)	CS-37	64.00	EC_2	61.50	False	0.0	1,576.3	0.002	0.01	0.13	0.02	
267	CH-F(2)	EC_2	61.50	H-11	59.00	False	0.0	1,168.1	0.002	0.03	0.01	0.47	
269	CH-D(3)	SC_2	60.10	H-3	59.00	False	0.0	1,137.8	0.001	0.07	0.00	1.22	
273	CH-D(4)	H-4	58.50	O-D	57.00	False	0.0	17.6	0.085	0.11	0.00	3.02	
274	CH-E(4)	H-10	58.50	O-E	57.00	False	0.0	10.1	0.149	0.01	0.00	3.02	
275	CH-F(3)	H-12	58.50	O-F	57.00	False	0.0	11.0	0.136	0.05	0.00	3.02	
287	CH-B(2)	WC_4	61.20	CS-38	60.28	False	0.0	1,784.8	0.001	0.05	0.09	0.05	
357	CH-E(2)	CS-34	59.25	CS-47	65.00	False	0.0	783.6	-0.007	0.00	0.00	0.00	
359	CH-E(1)	CS-48	65.00	CS-34	59.25	False	0.0	643.2	0.009	0.00	0.00	0.00	
415	CH-C(1)	CS-53	65.00	CS-54	61.40	False	0.0	1,808.6	0.002	0.00	0.00	0.01	
416	CH-C(2)	CS-54	61.40	H-5	59.20	False	0.0	14.3	0.153	0.01	0.00	2.39	

Proposed Condition
Conduit Table - Time: 24.00 hours

ID	Label	Start Node	Set Invert to Start?	Invert (Start) (ft)	Stop Node	Set Invert to Stop?
206	CO-D	H-3	True	59.00	H-4	True
226	CO-B3	H-5	True	59.20	Outfall West	True
258	CO-E	H-9	True	59.00	H-10	True
262	CO-F	H-11	True	59.00	H-12	True
354	CO-East	POS-6	False	57.00	Outfall East	True
406	CO-B2	MH-8	True	59.90	O-B(2)	True
423	CO-19	POS-5	False	58.80	Outfall West	True

Invert (Stop) (ft)	Has User Defined Length?	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)
58.50	False	0.0	88.3	0.006	Circle	54.0
58.70	True	90.0	71.3	0.006	Circle	48.0
58.50	False	0.0	65.6	0.008	Circle	48.0
58.50	False	0.0	58.3	0.009	Circle	48.0
56.50	False	0.0	274.5	0.002	Trapezoidal Channel	(N/A)
59.50	False	0.0	96.3	0.004	Circle	24.0
58.70	True	140.0	190.8	0.001	Trapezoidal Channel	(N/A)

Manning's n	Flow (Middle) (cfs)	Velocity (ft/s)	Depth (Middle) (ft)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)	Depth/Rise (%)
0.013	0.12	0.01	2.02	444.02	0.0	45.0
0.013	-1.52	-0.05	3.30	321.18	-0.5	82.6
0.013	0.01	0.00	2.02	125.38	0.0	50.6
0.013	0.05	0.01	2.02	132.98	0.0	50.6
0.030	0.19	0.00	3.89	485.99	0.0	86.5
0.013	0.05	0.47	0.07	43.73	0.1	3.5
0.030	0.07	0.06	0.11	214.18	0.0	2.7

Notes

Proposed Condition

Combined Pipe/Node Report - Time: 24.00 hours

Label	Start Node	Stop Node	Branch ID	GVFConduitResults_BranchElementID	Length (Unified) (ft)	GVFConduitResults_UpstreamInletC
CO-D	H-3	H-4	(N/A)		88.3	
CO-B3	H-5	Outfall West	(N/A)		90.0	
CO-E	H-9	H-10	(N/A)		65.6	
CO-F	H-11	H-12	(N/A)		58.3	
CO-East	POS-6	Outfall East	(N/A)		274.5	
CO-B2	MH-8	O-B(2)	(N/A)		96.3	
CO-19	POS-5	Outfall West	(N/A)		140.0	

System Intensity (in/h)	GVFConduitResults_UpstreamInletDrainageArea	GVFConduitResults_TotalRationalFlowToInlet	System CA (acres)	System Intensity (in/h)	System Rational Flow (cfs)	Rise (Unified) (ft)
(N/A)			(N/A)	(N/A)	(N/A)	4.50
(N/A)			(N/A)	(N/A)	(N/A)	4.00
(N/A)			(N/A)	(N/A)	(N/A)	4.00
(N/A)			(N/A)	(N/A)	(N/A)	4.00
(N/A)			(N/A)	(N/A)	(N/A)	4.50
(N/A)			(N/A)	(N/A)	(N/A)	2.00
(N/A)			(N/A)	(N/A)	(N/A)	4.00

Capacity (Full Flow) (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Notes
444.02	0.01	59.00	58.50	0.006	
321.18	-0.05	59.20	58.70	0.006	
125.38	0.00	59.00	58.50	0.008	
132.98	0.01	59.00	58.50	0.009	
485.99	0.00	57.00	56.50	0.002	
43.73	0.47	59.90	59.50	0.004	
214.18	0.06	58.80	58.70	0.001	

Proposed Condition

Outfall Table - Time: 24.00 hours

ID	Label	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Invert) (ft)	Boundary Condition Type	Boundary Element
116	O-A	66.40	True	60.10	Free Outfall	<None>
270	O-F	61.00	True	57.00	Boundary Element	East Pond
271	O-E	61.00	True	57.00	Boundary Element	East Pond
272	O-D	61.00	True	57.00	Boundary Element	East Pond
297	O-B(2)	61.00	True	59.50	Boundary Element	West Pond
323	Outfall West	65.00	True	58.70	User Defined Tailwater	<None>
353	Outfall East	61.00	True	56.50	User Defined Tailwater	<None>

Elevation (User Defined Tailwater) (ft)	Elevation-Flow Curve	Time-Elevation Curve	Cyclic Time-Elevation Curve	Tidal Gate?	Hydraulic Grade (ft)	Flow (Total Out) (cfs)
0.00	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	60.14	0.01
0.00	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	60.77	0.04
0.00	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	60.77	0.01
0.00	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	60.77	0.11
0.00	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	59.01	0.05
62.75	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	62.15	2.63
60.75	<Collection: 0 items>	<Collection: 0 items>	<Collection: 0 items>	False	60.69	0.19

Notes

Proposed Condition

Cross Section Table - Time: 0.00 hours

ID	Label	Cross Section Type	Irregular Channel Section	Elevation (Invert) (ft)	Bottom Width (ft)	Height (ft)
41	WC_2	User Defined	<Collection: 0 items>	60.90	11.0	5.50
43	WCD_3	User Defined	<Collection: 0 items>	62.20	12.0	4.20
60	WC_4	User Defined	<Collection: 0 items>	61.20	12.0	5.20
72		User Defined	<Collection: 0 items>	61.00	10.0	5.40
73	CS-13	User Defined	<Collection: 0 items>	60.00	10.0	6.40
93	EC_2	User Defined	<Collection: 0 items>	61.50	5.0	4.90
96	SC_1	User Defined	<Collection: 0 items>	61.00	10.0	5.40
97	SC_2	User Defined	<Collection: 0 items>	60.10	10.0	6.30
106	CS-22	User Defined	<Collection: 0 items>	61.90	10.0	4.50
228	CS-34	User Defined	<Collection: 0 items>	59.25	5.0	7.15
265	CS-37	User Defined	<Collection: 0 items>	64.00	5.0	2.40
286	CS-38	User Defined	<Collection: 0 items>	60.28	12.0	6.12
356	CS-47	User Defined	<Collection: 0 items>	65.00	5.0	1.40
358	CS-48	User Defined	<Collection: 0 items>	65.00	5.0	1.40
412	CS-53	User Defined	<Collection: 0 items>	65.00	5.0	1.40
414	CS-54	User Defined	<Collection: 0 items>	61.40	5.0	5.00

Slope (Left Side) (H:V)	Slope (Right Side) (H:V)	Manning's n	Hydraulic Grade (ft)	Notes
2.000	2.000	0.030	60.90	
3.000	3.000	0.030	62.20	
3.000	3.000	0.030	61.20	
3.000	3.000	0.030	(N/A)	
3.000	3.000	0.030	(N/A)	
3.000	3.000	0.030	61.50	
3.000	3.000	0.030	61.00	
3.000	3.000	0.030	60.10	
3.000	3.000	0.030	61.90	
3.000	3.000	0.030	59.25	
3.000	3.000	0.030	64.00	
3.000	3.000	0.030	60.28	
3.000	3.000	0.030	65.00	

Proposed Condition

Cross Section Table - Time: 0.00 hours

Slope (Left Side) (H:V)	Slope (Right Side) (H:V)	Manning's n	Hydraulic Grade (ft)	Notes
3.000	3.000	0.030	65.00	
3.000	3.000	0.030	65.00	
3.000	3.000	0.030	62.76	

Proposed Condition
Catchment Table - Time: 24.00 hours

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Method	Loss Method
31	LD-1	MH-8	23.786	Unit Hydrograph	SCS CN
32	LD-9	CS-22	32.111	Unit Hydrograph	SCS CN
33	LD-8	SC_1	29.370	Unit Hydrograph	SCS CN
34	LD-7	SC_2	25.860	Unit Hydrograph	SCS CN
35	LD-6	CS-34	21.180	Unit Hydrograph	SCS CN
36	LD-5	EC_2	27.680	Unit Hydrograph	SCS CN
37	LD-4	WC_2	24.050	Unit Hydrograph	SCS CN
38	LD-3	WCD_3	30.470	Unit Hydrograph	SCS CN
39	LD-2	WC_4	34.290	Unit Hydrograph	SCS CN
82	Existing Landfill (Not Active)		0.000	Unit Hydrograph	SCS CN
254	West Open Area	Outfall West	0.000	Unit Hydrograph	SCS CN
276	PD-D1	CS-22	0.000	Unit Hydrograph	SCS CN
277	PD-D2	SC_1	0.000	Unit Hydrograph	SCS CN
279	PD-D3	SC_2	0.000	Unit Hydrograph	SCS CN
280	PD-E1	CS-34	0.000	Unit Hydrograph	SCS CN
281	PD-F1	CS-37	0.000	Unit Hydrograph	SCS CN
282	PD-B1	WCD_3	0.000	Unit Hydrograph	SCS CN
283	PD-B2	WC_4	0.000	Unit Hydrograph	SCS CN
284	PD-B3	MH-8	0.000	Unit Hydrograph	SCS CN
350	East Pond	East Pond	0.000	Unit Hydrograph	SCS CN
365	West Pond	West Pond	0.000	Unit Hydrograph	SCS CN
417	PD-C1	CS-53	0.000	Unit Hydrograph	SCS CN
424	Drainage Ditch DA 1	Outfall West	0.000	Unit Hydrograph	SCS CN
425	East Pond Additional Area	East Pond	0.000	Unit Hydrograph	SCS CN

Proposed Condition

Catchment Table - Time: 24.00 hours

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Method	Loss Method
426	Drainage Ditch DA 2	Outfall West	0.000	Unit Hydrograph	SCS CN
427	South Additonal Area	Outfall East	0.000	Unit Hydrograph	SCS CN

Unit Hydrograph Method	Flow (Total Out) (cfs)	Notes	Volume (Total Runoff) (gal)	Scaled Area (acres)
SCS Unit Hydrograph	0.00		5,142,109.0	23.792
SCS Unit Hydrograph	0.00		6,941,286.1	32.122
SCS Unit Hydrograph	0.01		6,349,315.2	29.351
SCS Unit Hydrograph	0.00		5,590,506.3	25.799
SCS Unit Hydrograph	0.00		4,578,317.2	21.128
SCS Unit Hydrograph	0.01		5,983,660.0	27.921
SCS Unit Hydrograph	0.00		5,198,871.2	24.012
SCS Unit Hydrograph	0.00		6,586,769.3	30.419
SCS Unit Hydrograph	0.01		7,412,910.4	34.249
SCS Unit Hydrograph	(N/A)		(N/A)	101.848
SCS Unit Hydrograph	0.01		3,264,319.1	17.004
SCS Unit Hydrograph	0.00		378,327.3	1.750
SCS Unit Hydrograph	0.00		743,406.5	3.439
SCS Unit Hydrograph	0.00		875,280.6	4.049
SCS Unit Hydrograph	0.00		588,716.9	2.723
SCS Unit Hydrograph	0.00		1,273,087.1	5.889
SCS Unit Hydrograph	0.00		635,739.4	2.941
SCS Unit Hydrograph	0.00		1,133,493.2	5.243
SCS Unit Hydrograph	0.00		974,277.8	4.507
SCS Unit Hydrograph	0.00		2,221,848.9	10.279
SCS Unit Hydrograph	0.00		2,268,504.9	10.495

Proposed Condition

Catchment Table - Time: 24.00 hours

Unit Hydrograph Method	Flow (Total Out) (cfs)	Notes	Volume (Total Runoff) (gal)	Scaled Area (acres)
SCS Unit Hydrograph	0.00		785,357.3	3.633
SCS Unit Hydrograph	0.00		253,866.4	1.174
SCS Unit Hydrograph	0.00		226,757.0	1.049
SCS Unit Hydrograph	0.00		670,538.8	3.102
SCS Unit Hydrograph	0.00		1,392,790.4	6.443

Proposed Condition

Pond Table - Time: 24.00 hours

ID	Label	Volume Type	Initial Elevation Type	Elevation (Initial) (ft)	Hydraulic Grade (ft)	Storage (Maximum) (gal)	Flow (Total In) (cfs)	Flow (Total Out) (cfs)	Is Overflowing?	Notes
364	East Pond	Elevation-Area	Invert	0.00	60.77	10,643,769.4	0.17	0.19	False	
366	West Pond	Elevation-Area	Invert	0.00	59.01	1,716,821.0	0.05	0.07	False	

Proposed Condition

Pond Outlet Structure Table - Time: 24.00 hours

ID	Label	Upstream Pond	Has Control Structure?	Composite Outlet Structure	Notes
318	POS-5	West Pond	Yes	West pond	
341	POS-6	East Pond	Yes	East Pond	

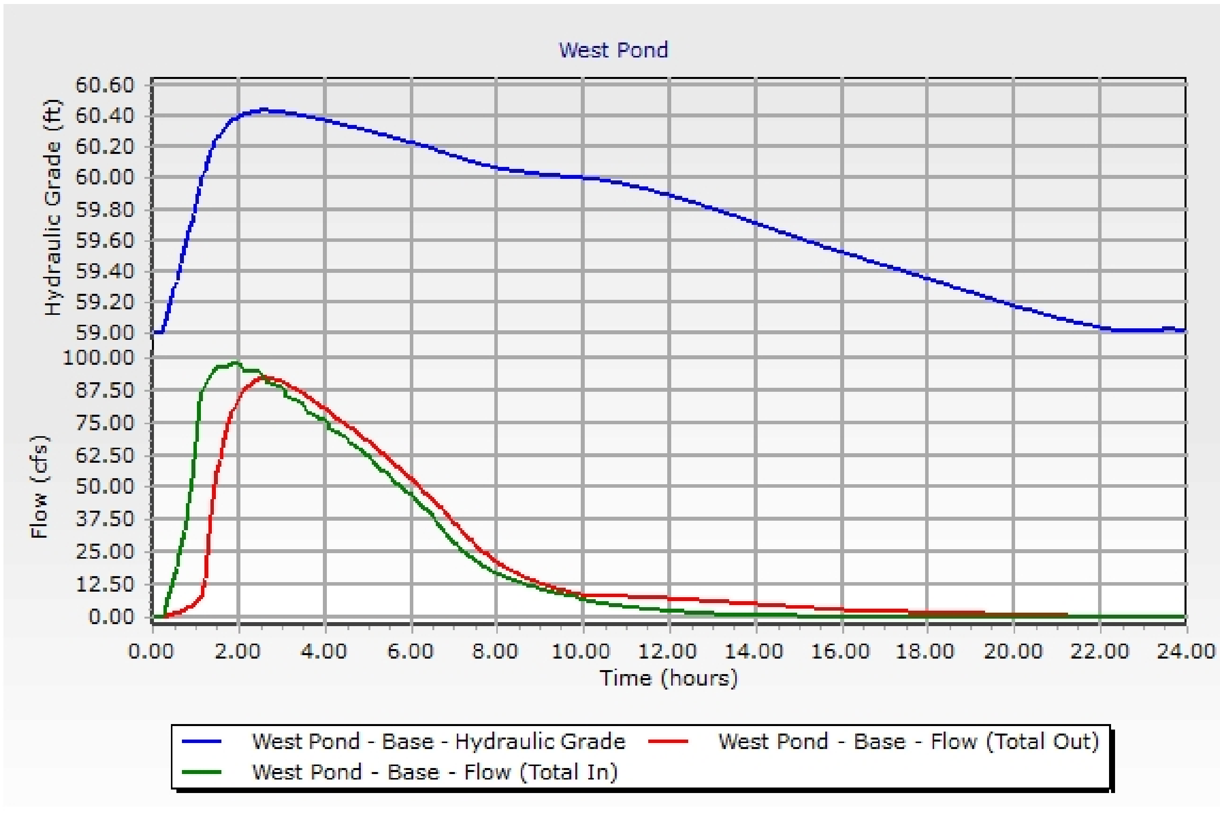
Proposed Condition
Headwall Table - Time: 24.00 hours

ID	Label	Has Cross Section?	Inlet Description	Culvert Barrel Shape	Upstream Pond	Boundary Condition Type
199	H-3	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall
202	H-4	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall
221	H-5	True	<None>	(N/A)	<None>	Free Outfall
256	H-9	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall
257	H-10	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall
263	H-11	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall
264	H-12	True	Concrete - Square edge w/headwall	(N/A)	<None>	Free Outfall

Network Boundary Type	CulvertInletEquationForm	InletChart	Physical_CulvertC	Physical_CulvertK	Physical_CulvertKe	Physical_CulvertKr
(N/A)						
(N/A)						
(N/A)						
(N/A)						
(N/A)						
(N/A)						
(N/A)						

Physical_CulvertM	Physical_CulvertSlopeCorrection	Flow (Total Out) (cfs)	Notes
		0.12	
		0.11	
		0.00	
		0.01	
		0.01	
		0.05	
		0.05	

Proposed Condition



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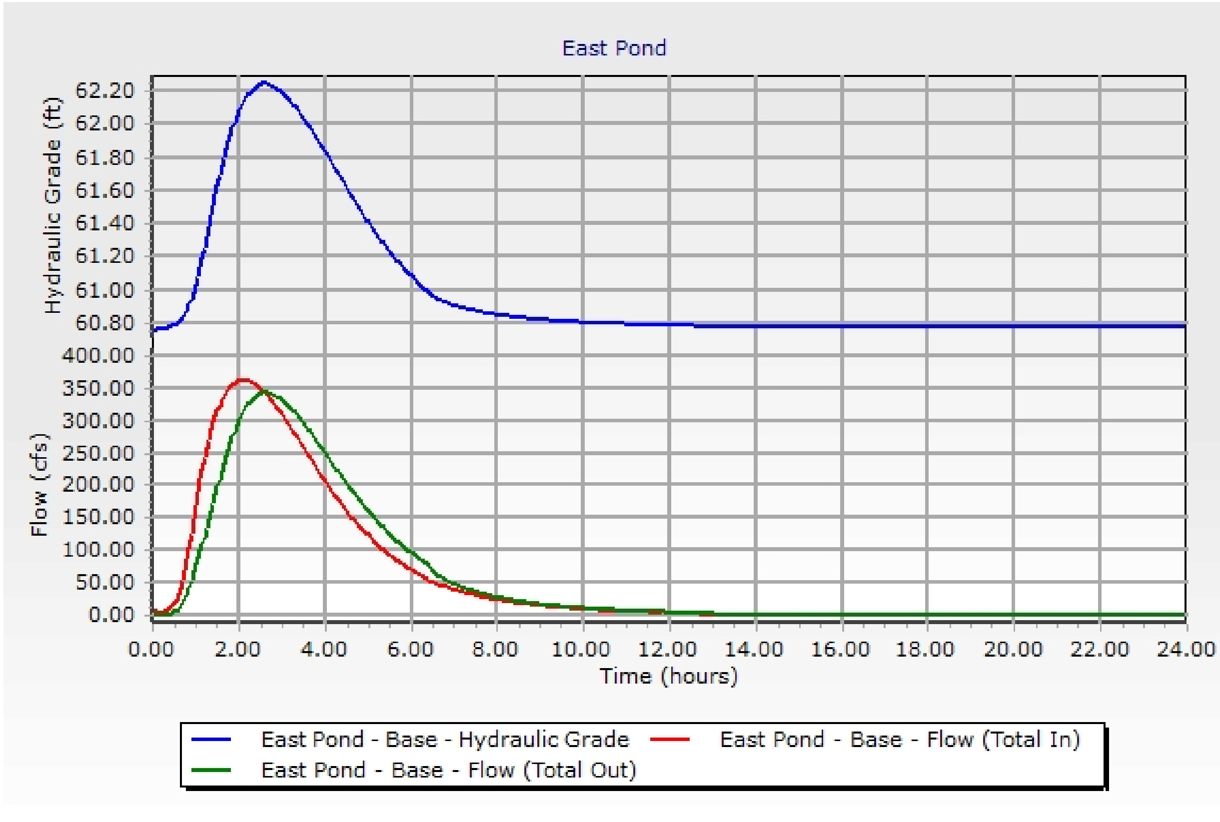

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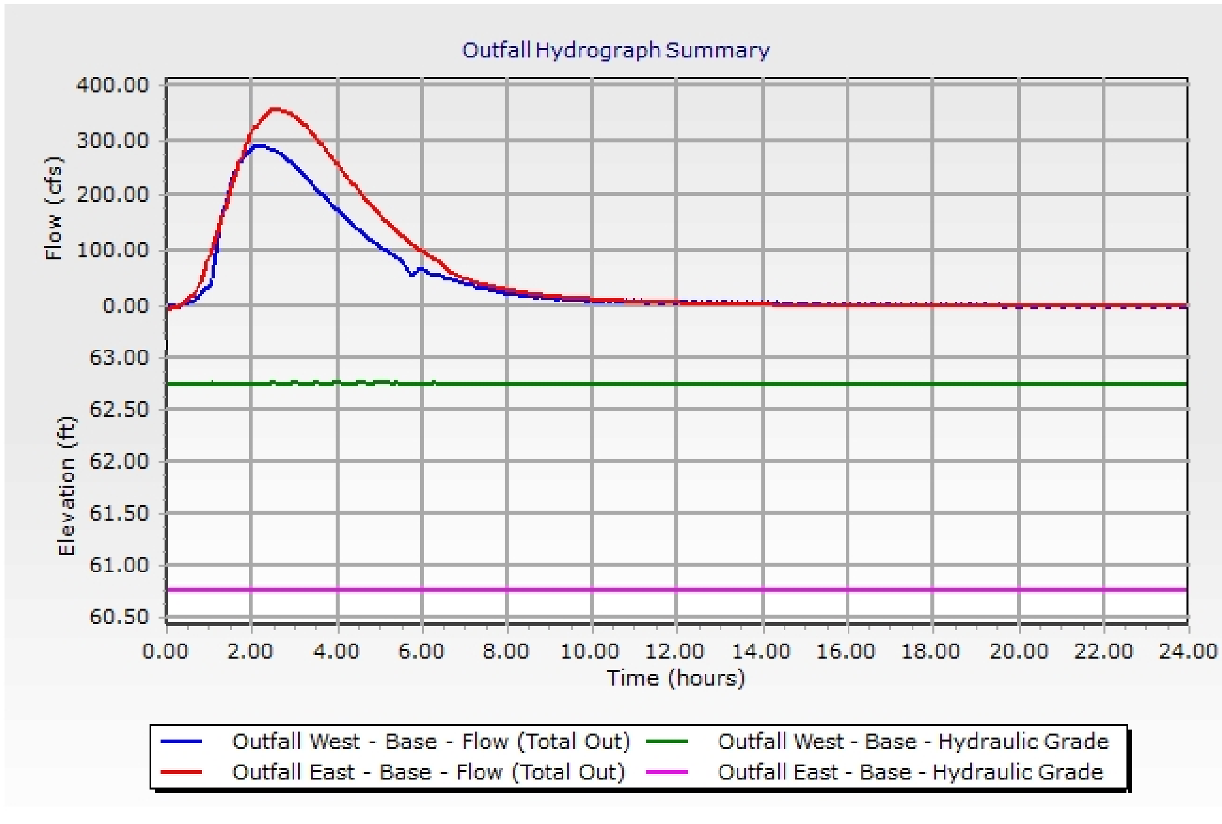

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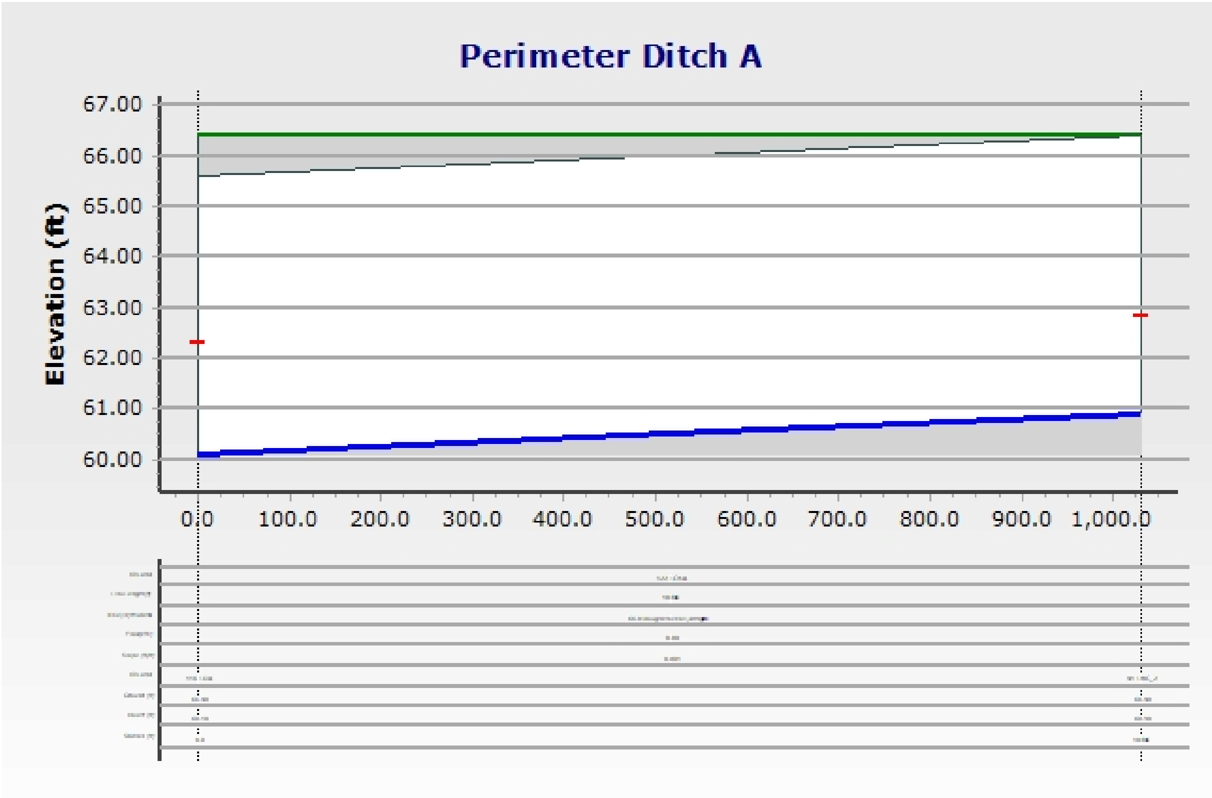

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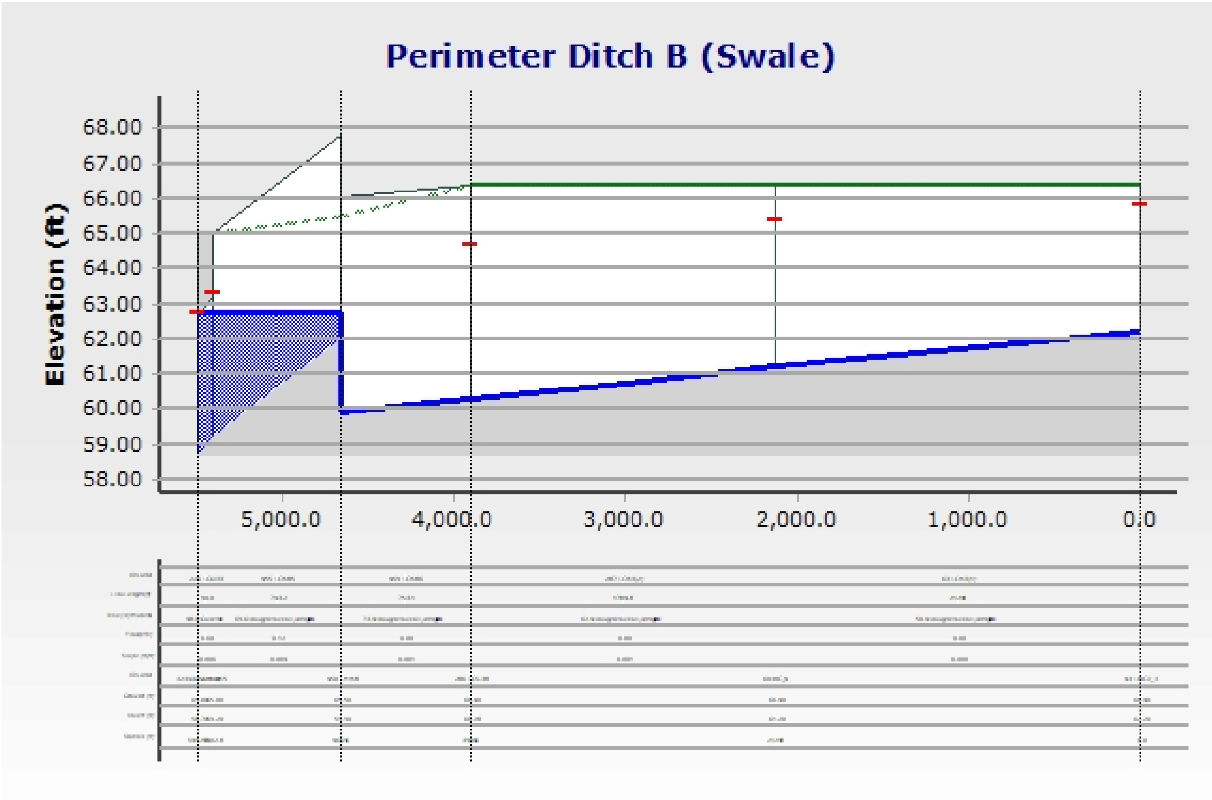

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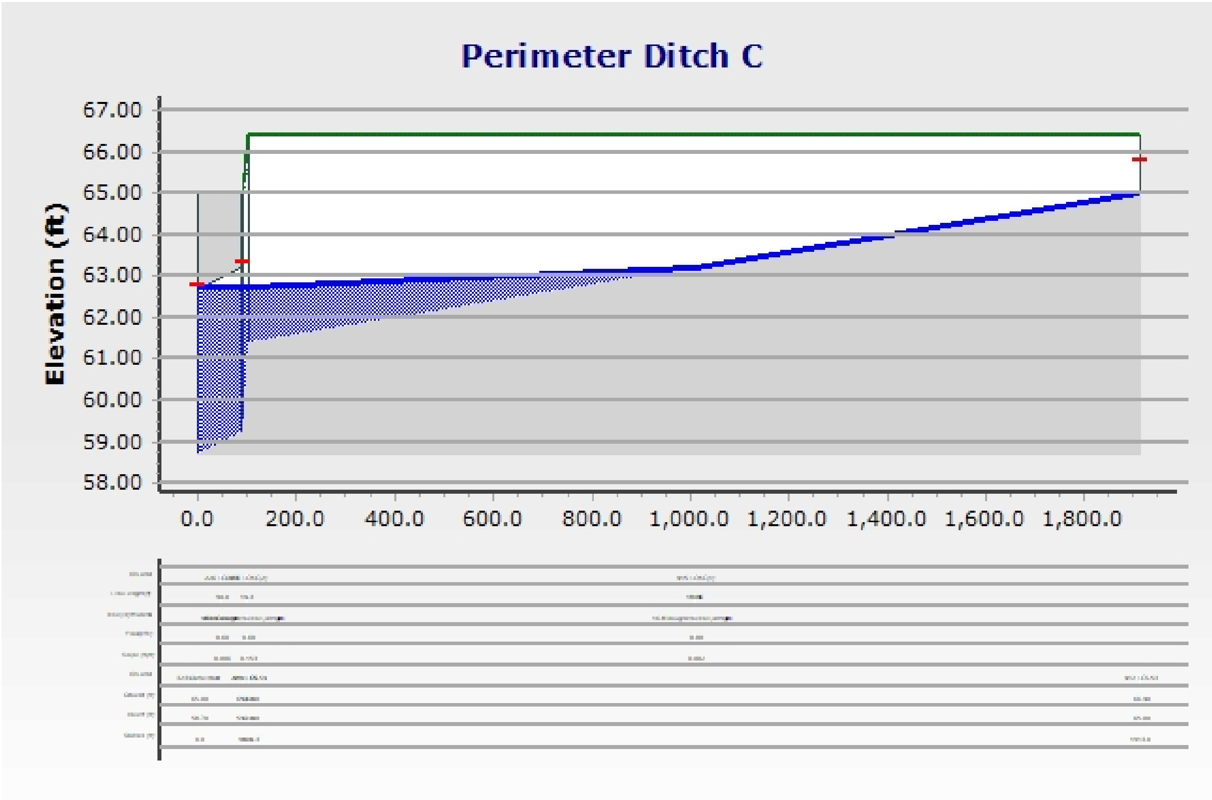

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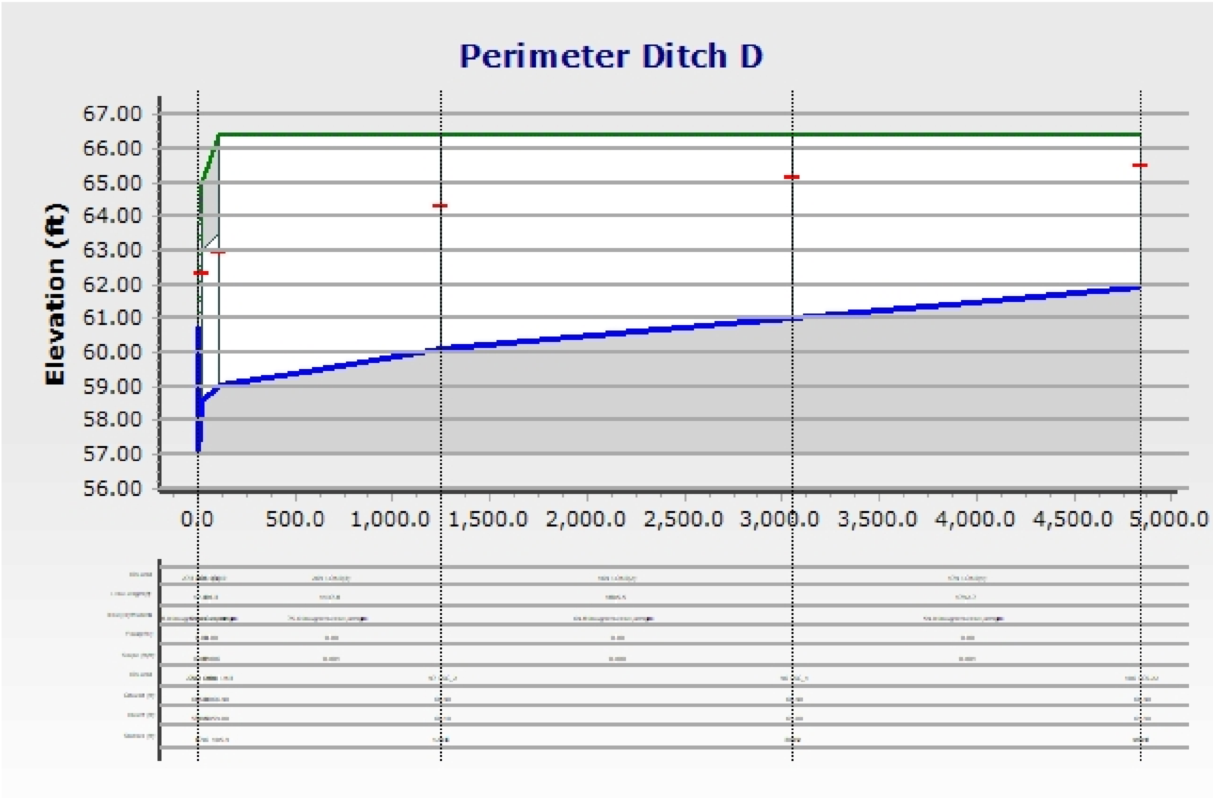

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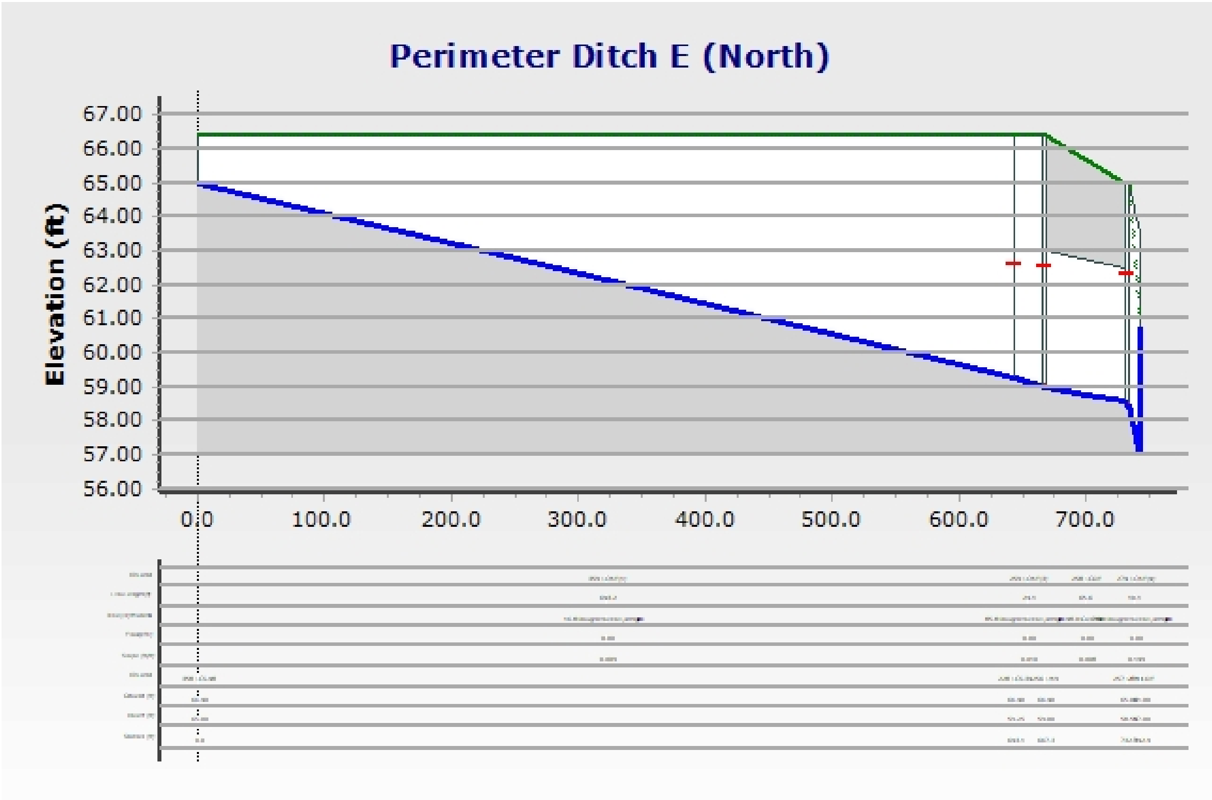

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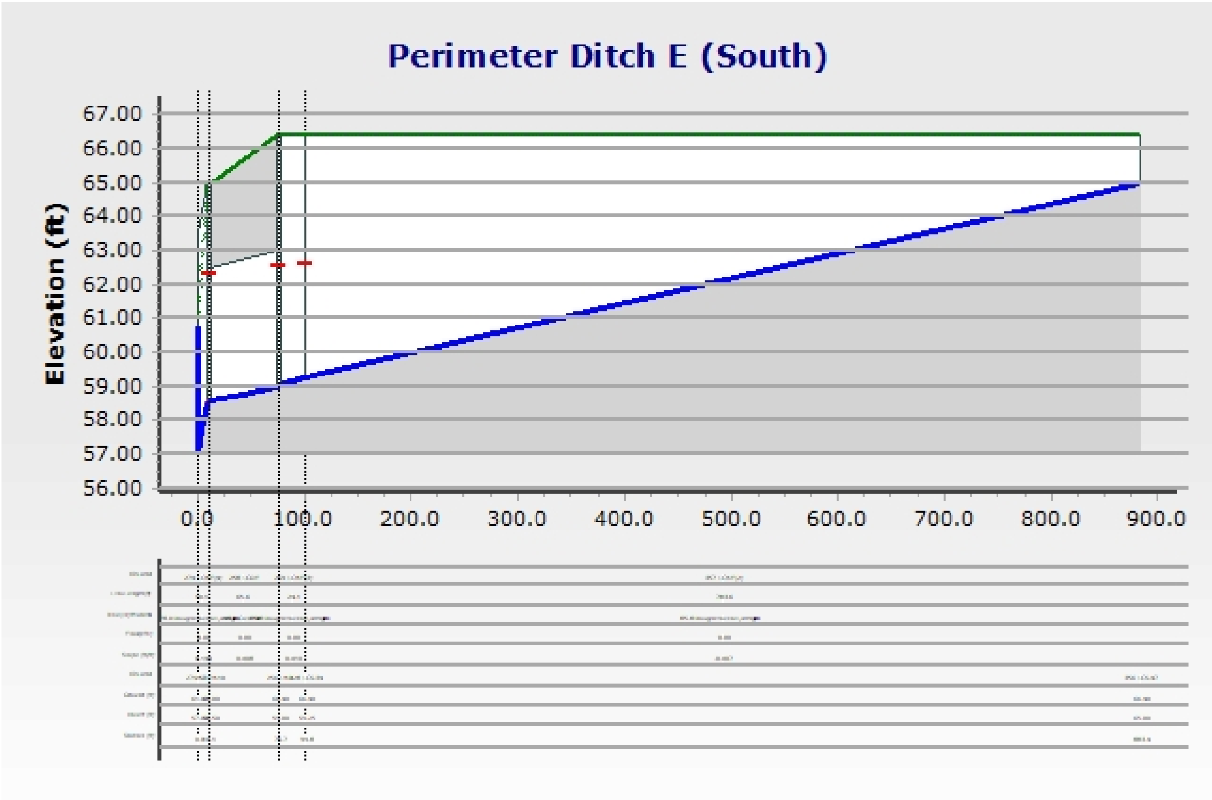

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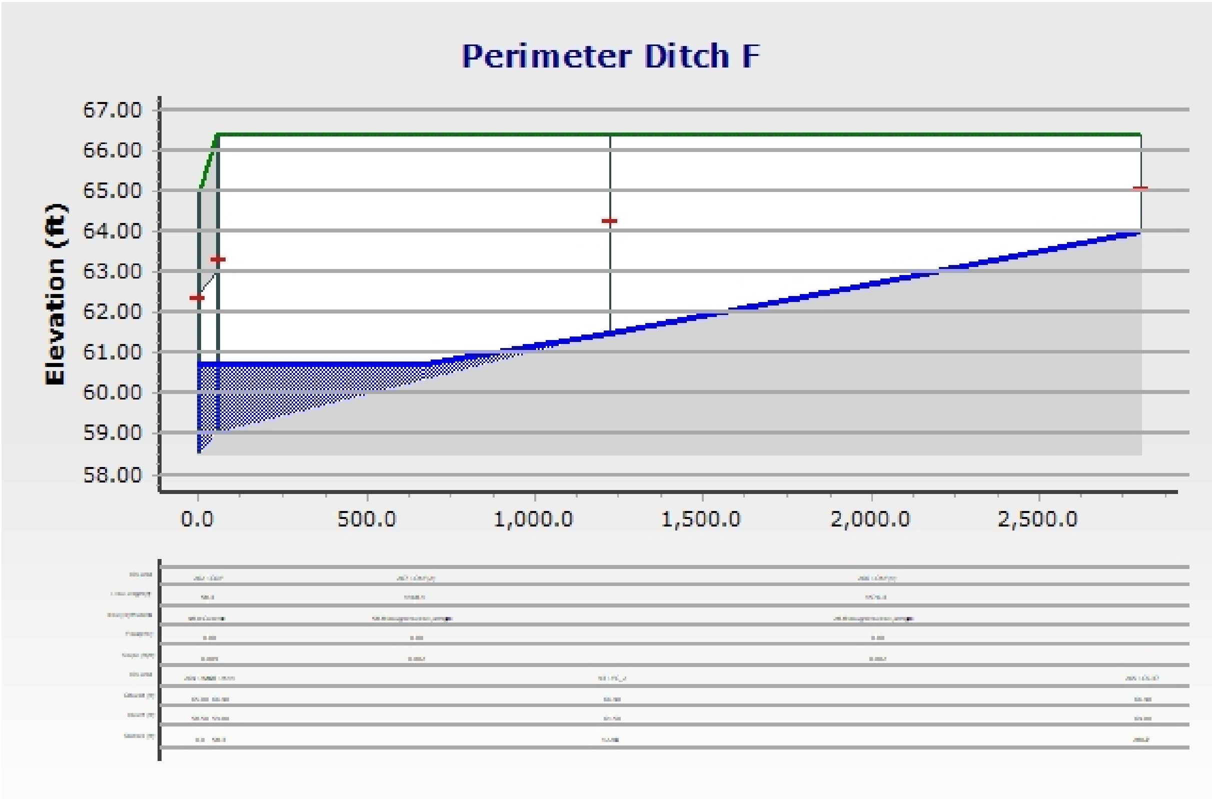

APPENDIX 2O – VICTORIA COUNTY FLOODPLAIN DEVELOPMENT PERMIT

VICTORIA COUNTY FLOODPLAIN ADMINISTRATION
FLOODPLAIN DEVELOPMENT PERMIT

PERMIT NUMBER: 005-22

Property Owner: City of Victoria	Owner's Telephone Number:
Property Address: 18545 FM 1686, Victoria, TX 77905 (Victoria Landfill)	(361) 485-3230
Owner's Mailing Address: 700 Main Center, Ste. 124, Victoria, TX 77901	
Contractor: n/a	Contractor's Telephone Number:
Contractor Contact:	
Contractor Mailing Address:	
Property Information	
Property ID or Parcel #: 28781, 28810, 28811	
If located within a subdivision:	
Name of Subdivision: n/a	Section No. Lot No. Block No.
If not located within a subdivision:	
Name & No. of Survey/Abstract: Polito Castillo Survey, No. 17 & S.A. & M.G.R.R Co. Survey, No 388	Acreage: 352.68
Appraised Value of Structure:	Estimated Damage or Improvements:
Substantially Damaged and/or Substantial Improvements ☐	☒ 100 Year Floodplain ☐ Floodway

Base Flood Elevation (BFE) Data

BFE in this area: 63.39 feet mean above sea level (National Geodetic Vertical Datum [NGVD] of 1929) Flood Insurance Rate Map (FIRM) – Community Number 480637
Panel Number: 480637 0200 B Date: September 18, 1987

Permit Information

The above named permittee applied for a development permit on Aug. 12, 2022. The application has been reviewed by the Victoria County Floodplain Administration and it has been determined that the proposed development is located within a special flood hazard area as defined by the County Floodplain Damage Prevention Ordinance. **This Permit expires 180 days from the day this permit is issued.** If the conditions of this permit are not met before the permit expires, the property owner must apply for an extension to the permit. A permit extension to the 180-day limitation may be considered.

The Victoria County Floodplain Administrator has reviewed the plans and specifications of the proposed development for conformance with the County standards. You are hereby authorized to proceed with the following described work:

Landfill expansion proposed to add ~90 years of capacity to the remaining life. A portion of the property containing the landfill expansion area is within a FEMA Zone A 100-year floodplain. The proposed design includes flood protection berms constructed at elevation 64 feet amsl, designed based on 100-year frequency flood.

☒ JAJ **All other Local, State and Federal Permits have been secured or will be secured prior to beginning the work authorized by this permit.**

☐ ______ **No Special Provisions (the above stated improvements may be constructed without further documentation)**

Special Provisions

To maintain compliance with FEMA standards and to minimize flood damage potential to the proposed development, you are hereby directed to construct your improvements in accordance with the following special provisions noted below:

Flood Damage Mitigation Requirements

		Owner/Agent initial	Floodplain Admin. initial	
☐	1	n/a	______	The lowest finished floor (including the basement), electrical services, electrical pumps, air conditioning units and any other electrical devices must be elevated at or above __________ feet mean above sea level (National Geodetic Vertical Datum [NGVD] of 1929.)
☐	2	n/a	______	Provide an "Elevation Certification" prepared by a Texas Licensed Professional Land Surveyor or a Texas Licensed Professional Engineer. The current FEMA "Elevation Certificate Form" may be found on the Internet: http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/elevation_certificate.shtm
☐	3	n/a	______	Provide a statement (letter), signed and sealed by a Texas Licensed Professional Land Surveyor or a Texas Licensed Professional Engineer that the electrical services, electrical pumps, air conditioning units and any other electrical devices have been elevated above the base flood elevation for this property.
☐	4	n/a	______	Provide a statement (letter), signed and sealed by a Texas Licensed Professional Engineer that all public utilities and facilities, such as sewer, gas, electrical, and water systems are designed, located and constructed to minimize or eliminate flood damage, and adequate drainage is provided to reduce exposure to flood hazards.

VICTORIA COUNTY FLOODPLAIN ADMINISTRATION
FLOODPLAIN DEVELOPMENT PERMIT

Foundation Design Requirements				
☐ - **Pier and beam Construction**				☐ - **Slab on Grade Construction with fill placement greater than one foot**
☐	5	n/a		Provide a statement (letter), signed and sealed by a Texas Licensed Professional Engineer that the foundation design of the structure and completed construction will resist collapse, flotation and lateral movement during the 1% chance (100 yr) flood. The Engineer shall attach a copy of his/her calculations and a list of assumptions to the statement.
☐ - **Slab on Grade Construction with fill placement one foot or less**				☐ - **Portable Storage Building with estimated flooding of one foot or less**
☐	6	n/a		Provide a statement (letter), signed and sealed by a Texas Licensed Professional Engineer that the foundation design of the structure and completed construction will resist collapse, flotation and lateral movement during the 1% chance (100 yr) flood. The Texas Licensed Professional Engineer shall attach a list of assumptions to the statement.
Manufactured Housing Installation				
☐	7	n/a		Provide a statement (letter), signed and sealed by a Texas Licensed Professional Engineer that the foundation design of the structure and completed construction will resist collapse, flotation and lateral movement during the 1% chance (100 yr) flood. The Texas Licensed Professional Engineer shall attach a copy of his/her calculations and a list of assumptions to the statement. This requirement is supported by "Texas Manufactured Housing Standards Act" (Chapter 1201, Occupation Code [1201.512(b)], Effective 9-1-2009) This document may be found on the Internet: http://www.tdhca.state.tx.us/mh/docs/09-ch1201revformat.pdf FEMA's Manual http://www.fema.gov/library/viewRecord.do?id=1577
Activities including Dredging, Filling, Mining, and Excavation				
☒	8		JAJ	Survey of property showing existing topographic elevations from a Texas Licensed Professional Land Surveyor or Texas Licensed Professional Engineer.
☒	9		JAJ	Provide a proposed fill/excavation plan including proposed final topographic elevations.
☒	10		JAJ	Provide a topographic elevation survey certified (signed and sealed) by a Texas Licensed Professional Land Surveyor or Texas Licensed Professional Engineer that the fill was placed in accordance with the approved plan.
☒	11		JAJ	Areas disturbed that are 1 acre or more must provided a copy of the *Construction Site Notice for the TCEQ Storm Water Program TPDES General Permit TXR040000.*
Non-residential Floodproofing				
☐	12	n/a		**Non-residential** structures (businesses and storage buildings) **may** be repaired, reconstructed or constructed using floodproofing construction methods. A Texas Licensed Professional Engineer must complete a "Floodproofing Certification" certifying that the floodproofing methods used will protect the structure up to or above the base flood elevation. The Texas Licensed Professional Engineer shall attach a copy of his/her calculations and/or a list of assumptions to the certification. The current FEMA form "Technical Bulletin 3-93, Non-Residential Floodproofing - Requirements and Certification." may be found on the Internet: http://www.fema.gov/pdf/fima/job6.pdf.
Placement of a Recreational Vehicle (RV or Travel Trailer) or Construction site office/building (commonly referred to as a "job shack")				
☒	13		JAJ	Placement of a recreational vehicle (RV) or Construction site building is allowed for no longer than 180 days from the issuance of the permit. The vehicle must be licensed and ready for highway use **or** meet the requirements of items 1,2,3,7 and 8 of this permit form. The vehicle is ready for highway use if it is on its wheels or jacking system; is attached to the site only by quick disconnect type utilities and security devices; and has no permanently attached additions. **No RV will be permitted in the FEMA designated Floodway**. The applicant must apply for a new permit prior to the expiration of the 180 days.
As-Built Drawings				
☒	14		JAJ	Provide a copy of the final plans or as-built drawings to the Victoria County Floodplain Administration.
Floodway Improvement Requirements: New Structures or Additions to Structures or Fill Placement				
☐	15	n/a		Provide a statement (letter), signed and sealed by a Texas Licensed Professional Engineer that the structure and or fill placed in the floodway will not result in any increase in flood levels within the community during times of flooding. The Texas Licensed Professional Engineer shall attach a copy of his/her calculations and/or a list of assumptions to the certification.

The above requirements are based on the information provided by the applicant for the proposed improvements in the FEMA designated Floodplain. It is the responsibility of the applicant to apply for a new permit(s) if the proposed improvements are modified.

Acknowledgement of Special Provisions:

(Burns & McDonnell Engineering Co., Inc.) Owner or Agent (Contractor) authorized by the Owner	8/12/2022 Date
Digitally signed by John A. Johnston, PE, CFM Date: 2022.08.23 10:49:19 -05'00' Signature of Floodplain Administrator	23 Aug 2022 Date
Original – Victoria County Floodplain Administration	Copy – Owner/Authorized Agent of the Owner

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ATTACHMENT III-3 – LEACHATE AND CONTAMINATED WATER PLAN

Part III, Attachment 3
Leachate and Contaminated Water Plan
TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria
City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part III, Attachment 3
Leachate and Contaminated Water Plan
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

Burns & McDonnell Engineering Company, Inc.
8911 N Capital of Texas Hwy, Building 3, Suite 3100
Austin, Texas 78759
Texas Firm Registration No. F-845

suitable materials consistent with §330.333 and will be rot resistant. The geotextile properties are provided in Attachment III-4, Soil Liner Quality Control Plan.

Leachate collection layer design calculation are presented in Appendix 3B, including anticipated peak flow and hydraulic head on the leachate collection layer.

2.2.3 Drainage Media

Drainage media will be placed in the trenches and sump and will help facilitate leachate collection. Detailed specifications for drainage media and thicknesses and placement around the leachate collection pipes, can be found in Attachment III-4, Soil Liner Quality Control Plan.

Leachate aggregate placed in the collection trenches and sumps will consist of natural or manufactured materials as described in Attachment III-4, Soil Liner Quality Control Plan.

2.2.4 Leachate Collection Pipe System

The leachate collection pipe system consists of perforated collection trench pipes and solid sidewall riser pipes. Sidewall risers will extent to the top of the perimeter perm to provide access for cleaning the leachate collection pipes and sump risers. Details are shown in Attachment III-1. Leachate piping will meet the criteria listed in Attachment III-4 Soil Liner Quality Control Plan.

Chimney drains will be installed above the leachate collection pipes to better facilitate drainage and will extend through the protective cover. Details illustrating the design of the chimney drains are included in Attachment III-1. For cells constructed for below-grade Class 1 disposal within the lateral expansion area, chimney drains will be used to facilitate the collection of leachate from above-grade MSW. Details are shown in Attachment III-1. Chimney drains will be spaced every 200 feet at the interface of above-grade MSW and below-grade Class 1 waste to convey leachate into the collection trench.

Collection trenches consist of a six-inch diameter perforated leachate collection pipe surrounded by drainage aggregate, used to convey leachate to the sumps. Leachate collection pipe design calculations are provided in Appendix 3D. Details are shown in Attachment III-1.

2.2.5 Leachate Sumps

Details of the leachate sumps are shown in Attachment III-1. The sump pumps will be operated consistent with 30 TAC §330.333, with a maximum allowable head of 30 centimeters on liner. A leachate level readout will be provided in the pump control panel. The pumps may be operated manually or by an automatic start switch. The exact allowable leachate head will be based on the as-build conditions of the leachate sump. Leachate sump material requirements are provided in Attachment III-4 Soil Liner Quality Control Plan.

2.2.6 Leachate Storage

Initial leachate storage occurs in the leachate sumps located within each trench in the northern portion of the landfill and shared between two cells in the lateral expansion area. Leachate will be pumped from the sumps directly through a leachate force main to storage tanks or a temporary storage facility.

Currently, onsite storage tanks are used for leachate storage. Cells in the Existing Area of the landfill are sloped to drain to the north. Leachate collected in these areas is conveyed to the on-site leachate storage tank area in the north of the site. As shown in Attachment III-1, Appendix 1A Historical Permit Drawings- Drawing 15G-1B, this area is designed and previously permitted for two leachate storage tanks. Currently, one 64,000-gallon tank has been constructed and is used for leachate storage. The storage tank is emptied, as needed, to maintain capacity for the leachate currently generated at the site.

Most of the lined cells in the Existing Area have been constructed. A single tank continues to provide sufficient leachate storage capacity, though the site was previously permitted to double storage capacity for full buildout of the Existing Area. The previously permitted option for two leachate storage tanks (doubling capacity) should continue to be sufficient as increasing slopes in Trenches 7 and 8 will reduce infiltration and increases to the waste column will reduce peak leachate production.

The lateral expansion area (Cells A1 through I2) are sloped to drain to the south, and leachate collected in these areas will be conveyed to an on-site leachate storage tank area on the east portion of the site. The proposed east storage tank area consists of four 64,000-gallon storage tanks, which have been designed to provide with a safety factor to provide enough storage capacity for the leachate expected to be generated within the lateral expansion area prior to hauling for off-site disposal. Leachate storage capacity calculations for the lateral expansion area are provided Appendix 3D.

Tanks will be equipped with a liquid-level sensor and alarm to prevent overfill and alert personnel of the high level in the tank who will take appropriate actions to reduce the leachate level in the tank. Additionally, the alarm will activate an electronic signal that will shut down leachate sump pumps until the issue is resolved.

Leachate storage tanks for the lateral expansion area will be located within a secondary containment area consisting of a concrete enclosure designed to prevent run-on from the 100-year, 24-hour storm event. The top of the enclosure’s concrete walls will be at elevation 66.4 ft amsl, which provides 3 feet of freeboard above the 100-year flood elevation. The capacity of the secondary containment area shall be adequate for holding the volume of the largest tank in the event of a release, plus the rainfall volume of a 25-year, 24-hour storm event that would be contained within the enclosure. Design calculations for the leachate tanks secondary containment area are provided in Appendix 3D.

Leachate storage tank secondary containment facilities will feature a low point where water collected during storm events, or leachate accumulated from a potential release inside the tank area can be removed with a portable or dedicated pump. If the water is suspected to be leachate from a release, will be pumped back into the storage tank.

2.2.7 Leachate Disposal

Leachate removed from the sumps will be solidified, treated and discharged, recirculated/sprayed within the waste fill, or transported off-site for treatment and disposal. The volume of leachate removed from the sumps will be recorded on a continuing basis. The results of any periodic analyses of leachate will also be placed in the Operating Record.

The primary disposal for leachate is off-site through a publicly owned treatment works. A copy of the original approval letter from the Guadalupe-Blanco River Authority Loop 175 Wastewater Treatment Plant for the off-site disposal of leachate is included in Attachment A. Consistent with §330.177, there is no regulatory requirement to characterize leachate and gas condensate sent to publicly owned treatment works for disposal; and leachate sampling and analysis will be performed in accordance with the treatment plant requirements.

Consistent with §330.177, recirculation of leachate and gas condensate may occur only on areas designed and constructed with a leachate collection system and composite liner. If utilized, procedures for recirculation may include:

- Discharge to trenches containing perforated pipes or prefabricated infiltration units spaced at regular horizontal and vertical intervals throughout the waste;
- Discharge to open trenches temporarily excavated into the waste which are then backfilled with waste and covered in accordance with §330.133;
- Spray application of leachate to working face or daily cover.

Refer to Section 10 of Part IV for operational procedures for recirculation of leachate and gas condensate.

3.0 CONTAMINATED WATER MANAGEMENT

Surface water that comes into contact with leachate, gas condensate, and/or waste will be considered contaminated water. Contaminated water will be managed consistent with §330.207. Contaminated water generation will be minimized through the use of best management practices:

- The active face shall be maintained to prevent run on flow and to prevent runoff from leaving the landfill boundary after contacting exposed waste.
- The active face shall be enclosed within a of temporary soil diversion berms.
- The active face will typically have minimal slopes, as to limit runoff
- The active face will be as narrow as possible to minimize the exposed area and reduce contaminated stormwater runoff.
- Sufficient daily and intermediate cover will be used over filled areas to minimize exposed waste. Cover placement procedures are provided in Part IV Site Operating Plan.

If waste is exposed in areas where daily or intermediate cover has been previously placed, runoff from these areas will be considered contaminated water.

3.1 Contaminated Water Collection, Containment and Disposal

Soil diversion berms will be constructed as needed around the active face to collect and contain surface water that has come into contact with waste. In addition to the planned berms around the active face, temporary containment berms will be constructed wherever needed to collect contaminated water. The design calculations and typical details for containment berms for a 25-year, 24-hour storm event are presented in Appendix 3E. Primary contaminated water storage will be provided by the containment berms, which will provide storage for the 25-year, 24-hour storm event.

Containment berms will be maintained until the contaminated water is removed. Contaminated water will be removed as soon as practical and not allowed to create nuisance conditions, but will be removed no later than seven days from the end of the rainfall (i.e., the end of the rainfall event is equivalent to the term “occurrence” as defined by 30 TAC §330.167). Contaminated water shall be disposed of in a manner that will not cause surface water or groundwater pollution, in accordance with §330.207. Contaminated water will be transferred to the leachate storage tanks for treatment. Currently, liquids from the leachate storage tank are hauled for treatment at a wastewater treatment plant. No offsite discharge of contaminated water will be made without specific authorized approval in accordance with §330.207(a) and §330.207(e).

4.0 GAS CONDENSATE MANAGEMENT

4.1 Gas Condensate Management

Per §330.3(57), gas condensate is the liquid generated as the result of any gas recovery process at a municipal solid waste facility. Gas condensate is collected in the landfill gas collection and control system (GCCS) as shown in Attachment III-1. Gas condensate will be delivered from the GCCS to the on-site leachate storage systems, or may be recirculated back into the landfill in accordance with §330.177 and Part IV – Landfill Permit Amendment Site Operating Plan.

APPENDIX 3E – DIVERSION BERM DESIGN CALCULATIONS

Victoria Landfill
CONTAMINATED WATER CONTAINMENT AND DIVERSION BERM CALCULATION

BURNS & McDONNELL

PROJECT: Victoria Landfill Permit Amendment 1522B
SUBJECT: Contaminated Water Containment and Diversion Berms
PROJECT NUMBER: 1076078
DATE: 11/2/2021 (all calculations) Page 1 of 3
11/18/2022 (added note only)

Purpose: The purpose of this calculation is to determine the height of the contaminated water containment berm at the downstream edge of the active face and the height of the diversion berm controlling stormwater run-on to the active face. *

***Rev 1, Nov 18, 2022 Note:** The term "active face" is synonymous with the term "working face" as defined in the 1522B Permit Application Part IV as "areas where waste is being deposited for disposal and daily cover or alternative daily cover is being applied."*

Methodology: These calculations are organized into two parts: those pertaining to the containment berm and those pertaining to the diversion berm. First, the containment berm height was calculated by estimating the volume of runoff within the active area, then solving for the required height based on this volume, the length of the berm and the geometry of the v-shaped water cross-section. Second, the diversion berm height was calculated using the Rational Method to estimate the peak flow from a typical run-on drainage basin and Mannings Equation to size the v-shaped swale. Runoff peak flows and volumes were calculated using the 25-year, 24-hour storm event for Victoria, TX.

Assumptions:

1. Runoff coefficient for the active face is determined according to exposed waste at 3% slopes.
2. The average weekly waste placement rate, used to size the active face was determined using the 2019 annual disposal tonnage, a 666 lb/cy factor, and a compaction ratio of 2:1 (volume in truck:volume in landfill)
3. The lift thickness, used to size the active face, is 10 feet. This is typical for landfill operations.
4. The active face is square-shaped.
5. The active face has a slope of 3%.
6. The containment/diversion berms shall have 2:1 slopes and no minimum top width.
7. Time of concentration is assumed to be 10 min.
8. Runoff coefficient for the run-on basin is determined according to interim cover material at 3:1 slopes that extend to touch the flowine of the berm.
9. Area of the run-on basin is 4 acres. This is equivalent to approximately 14 former active faces.
10. A 0.5% flowline slope was used to design the run-on berm. Actual slopes at time of installation should be 1.0%. This accounts for settlement.

References:

1. Texas DOT Hydraulic Design Manual, 2019
2. NOAA Atlas 14, Volume 11, Version 2 Estimates for Victoria, TX
3. Rainfall Intensity-Duration-Frequency Coefficients for Texas Version 2.1, 2015
4. Hydraflow Express Extension Output

7222 = Data Input Cell
7222 = Calculated and/or Referenced

Conclusions: 2-foot containment and diversion berms with 2:1 side slopes shall be installed around the active face. The diversion portion of the berm, along the upstream edge of the active face, shall have a flowline of at least 0.5% for the duration of the active face.

STATE OF TEXAS
SCOTT MARTIN
120819
LICENSED PROFESSIONAL ENGINEER
Scott Martin
4/5/2022

Prepared By: T. Schmidt Date: 11/2/2021
Checked By: D. Kantner Date: 11/8/2021

Approved By: S. Martin Date: 11/12/2021

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ATTACHMENT III-5 – GEOLOGY REPORT

Part III, Attachment 5 – Geology Report
TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part III, Attachment 5 – Geology Report
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

Burns & McDonnell Engineering Company, Inc.
8911 N Capital of Texas Hwy, Building 3, Suite 3100
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Texas Firm Registration No. F-845 / 50338

STATE OF TEXAS
AMANDA K. BREITLING
GEOLOGY
11071
LICENSED
PROFESSIONAL GEOSCIENTIST

11/18/22

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STATE OF TEXAS
AMANDA K. BREITLING
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11/18/22

their epicenter; the occurrence of significantly larger earthquakes is unlikely based on review of the Regional hazard assessment, South-Central Texas (The University of Texas at Austin, no date).

According to the 2018 U.S. Geological Survey Long-term National Seismic Hazard Maps (USGS, 2018) (see Appendix 5B), the region is considered low hazard with 0.04-0.08 peak ground acceleration (expressed as a fraction of standard gravity) for 2 percent probability of exceedance in 50 years (Petersen, 2019). This is equivalent to less than 10 percent probability over 250 years. The area was predicted to have a less than one percent chance of potentially minor or moderate damage from ground shaking due to natural and induced earthquakes in 2018 (Petersen, 2018).

Land subsidence has been observed in areas southeast of the site, likely due to oil and gas and production (Ratzlaff, 1982). There are no oil and gas wells within one mile of the site. The site is not located in a karst region.

2.3 Regional Hydrogeology [30 TAC §330.63(e)(3)]

According to the TWDB Report 380, *Aquifers of Texas*, the site overlies formations belonging to the Gulf Coast Aquifer. The Gulf Coast Aquifer forms a wide belt along the Gulf of Mexico from Florida to Mexico. In Texas, the aquifer provides water to all or parts of 54 counties and extends from the Rio Grande northeastward to the Louisiana-Texas border. Municipal and irrigation uses account for a large percentage of the total pumpage from the aquifer according to the Victoria County Groundwater Conservation District Groundwater Management Plan (Victoria County Groundwater Conservation District, 2018) and data from the TWDB (TWDB, no date). Water wells located within one mile of the site are depicted on Figure 2-4.

The aquifer consists of discontinuous, complex, interbedded clays, silts, sands, and gravels of Cenozoic age, which are hydrologically connected to form a large, leaky artesian aquifer system. The lithology of alternating silty clays and water bearing sands can extend for hundreds of feet while some pinch-out at relatively short distances. Five major components make up the Gulf Coast Aquifer including, from deepest to shallowest, the Catahoula confining system, the Jasper aquifer (primarily within the Oakville Sandstone), the Burkeville confining system (not an aquifer), the Evangeline aquifer (Fleming and Goliad sands), and the Chicot aquifer (Willis Sand, Lissie Formation [Bentley Formation and Montgomery Formation], Beaumont Formation, and overlying alluvial deposits). These formations are not continuous throughout the system and nomenclature can differ across regions. In general, the total sand thickness in the Chicot aquifer (uppermost regulated aquifer) ranges from 700 feet in the south to 1,300 feet in the north. The Chicot aquifer is confined by interbedded clay and silty sand layers within the Beaumont Formation and is generally present at approximately 65 ft amsl.

In the general area of the site, the regional aquifers are composed of unconsolidated layers of silt, sand, and gravel deposits separated by beds of clay. The heterogeneous character of these younger sediments makes correlation of the sands and clays difficult and imprecise over distances of several miles. The deposits are often lenticular; the lenses pinch out, coalesce, or grade into each other over short distances. The majority of groundwater in the region is under artesian conditions with the shallow groundwater present within Holocene age alluvium under unconfined conditions (JFK Group, Inc., 1997). According to the SDP, the upper soils at the site consist of medium to highly plastic clays with permeabilities of 1 x 10^{-7} centimeters per second (cm/s) or less. Hydraulic conductivity in the Upper Chicot ranges from 0.008 to 0.03 cm/s and hydraulic conductivity in the Lower Chicot ranges from 0.007 to 0.03 cm/s. Groundwater in the Upper Chicot generally flows to the west/northwest at a rate of 0.01 to 0.04 feet per day (ft/day) and groundwater in the Lower Chicot generally flows to the east/southeast at a rate of 0.02 to 0.2 ft/day. The hydraulic conductivity of the Evangeline ranges from 0.01 to 0.02 cm/s and groundwater generally flows to the east/southeast at a rate of 0.02 to 0.2 ft/day (Parsons, 2015). The coefficient of transmissivity in eight wells in Victoria County ranged from 21,000 to 87,000 gallons per day per foot. The field coefficient of permeability ranged from 100 to 276 gallons per day per foot and averaged 192 gallons per day per foot (Marvin, 1962). Coefficients of transmissivity in the Goliad, Willis, and Lissie range from 11,000 to 67,000 gallons per day per foot (Wood, 1963).

Water quality in the shallower Chicot and Evangeline aquifers is typically suitable for drinking. Total dissolved solids from water wells in Victoria County indicated total dissolved solids levels ranging from 384 parts per million (ppm) to 1930 ppm (Marvin, 1962). Generally, the freshwater zone becomes thinner as it approaches the Gulf of Mexico and in many coastal locations, pumping has caused saltwater intrusion. A regional potentiometric surface map is included in Appendix III-5B. An isopachous map of sand containing fresh or slightly saline water, Victoria and Calhoun Counties, Texas (Marvin, 1962) is in included in the SDP.

Based on the Geologic Atlas of Texas, recharge of the Beaumont clay and Lissie Formations is through precipitation that falls directly on the formations. Recharge through the Beaumont Clay that outcrops along the coast is generally small except in areas where valleys have been cut into the formation. Water not evaporated, consumed by plants through transpiration, or drained by streams from surface runoff infiltrates into the subsurface and eventually reaches the water table (TWDB, 2006). The Goliad Formation outcrops at the northwestern corner of Victoria County, more than 10 miles north of the site.

respectively. Historical groundwater elevations and monitoring data from monitoring wells in the Landfill monitoring program are included in Appendix 5J.

4.3 Soils Laboratory Testing

Select soil samples obtained from drilling activities were tested by TSI Laboratories, Inc. to determine engineering properties of the soil and to aid in classifying the soils encountered during drilling. Soil samples were labeled in the field according to the boring date and time, boring number, depth, and field classification by the field geologist. The laboratory test results are shown in Table 3-3 and geotechnical laboratory reports are included in Appendix 5D. Permeability results are summarized below:

- Upper (surficial) clay layer ranged from $1.3\text{x}10^{-8}$ to $1.3\text{x}10^{-9}$ cm/s
- Upper sand layer (intervals with clay present) ranged from $2.1\text{x}10^{-6}$ to $3.5\text{x}10^{-8}$ cm/s
- Middle (intermediate) clay layer ranged from $1.4\text{x}10^{-8}$ to $5.1\text{x}10^{-9}$ cm/s
- Deep clay (lower confining unit) ranged from $6.7\text{x}10^{-7}$ to $6.4\text{x}10^{-8}$ cm/s

Discussion of the suitability of soils and the uses for which they are intended are included in Attachment III-7 Slope Stability and Settlement Analysis. The material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in the landfill development (including waste and construction materials). The professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed.

APPENDIX 5K - ADDITIONAL HISTORICAL INFORMATION

Path: Z:\Clients\ENS\CityVictoria\107608_LandfillPermit\Studies\Geospatial\DataFiles\ArcDocs\Figure3_BoringLocation.mxd ewemmerich 10/12/2018

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

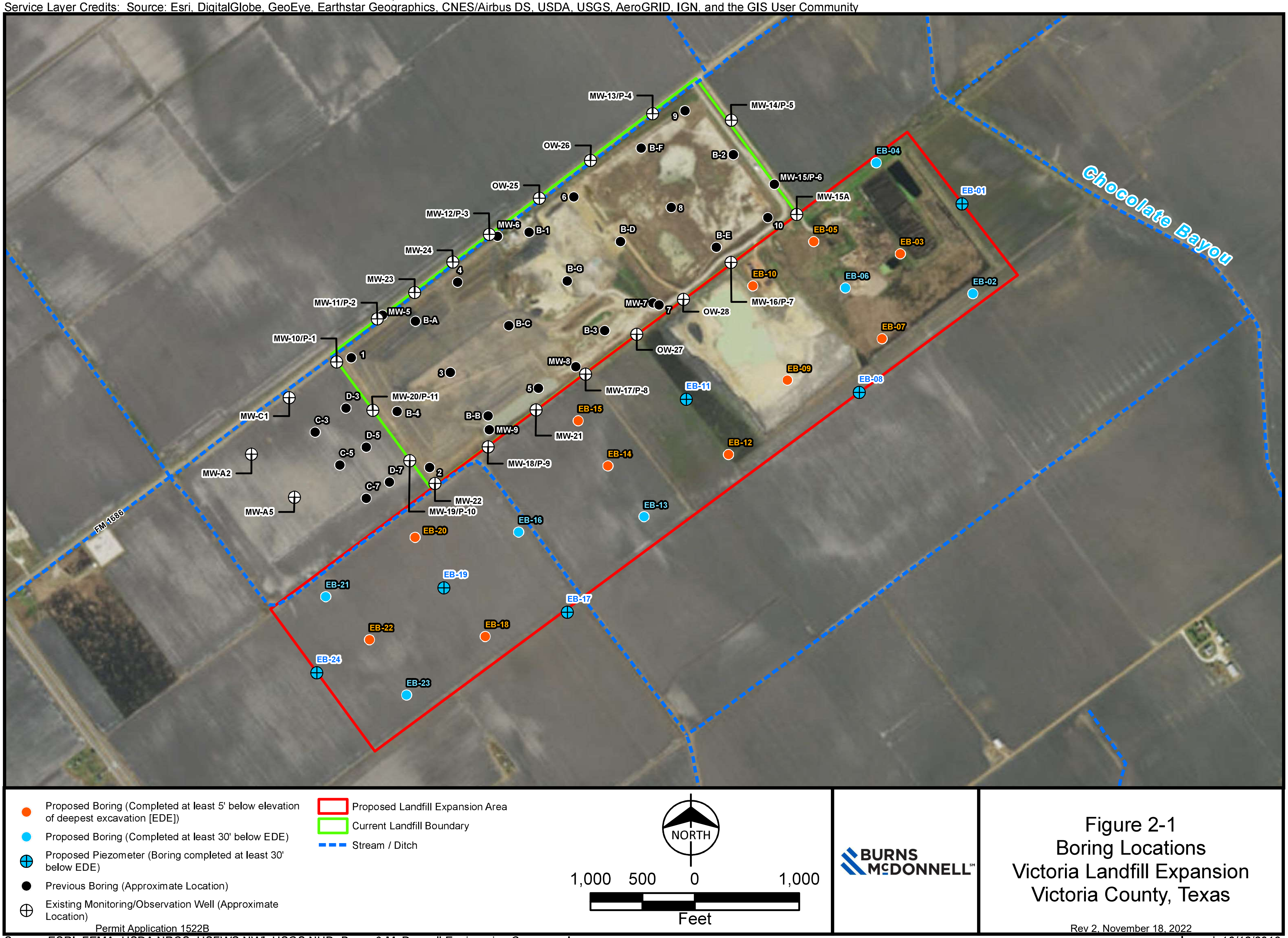


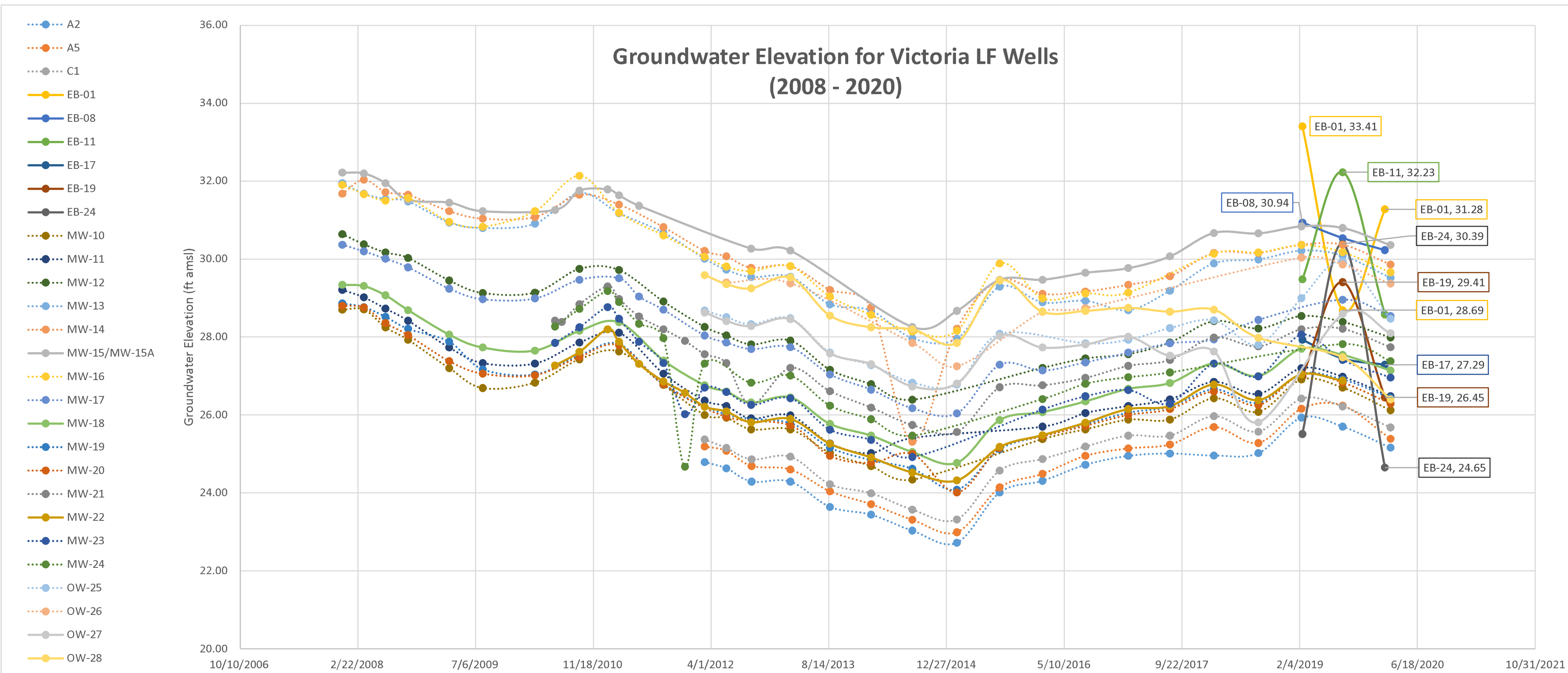
Figure 2-1
Boring Locations
Victoria Landfill Expansion
Victoria County, Texas

Permit Application 1522B

Rev 2, November 18, 2022

Source: ESRI; FEMA; USDA NRCS; USFWS NWI; USGS NHD; Burns & McDonnell Engineering Company, Inc

Issued: 10/12/2018


Groundwater Elevation for Victoria LF Wells
(2008 - 2020)
A2
A5
C1
EB-01
EB-08
EB-11
EB-17
EB-19
EB-24
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15/MW-15A
MW-16
MW-17
MW-18
MW-19
MW-20
MW-21
MW-22
MW-23
MW-24
OW-25
OW-26
OW-27
OW-28
Groundwater Elevation (ft amsl)
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
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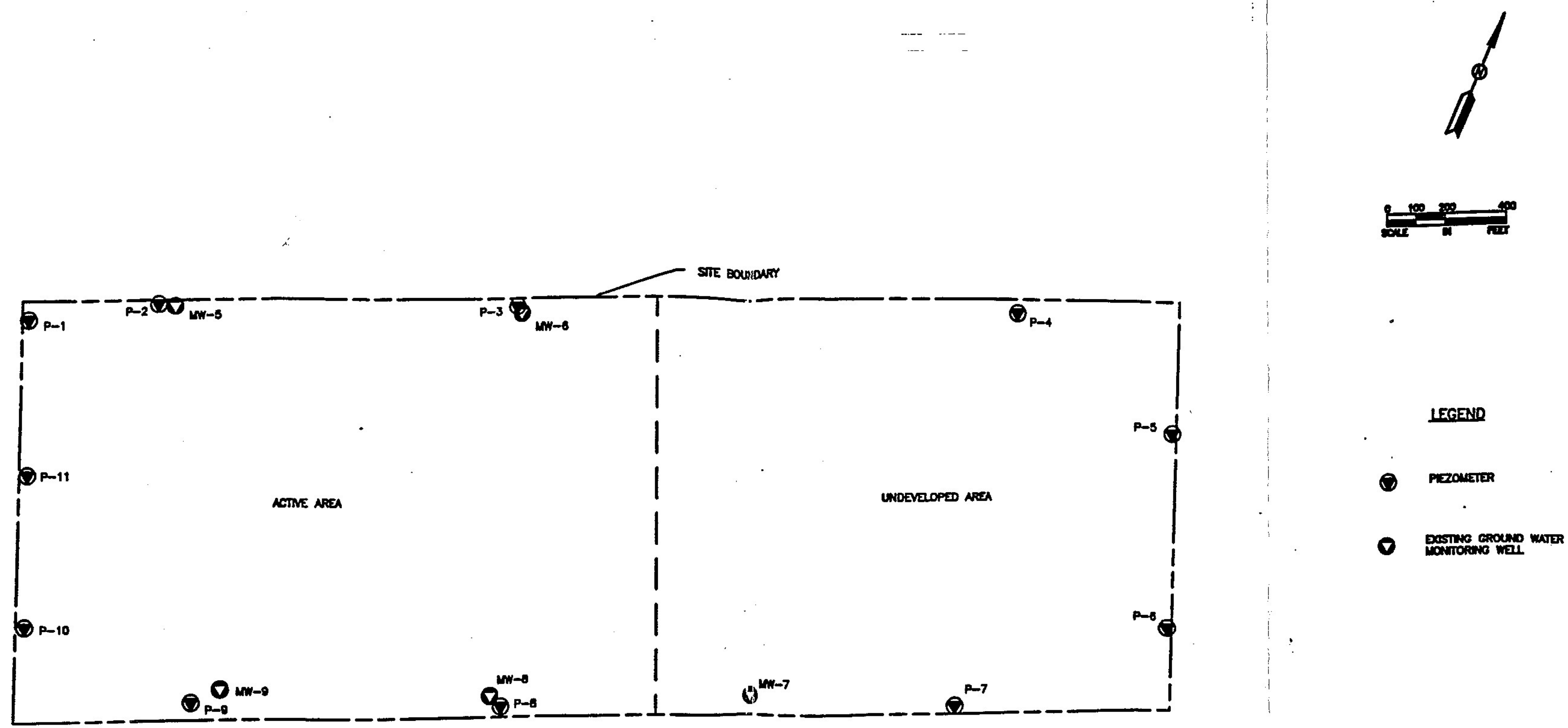


Attachment 4G

Rev 2, November 18, 2022

BROWNING-FERRIS INDUSTRIES

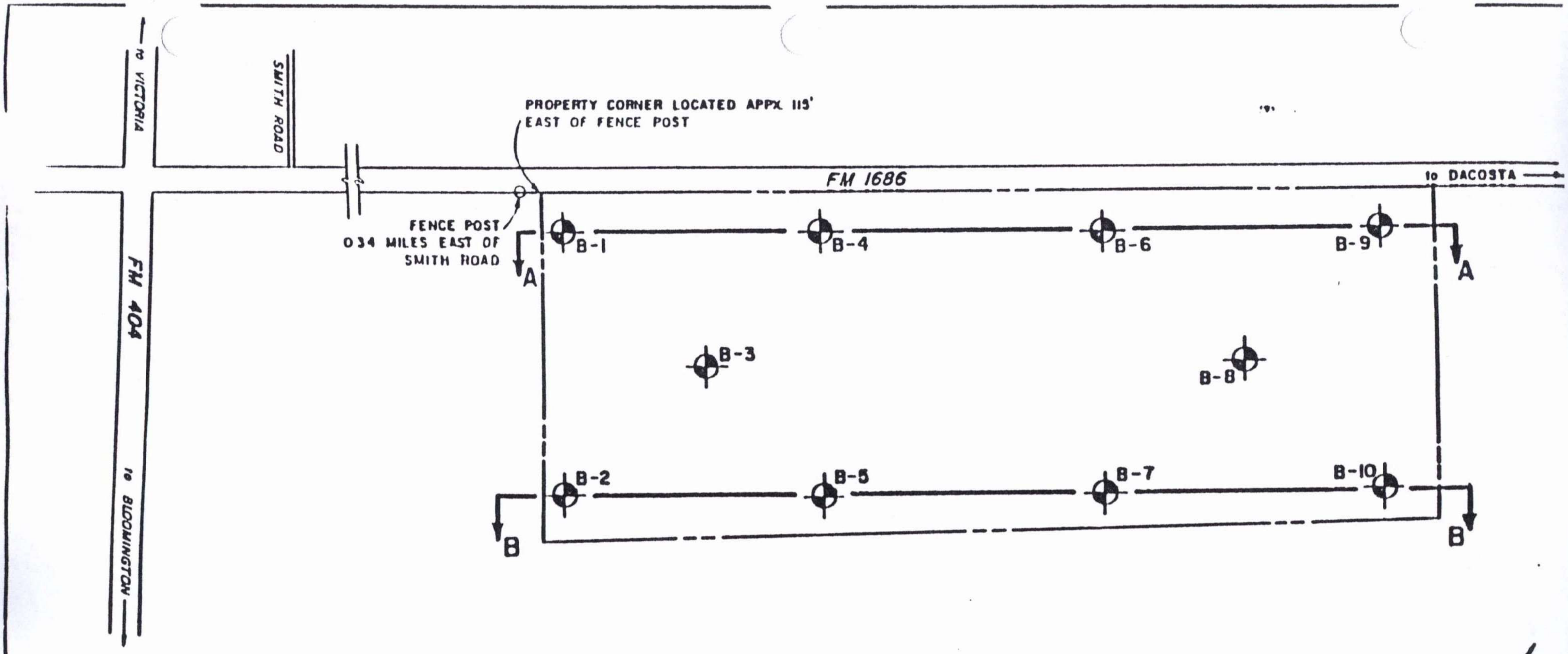
EMCON

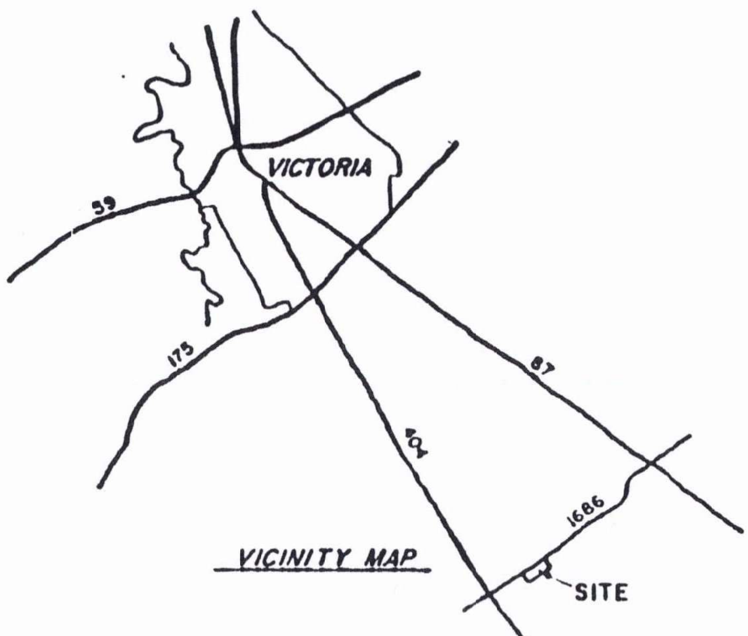
CITY OF VICTORIA LANDFILL
FM 1686 AND HWY 185
VICTORIA, TEXAS

SITE MAP

FIGURE 2

PROJECT NO. 61300-023-070





TRINITY ENGINEERING TESTING CORPORATI
GEOTECHNICAL ENGINEERING DIVISION

SANITARY LANDFILL SITE
VICTORIA, TEXAS

LOCATION OF BORINGS

SCALE: 1" = 800'	DATE: 7 NOV 1980	PLATE:
DRAWN BY: DWH		

A. Monitor Well Data Sheet

Texas Water Commission
Municipal Solid Waste Division
SE 67

Permittee or Site Name: Victoria Municipal Landfill

County: Victoria

Date of Monitor Well Installation: May 13, 1992

Monitor Well: Latitude: 28°41'29.2" Longitude: 96°54'38.4"

Monitor Well Groundwater

Gradient: Upgradient ___ Downgradient X

TDH Permit No.: 1522

Monitor Well I.D. No.: 5

Date of Monitor Well Development: June 26, 1992

Monitor Well Driller Name: Ricky Lane

License No.: 3061-M

NOTE:

(A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
(B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
(C) The minimun distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
(D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
(E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Kirk M. Nixon

Static Water Level Elevation (with respect to MSL) after Well Developement: 26.07'

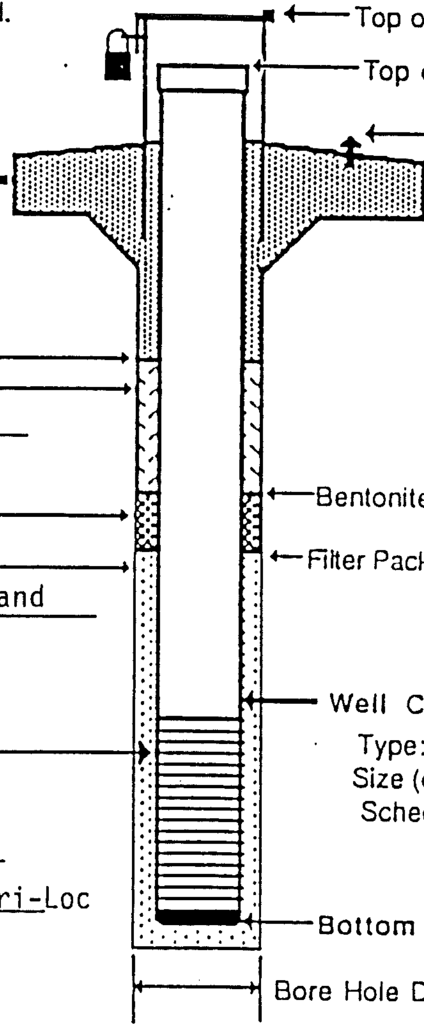
Name of Geologic Formation(s) in which Well is completed: Beaumont Formation

Type of Locking Device: Master Lock

Type of Casing Protection: 6"x6"x5' Steel Upright

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 6'x6'x6"

Surface Elevation: 64.30'



Top of Protective Collar Elevation: 67.71'

Top of Casing Elevation: 67.27'

Surveyor's Pin Elevation: 64.80'

Concrete Seal Depth: 3'

Casing Seal (Backfill) Material: Volclay

Bentonite Seal

Filter Pack

Filter Pack Material: 20/40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top Depth: 26' Elevation: 38.30'

Filter Pack Top Depth: 28' Elevation: 36.30'

Well Casing
Type: B-K Tri-Loc
Size (diameter): 4"
Schedule or Thickness: Sch 40

Well Screen
Top Depth: 30'
Top Elevation: 33.80'
Type of Well Screen: B-K Tri-Loc
Screen Opening Size: 0.010 inch

Bottom Cap (Depth: 65.00')

Bore Hole Diameter: 10.25"

DOCUMENTATION OF WELL CONSTRUCTION

Within 30 days after installation of a monitor well, this form and the attached Monitor Well Data Sheet must be completed and submitted to the Commission. If development of the well is not complete, notify the Commission within 30 days of the installation and request an extension of the due date for these forms.

1. Name of the geologist, hydrologist, or engineer who supervised the installation and development of the monitor well.
   Kirk M. Nixon

2. License number and name of monitor-well driller who drilled the monitor well. Ricky Lane 3061-M

3. Date of well construction. May 13, 1992

4. Drilling method. Hollow-stem Auger 10.25" O.D.

5. Drilling fluid. Not Applicable

6. Filter pack placement method. Tremie

7. Annular seal material. Bentonite Pellets
   Bentonite pellet or particle size. 3/8"

8. Casing seal material. Volclay Grout

9. Well development procedure. Utilized Grundfos ReadiFlo II Pump at 6 gallons per minute

10. Attach the log (with detailed lithologic descriptions) of the monitor well.

11. Attach copies of reports filed with other agencies.

A. Monitor Well Data Sheet

Texas Water Commission
Municipal Solid Waste Division
SE 67

Permittee or Site Name: Victoria Municipal Landfill

County: Victoria

Date of Monitor Well Installation: May 12, 1992

Monitor Well: Latitude: 28°41'36.9" Longitude: 96°54'26.1"

Monitor Well Groundwater

Gradient: Upgradient X Downgradient ___

TDH Permit No. : 1522

Monitor Well I.D. No.: 6

Date of Monitor Well Development: June 26, 1992

Monitor Well Driller Name: Ricky Lane

License No.: 3061-M

NOTE:

(A)The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
(B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
(C) The minimun distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
(D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
(E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Kirk M. Nixon

Static Water Level Elevation (with respect to MSL) after Well Developement : 26.88'

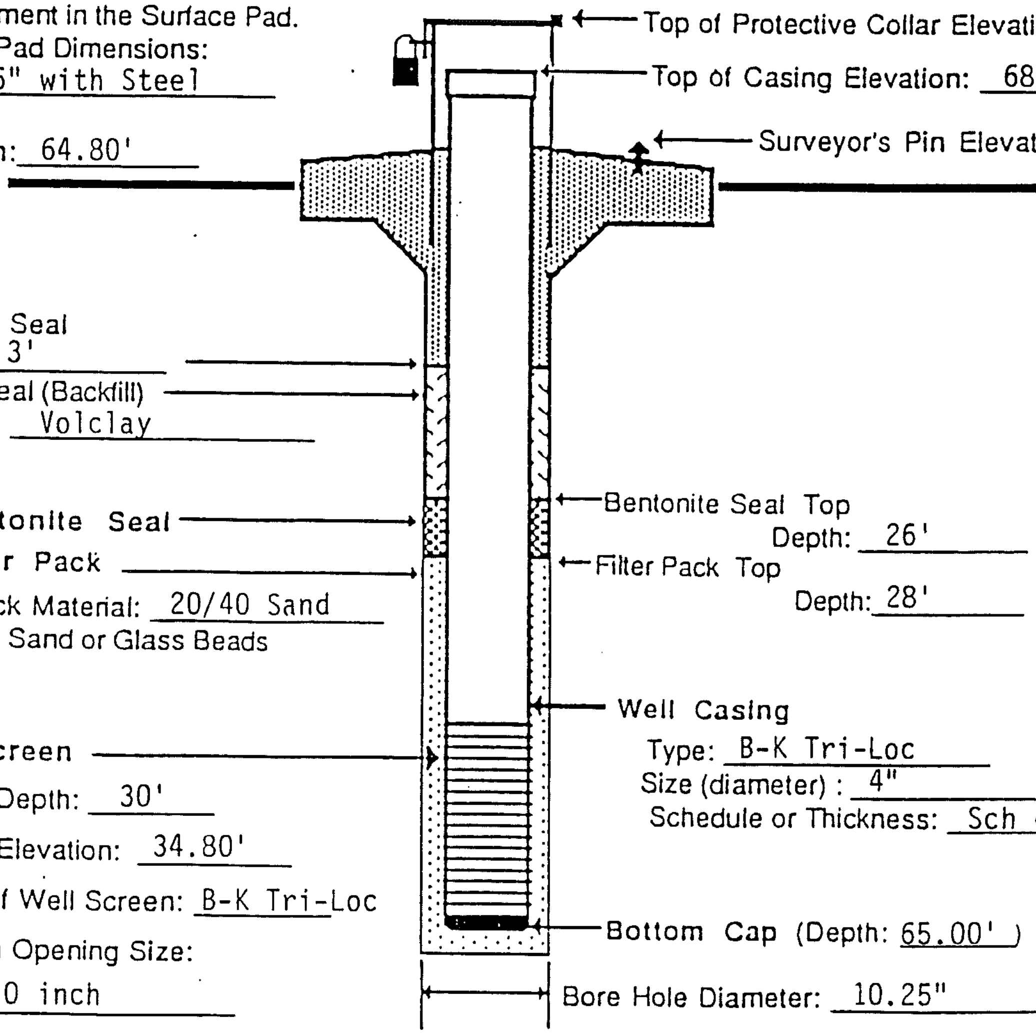
Name of Geologic Formation(s) in which Well is completed: Beaumont Formation

Type of Locking Device: Master Lock

Type of Casing Protection: 6"x6"x5' Steel Upright

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 6'x6'x6" with Steel

Surface Elevation: 64.80'



Top of Protective Collar Elevation: 68.65'

Top of Casing Elevation: 68.31'

Surveyor's Pin Elevation: 65.36'

Concrete Seal Depth: 3'

Casing Seal (Backfill) Material: Volclay

Bentonite Seal

Filter Pack

Filter Pack Material: 20/40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top Depth: 26' Elevation: 38.80'

Filter Pack Top Depth: 28' Elevation: 36.80'

Well Casing
Type: B-K Tri-Loc
Size (diameter) : 4"
Schedule or Thickness: Sch 40

Well Screen
Top Depth: 30'
Top Elevation: 34.80'
Type of Well Screen: B-K Tri-Loc
Screen Opening Size: 0.010 inch

Bottom Cap (Depth: 65.00')

Bore Hole Diameter: 10.25"

DOCUMENTATION OF WELL CONSTRUCTION

Within 30 days after installation of a monitor well, this form and the attached Monitor Well Data Sheet must be completed and submitted to the Commission. If development of the well is not complete, notify the Commission within 30 days of the installation and request an extension of the due date for these forms.

1. Name of the geologist, hydrologist, or engineer who supervised the installation and development of the monitor well.
   Kirk M. Nixon
2. License number and name of monitor-well driller who drilled the monitor well. Ricky Lane 3061-M
3. Date of well construction. May 12, 1992
4. Drilling method. Hollow-stem Auger 10.25" O.D.
5. Drilling fluid. Not Applicable
6. Filter pack placement method. Tremie
7. Annular seal material. Bentonite Pellets
   Bentonite pellet or particle size. 3/8"
8. Casing seal material. Volclay Grout
9. Well development procedure. Utilized Grundfos ReadiFlo II Pump at 5 gallons per minute
10. Attach the log (with detailed lithologic descriptions) of the monitor well.
11. Attach copies of reports filed with other agencies.

A. Monitor Well Data Sheet

Texas Water Commission
Municipal Solid Waste Division
SE 67

Permittee or Site Name: Victoria Municipal Landfill

County: Victoria

Date of Monitor Well Installation: May 14, 1992

Monitor Well: Latitude: 28°41'30.9" Longitude: 96°54'07.5"

Monitor Well Groundwater Gradient: Upgradient X Downgradient ____

TDH Permit No.: 1522

Monitor Well I.D. No.: 7

Date of Monitor Well Development: June 26, 1992

Monitor Well Driller Name: Ricky Lane

License No.: 3061-M

NOTE:

(A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
(B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
(C) The minimun distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
(D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
(E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Kirk M. Nixon

Static Water Level Elevation (with respect to MSL) after Well Developement: 27.42'

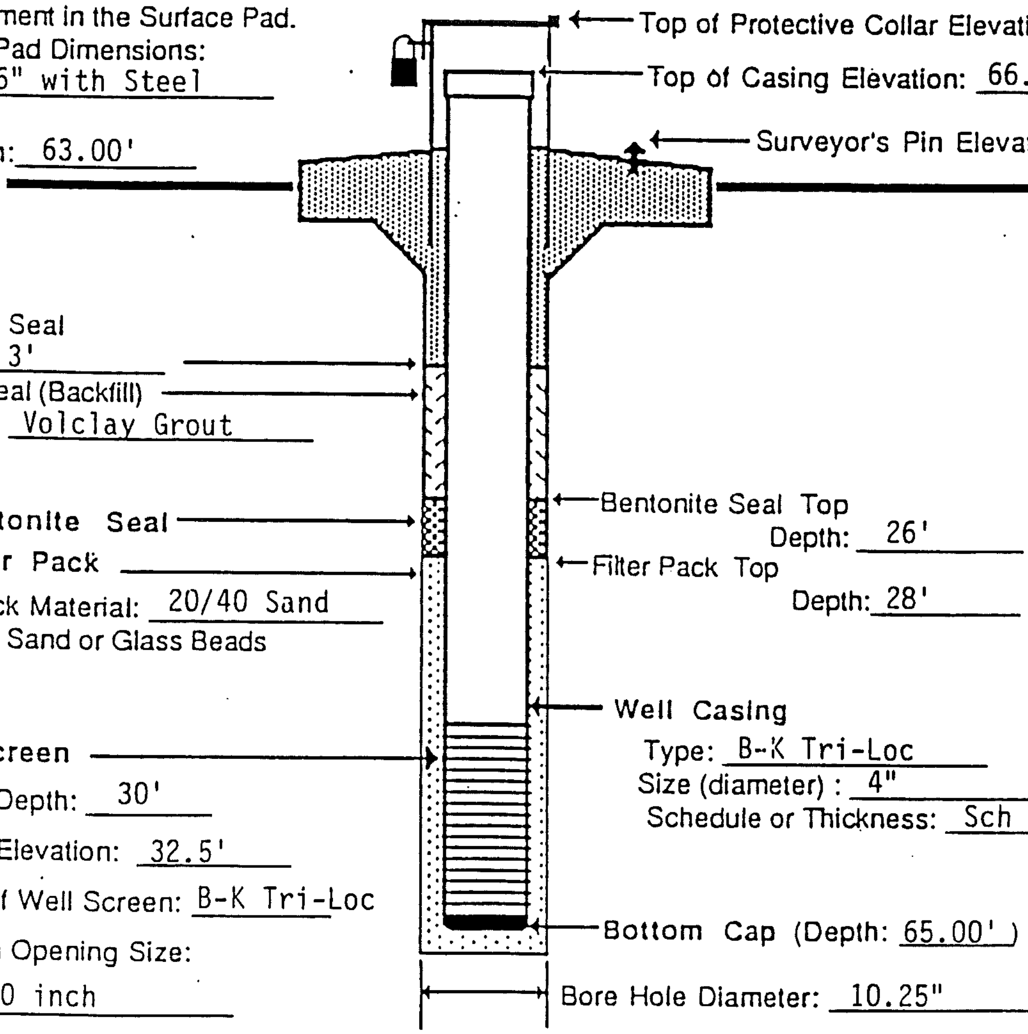
Name of Geologic Formation(s) in which Well is completed: Beaumont Formation

Type of Locking Device: Master Lock

Type of Casing Protection: 6"x6"x5' Steel Upright

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 6'x6'x6" with Steel

Surface Elevation: 63.00'



Top of Protective Collar Elevation: 66.68'

Top of Casing Elevation: 66.30'

Surveyor's Pin Elevation: 63.58'

Concrete Seal Depth: 3'

Casing Seal (Backfill) Material: Volclay Grout

Bentonite Seal

Filter Pack

Bentonite Seal Top Depth: 26' Elevation: 37'

Filter Pack Top Depth: 28' Elevation: 35'

Filter Pack Material: 20/40 Sand
Sterilized Sand or Glass Beads

Well Screen
Top Depth: 30'
Top Elevation: 32.5'
Type of Well Screen: B-K Tri-Loc
Screen Opening Size: 0.010 inch

Well Casing
Type: B-K Tri-Loc
Size (diameter): 4"
Schedule or Thickness: Sch 40

Bottom Cap (Depth: 65.00')

Bore Hole Diameter: 10.25"

DOCUMENTATION OF WELL CONSTRUCTION

Within 30 days after installation of a monitor well, this form and the attached Monitor Well Data Sheet must be completed and submitted to the Commission. If development of the well is not complete, notify the Commission within 30 days of the installation and request an extension of the due date for these forms.

1. Name of the geologist, hydrologist, or engineer who supervised the installation and development of the monitor well.
   Kirk M. Nixon
2. License number and name of monitor-well driller who drilled the monitor well. Ricky Lane 3061-M
3. Date of well construction. May 14, 1992
4. Drilling method. Hollow-stem Auger 10.25" O.D.
5. Drilling fluid. Not Applicable
6. Filter pack placement method. Tremie
7. Annular seal material. Bentonite Pellets
   Bentonite pellet or particle size. 3/8"
8. Casing seal material. Volclay Grout
9. Well development procedure. Utilized Grundfos ReadiFlo II Pump at 6 gallons per minute
10. Attach the log (with detailed lithologic descriptions) of the monitor well.
11. Attach copies of reports filed with other agencies.

A. Monitor Well Data Sheet

Texas Water Commission
Municipal Solid Waste Division
SE 67

Permittee or Site Name: Victoria Municipal Landfill

County: Victoria

Date of Monitor Well Installation: June 18, 1992

Monitor Well: Latitude: 28°41'24.5" Longitude: 96°54'16.5"

Monitor Well Groundwater

Gradient: Upgradient X Downgradient ____

TDH Permit No.: 1522

Monitor Well I.D. No.: 8

Date of Monitor Well

Development: June 26, 1992

Monitor Well Driller

Name: Ricky Lane

License No.: 3061-M

NOTE:

(A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
(B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
(C) The minimun distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
(D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
(E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Kirk M. Nixon

Static Water Level Elevation (with respect to MSL) after Well Developement: 26.83'

Name of Geologic Formation(s) in which Well is completed: Beaumont Formation

Type of Locking Device: Master Lock

Type of Casing Protection: 6"x6"x5' Steel Upright

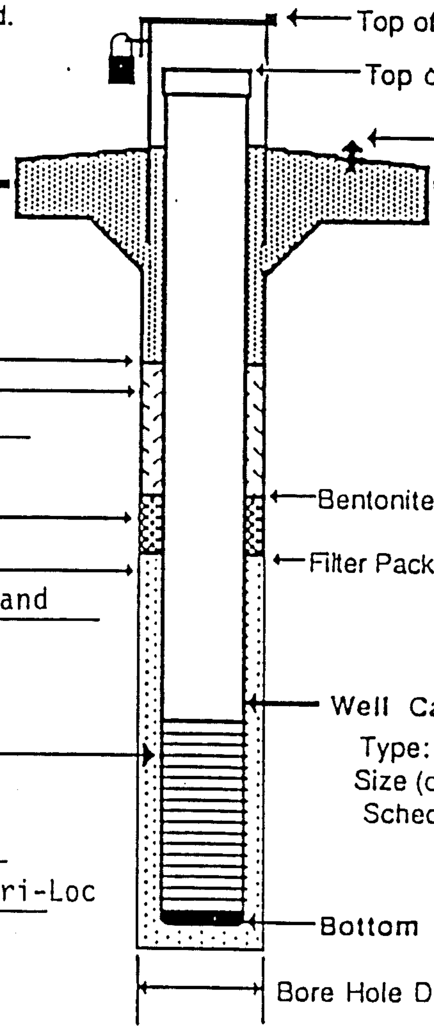
Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 6'x6'x6" with Steel

Surface Elevation: 63.40'

Top of Protective Collar Elevation: 67.19'

Top of Casing Elevation: 66.81'

Surveyor's Pin Elevation: 63.80'



Concrete Seal Depth: 3'

Casing Seal (Backfill) Material: Volclay

Bentonite Seal

Filter Pack

Filter Pack Material: 20/40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top Depth: 26' Elevation: 37.40'

Filter Pack Top Depth: 28' Elevation: 35.40'

Well Screen

Top Depth: 30'

Top Elevation: 33.40'

Type of Well Screen: B-K Tri-Loc

Screen Opening Size:

0.010 inch

Well Casing

Type: B-K Tri-Loc

Size (diameter): 4"

Schedule or Thickness: Sch 40

Bottom Cap (Depth: 65.00')

Bore Hole Diameter: 10.25"

DOCUMENTATION OF WELL CONSTRUCTION

Within 30 days after installation of a monitor well, this form and the attached Monitor Well Data Sheet must be completed and submitted to the Commission. If development of the well is not complete, notify the Commission within 30 days of the installation and request an extension of the due date for these forms.

1. Name of the geologist, hydrologist, or engineer who supervised the installation and development of the monitor well.
   Kirk M. Nixon
2. License number and name of monitor-well driller who drilled the monitor well. Ricky Lane 3061-M
3. Date of well construction. June 18, 1992
4. Drilling method. Hollow-stem Auger 10.25" O.D.
5. Drilling fluid. Not Applicable
6. Filter pack placement method. Tremie
7. Annular seal material. Bentonite Pellets
   Bentonite pellet or particle size. 3/8"
8. Casing seal material. Volclay Grout
9. Well development procedure. Utilized Grundfos ReadiFlo II Pump at 5 gallons per minute
10. Attach the log (with detailed lithologic descriptions) of the monitor well.
11. Attach copies of reports filed with other agencies.

A. Monitor Well Data Sheet

Texas Water Commission
Municipal Solid Waste Division
SE 67

Permittee or Site Name: Victoria Municipal Landvill

County: Victoria

Date of Monitor Well Installation: June 16, 1992

Monitor Well: Latitude: 28°41'18.7" Longitude: 96°54'25.9"

Monitor Well Groundwater

Gradient: Upgradient ___ Downgradient X

TDH Permit No.: 1522

Monitor Well I.D. No.: 9

Date of Monitor Well Development: June 26, 1992

Monitor Well Driller Name: Ricky Lane

License No.: 3061-M

NOTE:

(A)The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
(B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
(C) The minimun distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
(D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
(E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Kirk M. Nixon

Static Water Level Elevation (with respect to MSL) after Well Developement: 26.39'

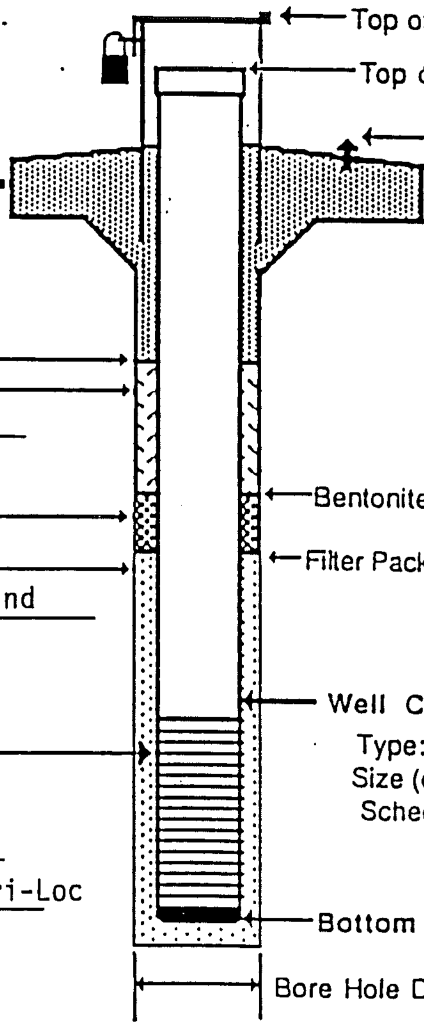
Name of Geologic Formation(s) in which Well is completed: Beaumont Formation

Type of Locking Device: Master Lock

Type of Casing Protection: 6"x6"x5' Steel Upright

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 6'x6'x6" with Steel

Surface Elevation: 63.40'



Top of Protective Collar Elevation: 67.21'

Top of Casing Elevation: 66.89'

Surveyor's Pin Elevation: 64.03'

Concrete Seal Depth: 3'

Casing Seal (Backfill) Material: Volclay

Bentonite Seal

Filter Pack

Filter Pack Material: 20/40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top Depth: 26' Elevation: 37.40'

Filter Pack Top Depth: 28' Elevation: 35.40'

Well Casing
Type: B-K Tri-Loc
Size (diameter): 4"
Schedule or Thickness: Sch 40

Well Screen
Top Depth: 30'
Top Elevation: 33.40'
Type of Well Screen: B-K Tri-Loc
Screen Opening Size: 0.010 inch

Bottom Cap (Depth: 65.00')

Bore Hole Diameter: 10.25"

DOCUMENTATION OF WELL CONSTRUCTION

Within 30 days after installation of a monitor well, this form and the attached Monitor Well Data Sheet must be completed and submitted to the Commission. If development of the well is not complete, notify the Commission within 30 days of the installation and request an extension of the due date for these forms.

1. Name of the geologist, hydrologist, or engineer who supervised the installation and development of the monitor well.
   Kirk M. Nixon
2. License number and name of monitor-well driller who drilled the monitor well. Ricky Lane 3061-M
3. Date of well construction. June 16, 1992
4. Drilling method. Hollow-stem Auger 10.25" O.D.
5. Drilling fluid. Not Applicable
6. Filter pack placement method. Tremie
7. Annular seal material. Bentonite Pellets
   Bentonite pellet or particle size. 3/8"
8. Casing seal material. Volclay Grout
9. Well development procedure. Utilized Grundfos ReadiFlo II Pump at 6 gallons per minute
10. Attach the log (with detailed lithologic descriptions) of the monitor well.
11. Attach copies of reports filed with other agencies.

Monitor Well Data Sheet

Texas Commission on Environmental Quality
Waste Permits Division

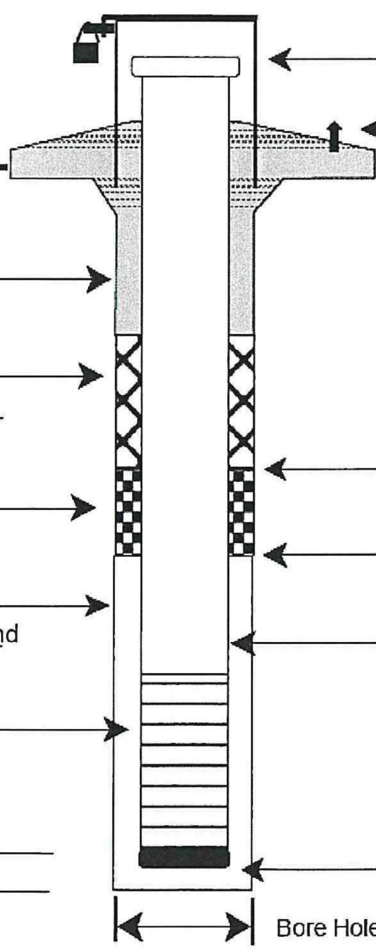
Permittee or Site Name: City of Victoria Landfill
County: Victoria County, Texas
Date of Monitor Well Installation: 8/23/2021
Monitor Well Latitude : 28.693891 Longitude: -95.8983
Monitor Well Hydraulic Position:
Upgradient X Downgradient ____

MSW Permit No.: 1522A
Monitor Well I.D. No.: MW-15AR
Date of Well Development: 8/26/2021
Monitor Well Driller
Name: L. Tobola
License No.: 3026

Geologist, Hydrologist, or Engineer Supervising Well Installation: L. Scarborough
Static Water Level Elevation (with respect to MSL) after Well Development: 36.86
Name of Geologic Formation(s) in which Well is completed: Beaumont Formation
Type of Locking Device: Pad Lock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4.5'x4.5'x6"

Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.



Top of Casing Elevation: 67.57'
Surface Elevation: 63.90'
Surveyor's Pin Elevation: 64.72'
Concrete Seal Depth: 2'
Casing Seal (backfill) Material: Grout Seal
Bentonite Seal
Bentonite Seal Top Depth: 42' Elevation: 21.9
Filter Pack Top Depth: 46' Elevation: 17.9
Filter Pack
Filter Pack Material: 20/40 Sand
Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: Sch. 40
Well Screen
Top Depth: 50'
Top Elevation: 13.9
Type of Well Screen: PVC
Screen Opening Size: 0.01"
Bottom Depth: 60'
Bottom Elevation: 3.9
Bottom Cap Depth: 60.5'
Bore Hole Diameter: 8.25"

TCEQ-10308 (Rev. 11/18/11)

Victoria Land Fill Well Location Survey

Source Name	Northing Location	Easting Location	Top of Casing Elev. (MSL)	Top of Concete Slab Elev. (MSL)	Natural Ground Elevation (MSL)
EB-01	13442437.81	2643817.21	64.02	62.35	62.0
EB-02	13441678.37	2643849.85			61.9
EB-03	13441952.68	2643230.03			64.4
EB-04	13442829.13	2643005.70			62.3
EB-05	13442071.13	2642394.99			62.9
EB-06	13441621.93	2642706.68			67.4
EB-07	13441135.03	2643063.23			62.6
EB-08	13440629.72	2642843.15	64.04	62.43	61.9
EB-09	13440552.23	2642295.84			56.2
EB-10	13441642.93	2641822.79			63.3
EB-11	13440532.65	2641163.79	64.54	63.75	63.1
EB-12	13440010.68	2641570.40			62.6
EB-13	13439433.10	2640793.75			63.1
EB-14	13439942.32	2640467.14			63.4
EB-15	13440350.70	2640150.15			63.5
EB-16	13439284.65	2639576.79			64.0
EB-17	13438595.87	2639999.39	64.25	62.6	62.1
EB-18	13438298.99	2639259.96			62.6
EB-19	13438734.31	2638841.31	65.31	63.79	63.3
EB-20	13439244.50	2638581.89			63.7
EB-21	13438660.85	2637726.28			63.9
EB-22	13438260.57	2638153.95			63.2
EB-23	13437709.96	2638483.34			62.9
EB-24	13437928.12	2637633.08	65.10	63.59	63.2

Site Benchmark (Provided information)		Elevation (MSL)
13442155.43	2639554.51	64.97

STATE OF TEXAS
REGISTERED
WM. PATRICK HOHLT
5523
PROFESSIONAL
LAND SURVEYOR

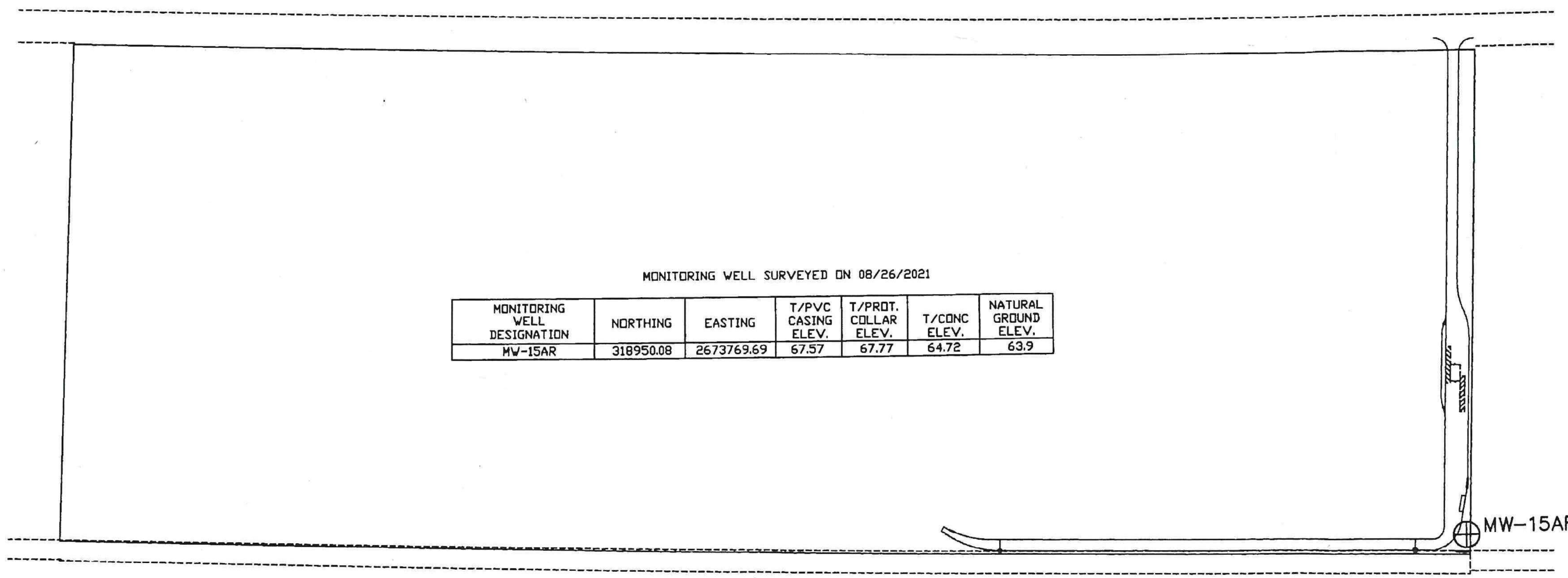
Wm. Patrick Hohlt
5/31/19

NOTES:
1) ELEVATIONS BASED ON EXISTING GAS PROBE LOCATIONS TAKEN FROM PAPE-DAWSON ENGINEERS DRAWING NO. 9478-93 DATED NOVEMBER 1993.

2) COORDINATES ARE TO THE TOP OF PROTECTIVE COLLAR

0 400 800 1200

STATE OF TEXAS
REGISTERED
KEVIN A OLSON
4524
PROFESSIONAL
LAND SURVEYOR



MONITORING WELL SURVEYED ON 08/26/2021

MONITORING WELL DESIGNATION	NORTHING	EASTING	T/PVC CASING ELEV.	T/PROT. COLLAR ELEV.	T/CONC ELEV.	NATURAL GROUND ELEV.
MW-15AR	318950.08	2673769.69	67.57	67.77	64.72	63.9

FIRM REGISTRATION NO. 10194114
MARTIN OLSON SURVEY INC.
PROFESSIONAL SURVEYORS, BOUNDARY
CONSTRUCTION & TOPOGRAPHIC SURVEYS
227 DERRICK DR.
HUMBLE, TEXAS 77338
PH: 281-446-8899
MARTIN FILE: VL_MW 15AR_08262021.DWG

RECORD DRAWING
WELL SURVEY

CITY OF VICTORIA LANDFILL
VICTORIA COUNTY, TEXAS

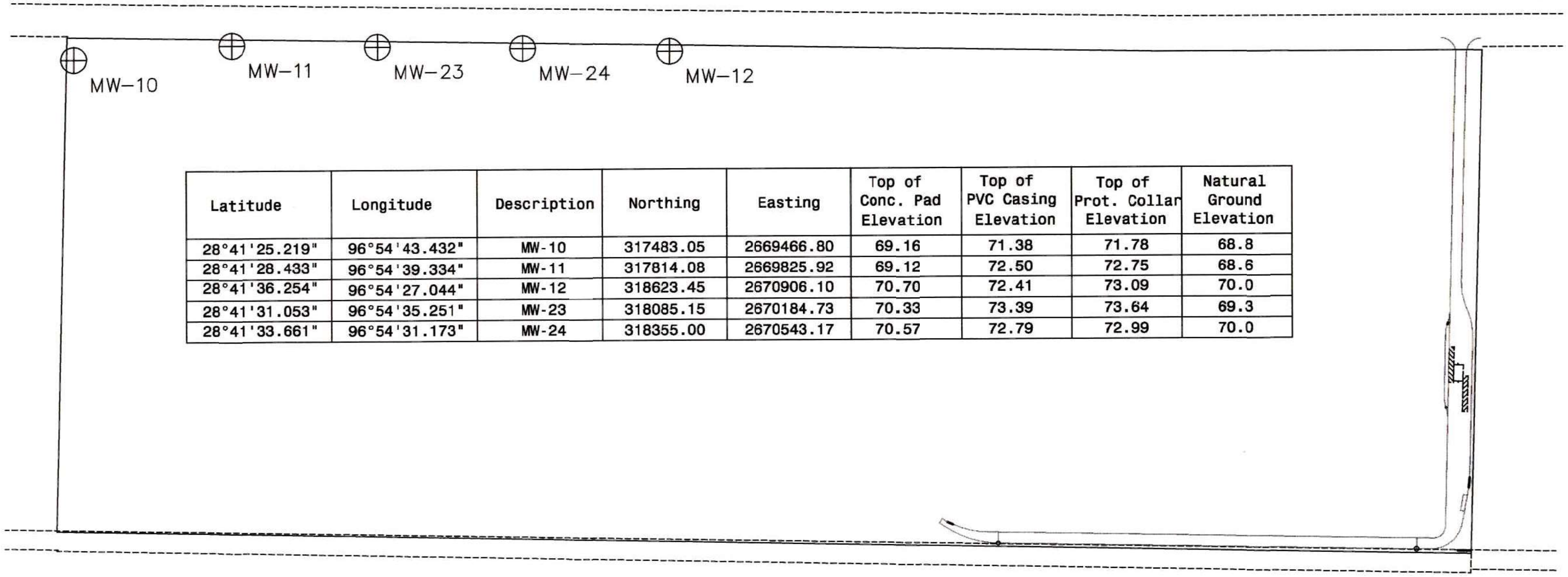
REPUBLIC SERVICES

NOTES:
1) COORDINDATES ARE TO THE DISK IN CONCRETE PAD.
2) COORDINATES AND ELEVATIONS BASED ON EXISTING GAS PROBE LOCATIONS TAKEN FROM PAPE-DAWSON ENGINEERS DRAWING NO. 9478-93 DATED NOVEMBER 1993.

0 400 800 1200

STATE OF TEXAS
REGISTERED
KEVIN A. OLSON
4524
PROFESSIONAL
LAND SURVEYOR

SURVEYED ON THE GROUND: 10/08/2015



Latitude	Longitude	Description	Northing	Easting	Top of Conc. Pad Elevation	Top of PVC Casing Elevation	Top of Prot. Collar Elevation	Natural Ground Elevation
28°41'25.219"	96°54'43.432"	MW-10	317483.05	2669466.80	69.16	71.38	71.78	68.8
28°41'28.433"	96°54'39.334"	MW-11	317814.08	2669825.92	69.12	72.50	72.75	68.6
28°41'36.254"	96°54'27.044"	MW-12	318623.45	2670906.10	70.70	72.41	73.09	70.0
28°41'31.053"	96°54'35.251"	MW-23	318085.15	2670184.73	70.33	73.39	73.64	69.3
28°41'33.661"	96°54'31.173"	MW-24	318355.00	2670543.17	70.57	72.79	72.99	70.0

FIRM REGISTRATION NO. 10194114

MARTIN OLSON SURVEY INC.
PROFESSIONAL SURVEYORS, BOUNDARY
CONSTRUCTION & TOPOGRAPHIC SURVEYS
8810 VILL CLAYTON PKWY SUITE F
HUMBLE, TEXAS 77338
PH: 281-446-8899
FAX: 281-446-8609

MARTIN FILE: VLMW10082015.DWG

RECORD DRAWING
MONITORING WELL SURVEY

CITY OF VICTORIA LANDFILL
VICTORIA COUNTY, TEXAS

REPUBLIC WASTE SERVICES

ATTACHMENT III-6 – GROUNDWATER SAMPLING AND ANALYSIS PLAN

Part III Landfill Permit Amendment Attachment 6 – Groundwater Sampling and Analysis Plan and Groundwater Monitoring Plan TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 1, November 18, 2022

Part III Landfill Permit Amendment Attachment 6 – Groundwater Sampling and Analysis Plan and Groundwater Monitoring Plan TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 1, November 18, 2022

prepared by

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Austin, Texas
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1.0 INTRODUCTION

This Groundwater Sampling and Analysis Plan (GWSAP) and Groundwater Monitoring Plan (GMP) has been prepared to support completion of the requirements of Texas Administrative Code (TAC) Title 30 Chapter 330 Rule 63(f) (30 TAC §330.63(f)) for the City of Victoria (City) Landfill (Landfill). This document includes establishment of a groundwater monitoring program. A copy of this document will be placed in the facility's operating record upon document approval by the TCEQ. The groundwater monitoring program for the existing unit is not modified by this GMP, except for removal of wells related to construction of the Landfill expansion. Locations and elevations of new monitoring wells will be surveyed by a Texas registered professional land surveyor (RPLS).

2.0 GROUNDWATER SAMPLING AND ANALYSIS PLAN

A GWSAP for the City of Victoria Landfill unit was prepared in accordance 30 TAC §330.401 through §330.421 and the TCEQ *Guidelines for Preparing a Groundwater Sampling and Analysis Plan (RG-074) revised May 2018,* and will be adopted for groundwater monitoring for the existing Landfill and Landfill expansion area. The GWSAP is included as Appendix 6A.

The GWSAP describes the consistent collection, processing, and analysis of groundwater samples and the basic laboratory requirements for obtaining valid, defensible data. The purpose of the GWSAP, in accordance with the requirements set forth in 30 TAC §330.405, is to establish the standards and practices for compliance with the landfill's permit specifications and to obtain samples that are representative of the groundwater present in the geologic formation sampled by the monitoring wells. The GWSAP also generally describes the purpose and procedures for quality assurance, quality control, statistical analysis, and reporting of the resu1ts of groundwater monitoring samples collected for the purpose of groundwater monitoring at the waste management unit.

4.0 REFERENCES

Hydrex Environmental, Inc. (2011, August). *Report on Assessment of Corrective Measures for Exceedances of Arsenic in Groundwater, Victoria Landfill, MSW Permit No. 1522A, Victoria County, Texas*.

Hydrex Environmental, Inc. (2021, April). *1st 2021 Semi-Annual Detection, Assessment, and Corrective Action Groundwater Monitoring Report, City of Victoria Landfill, MSW Permit No. 1522A, Victoria County, Texas*.

APPENDIX 6A – GROUNDWATER SAMPLING AND ANALYSIS PLAN

Part III, Attachment 6, Appendix 6A
Groundwater Sampling and Analysis Plan
TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 1, November 18, 2022

Part III, Attachment 6, Appendix 6A
Groundwater Sampling and Analysis Plan
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 1, November 18, 2022

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
COC	Chain of Custody
EPA	Environmental Protection Agency
GWSAP	Groundwater Sampling and Analysis Plan
LCN	Laboratory Case Number
LOQ	Limit of Quantitation
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
MSWL	Municipal Solid Waste Landfill
NELAC	National Environmental Laboratory Accreditation Conference
PQL	Practical Quantitation Level
QA/QC	Quality Assurance and Quality Control
SDL	Sample Detection Limit
SSI	Statistically Significant Increase
SVOC	Semi-volatile Organic Compound
TCEQ	Texas Commission on Environmental Quality
TOC	Top of Casing
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Groundwater Sampling and Analysis Plan (GWSAP) has been prepared for the City of Victoria Landfill MSW Permit No. 1522-B.

The following plan describes the consistent collection, processing and analysis of groundwater samples and the basic laboratory requirements for obtaining valid, defensible data. The purpose of the GWSAP, in accordance with the requirements set forth in 30 TAC §330.405, is to establish the standards and practices for compliance with the landfill's permit specifications and to ensure that samples obtained are representative of the groundwater present in the geologic formation sampled by the monitoring wells.

In addition, this GWSAP generally describes the purpose and procedures for quality assurance, quality control, statistical analysis and reporting of the results of groundwater monitoring samples collected for the purpose of groundwater monitoring at the waste management unit.

A complete description of the groundwater monitoring system is included in Attachment III-6 of the facility's Site Development Plan.

2.0 FIELD PROCEDURES

2.1 Personnel

Field personnel responsible for sampling will possess, at a minimum, a degree of competence typical of that for trained field personnel who are actively involved in monitor well sampling. Personnel will be thoroughly familiar with all required field equipment, its operation, maintenance, and calibration. Personnel shall also possess a knowledge of all methodologies, procedures, and measurements which relate to field sampling.

2.2 Sample Event Preparation and QA/QC

2.2.1 General Event Preparation

Preparation for a groundwater monitoring event should include acquisition of all necessary coolers, pre-cleaned containers, trip blankets, chemical preservatives, labels, custody seals, chain-of-custody (COC), properly operating and calibrated measuring devices, and necessary sampling equipment. All field data shall be entered on a Field Data Sheet, similar to the example contained in Appendix A, or an equivalent form.

2.2.2 Sample Container Selection

Sample containers need to be constructed of a material compatible and non-reactive with the material it is to contain. The number and types of containers and their respective physical and chemical preservatives will be consistent with requirements of the approved analytical method as described in **Section 6.0** of this GWSAP.

2.2.3 Sample Container Preparation

Sample containers will be purchased as a pre-cleaned product or cleaned in the laboratory in a manner consistent with Environmental Protection Agency (EPA) protocol.

2.2.4 Equipment Preparation and Decontamination Procedures

This section outlines the equipment preparation and the decontamination procedures to be used during the event. This equipment preparation included minimum decontamination procedures for water level indicator(s), filter device (when applicable), and field parameter measurement device(s). Operation and calibration of field instruments will be performed per the manufacturer's instructions.

Water Level Indicator(s) – Water level indicator(s) will be decontaminated by hand washing the sensor probe in a laboratory grade non-phosphate detergent followed by rinsing with deionized water. Prior to the event and after use at each well, the instrument will be decontaminated according to the procedures outlined in Appendix C.

Field Parameter Measuring Device(s) – Field parameter measuring device(s) will be decontaminated according to the procedures outlined in Appendix C. Meters will be checked for proper calibration and operation as per the manufacturer's instructions. Any malfunctioning meter will be replaced or repaired.

Filtration Device – Filtering of groundwater samples, if required, will be done with in-line disposable filtration cartridges requiring no decontamination or a portable filtration device. A sufficient number of disposable filtration cartridges will be taken to the site. Disposable cartridges will not be reused between wells. If portable filtration device is used, the filter chamber will be disassembled and decontaminated according to the procedures outlined in Appendix C, prior to initial use and between wells where used. Field filtering will not be conducted for samples to be analyzed for total metals or VOCs.

Portable Purge and Sample Equipment (portable pumps, disposable tubing, portable/disposable bailers) – Should portable purge and sample equipment be used, the equipment will be decontaminated, according to the procedures outlined in Appendix C, prior to initial site arrival and between wells where used. Portable pumps and bailers will also be decontaminated according to the procedures outlined in Appendix C. Disposable tubing and/or bailers will be discarded between each monitoring well, and new tubing or disposable bailer used, therefore no decontamination is necessary.

In the case of equipment failure, it is recommended that back-up instruments be in the sample crew's possession. If a back-up instrument is not available, or fails in addition to the primary equipment, sampling will not proceed until the proper equipment is available.

2.2.5 Field QA/QC Samples

Field Quality Assurance and Quality Control (QA/QC) samples consist of two primary areas of quality control. The first area is the quality control of sample contamination which may occur in the field and/or shipping procedures. This is monitored in the trip blank(s) and field blank(s). A basic description of each is as follows:

Trip Blank – These samples will be prepared by filling the appropriate clean sample containers with laboratory grade deionized water and adding the applicable chemical preservative, if any. These containers are to be labeled, the analyses to be performed on each container indicated, and then shipped in the typical transportation cooler to the field and back to the laboratory along with the other sample set containers for a given event. This blank is tested to detect any contamination that may occur as a result of the containers, sample coolers, cleaning procedures, or chemical preservatives used. Trip blanks will consist of analysis of volatile organics and shall be taken and analyzed at a minimum of one per sampling event.

Field Blank – Field blank containers will be prepared in the field at a routine sample collection point during a monitoring event by filling the appropriate sample containers from the field supply of laboratory grade deionized water. This blank is tested for any contamination that may occur as a result of site ambient air conditions and serves as an additional check for any contamination in the containers, sample transport coolers, cleaning procedures, and any chemical preservatives. Field blanks will consist of analysis of volatile organics and shall be taken and analyzed at a frequency of one per sampling event.

Equipment (Rinsate) Blank – In the event that a dedicated pump is inoperative and a non-dedicated pump is used to purge and/or sample a well, an equipment blank will be collected. Field supply laboratory grade deionized water will be passed through the non-dedicated equipment in the same manner as a groundwater sample. This blank confirms proper field decontamination procedures on non-dedicated equipment utilized in the field. Equipment blanks will consist of analysis of volatile organics and shall be collected at a minimum of one per event at which a dedicated pump is found to be inoperable and a non-dedicated pump is utilized for purging and/or sampling.

Other Field QA/QC Samples – A second area of standard field QA/QC samples are field duplicates, matrix spike and matrix spike duplicates.

Field Duplicates are an extra set of samples taken at a particular monitoring point, generally from a designated downgradient well, and labeled so that the laboratory is unaware at what point the duplicate was collected. These are independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently.

Field duplicates are useful in documenting the precision of the sampling and analytical process. Samples shall be collected in proper alternating order for the sample point and field duplicate for each parameter (e.g. collect first VOC sample, then duplicate VOC sample; then collect first metals sample, then duplicate metals sample; and so on). Field duplicates shall be taken and analyzed at a sample point (monitor well) batch minimum of one per sample event.

Appropriate field QA/QC documentation should be recorded on the Field Data Sheet or equivalent form (e.g. location where field blank was collected).

2.3 Well Purge

2.3.1 General Well Purge Information

Purging a monitoring well is just as important as the subsequent sampling of the well. Water standing in a monitoring well over a certain period of time may become unrepresentative of formation water because of chemical and biochemical changes which may cause water quality alterations.

Prior to monitoring well purge, inspection of the monitoring well integrity will be performed at each sampling event by utilizing the Field Data Sheet (see Appendix A) or an equivalent form. Visual problems with the monitor well integrity and potential sources of possible contamination should be noted on the Field Data Sheet. When necessary, appropriate repairs will be made to damaged wells. Any monitoring well that is damaged to the extent that it is no longer suitable for sampling shall be reported to the Executive Director who may make a determination about whether to repair or replace the well. At a minimum, the sampler should do all the following:

Check casing, concrete pad, protective collar, and protective barriers for cracks, fissures, or damage (by equipment, animals, vandalism, or other cause).

Check that the lid of the protective collar has a lock, that the lock is functional, and that the lid was locked when the sampler visited the well.

Check that the well cap is present on the top of the well casing. If the well is flush-mounted (casing is in a ground-level vault and is not above ground level), check that the well cap and lid to the vault are both watertight. Any water present inside a flush-mounted well vault should be removed before removing the well cap.

Note the proximity of the well to potential sources of contamination, including facility roads.

Avoid using organic sprays or other potential contaminants to remove any insects found on or in the casing, or organic lubricants on well components such as hinges and locks.

2.3.2 Water Level Measurement

Prior to any purge or sampling activity at each monitoring well, a water level measurement is required to be taken and recorded on the Field Data Sheet or an equivalent form. Measurement of the static water level is important in determining the hydrogeologic characteristics of the subsurface (e.g. upgradient and downgradient). Total depth measurements will be taken as deemed necessary to evaluate monitor well integrity or determine the need for redevelopment.

Water level indicator equipment will be constructed of chemically inert materials and, during mobilization preparation and following each monitoring point, will be decontaminated at each well in accordance with Appendix C. Decontamination water and rinse water will be handled in the same manner as purge water. Water levels will be measured with a precision off +/- 0.01 foot. Water-level measurements will be taken from a permanent, easily identified reference point, or datum, at the well. Typically this datum will be the top of the casing (TOC) or the top of the protective pipe. The elevation of the datum will be established by a licensed surveyor. This reference point elevation is measured in relation to Mean Sea Level (MSL).

Groundwater elevations in wells must be measured within a 48-hour period to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

2.3.3 Well Purging

Prior to sampling, each well will be purged by bailing or pumping. Purging of the well will remove stagnant water and ensure that representative and meaningful samples are obtained.

Well purging will take place from hydraulically upgradient wells to hydraulically downgradient wells. If known impacts exist, purging will take place from the least impacted well to the most impacted well.

Prior to purge, the sample crew will put on clean disposable nitrile gloves and an initial water level will be taken as described in **Section 2.3.2**.

Care will be exercised during purging to avoid introducing contaminants into the water in the well. Disposable, powder-free, nitrile or latex gloves will be used to minimize the chances of cross contamination. Gloves will be changed after each well. Either disposable bailers, or well-dedicated bailers/pumps will be used to maximize the likelihood of obtaining a clean sample and minimize the potential for cross-contamination. If disposable boilers are utilized, each bailer will be used for only one well. The bailer will be discarded after use.

If conditions do not allow either dedicated or disposable equipment, the purging device(s) will be decontaminated between wells. Decontamination of the reusable purging equipment will be performed to ensure that there is no cross contamination between wells. The collection, storage and disposal of decontamination fluids will be handled in the same manner as purge water. Decontamination procedures will be performed as outlined in Appendix C.

If pumps are used, the pump will be designed to prevent air from contacting the sample. In keeping with EPA guidance, purging rates should minimize the possibility of stripping VOCs or re-development of the well. Pumps used to sample groundwater at the waste management unit may include pumps and equipment used to employ low-flow purging and sampling techniques. Low-flow purging and sampling is a technique that allows for the collection of representative groundwater samples directly from the screened interval of a well. Using the low-flow technique, the well is purged and samples are collected at a rate approximately equal to or less than the rate of well recharge. This minimizes drawdown of the water level within the well. Maintaining minimal drawdown allows for purging of water directly from the screened interval of a well and limits the influence of stagnant, non-representative casing water. Eliminating casing water influence reduces the purge volume necessary to ensure collection of representative samples. A site-specific demonstration of the applicability of low-flow techniques will be made prior to using low-flow techniques for groundwater monitoring purposes. The following procedures will be used during low-flow techniques:

Place the pump intake in the middle of the screened interval to avoid mixing formation water with sediments in the well bottom or overlying stagnant water within the well casing. We suggest the use of dedicated purging and sampling devices. If non-dedicated equipment is used, it must be decontaminated between wells to prevent cross-contamination.
Limit low-flow purging to wells that exhibit no continuous drawdown under sustained pumping.
Measure and record water levels before pumping.
Initiate purging and adjust flow to a rate that results in a minimal (<0.1 m) well drawdown. If the minimal drawdown exceeds 0.1 m but remains stable, continue purging.

If non-low-flow techniques are used, purging rates should minimize the possibility of stripping VOCs or re-development of the well. Wells may be purged to dryness if unavoidable at low purge rates. Purging will be considered complete once a minimum of at least 2 pump and tubing volumes have been removed (if the well is not purged to dryness).

Data collected prior to and during sampling will be recorded on field data sheets (similar to that included in Appendix A) and will include the volume of water purged from the well, depth to water, water-level elevation, depth to the bottom of the well, height of the water column, well volume, well purging, time, a record of pH, conductivity, temperature, and turbidity observations, and any other pertinent information. Water quality indicator parameters should be continuously monitored during purging, preferably with a flow-through cell. Stabilization of parameters such as pH, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, and turbidity should be used to determine when stagnant casing water has been purged and formation water is available for sampling. A minimum subset should include pH, specific conductance, and either turbidity or DO. Measurements should be recorded every 3 to 5 minutes. Temperature and pH are not helpful in distinguishing between formation water and stagnant casing water, but are still important for data interpretation. Stabilization is considered achieved when all the parameters are within the following ranges for three successive readings:

±0.1 units for pH
±3% for specific conductance
±10 millivolts for ORP
±10% for turbidity and DO

If pumping is not an option, wells may be purged using bailers. Bailers used for purging shall be constructed of Teflon™, polypropylene, flexible PVC, or stainless steel or other inert material. To minimize turbidity, the bailer will be lowered gently to a point one to two feet above the bottom of the screen, allowed to sit for several seconds, and then brought slowly and steadily to the surface.

Prior to sampling with a bailer, the well will be purged until at least three well volumes of water have been removed and/or until the field parameters have stabilized. Calculation of well volumes for each well will be based on the total height of water, as measured prior to purging, and the following rates for 2-inch and 4-inch wells, respectively: 2-inch - 0.163 gal/ft, 4-inch - 0.6528 gal/ft. For wells that recharge slowly, the well may be purged dry before the three well volumes are removed. For these wells, purging to dryness is sufficient. Where possible, the water level will be allowed to recover to within approximately 90 percent of the pre-purge water level so that a complete collection of samples can be obtained. For those wells that are slow to recharge, it is acceptable to collect an incomplete set of samples if sufficient water is available for sampling. A recharge period of up to 72 hours is allowable for slow-recharging wells.

2.3.4 Purge Water Management

All purge water (and excess sample water) will initially be collected in appropriate containers or directly into a leachate collection system, contaminated water container, or gas condensate storage tank and not discharged to the ground surface. Purge water (and excess sample water) will be disposed by methods consistent with Permit specific waste management, and leachate (and/or gas condensate) storage and management options and procedures. Purge water may be managed by the following methods:

Utilizing leachate storage tanks, leachate risers, or landfill gas condensate storage tanks;
Disposal at the active working face;
Disposal at the liquid waste bulking facility; and
Disposal via a direct discharge to a sanitary sewer system.

If the purge water is below background concentrations for monitored constituents, it may be discarded to the ground surface away from the monitor well area.

2.4 Monitoring Well Sample Collection

2.4.1 General Sample Collection

The time interval between the completion of well purge and sample collection normally should not exceed 24 hours. Longer times not exceeding 6 or 7 days may be allowed for slow recharging wells. If after 7 days a slowly recharging well has not recovered sufficiently for a complete set of samples, a partial set of samples may be collected in the order specified until no more samples for the set can be collected.

2.4.2 Sample Collection Order

To avoid cross-contamination of samples between wells, sampling will begin at the well that is known to be least contaminated and end with the most contaminated well. If contamination is not known to be present, then the sampling will proceed from the well with the highest water level elevation to wells with successively lower water level elevations. Sample containers will be filled in the following order (based upon volatilization sensitivity):

1. VOCs (volatile organic compounds)
2. SVOCs (semi-volatile organic compounds)
3. Metals
4. Other Inorganic Constituents

This sequence may be modified to allow for wells which are slow to recharge and which require a longer recovery period.

2.4.3 Sampling Equipment/Procedures

Efforts shall be made to minimize turbulence and aeration during sampling. If a bailer is used, it shall be equipped with a bottom-emptying device which will reduce turbulence. The bailer will also be capable of significantly minimizing sample agitation and be able to discharge the sample at a low rate. If a pump not employing low-flow techniques is used for sampling, the sample discharge rate will not exceed 1.0 L/min and the rate should be reduced to 0.1-0.25 L/min during collection of VOC samples. For pumps employing low-flow techniques, sample discharge rates should comply with the required demonstration as described in **Section 2.3.3** of this GWSAP. Additionally, the intake device for both bailers and pumps will be located within the screened portion of the well. If the well screen is not completely submerged, the pump intake will be located approximately hallway between the water table and the bottom of the screen interval.

Transfer containers will not be used for sample collection. For low-flow purge systems, in-line, flow-through collection devices may be used to eliminate the need for transfer containers. If non-dedicated sampling devices are used, they will be cleaned and decontaminated using those procedures outlined in Appendix C. All non-dedicated equipment will be subjected to a final rinse with distilled or deionized water. Soiled sample bottles, bailer rope, rubber hose, gloves, or filtration media shall not be used.

For sampling that does not employ low-flow techniques, if a sufficient volume of water is available in the well, the first portion of water (approximately one gallon), shall be discarded to help eliminate any oxidized water that may be present at the top of the water column. For low-flow sampling techniques, sampling may commence immediately following completion of well purging. Discarded water will be managed in the same manner as purge water.

2.4.4 VOC Sample Collection

Filling VOC sample containers involves extra care. Allow the water stream to flow down the inner wall of the vial to minimize formation of air bubbles until a positive meniscus is formed over the top of the container such that no headspace is present in the sample vial upon replacing the cap. Screw the caps on carefully to avoid leaving any airspace in the vials. If an air bubble forms in the bottle, do not open the bottle to remove it, but collect an additional, separate sample.

2.4.5 Sample Filtration

Filtering will not be conducted for samples collected for detection or assessment monitoring.

2.4.6 Sample Preservation and Holding Times

Holding times, sample preservation, and sample volumes required for each analysis will be reviewed with the laboratory prior to sampling. Acceptable sample holding times and preservation methods will be consistent with the requirements of the approved analytical methods as described in **Section 6.0** of this GWSAP. Examples of holding times and preservation methods that may be applicable are found in Appendix B.

2.4.7 Field Measurements

Required field measurements include water levels, temperature, pH, specific conductivity, and turbidity observations. Water level measurement procedures are described in **Section 2.3.2**. Field parameters will be measured using either handheld instruments placed directly into discharged water or an in-line flow cell. Each of these measurements is important in the documentation of properly collected groundwater samples. All instruments shall be properly calibrated and checked with standards according to the manufacturer’s instructions. Back-up instruments are recommended to be available with the sample crew.

2.5 Recordkeeping

2.5.1 Labeling Sample Containers

All sample containers must be labeled with permanent ink for identification purposes, including information such as the sample number (with the well number as part of the sample number), site identification, analysis to be performed, preservatives used, date and time of sample collection, and sampler name. Cover sample labels with transparent tape to protect the written data.

2.5.2 Quality Control Samples

Quality Control (QC) samples will be used to help determine whether samples have been contaminated from other sources. QC samples include trip blanks (collected one for each sampling event), field blanks (one per day, or one for every 10 wells sampled, whichever is greater), equipment blanks (one per day or sampling event) and field duplicates (one for every 20 wells sampled, with at least one per sampling event).

2.5.3 Field Data Sheets

All field information will be entered on a standard Field Data Sheet (an example of which is provided as Appendix A) or equivalent form. All entries should be legible and made in indelible ink. Entry errors will be crossed out with a single line, dated, and initialed by the person making the corrections.

2.5.4 Chain-of-Custody/Sample Container Labels

COC records are required to trace the integrity of the samples and the conditions of the samples upon receipt at the laboratory, including temperatures of the samples at the time of log-in. The required COC document will be initiated by the sampler. The COC will accompany the samples during transport and will be protected from moisture in a re-sealable plastic bag. It will be completed by each party handling the samples, to provide evidence of possession of the samples at all times. Individuals relinquishing and receiving the samples will sign, date, and record the time of transfer on the COC form.

Prior to sampling, labels will be filled out and placed on the sample bottles. The labels should contain pertinent information, which may include the following: date, type of analysis required, site permit name or number, well number, sampler's name, and a unique lab identification number. All information will be printed on the labels with a waterproof, indelible pen. The label may also be covered with transparent tape for protection and to prevent easy removal. For some bottles, information may be written on the bottles and separate labels may not be necessary.

2.6 Sample Storage and Transport

Properly labeled and filled sample containers shall be placed in re-sealable bags, then into an ice chest or other insulated container packed with sufficient ice to keep them cold (approximately 4°C or 39.2° F). Adequate ice will be kept in the ice chest to maintain the temperature until the samples are transported to the laboratory. Dry ice will not be used to chill the samples because of the danger of freezing the samples and bursting the containers. Adequate holding times and volume of samples required for each analysis will be considered with the laboratory prior to sampling. All samples will be transported to the laboratory as soon as possible, preferably within 48 hours of sampling.

If the samples are shipped, sturdy insulated containers will be used. The insulated container shall be cushioned inside to prevent breakage of the sample containers. The samples, blanks, and COC documents will be well packed in the insulated cooler, with as little extra air space as possible, utilizing ice bags, foam, or bubble wrap to add padding. Finally, the insulated container will be thoroughly sealed with shipping and will include adhesive custody seals. Flimsy, expanded-foam or soft-sided ice chests are not suitable for shipping.

3.0 LABORATORY PROCEDURES/PERFORMANCE STANDARDS

The environmental testing laboratory must be accredited in accordance with 30 TAC, Chapter 25 (except as provided in 30 TAC 25.6). Laboratory data and analyses will be performed and submitted in accordance with 30 TAC 330.405 through 330.415. In accordance with 30 TAC 330.419, unless otherwise specified, the owner or operator must sample and analyze for the constituents listed in Appendix I to 40 CFR, Part 258, in all groundwater monitoring wells.

The owner or operator shall review all analytical data submitted under the requirements of this permit to ensure compliance with data quality objectives, prior to submittal of the data to the commission for review. This data review must include examination of the quality control results and other supporting data, including any data review by the laboratory, and must identify any potential impacts such as bias on the quality of the data using qualifiers in the test reports tied to explanations in the footnotes and in any laboratory case narrative which is required.

It is the responsibility of the owner or operator to ensure that the laboratory documents and reports all problems and anomalies observed that are associated with the analysis. If the analysis of the data indicates that it failed to meet the quality control goals for the laboratory's analytical data analysis program, it does not necessarily mean that the data is unusable. The owner and/or operator may still report the analytical data but must report any and all problems and corrective action that the laboratory identified during the analysis.

3.1 Practical Quantitation Limit

30 TAC 330.405(f)(5) defines the practical quantitation limit (PQL) as the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

For each constituent listed in 40 CFR, Part 258, Appendix I or Appendix II, or for each groundwater parameter that has a groundwater protection standard (GWPS), the laboratory will demonstrate that the method and procedure used in the analysis can attain a PQL at or below the GWPS.

Laboratory quality control samples will meet the precision and accuracy data-quality objective that are listed in the table below:

Table 3-1: Measurement-Quality Objectives

Chemical of Concern	Precision (% RSD)	Accuracy (% recovery)
Metals	10	70-130
Volatiles	20	50-150
Semivolatiles	30	50-150

The laboratory will report non-detected results as less than the value of the PQL. When the limits for precision and accuracy listed in Table 1 cannot be met, the owner or operator will submit information to support a recommendation for using alternative precision and accuracy limits.

3.2 Laboratory Case Narrative

All analytical data submitted under the requirements of this permit will be examined by the owner or operator to ensure that the data-quality objectives are considered and met prior to submittal for the commission's review. The owner or operator will determine if the results for a sample are accurate and complete. The quality control results, supporting data, and data review by the laboratory must be included when the owner or operator reviews the data. The owner or operator will report any anomalies that were identified in the laboratory case-narrative summary.

The owner or operator will ensure that the laboratory documents and reports all problems and anomalies associated with the analysis. If analysis of the data indicates that the data fails to meet quality control goals, the owner or operator will determine if the data is usable. If the owner or operator determines that the analytical data may be used, all problems and corrective action that the laboratory identified during the analysis will be included in the report submitted to the TCEQ.

A Laboratory Case Narrative (LCN) for all problems and anomalies observed will be submitted by the owner or operator. The LCN will provide the following information:

1. The exact number of samples, constituents analyzed, and sample matrices.
2. The name of the laboratory performing analyses. If more than one laboratory is used, all laboratories will be identified in the case narrative.
3. Explanation of each failed precision and accuracy measurement determined to be outside of the laboratory or method control limits.
4. Explanation if the failed precision and accuracy measurements cause a positive or negative bias on the results.

5. Identification and explanation of problems associated with the sample results, along with the limitations on data usability.
6. When appropriate and when requested, a statement on the estimated uncertainty of analytical results of the samples.
7. A statement of compliance or noncompliance with data-quality objectives. Holding-time exceedances and matrix interferences must be identified. Dilutions must be identified, and if dilutions are necessary, they must be done to the smallest dilution possible to effectively minimize matrix interferences and bring the sample into control for analysis.
8. Identification of all applicable quality assurance and quality control samples that will require special attention by the reviewer.

3.3 Other Information

In addition to the LCN, a laboratory report will include the following:

1. A table identifying the field-sample name with the sample identification in the laboratory report.
2. Chain of custody.
3. For each sample, a report (certificate of analysis) of the constituents analyzed, the analytical methods, and the laboratory PQLs.
4. A release statement provided by the laboratory, with the following wording: *"I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge that all problems or anomalies that were observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data."*

   If an in-house laboratory is used, the laboratory release statement must also include the following: *"This laboratory is an in-house laboratory controlled by the person responding to the rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming that the above release statement is true."*
5. An MSW Laboratory Review Checklist (LRC). For every "exception report"—a response of "No," "NA," or "NR"—on the checklist, the permittee will ensure that the laboratory provides a detailed description of the exception in the summary of the LCN.

4.0 SAMPLING FREQUENCY

4.1 Background

Due to the seasonal and temporal variations natural in groundwater analytical data and the distinctive change in Municipal Solid Waste Landfill (MSWL) groundwater monitoring requirements in Texas, at least four background samples for VOCs and eight background samples for remaining parameters will be collected from each well and analyzed for constituents referenced in 30 TAC 330.419 or an alternative list.. In order to establish that background monitoring produces statistically independent samples, sampling shall be conducted on a quarterly basis. This schedule will allow for hydraulic and chemical stabilization of the groundwater between sampling events and will provide information on possible seasonal fluctuations in water chemistry. Background samples will be taken from each existing well that is part of the groundwater monitoring system, as well as from any new or replaced monitor well that belongs to the system.

4.1.1 Updating Background Data

Updating of background data will be performed as per **Section 5.1**.

4.2 Detection Monitoring Events

After establishment of background values, detection monitoring of upgradient and point of compliance wells will be conducted on a semi-annual basis for required constituents.

4.3 Groundwater Analysis Result Submittals

The results of the analyses of groundwater samples collected during background/detection monitoring will be submitted to the TCEQ annually and not later than 90 days after the facility's last groundwater monitoring event in a calendar year. The annual monitoring report will include the following items as related to the calendar year represented by the annual report:

A statement describing the occurrence and status of any Statistically Significant Increases (SSIs) reported,
The results of all groundwater monitoring, testing, and analytical work performed as a part of the requirements of the facility's permit,
A summary of background groundwater quality values,
A summary of groundwater monitoring analyses,
Pertinent statistical calculations, graphs, drawings,
A contour map and associated data demonstrating the piezometric water levels of the uppermost aquifer, and

Other items as requested by the Executive Director.

The annual groundwater monitoring report will include a determination of the groundwater flow rate and direction of the uppermost aquifer as determined for the calendar year addressed in the annual report. The data used to determine the groundwater flow rate and direction will also be included in the annual groundwater monitoring report. Additionally, the annual groundwater monitoring report will include recommendations for any changes related to groundwater monitoring activities.

The results will be submitted in triplicate (the original and two copies) on TCEQ-0312 form with all the appropriate heading information completed and in any other format prescribed by the MSW Permits Section (e.g. electronically).

TCEQ-0312 form should be accompanied by the laboratory report itself, appropriate QA/QC data, and copies of the chain-of-custody forms. The first page of TCEQ-0312 form will be completely filled out. It will be signed and dated by the site operator. Pages two, three, and four of the forms will be completed and submitted. These pages will include a list of all analytical methods used and provide Practical Quantitation Levels (PQLs) or Sample Detection Limits (SDLs) for each of the analyzed constituents.

Laboratory Case Narrative and Laboratory Checklist (Section 3) may be provided in lieu of laboratory analytical sheets and QA/QC documentation. If requested by the TCEQ, laboratory analytical reports and QA/QC will be provided in either electronic or in hard copy form.

Not later than 74 days after each sampling event, the owner or operator will notify the Executive Director and any local pollution agency with jurisdiction that has requested to be notified in writing if there has been an SSI from background of any tested constituent at any monitoring well. All submittals, including cover letters will be submitted in triplicate.

5.0 STATISTICAL METHODOLOGY – GROUNDWATER DATA ANALYSIS

Statistical analyses of groundwater data will be performed in accordance with applicable regulations. A statistical analysis plan has been included in Appendix E.

5.1 Updating Background Data

In accordance with applicable regulations, background data sets may be updated once every 2 years with results from semi-annual detection monitoring that have been determined to be representative of background groundwater quality. A report demonstrating that the results to be incorporated into background are representative of groundwater quality will be submitted to the Executive Director. This report will be submitted prior to the monitoring event for which the updated data are to be used for statistical analysis.

5.2 Statistically Significant Constituents, Verification Resampling, and Assessment Monitoring

During detection monitoring, an SSI from background of any tested constituent may result in the implementation of assessment monitoring. If an apparent SSI occurs for a constituent referenced in 30 TAC §330.419(a), or any other constituent that has a primary maximum contaminant level (MCL), an assessment monitoring program will be initiated within 164 days of the original sampling event or on the next regularly scheduled semiannual detection monitoring event, unless it can be demonstrated to the satisfaction of the Executive Director that the SSI is the result of error, seasonal variations, or cause other than the MSWLF or if the SSI is disproved by verification and/or statistical resampling. In accordance with applicable regulatory guidelines, the following timeline in **Table 5-1** can be used for the implementation of the assessment monitoring process.

Table 5-1: Assessment Monitoring Process Timeline

Activity/Report Description	Submittal Day in Timeline
Detection Sample Completion Date	Start of timeline – Day 0
Determination of SSI	On/Before Day 60
SSI Notice to Executive Director/Local Pollution Control Agency	On/Before Day 74
Notice of Intent to Submit Demonstration to Executive Director/Local Pollution Control Agency	On/Before Day 74
Submit Results of Resampling	On/Before Day 120
Submit Alternate Source/Error Demonstration	On/Before Day 150
Initiation of Assessment Monitoring	At Next Scheduled Event or On/Before Day 164

Assessment and/or corrective action monitoring activities will be performed as authorized by the Executive Director. Assessment monitoring samples will be collected from the well demonstrating the SSI(s) and the immediately surrounding point of compliance wells unless otherwise allowed by the Executive Director.

6.0 ANALYTICAL METHODS AND REPORTING LIMITS

The groundwater monitoring program will include analytical methods that are appropriate and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. Acceptable methods of analyses include those in *Standard Methods for the Examination of Water and Wastewater*, as revised; and EPA document SW 846, *Test Methods for Evaluating Solid Waste*, as revised; and as listed in future updates.

The PQL is defined as the lowest concentration reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions and is analogous to the limit of quantitation (LOQ) definition in the most recent available NELAC Standard. The PQL is method, instrument, and analyte specific and may be updated as more data become available. The PQL must be below the groundwater protection standard established for that analyte as defined by 30 TAC §330.409(h) unless approved otherwise by the TCEQ. The precision and accuracy of the PQL shall be initially determined from the PQLs reported over the course of a minimum of eight groundwater monitoring events. The results obtained front these events shall be used to demonstrate that the PQLs meet the specific precision and accuracy as shown in Table 3-1. The PQL will be supported by analysis of a PQL check sample, which is a laboratory reagent grade sample matrix spiked with chemicals of concern at concentrations equal to or less than the PQL. At a minimum, a PQL check sample will be performed quarterly during the calendar year to demonstrate that the PQL continues to meet the specified limits for precision and accuracy as defined in Table 3-1.

For analytes that the established PQL cannot meet the precision and accuracy requirements in Table 3-1, the owner/operator will ensure the laboratory will submit sufficient documentation and information to the TCEQ for alternate precision and accuracy limits on a case-by-case basis. Non-detected results will be reported as less than the established PQL limit that meets these precision and accuracy requirements

APPENDIX A

SAMPLE FIELD DATA SHEET

Hydrex ENVIRONMENTAL, INC.

FIELD DATA SHEET

Well ID: ________________ Project No.: ____________________ Date: ____________________

Site: ___________________________ Technician: ____

Water Level Prior to Purging (measurements in feet): Well Diameter (inches): __________

a. Total Depth of Well (from TOC) __________ Top of Casing Elevation __________

b. Depth to water (from TOC) __________ Water Level Elevation __________

c. Height of water column (a-b) __________ X ________ gal/ft. X 3 well volumes = ________ gals.

Well Volume of 4" well = 0.6528 gallons/ft. Well Volume of 2" well = 0.163 gallons/ft.

Well Volume of 1" well = 0.07 gallons/ft.

Time of Purge: __________ Amount Purged: __________ gal. Purged to dryness: yes / no

Purge Water Characteristics

	Color	Odors	pH	Conductivity	Temperature	Remarks
Vol 1						
Vol 2						
Vol 3						
Vol 4						

Sampling Date : ____________________

Water Level Prior to Sampling (From TOC) : __________

Time of Sampling: __________

Field Blank: yes / no Trip Blank: yes / no

Disposal Bailer: yes / no No. Containers: __________

Sample Color	Odor	pH	Spec. Cond.	Temp (°C)

#	Size	Filtered	Preservatives	Lot/Prod #
___	VOA	yes / no		
___	250 ml	yes / no		
___	500 ml	yes / no		
___	1 L glass	yes / no		
___	2 L plastic	yes / no		
___	1 L plastic	yes / no		
___	______	yes / no		
___	______	yes / no		
___	______	yes / no		

Additional Notes (immiscible layers, foaming, etc.):

____

____

____

____

March 2008, Hydrex

APPENDIX B

EXAMPLES OF CONTAINERIZATION AND PRESERVATION OF SAMPLES

EXAMPLES OF CONTAINERIZATION AND PRESERVATION OF SAMPLES

Measurement	Volume, (mL)	Container$_a$	Preservative	Max. Holding Times	Reference
Physical Properties					
Spec. Cond. (Field)	100	P, G	None	Det. On Site	1
pH (Field)	50	P, G	None	Det. On Site	1, 2
Total Dissolved Solids	50	P, G	Cool, 4°C	7 days	1
Temperature (Field)	1000	P, G	None	Det. On Site	1
Turbidity (Field)	100	P, G	None	Det. On Site	1

Measurement	Volume, (mL)	Container$_a$	Preservative	Max. Holding Times	Reference
Inorganics, Non-Metallics					
Ammonia	400	P, G	Cool, 4°C H_2SO_4 to pH <2	28 days	1
Chloride	200	P, G	Cool, 4°C	28 days	1, 2
Nitrate plus Nitrite [c]	200	P, G	Cool, 4°C H_2SO_4 to pH <2	28 days	1, 2
Sulfate	100	P, G	Cool, 4°C	28 days	1, 2
Total Alkalinity	200	P, G	Cool, 4°C	14 days [c]	1

Measurement	Volume, (mL)	Container$_a$	Preservative	Max. Holding Times	Reference
Metals (except mercury)					
Total	500	P, G	HNO_3 to pH <2	6 Mos	1, 2
Dissolved	500	P, G	Filt. + HNO_3 to pH <2	6 Mos	1, 2

Measurement	Volume, (mL)	Container$_a$	Preservative	Max. Holding Times	Reference
Organics					
Volatile Organics by GC/MS	80 (2 vials @ 40mL)	G. Teflon septum cap	Cool, 4°C HCl to pH <2	14 days	2, 3

NOTES:

a - Plastic (P) or Glass (G). For metals, polyethylene with an all polypropylene cap is preferred.

b - Unpreserved Nitrate recommended 48 hrs. Holding time. Nitrate - Nitrite preserved sample recommended 28 days holding time.

c - TNRCC Technical Guidance recommends 48 hrs. Holding time.

REFERENCES

1 - Methods for Chemical Analysis of Water and Wastes, March, 1983, USEPA, 6(X)/4-79-020 and additions thereto.

2 - Test Methods for Evaluating Solid Waste, Physical Method, November 1986, Third Edition, USEPA, SW-846 and additions thereto.

3 - "Guidelines Establishing Test Procedures for the Analysis of Pollution Under the Clean Water Act," Environmental Protection Agency, Code of Federal Regulations (CFR), tile 40, Part 136.

Examples of this Appendix notwithstanding, holding times and preservation methods will be consistent with the requirements of the approved analytical methods as described in Section 6 of this GWSAP.

APPENDIX C
RECOMMENDED CLEANING AND DECONTAMINATION PROCEDURES

Recommended Cleaning and Decontamination Procedures

Field Procedure

The following cleaning and decontamination procedure is recommended for purging and sampling equipment that will be placed into the well or come into contact with the collected sample.:

i) Clean sampling equipment with a non-phosphate detergent soap mixture,
ii) Rinse with, in order
- dilute hydrochloric acid or nitric acid, and
- rinse with distilled or deionized water.

In addition, if non-dedicated (reusable) pumps or bailers are used, these further steps will be included:

iii) Equipment which will be used immediately will be placed on a clean plastic sheet. Equipment which will not be used immediately will be wrapped in clean plastic.

iv) Pumps will be decontaminated by disassembling the pump, properly cleaning all internal and external parts according to the afore-mentioned procedure, and reassembling the pump.

APPENDIX D
LABORATORY CHECKLIST

Laboratory Data Package Cover Page

This data package consists of:

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;
- ☐ R10 Other problems or anomalies.
- ☐ The Exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [ ] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name (Printed)	Signature	Official Title (printed)	Date

March 2008, Hydrex

Laboratory Review Checklist: Reportable Data								
Laboratory Name:		LRC Date:						
Project Name:		Laboratory Job Number:						
Reviewer Name:		Prep Batch Number(s):						
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?					
		Were all departures from standard conditions described in an exception report?					
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?					
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?					
		Were calculations checked by a peer or supervisor?					
		Were all analyte identifications checked by a peer or supervisor?					
		Were sample quantitation limits reported for all analytes not detected?					
		Were all results for soil and sediment samples reported on a dry weight basis?					
		Were % moisture (or solids) reported for all soil and sediment samples?					
		If required for the project, TICs reported?					
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?					
		Were surrogate percent recoveries in all samples within the laboratory QC limits?					
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?					
		Were blanks analyzed at the appropriate frequency?					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?					
		Were blank concentrations < MQL?					
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?					
		Were LCSs analyzed at the required frequency?					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?					
		Was the LCSD RPD within QC limits?					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?					
		Were MS/MSD analyzed at the appropriate frequency?					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?					
		Were MS/MSD RPDs within laboratory QC limits?					
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?					
		Were analytical duplicates analyzed at the appropriate frequency?					
		Were RPDs or relative standard deviations within the laboratory QC limits?					
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?					
		Are unadjusted MQLs included in the laboratory data package?					
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?					
		Were all necessary corrective actions performed for the reported data?					
		Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?					

March 2008, Hydrex

Laboratory Review Checklist: Supporting Data

Laboratory Name:	LRC Date:
Project Name:	Laboratory Job Number:
Reviewer Name:	Prep Batch Number(s):

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?					
		Were percent RSDs or correlation coefficient criteria met?					
		Was the number of standards recommended in the method used for all analytes?					
		Were all points generated between the lowest and highest standard used to calculate the curve?					
		Are ICAL data available for all instruments used?					
		Has the initial calibration curve been verified using an appropriate second source standard?					
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank[6] :**					
		Was the CCV analyzed at the method-required frequency?					
		Were percent differences for each analyte within the method-required QC limits?					
		Was the ICAL curve verified for each analyte?					
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?					
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?					
		Were ion abundance data within the method-required QC limits?					
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?					
	OI	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?					
		Were data associated with manual integrations flagged on the raw data?					
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?					
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?					
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?					
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?					
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?					
		Is the MDL either adjusted or supported by the analysis of DCSs?					
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?					
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?					
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?					
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C?					
		Is documentation of the analyst's competency up-to-date and on file?					
S15	OI	**Verification/validation documentation for methods (NELAC Chap 5n 5)**					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?					
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?					

Laboratory Review Checklist: Exception Reports	
Laboratory Name:	LRC Date:
Project Name:	Laboratory Job Number:
Reviewer Name:	Prep Batch Number(s):

ER #[5]	DESCRIPTION

1. Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O= organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

6. CCB = Continuing Calibration Blank

APPENDIX E
STATISTICAL ANALYSIS PLAN

CONTENTS

1 DETECTION MONITORING STATISTICAL METHODS

The purpose of the statistical evaluation of groundwater data is to determine if there is evidence of a statistically significant increase (SSI) from background values for each detection-monitoring constituent required in the groundwater monitoring program. As more data are collected over time, characteristics of the respective data sets may require the employment of different statistical methods for some wells/constituents. Statistical analyses will be performed in accordance with applicable sections of 30 TAC §330.

1.1 Statistical Evaluation of Metals

Under detection monitoring as described in 30 TAC 330.405(e), at least two types of comparisons are possible at a site with more than one monitoring well:

- comparison of an individual downgradient well to an individual, or group, of upgradient wells (interwell comparison), and
- comparison of current data for a well may be compared to the historical data for the same well (intrawell comparison).

It is important to determine which of the comparisons are likely to be useful before selecting the method(s) to be used. By useful, it is understood that the method has an acceptable Type I error (false positive error) rate and maximizes the statistical power. In accordance with applicable regulatory requirements, statistical analysis will be conducted separately for each tested constituent in each well.

The following discussion includes methods available for proper statistical analysis.

1.1.1 Shewart-CUSUM Control Charts

The Shewart-CUSUM Control Chart procedure assumes that the data are independent and have a normal or transformed normal distribution. A prediction limit analysis will be used in place of a control chart, if appropriate. Shewart-CUSUM control charts allow detection of both major and gradual releases from the facility independent of spatial variation

1.1.1.1 Procedure

Control charts are a form of time-series graph, on which a parametric statistical representation of concentrations of a given constituent are plotted at intervals over time.

The statistics are computed and plotted together with an upper and/or lower control limit on a chart where the x-axis represents time.

The Procedure for conducting the intrawell analysis using combined Shewart-CUSUM Control Charts is provided below:

Three parameters are selected prior to plotting:

h - The control limit to which the cumulative sum (CUSUM) values are compared. The EPA recommended value for **h** is 5 units of standard deviation.

k - A reference value that establishes the upper limit for the acceptable displacement of the standardized mean. The EPA recommended value for k is 1.

SCL- The upper Shewart control limit it which the standardized mean will be compared. The EPA recommended value for **SCL** is 4.5.

For each time period, T_i, take n_i independent samples (n_i may be one), and calculate the mean, $\bar{x}_i$. Compute the standardized mean Z_i of the measured concentrations where only a single new measurement is obtained for each constituent at each event as:

$$Z_i = (x_i - \bar{x})\sqrt{n_i} / s$$

Where:

x_i = value obtained for a constituent during monitoring event i.
s = The standard deviation obtained from prior monitoring data from the same well.

When applicable, for each time period, Ti, compute the cumulative sum, Si, as:

$$S_i = \max\{0, (Z_i - k) + S_{i-1}\}$$

Where max {A,B} is the maximum of A and B, and $S_0 = 0$.

Plot Z_i and S_i against T_i on the control chart. The results may be plotted in standardized units or converted to the concentration units of the constituents being evaluated. An "out-of-control" situation (potential contamination occurs whenever $Z_i \geq$ SCL or $S_i \geq$ h. Two different types of situation are controlled by the limits. Too large a standardized mean will occur if there is a rapid increase in concentration in the well. Too large a cumulative sum may also occur for a more gradual trend. A statistically significant increase (SSI) occurs if both the initial result and a verification sample result consecutively exceed one of the above mentioned statistical limits.

1.1.1.2 Verification Resamples

The standardized mean and CUSUM values are affected differently by outliers. The standardized mean values of the control chart are used as a comparison of each individual new measurement to the control limit, therefore the next monitoring event constitutes an independent verification of the original result. However, the CUSUM procedure incorporates all historical values in the computation, therefore, the effect of the outlier will be present in both the initial and verification sample. Hence, the statistical test will be invalid unless the verification sample value replaces the suspected outlier value. Therefore, outlier values will be replaced by verification resample results.

1.1.2 Prediction Limits

For those metals and inorganic indicator constituents with fewer than 50-percent detections a non-parametric upper prediction limit analysis will be used. An upper prediction limit is a statistical limit calculated to include one or more observations from the same populations with a specified confidence. In groundwater monitoring, an upper prediction limit approach may be used to make comparisons between background and compliance well data. The limit is constructed to contain all k observations with stated confidence. If any observation exceeds the upper prediction limit, this is statistically significant evidence that the observation is not representative of the background group. Both non-parametric and parametric limit analyses will be used as applicable.

1.2 Statistical Evaluation of Volatile Organic Compounds

Volatile organic compounds will be routinely monitored during the detection monitoring program. The statistical limits will be set as the reporting limit (RL) for that VOC constituent.

2.0 HANDLING OF NON-DETECTS

The use of appropriate methods for incorporating non-detect values within groundwater data sets into statistical interval formulas requires careful consideration with respect to the applicability of the non-detect methodology and the subsequent analysis. Numerous methods of statistical analysis are available for data sets with both small to medium and large percentages of non-detects. Approved methods are simple substitution (PQL/2), Cohen's Method and the modified-Aitchison method. Each of these methods makes certain assumptions regarding the non-detect values in the data set. Both statistical and non-statistical considerations will be used in determining the most appropriate way to handle non-detect values. The method chosen for handling non-detect results will be consistent with dataset properties and the statistical analysis chosen.

CREATE AMAZING.

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APPENDIX 6B – PROPOSED MONITORING WELL CONSTRUCTION DETAILS

ATTACHMENT III-7 – SLOPE STABILITY AND SETTLEMENT ANALYSIS

Introduction

This project involves the permitting and design of a new cell and partial vertical expansion of the existing cell at the Victoria, Texas municipal solid waste (MSW) landfill near Victoria, Texas. The new cell is located south of the existing cell. The new portion of landfill has a geosynthetic liner system and side slopes that are 3H:1V. The vertical expansion over the existing landfill is over an eastern portion of the existing cell and increases the crest height approximately 40 feet from existing permitted geometry. The final side slope crest elevation will be 160 feet and the landfill crest elevation will be 180 feet.

This packet contains slope stability, settlement evaluations and cover stability for both the new cell and vertical expansion portion of the existing cell. The material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in the landfill development (including waste and construction materials). The professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed.

Subsurface Information

As part of work at the site, 8 borings were drilled. Six of these borings were within the footprint of the future cell and two borings were located to the north of the existing landfill cell. All borings were drilled to a depth of 50 feet below ground surface. Standard Penetration Test (SPT) and Shelby tube samples were obtained. Shelby tube samples were obtained at depths based on materials encountered and observations made by the on-site Burns & McDonnell (BMcD) Geotechnical Engineer. Laboratory testing was assigned by BMcD Geotech and included index testing, unconsolidated undrained triaxial testing, consolidation and direct shear strength testing.

Upper subsurface materials were made up mainly of high plasticity clays. Beneath the high plasticity clays were sandy high plasticity and low plasticity clays, with some intermittent layers of clayey sands or poorly graded sands. Different material types were controlled by the varying sand to fines ratio. Underlying these soils and down to termination depth were poorly graded sands with some locations being clayey sands. These material types were also controlled by variations in the sand to fines ratio.

The upper high plasticity clays are stiff to very stiff consistency based on SPT blow counts and pocket penetrometer readings. The sandy high plasticity and low plasticity clays are very stiff to hard consistency based on SPT blow counts and pocket penetrometer readings. Poorly graded sands and clayey sands are very dense based on SPT blow counts.

For the purposes of design and based on reviewing laboratory testing results, the following soil design groups will be used for the evaluations:

- Fat Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Clayey Sand
- Poorly Graded Sand

Groundwater was encountered during drilling of borings between depths of 31 to 38 feet below ground surface. This corresponds to elevations between 22 and 30 feet. In reviewing previous groundwater

Geosynthetic Design Parameters

Geosynthetic materials will be utilized as part of the base liner and will be considered as part of the prescriptive final cover design. They also have been utilized for the base liner system in the existing cell. Interface shear strengths of geosynthetics for the base liner and cover can control slope stability and require special evaluation. Note that the existing permitted cover system is a soil only system and does not require an interface evaluation.

For the base liner of the existing cell, the system is made up of the following materials, from top to bottom:

- 24 inches of protective cover soil (assumed cohesive),
- Leachate Collection System
    - Granular drainage material with geotextile fabric on top
- 60-mil HDPE Smooth Geomembrane
- Clay subgrade

For the base liner of the new cell, the system will be made up of the following materials, from top to bottom:

- 24 inches of protective cover soil (assumed cohesive),
- Leachate Collection System
    - Geocomposite
- 60-mil HDPE Textured Geomembrane
- Needle punched GCL encased with an underlying textured 60-mil geomembrane (in leachate sumps only)
- Clay subgrade

For the cover system, the prescriptive cover system is made up of the following materials, from top to bottom:

- 6 inches of Cover Soil (cohesive)
- 18 inches of Compacted Clay
- Drainage Layer
    - Geocomposite
- 40-mil LLDPE Textured Geomembrane
- 6 inches of Cover Soil (cohesive)

To estimate these different interface strengths, published values in the *GRI Report #30* were reviewed. For each interface, both peak and residual strengths will be noted. Base liner interfaces and strengths for the existing and new cells will be noted separately. The interface information for the existing cell base liner are noted below:

Table 7-1. Existing Cell Base Liner Interfaces and Strengths

	Peak		Residual	
Interface	Friction Angle (deg)	Cohesion (psf)	Friction Angle (deg)	Cohesion (psf)
Cover Material – Geotextile	30	100	21	0
Geotextile – Granular Drainage Material	33	0	33	0
Granular Material – Geomembrane (smooth)	21	0	17	0
Geomembrane (smooth) – Compacted Clay	11	280	11	0

The interface information for the new cell base liner are noted below:

Table 7-2. New Cell Base Liner Interfaces and Strengths

	Peak		Residual	
Interface	Friction Angle (deg)	Cohesion (psf)	Friction Angle (deg)	Cohesion (psf)
Cover Material – Geocomposite	30	100	21	0
Geocomposite – Geomembrane (textured)	25	160	17	0
Geomembrane (textured) – GCL	23	160	13	0
GCL Internal (needle punched)	16	760	6	120
Geomembrane (textured) – Compacted Clay	18	200	16	0

For the cover system, the geomembrane is assumed to be textured given the side slopes and lengths of slopes. Estimated interface information for the cover system are listed below:

Table 7-3. New and Existing Cells Cover Interfaces and Strengths

	Peak		Residual	
Interface	Friction Angle (deg)	Cohesion (psf)	Friction Angle (deg)	Cohesion (psf)
Compacted Clay – Geocomposite	30	100	21	0
Geocomposite – Geomembrane (textured)	26	160	17	190
Geomembrane (textured) – Compacted Clay	21	220	13	140

For determining the controlling strength for the base liner, the interface shear strength for every interface was calculated for a range of effective stresses. This was done because different interfaces control for different effective stress ranges. Based on this evaluation, the following design strength envelope was determined for the existing cell base liner:

Table 7-4. Existing Cell Base Liner Design Strength Envelope

Peak		Residual	
Effective Stress (psf)	Interface Shear Strength (psf)	Effective Stress (psf)	Interface Shear Strength (psf)
0	0	0	0
1500	572	10000	1944
10000	2224		

The following design strength envelope was determined for the new cell base liner:

Table 7-5. New Cell Base Liner Design Strength Envelope

Peak		Residual	
Effective Stress (psf)	Interface Shear Strength (psf)	Effective Stress (psf)	Interface Shear Strength (psf)
0	100	0	0
500	363	1000	225
10000	3449	10000	1171

For the cover system, all interface strength values will be evaluated using the parameters listed in Table 7-3.

Excerpt from the *GRI Report #30* and base liner strength determinations are included are included in Appendix 7-C.

<u>Sections</u>

Sections were drawn across the area of the new cell. Section B was drawn across the new cell only and Section D was drawn across the new cell and vertical expansion area of the existing landfill cell.

For the new cell, the base liner has a slope of 0.5% for the center portion of the cell and 1.0% on the sump side of the cell on the south side of the cell. Based on this, the south slope of the new cell is the controlling slope. Final landfill side slopes were specified as 3H:1V with a crest elevation of 160 feet. Above this point, the top slope decreases to 5% with a maximum top of landfill elevation of 180 feet.

For the vertical expansion area, the base liner has a slope of 0.5% for the center portion of the cell and 1.0% on the sump side on the north side of the existing cell. The existing permitted slope is 4H:1V. This slope will be extended up in the vertical expansion area to match the new permitted geometry. The top of landfill elevations are the same as those noted for the new cell.

Different subsurface conditions represented by the different borings were then evaluated. Subsurface conditions with the maximum Fat Clay, Sandy Fat Clay and Sandy Lean Clay soils were determined to be controlling as they represent the lowest strength materials, especially for drained shear strengths.

Given the excavation that will occur to reach design base liner elevations, much of these materials will be removed beneath the landfill. It was determined that using borings B-4 and B-5 to determine the subsurface conditions along Section B would provide the controlling subsurface conditions.

For the vertical expansion area on top of the existing landfill, Section D was drawn given the relatively limited width of the vertical expansion. For subsurface conditions, B-2 was considered for the north portion of the existing cell given the proximity of this boring to the vertical expansion. For the southern portion of subsurface conditions, B-5 and B-7 were compared with B-5 being determined to have controlling conditions.

Section information is included in Appendix 7-D.

Slope Stability

Slope stability calculations were performed for Sections B and D using UTexas4. Calculations were performed for the following conditions:

- End of Construction (EOC) – Undrained strength (cohesion) for cohesive soils, full MSW height
- Long-term Steady State 1 (LTSS-1) – Effective Shear Strength envelope for all soils, full MSW height
- Long-term Steady State 2 (LTSS-2) – Noncircular Surface Through Liner, Effective Shear Strength envelope for all soils, Peak and residual liner strengths, full MSW height

For the EOC case, the cohesion values determined based on the undrained unconsolidated triaxial testing were used for modeling the Fat Clay, Sandy Fat Clay and Sandy Lean Clay. These tests were performed on materials that were only consolidated under the existing soil conditions at the time of the investigations. During placement of the MSW, the materials will be loaded in an undrained manner as layers of MSW are placed. After placement of each layer, dissipation of excess pore pressures will occur, increasing the effective stress increases in these soils, thus increasing the undrained shear strengths of these material. Based on this, using the in-situ undrained cohesion under full MSW landfill loading, essentially assuming the MSW is placed instantaneously, is a conservative design assumption.

For the LTSS–2 case, the stability factor of safety was controlled by the interface shear strength of the base liner. As noted, the existing and new cell base liners vary, with each having a separate interface strength envelope. The existing cell base liner interface strength envelope was used for Section E and the new cell base liner interface strength envelope was used for Section B.

Base liner evaluations will consider both peak shear strength and residual shear strength. Residual shear strengths can be caused by settlement induced liner movement or strain compatibility of the MSW shear strength (peak strength developed at high strains) and the liner system (peak strength developed at low strains).

The 2014 USGS Deaggregation online program was utilized for determining the design seismic event peak ground acceleration. For a Site Class B/C, which represents acceleration on bedrock, the bedrock acceleration is 0.028g. Given this low acceleration, evaluating seismic stability was not considered necessary and was not performed.

For the EOC and LTSS-1 cases, a "floating grid" search method was used for calculating the stability factor of safety. This method involves setting a gridded location of circular centers and then choosing a point along the surface to run all the circular surfaces through. UTexas4 will then cycle through all the circles based on the different circular centers. Multiple points along the surface were evaluated to determine the lowest factor of safety.

For the LTSS-2 case, noncircular surfaces are evaluated. Since this case is to evaluate surfaces along the liner interface, the surface must stay within the base liner system. This requires a noncircular surface. Multiple different points along the slope surface and base liner were evaluated to determine the controlling factor of safety.

Results of the slope stability analyses are listed below:

Table 7-6. Slope Stability Factors of Safety

Section	Case	Factor of Safety
Section B	EOC	2.60
	LTSS – 1	2.57
	LTSS – 2 – Peak Textured	2.28
	LTSS – 2 – Residual Textured	1.41
Section D	EOC	3.22
	LTSS – 1	3.22
	LTSS – 2 – Peak Smooth	2.18
	LTSS – 2 – Residual Smooth	1.87

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No direct guidance for slope stability factors of safety is included in TCEQ regulations for MSW landfill. Therefore, generally accepted minimum factors of safety for slope stability were relied upon and are listed below:

- EOC – 1.3
- LTSS-1 and LTSS-2 peak liner strength – 1.5
- LTSS-2 residual liner strength – 1.0

Factors of safety for EOC and LTSS cases are based off generally accepted values for slope stability evaluations of MSW landfills. For EOC and LTSS-1 and LTSS-2 with peak liner strength, factors of safety were used consistent with Duncan and Wright *Soil Strength and Slope Stability*. For LTSS-2 with residual liner strength, the paper by Stark and Poeppel entitled *Landfill Liner Interface Strengths from*

Torsional-Ring-Shear Tests was reviewed. Direction in this paper is to consider a case with fully residual strengths for the liner with a target factor of safety of 1.0.

Inputs and outputs from the UTexas4 program, the 2014 USGS deaggregation for the site and the Stark and Poeppel paper are included in Appendix 7-E.

Settlement

Total and differential settlements were evaluated to confirm that the settlements do not affect design liner grades such that leachate flow towards the sumps is disrupted.

Settlement is controlled by the specific settlement characteristics of the soils as well as the thickness of the soil deposits. Based on site conditions in this area of Texas, the soil deposits are known to be very deep (hundreds to thousands of feet). While these deep soils are very stiff, they will still experience some strain caused by the loading from the landfill. Given the size of the landfill, the depth of stress from the MSW will be very deep also, on the order of several thousand feet.
For the upper 100 feet, site conditions and settlement parameters are considered to be well known. Consolidation testing for the Fat Clay, Sandy Fat Clay and Sandy Lean Clay were performed to determine consolidation characteristics. Modulus values were estimated for the Clayey Sand and Poorly Graded Sand based on measured blow counts and correlated values.

As noted, the soils are several thousand feet deep at this site. Characteristics of these deeper soils are not specifically known but given a general understanding of the deposits at the site and indications of the soils near the base of the current investigation, these soils are expected to be very dense/hard deposits. For modeling the settlement response of these deeper soils, a modulus of 4,000 ksf was used for all of these materials. This value was chosen based on the upper end modulus values recommended in Table D-3 of the *USACE EM 1110-1-1904 Settlement Analysis*.

For evaluating the soils beneath 100 feet, the depth of soils that are assumed to settle was reviewed based on available geologic information. Published geology maps indicated that the approximate upper 1,000 feet at the site is made up of the Lissie and Willis formations. These formations are noted as being made up of unconsolidated alluvial formations and are expected to settle under the landfill loading. Below the Willis formation is the Fleming and Oakville formations. These formations are described as calcareous sedimentary rock. Given this designation, these formations are not considered compressible.

Assuming that the Lissie and Willis formations extend 1,000 feet, the total expected settlement is 28 inches beneath the center of the landfill (cover elevation of 180 feet), 20 inches under the slope crest (cover elevation of 160 feet) and 6 inches at the perimeter of the landfill.

Results from the Settle3D analysis and geology references are included in Appendix 7-F.

Cover Stability

Cover stability was also evaluated for cover options that will include geosynthetics. Both dry and saturated conditions were evaluated for peak interface shear strengths for the four different interfaces. For saturated conditions, the maximum allowable water height is the full 2 feet thickness of the soil/granular material cover. A slope of 3H:1V was evaluated based on current grading plans. Note that the existing landfill cell is to sloped at 4H:1V.

Ditches will be constructed as part of the surface water management along the landfill cover slope. To account for this additional driving force from the small earthen embankments, multiple calculations considering different ways to apply the loading were performed.

Interface strengths used in modeling are based on the *GRI Report #30*. Interface shear strengths for interfaces with either cohesive soils or textured geomembrane include adhesion. Adhesion has a significant effect on the stability of the cover system as the thin soil veneer has a relatively low driving force associated with it.

For peak strengths, factors of safety were above 1.5 for all cases.
During final construction, confirmation of the assumed interface shear strengths will be required to confirm the final materials are stable. Calculations for the cover stability based on published interface shear strengths are included in Appendix 7-G.

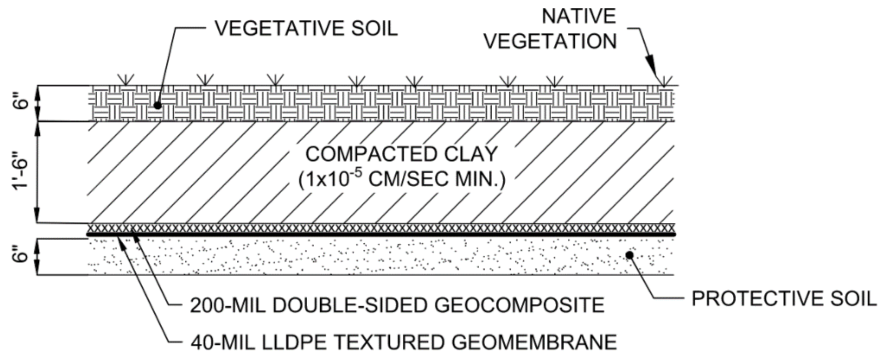
Appendix 7-G – Cover Stability

Introduction

Previous calculations involving the mass stability of the planned Victoria, Texas MSW landfill were performed as part of the permitting process. Based on discussions with TCEQ, additional calculations were requested related to the final cover system, specifically for the planned stormwater ditches that will be constructed.

Cover System

The cover system is made up of the following system:



Based on this system including geosynthetics, the stability will be controlled by the strength along the interfaces of the controlling geosynthetic. The following interfaces will be evaluated:

- Compacted Clay (cohesive) – Geocomposite (Interface #1)
- Geocomposite – LLDPE Textured Geomembrane (Interface #2)
- LLDPE Textured Geomembrane – Vegetative soil (cohesive) (Interface #3)

For the interface shear strengths of these geosynthetics interfaces, GRI Report #30 was reviewed. Based on this reference, the following interface shear strengths were used:

- Interface #1: Phi = 30 degrees, cohesion = 100 psf [peak]; phi = 21 degrees, cohesion = 0 psf [residual]
- Interface #2: Phi = 26 degrees, cohesion = 160 psf [peak]; phi = 17 degrees, cohesion = 190 psf [residual]
- Interface #3: Phi = 21 degrees, cohesion = 220 psf [peak]; phi = 13 degrees, cohesion = 140 psf [residual]

Final cover slope is 3H:1V and has crest and toe elevations of approximately 160 feet and 70 feet, respectively.

As noted, storm ditches are needed along the length of the cover system. These ditches will be spaced every 30 vertical feet along the cover system, with a total of approximately four. The ditch is made up of a triangular fill placed along the cover system that creates a 2 feet deep ditch. The interior and exterior slopes of the fill are 2H:1V. See below for storm ditch section:

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Project:	107608	Date:	11/18/2022	Made by:	Textor
Victoria, TX Landfill Expansion				Checked by:	
Cover Stability				Prelim:	Final:

Multiple slope lengths were evaluated to better understand the variation in calculated factors of safety depending on the assumptions in the calculations. The following cases were evaluated:

- Full length slope (284 feet), four stormwater ditches (20,000 pounds)
- Slope between stormwater ditches (95 feet), two stormwater ditches (10,000 pounds)
- Slope beneath stormwater ditch (25.3 feet), one stormwater ditch (5,000 pounds)

	L = 284 feet FoS	L = 95 feet FoS	L = 25.3 feet FoS
Interface #1	3.0	2.8	2.2
Interface #2	3.1	2.9	2.5
Interface #3	3.4	3.1	2.5

Based on these calculations, the cover system is considered stable with the addition of the stormwater ditches.

Spreadsheets showing limit equilibrium calculations are included in Appendix G3. Hand calculations for one of the spreadsheets are included in Appendix G4.

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Appendix G3 – Calculation Spreadsheets

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	284	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	200	Interface cohesion (psf)
Phi (inter)	18	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	20000	Weight of stormwater ditch (lbs)
Wa	86561.7	
Na	82122.0	
Ca	55534.8	
Wp	800.2	
C	0.0	
a	8207.9	
b	-24659.7	
c	0.0	
FS	3.0	

Slope length = 284 feet
Four (4) Stormwater Ditches (20,000 lbs)
Cover Soil-Geocomposite Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	284	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	160	Interface cohesion (psf)
Phi (inter)	26	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	20000	Weight of stormwater ditch (lbs)
Wa	86561.7	
Na	82122.0	
Ca	44427.8	
Wp	800.2	
C	0.0	
a	8207.9	
b	-25338.6	
c	0.0	
FS	3.1	

Slope length = 284 feet
Four (4) Stormwater Ditches (20,000 lbs)
Geocomposite-Geomembrane Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	284	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	220	Interface cohesion (psf)
Phi (inter)	21	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	20000	Weight of stormwater ditch (lbs)
Wa	86561.7	
Na	82122.0	
Ca	61088.2	
Wp	800.2	
C	0.0	
a	8207.9	
b	-27777.2	
c	0.0	
FS	3.4	

Slope length = 284 feet
Four (4) Stormwater Ditches (20,000 lbs)
Geomembrane-Cohesive Soil Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	95	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	200	Interface cohesion (psf)
Phi (inter)	18	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	10000	Weight of stormwater ditch (lbs)
Wa	31201.7	
Na	29601.4	
Ca	17734.8	
Wp	800.2	
C	0.0	
a	2958.6	
b	-8204.0	
c	0.0	
FS	2.8	

Slope length = 95 feet
Two (2) Stormwater Ditches (10,000 lbs)
Cover Soil-Geocomposite Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	95	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	160	Interface cohesion (psf)
Phi (inter)	26	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	10000	Weight of stormwater ditch (lbs)
Wa	31201.7	
Na	29601.4	
Ca	14187.8	
Wp	800.2	
C	0.0	
a	2958.6	
b	-8585.6	
c	0.0	
FS	2.9	

Slope length = 95 feet
Two (2) Stormwater Ditches (10,000 lbs)
Geocomposite-Geomembrane Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	95	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	220	Interface cohesion (psf)
Phi (inter)	21	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	10000	Weight of stormwater ditch (lbs)
Wa	31201.7	
Na	29601.4	
Ca	19508.2	
Wp	800.2	
C	0.0	
a	2958.6	
b	-9259.2	
c	0.0	
FS	3.1	

Slope length = 95 feet
Two (2) Stormwater Ditches (10,000 lbs)
Geomembrane-Cohesive Soil Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	25.3	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	200	Interface cohesion (psf)
Phi (inter)	18	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	5000	Weight of stormwater ditch (lbs)
Wa	9473.7	
Na	8987.8	
Ca	3794.8	
Wp	800.2	
C	0.0	
a	898.3	
b	-2014.1	
c	0.0	
FS	2.2	

Slope length = 25.3 feet
One (1) Stormwater Ditch (5,000 lbs)
Cover Soil-Geocomposite Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	25.3	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	160	Interface cohesion (psf)
Phi (inter)	26	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	5000	Weight of stormwater ditch (lbs)
Wa	9473.7	
Na	8987.8	
Ca	3035.8	
Wp	800.2	
C	0.0	
a	898.3	
b	-2225.3	
c	0.0	
FS	2.5	

Slope length = 25.3 feet
One (1) Stormwater Ditch (5,000 lbs)
Geocomposite-Geomembrane Interface

Gamma	120	Cover soil unit weight (pcf)
h	2	Cover soil thickness (ft)
L	25.3	Length of slope (ft)
Beta	18.43	Slope of cover (degrees)
ca	220	Interface cohesion (psf)
Phi (inter)	21	Interface friction angle (deg)
c	0	Cover soil cohesion (psf)
Phi (soil)	0	Cover soil friction angle (deg)
W ditches	5000	Weight of stormwater ditch (lbs)
Wa	9473.7	
Na	8987.8	
Ca	4174.2	
Wp	800.2	
C	0.0	
a	898.3	
b	-2286.8	
c	0.0	
FS	2.5	

Slope length = 25.3 feet
One (1) Stormwater Ditch (5,000 lbs)
Geomembrane-Cohesive Soil Interface

Appendix G4 – Example Hand Calculations

BURNS & McDONNELL

030215 Form GCO-28

Client Victoria, TX Page ______ of ______

Project 107608 Date 11/8/22 Made By Tester

Victoria Landfill Checked By ______

Cover Spreadsheet Hand Calc Preliminary ______ Final ______

Inputs:

Cover Soil Unit Weight: 120 pcf

Cover Soil Thickness: 2 ft (above geosynthetics)

Slope length: 284 ft

Slope angle: 18.43 degrees

Interface cohesion: 100 psf

Interface friction angle: 30 deg

Soil cohesion: 0 psf

Soil friction angle: 0 degrees

} → ignore soil passive resistance

Weight of ditches: 20,000 lbs

Active Wedge

$$W_A = \gamma H^2 \left[\frac{L}{H} - \frac{1}{\sin\beta} - \frac{\tan\beta}{2} \right] + W_{ditches}$$

$$= 120 (2^2) \left[\frac{284}{2} - \frac{1}{\sin 18.4} - \frac{\tan 18.4}{2} \right] + 20000$$

$$= 480 \left[142 - 3.16 - 0.166 \right] + 20000$$

$$= 86,564 \text{ lbs}$$

$$N_A = W_A \cos\beta = (86,564)(\cos 18.4) = 82,124 \text{ lbs}$$

$$C_A = C_a \left(L - \frac{h}{\sin\beta} \right) = 100 \left(284 - \frac{2}{\sin 18.4} \right) = 27,767 \text{ lbs}$$

$$W_P = \frac{\gamma H^2}{\sin 2\beta} = \frac{(120)(2^2)}{\sin(2 \cdot 18.43)} = 800 \text{ lbs}$$

$$C = \frac{c\,h}{\sin\beta} = \frac{(0)(2)}{\sin(18.43)} = 0 \text{ lbs}$$

$$a = [W_A - N_A \cos\beta] \cos\beta$$

$$= [86{,}564 - 82{,}124 \cos 18.43] \cos 18.43$$

$$= (8652) \cos 18.43 = 8208$$

$$b = -[(W_A - N_A \cos\beta) \sin\beta \tan\phi + (N_A \tan\delta + C_a) \sin\beta \cos\beta + \sin\beta (C + W_p \tan\phi)]$$

$$-[(86{,}564 - (82{,}124) \cos 18.43) \sin 18.43 \tan 0 + (82124 \tan 30 + 27{,}767) \sin 18.43 \cos 18.43 + \sin 18.43 (0 + 800 \tan 0)]$$

$$-[(8652) \sin 18.43 (0) + (75181) \sin 18.43 \cos 18.43 + 0]$$

$$= -(0 + 22549] = -22{,}549$$

$$c = (N_A \tan\delta + C_a) \sin^2\beta \tan\overset{0}{\phi} = 0$$

$$FS = \frac{-b + \sqrt{b^2 - 4ac}}{2a} = \frac{22549 + \sqrt{-22549^2 - 4(8208)(0)}}{2(8208)}$$

$$= 2.7$$

ATTACHMENT III-9 – FINAL CLOSURE PLAN

III. Description of the Final Cover System Design

A. Types and Descriptions of the Final Cover Systems

Table 5. Types and Descriptions of the Final Cover Systems Permitted or Proposed for Closure of the Landfill Units.

Landfill Unit Name or Descriptor	Type of Final Cover System	Final Cover System Components Description	Other Information (Enter other information as applicable)
Existing Area	Pre-Subtitle D prescriptive final cover	6”-thick topsoil erosion layer (earthen material capable of sustaining native plant growth) 18”-thick compacted clay-rich layer (k<1x10^-7 cm/s)	Existing Area – Closed & Existing Area – Constructed: Immediately following the application of the final cover, it will be seeded with Common Bermuda grass, or other similar turf grasses that have with the majority of the root depths of 6 inches or less, in order to minimize erosion
Existing Area	Historic Prescribed Composite Final Cover	24”-thick topsoil erosion layer (earthen material) with top 6” capable of sustaining native plant growth 40-mil LLDPE geomembrane (smooth on top deck and textured on side slopes) 18”-thick compacted clay-rich layer (k<1x10^-5 cm/s)	Existing Area – Closed and Existing Area – Trench 11: Immediately following the application of the final cover, it will be seeded with Common Bermuda grass, or other similar turf grasses that have with the majority of the root depths of 6 inches or less, in order to minimize erosion
Existing Area	Prescribed Composite Final Cover	6”-thick soil layer capable of sustaining native plant growth 18”-thick compacted clay layer (k<1x10^-5 cm/s) 200-mil double-sided drainage geocomposite 40-mil LLDPE geomembrane (textured both sides) 6”-thick protective soil layer	Existing Area – Constructed and To Be Constructed: Includes Cells 5 – 9. Immediately following the application of the final cover, it will be seeded with Common Bermuda grass, or other similar turf grasses that have with the majority of the root depths of 6

Landfill Unit Name or Descriptor	Type of Final Cover System	Final Cover System Components Description	Other Information (Enter other information as applicable)
			inches or less, in order to minimize erosion
Expansion Area	Prescribed Composite Final Cover	6”-thick topsoil layer (capable of sustaining native plant growth) 18”-thick compacted clay-layer (k<1x10^-5 cm/s) 200-mil double-sided drainage geocomposite (side slopes) and cushion geotextile (top deck) 40-mil LLDPE textured geomembrane 6”-thick protective soil layer	Lateral and Vertical: Immediately following the application of the final cover, it will be seeded with Common Bermuda grass, or other similar turf grasses that have with the majority of the root depths of 6 inches or less, in order to minimize erosion

B. Design Details

Table 6. Design Details of the Final Cover Top and Side Slopes for the Landfill Units.

Landfill Unit Name or Descriptor	Maximum Final Elevation of Waste (feet above mean sea level [ft-msl])	Maximum Elevation of Top of Final Cover (ft-msl)	Minimum Grade of the Final Cover Top Slope (%)	Maximum Grade of the Final Cover Side Slope (%)	Other Information (enter other information as applicable, e.g. above-grade Class 1 Cell Dikes)
Existing Area	142'	144'	2.5	25	Pre-Subtitle D
Existing Area	140.5'	144'	2.5	25	Subtitle D/MSW/Trench 11, Trench 9, Parts of Trench 5
Existing Area	165.7'	168.2	5.0	25 (NW slope) 33 (other slopes)	MSW Trenches 7 and 8. Parts of Trenches 5 and 6.
Expansion Area	185.4'	187.9	5.0	33	MSW and Class 1 industrial waste below the exterior berm elevation (66.4’ AMSL) and covered by a 4-foot clay rich soil barrier

(5) Submittal of a Copy of the "Affidavit to the Public" and the "Modified Deed" to the TCEQ Executive Director:

Within ten days after completion of final closure activities of the facility, the site operator will submit the following to the TCEQ executive director by registered mail:

(a) A certified copy of the "Affidavit to the Public";

(b) A certified copy of the modified deed to the facility property; and

(c) A certification, signed by an independent licensed professional engineer, verifying that final facility closure has been completed in accordance with the approved closure plan. The submittal will contain all applicable documentation necessary for certification of final facility closure, including:

- Final Cover System Evaluation Report (FCSER) documenting the installation of the final cover. The FCSER may be submitted earlier as a separate document for review and approval following the completion of the final cover installation. In that case, the certification of closure will be submitted subsequently;
- A final contour map as described under Item III.G above;
- Copy of a letter to the TCEQ regional office requesting a final closure inspection of the facility; and
- Copies of documents verifying newspaper publication of the notice of the final facility closure.

(6) Other

Additional items relating to the schedule for final facility closure, and additional closure activities specific to the final closure of this facility include:
Cells A1-I2 indicated on Attachment III-1 - Drawing III.A1.4 are suitable for disposal of both MSW and Class 1 waste. Class 1 waste shall be disposed of below the exterior berm elevation (66.4' AMSL), and covered by a 4-foot clay rich soil barrier. The material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in the landfill development (including waste and construction materials). The professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed.

(7) TCEQ's Acceptance of Termination of Operation and Closure of a Landfill Facility:

Following the TCEQ executive director's receipt and completion of the review of the professional engineer's certification of the completion of facility closure and the final closure documents, and receipt of the inspection report from the agency's regional office verifying proper closure of the facility according to this

VII. Professional Engineer's Statement, Seal, and Signature

Name: Tonya Koller

Title: Project Engineer

Date: 11/18/2022

Company Name: Burns & McDonnell

Firm Registration Number: F-845

Professional Engineer's Seal

Signature

ATTACHMENT III-10 – FINAL CLOSURE QUALITY CONTROL PLAN

Part III, Attachment 10
Final Cover Quality Control Plan
TCEQ MSW Permit No. 1522B

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part III, Attachment 10
Final Cover Quality Control Plan
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

Burns & McDonnell Engineering Company, Inc.
8911 N Capital of Texas Hwy, Building 3, Suite 3100
Austin, Texas 78759
Texas Firm Registration No. F-845

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TONYA L. KOLLER
133943
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PROFESSIONAL ENGINEER
11-18-22

APPENDIX 10A – EXAMPLE CQA FORMS
APPENDIX 10B – GRI GM17
APPENDIX 10C – 2014 CQA PLAN

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Representative Sample – A representative sample of FML material consists of one or more specimens (commonly referred to as coupons) from the same rectangular portion of FML material, oriented along a seam, that is removed for field or laboratory testing purposes.

Soil Borrow Source – Soils in which the LL and PI do not vary by 10 points. A soil that varies by 10 or more points from the originally established LL or PI is considered as a separate soil source for the purpose of this FCQCP and requires a separate soil test series.

Soil Test Series – Tests performed to determine a soil's physical characteristics and to document its ability to satisfy the MSWR compacted clay layer requirements. These tests include sieve analysis (gradation), Atterberg Limits, moisture/density, and coefficient of permeability.

Specimen – (With respect to FML destructive testing) – A specimen is the individual test strip (sometimes called coupon) from a sample location. A sample location usually consists of many specimens.

1.3 Final Cover Systems

Final cover at the City of Victoria Landfill includes three types of final cover systems. These final cover systems are included under the following unit classifications:

- Pre-Subtitle D: Existing Area – Closed
- Subtitle D: Existing Area – Closed
- Prescriptive Composite:
  - Existing Area – Constructed or To Be Constructed (TBC)
  - Expansion Area – Lateral or Vertical

These Areas are defined in Attachment III-9 – Final Closure Plan.

The Pre-Subtitle D prescriptive final cover system includes an 18-inch-thick compacted clay-rich soil and a 6-inch thick topsoil erosion layer consisting of earthen material capable of sustaining native plant growth.

The Subtitle D Conventional Composite cover system includes an 18-inch-thick compacted clay layer, 40 mil LLDPE textured geomembrane (textured on both sides), and 24-inch thick erosion layer, of which the top 6 inches can sustain vegetative growth.

Most Existing Areas utilizing Pre-Subtitle D and Subtitle D cover have been closed as of 2015. Final cover for the remaining Pre-Subtitle D open area (Existing Area – Constructed) and Subtitle D open area (Existing Area – Trench 11) will be installed per the previously permitted and approved CQA plan located in Appendix 10C.

The Prescriptive Composite cover system will include a 6-inch thick soil layer capable of sustaining vegetative growth, an 18-inch-thick compacted clay layer, 200-millimeter (mil) double-sided drainage geocomposite, 40 mil LLDPE geomembrane (textured both sides), and a 6-inch thick protective soil layer. The vegetative layer will be seeded with Common Bermuda grass, or other similar turf grasses that have most of the root depths of 6 inches or less.

Prescriptive Composite cover will be placed on all areas that have yet to receive final cover, including Existing Area – Constructed or TBC and Expansion Areas. This FCQCP covers the CQA requirements for the Prescriptive Composite cover system.

The final cover systems at the site are designed to minimize the amount of precipitation that infiltrates the deposited waste, thus minimizing the amount of leachate generated. The final cover system is designed to convey stormwater to detention ponds via final cover erosion control structures and perimeter channels.

The material properties (internal and interface) used in the slope stability analysis will be tested on the materials to be used in the landfill development (including waste and construction materials). The professional engineers responsible for the design and construction of the individual area will review the test results and decide whether the stability analysis results are still valid or new stability analysis using the test results is needed.

In the Expansion Area, final cover installation will require construction on slopes in excess of 25%. Additional safety precautions for operating on steep slopes should be used, including awareness and spotting, angle of approach and operation, weather considerations, use of safe speed and appropriate track, etc.

- PI equal to or greater than 15.
- LL equal to or greater than 30.
- Percent passing the No. 200 mesh sieve equal to or greater than 30 percent.
- Percent passing the one-inch screen equal to 100 percent.
- Coefficient of permeability should meet the requirements set forth in Section III of Part III, Attachment III-9: for the composite Existing Areas (Constructed and TBC) as well as Expansion Area final cover compacted clay layers, coefficient of permeability of less than or equal to $1x10^{-5}$ centimeters per second (cm/s). The 18 inches of compacted clay material will be tested for co-efficient of permeability at a frequency of at least one test per surface acre of final cover. Permeability data shall be submitted to the executive director.

The compacted clay layer material will consist of relatively homogeneous clay, and clayey soils. The soil will be free of debris, rocks greater than one inch in diameter, vegetative matter, frozen materials, foreign objects, and organics. Testing will be performed in accordance with Section 2.4.1 (refer to Table 2-1 test methods) for each borrow source. A permeability test will be conducted on samples from each borrow source. The permeability test specimens will be prepared by laboratory compaction to a dry density of approximately 95 percent of the Standard Proctor (ASTM D698) maximum dry density at a moisture content at or above the optimum moisture content. One Proctor moisture-density relationship and remolded permeability test will be required for each different material as determined by a change in the liquid limit or plasticity index of more than 10 points.

The lift thickness will be controlled so that there is total penetration through the loose lift under compaction into the top of previously compacted lift; therefore, the compacted lift thickness will not be greater than the pad or prong length. The material will be compacted to a minimum of 95 percent of the maximum dry density determined by Standard Proctor (ASTM D698) at a moisture content between the Standard Proctor optimum and 5 percentage points above optimum. The CQA Officer, earthwork contractor, and/or operator will identify the clay material during excavation, and the clay material will be stockpiled separately, if stockpiling is required.

Because of possible variability of the available clay materials, additional stockpile testing will be performed if different physical properties of the borrow soil (color, texture, etc.) are observed by the CQA Officer, and the materials vary by more than ten points in either liquid limit or plasticity index from previously evaluated materials.

3.0 CONSTRUCTION QUALITY ASSURANCE FOR GEOSYNTHETICS

This section describes CQA procedures for the installation of geosynthetic components.

The scope of geosynthetic-related construction quality assurance includes the following elements:

- Geomembrane Liner: 40-mil LLDPE – textured on both sides. Minimum required material properties for the geomembrane are listed in Appendix 10B.
- Drainage Layer: 200-mil drainage geocomposite – minimum required material properties for the drainage layer are found in Appendix 10B.

The overall goal of the geosynthetics quality assurance program is to assure that proper construction techniques and procedures are used, the geosynthetic contractor implements their quality control plan in accordance with this FCQCP, the construction and testing of all elements of the final cover are performed in accordance with this FCQCP and the Attachment III-9 – Final Closure Plan, and that the project is built in accordance with the project construction drawings and technical specifications. The quality assurance program is intended to identify and define problems that may occur during construction and to observe that these problems are avoided and/or corrected before construction is complete. The FCSER, prepared after project completion, will document that the constructed facility meets design intent and specifications and that all final cover construction and QA/QC testing are performed in accordance with this FCQCP.

3.1 Geosynthetics Quality Assurance

3.1.1 General

A geomembrane and drainage geocomposite are the geosynthetic components of the Prescriptive Composite final cover system. All testing requirements and minimum required properties are listed in Appendix 10B. Construction quality control for the geosynthetic installation will be performed by the geosynthetic installation contractor. Construction quality assurance for the geosynthetic installation will be performed by the POR to assure the geosynthetic is constructed as specified in the design. Construction must be conducted in accordance with the project construction drawings, which will be developed in accordance with this FCQCP and the Attachment III-9 – Final Closure Plan at the time of each final cover construction and in accordance with specifications outlined in this FCQCP. Where there is discrepancy, the project construction drawings and specifications shall govern. To monitor compliance, a quality assurance program will include the following:

- Review of Installer's QC submittals

4.0 CONSTRUCTION QUALITY ASSURANCE FOR EROSION LAYER

The erosion layer for the Prescriptive Composite final cover areas will consist of a minimum of 6 inches of earthen material. The erosion layer will be capable of sustaining native and introduced vegetative growth and must be seeded immediately after completion of the final cover. Temporary or permanent erosion control materials may be used to minimize erosion and aid establishment of vegetation. The physical characteristics of the erosion layer will be evaluated through visual observation (and laboratory testing if deemed necessary by the POR) before construction and visual observation during construction. Additional testing during construction will be at the discretion of the POR.

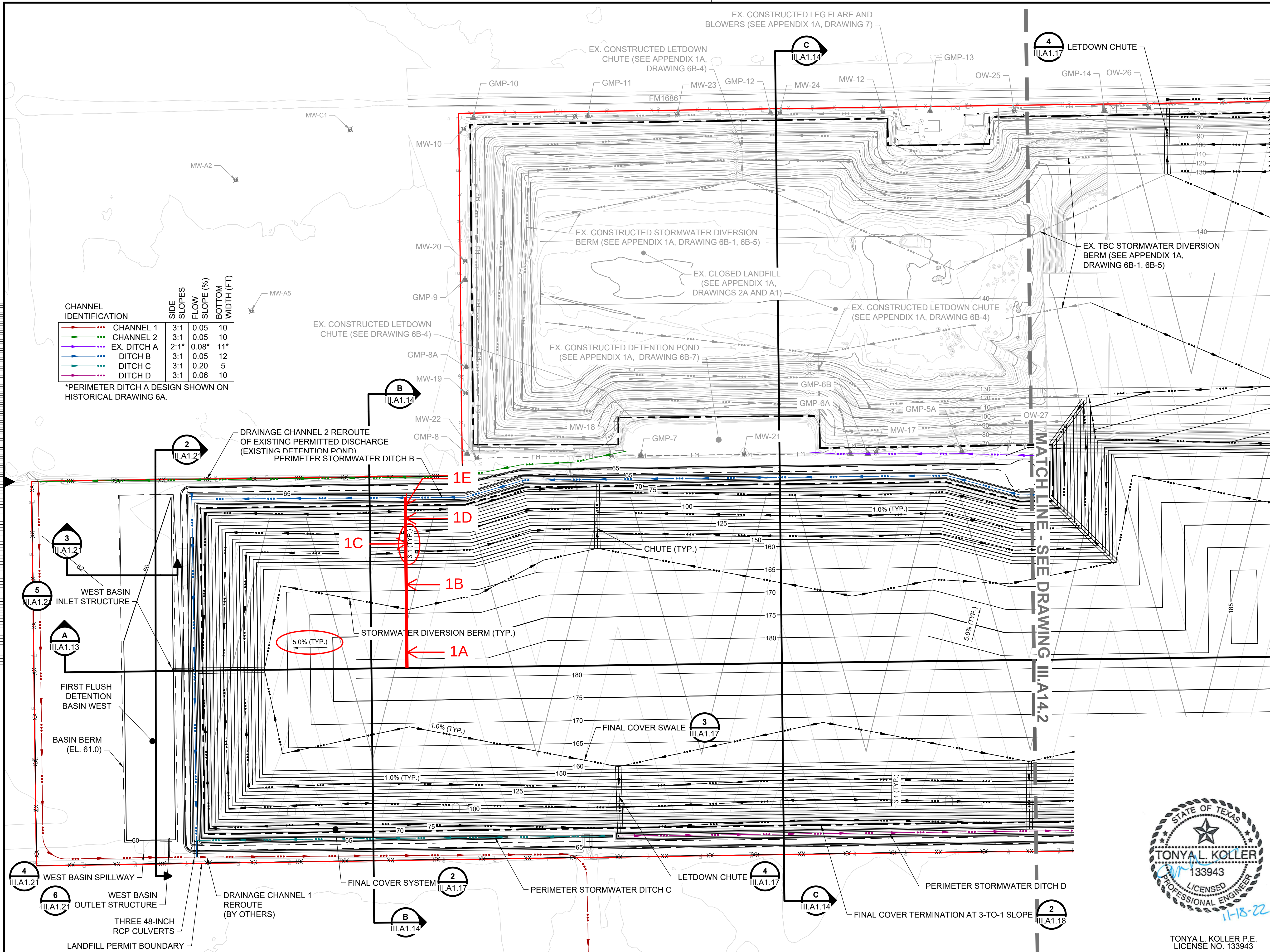
The erosion layer may be placed using any appropriate equipment capable of completing the work and should only receive minimal compaction required for stability. Under no circumstances will the construction equipment come in direct contact with the installed geosynthetics. Equipment used to install the erosion layer must meet the requirement of Section 3.4.

The thickness of the erosion layer will be verified with surveying procedures at a minimum of one survey point per 10,000 square feet of constructed area by a licensed Texas surveyor with a minimum of one reference point. The survey results for the erosion layer will be included in the FCSER.

During construction, the CQA Officer will:

- Verify that grade control is performed prior to work.
- Verify that underlying geosynthetic installations are not damaged during placement operations or by survey grade controls. Mark damaged geosynthetics and verify that damage is repaired.
- Monitor haul-road thickness over installed geosynthetics and verify that equipment hauling, and material placement meet equipment specifications (see Section 3.4).
- The POR will coordinate with the project surveyor to perform a thickness verification survey of the erosion layer materials upon completion of placement operations. Verify corrective action measures as determined by the verification survey. Thickness surveying to determine minimum erosion layer thickness will be performed similar to the compacted clay layer thickness verification shown in Table 2-1.

ATTACHMENT III-14 – RUSLE2 REPORT



CHANNEL IDENTIFICATION	SIDE SLOPES	FLOW SLOPE (%)	BOTTOM WIDTH (FT)
CHANNEL 1	3:1	0.05	10
CHANNEL 2	3:1	0.05	10
EX. DITCH A	2:1*	0.08*	11*
DITCH B	3:1	0.05	12
DITCH C	3:1	0.20	5
DITCH D	3:1	0.06	10

*PERIMETER DITCH A DESIGN SHOWN ON HISTORICAL DRAWING 6A.

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD

NOTES:

1. DESIGN CONTOURS REPRESENT TOP OF FINAL COVER. DESIGN CONTOUR INTERVAL IS 5-FEET. BACKGROUND CONTOURS REPRESENT TOP OF SOIL LINER AND EXISTING GROUND (OUTSIDE OF TRENCHES 6-9, EASTERN PORTION OF TRENCH 5 AND CELLS A1-I2). BACKGROUND CONTOUR INTERVAL IS 2-FEET.
2. PERIMETER DITCH CROSS SECTIONS SHOWING DIMENSIONS, FLOW DEPTHS, ETC. ARE PROVIDED ON DRAWINGS III.A1.19 AND III.A1.20.

PRELIMINARY - NOT FOR CONSTRUCTION

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date: MARCH 2022 | detailed: T. CAMMACK
designed: T. SCHMIDT | checked: T. KOLLER

THE CITY OF VICTORIA TEXAS
Victoria County, Texas

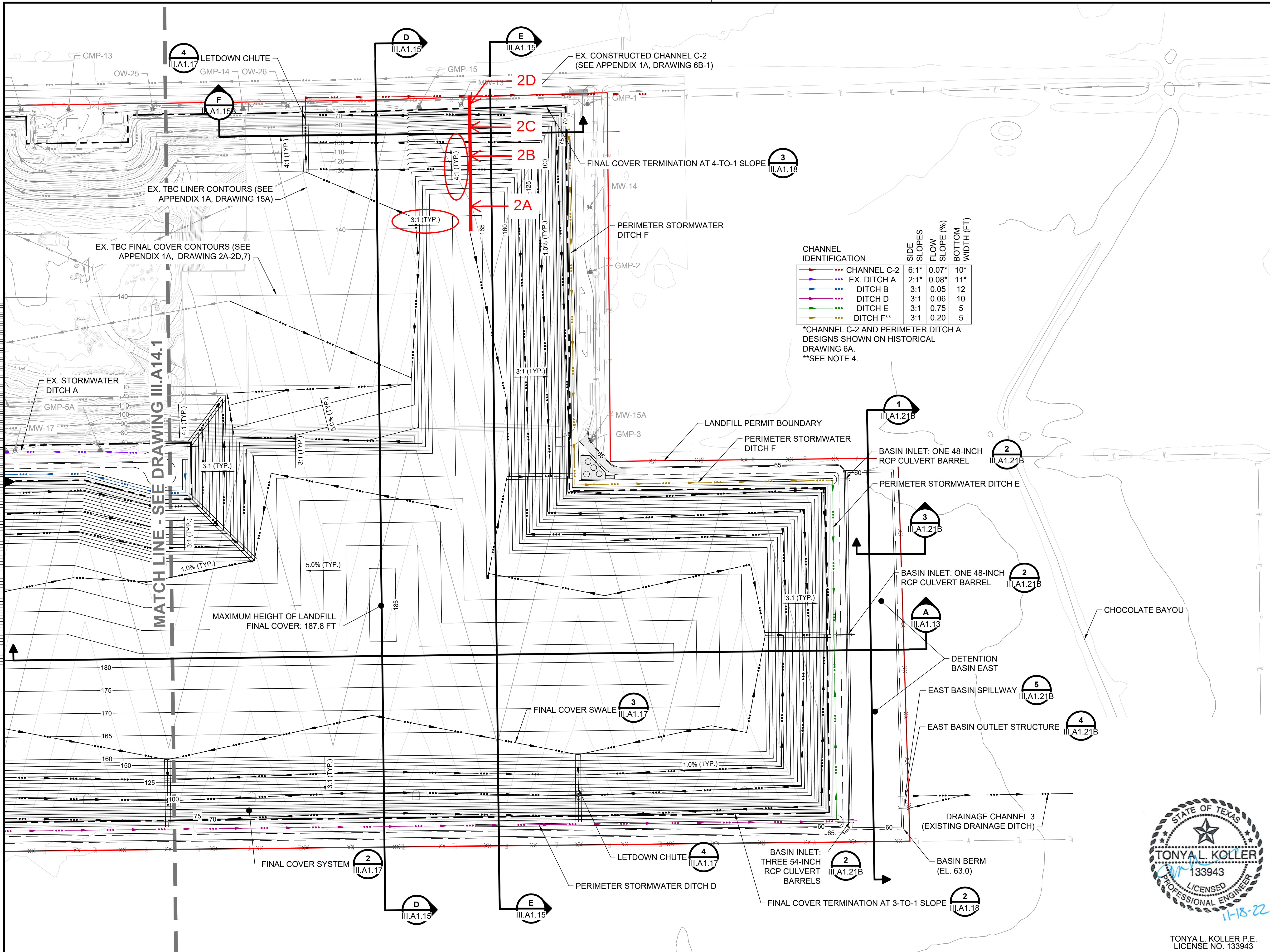
1522B PERMIT AMENDMENT
FINAL GRADING PLAN - WEST

project: 107608 | contract: -
drawing: III.A14.1 | rev. 2
sheet 8 of 25 sheets
file 107608III.A1.7.dwg

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED PROFESSIONAL ENGINEER
11-18-22

TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
0	3/28/22	TJS	SAM	INITIAL SUBMITTAL
1	8/15/22	TJS	TLK	REV. PER TCEQ NOD
2	11/18/22	TJS	TLK	REV. PER TCEQ NOD



CHANNEL IDENTIFICATION	SIDE SLOPES	FLOW SLOPE (%)	BOTTOM WIDTH (FT)
CHANNEL C-2	6:1*	0.07*	10*
EX. DITCH A	2:1*	0.08*	11*
DITCH B	3:1	0.05	12
DITCH D	3:1	0.06	10
DITCH E	3:1	0.75	5
DITCH F**	3:1	0.20	5

*CHANNEL C-2 AND PERIMETER DITCH A DESIGNS SHOWN ON HISTORICAL DRAWING 6A.
**SEE NOTE 4.

NOTES:

1. THE EAST BASIN DISCHARGES INTO AN EXISTING DITCH NOT SHOWN IN THE EXISTING TOPOGRAPHY.
2. DESIGN CONTOURS REPRESENT TOP OF FINAL COVER. DESIGN CONTOUR INTERVAL IS 5-FEET. BACKGROUND CONTOURS REPRESENT TOP OF SOIL LINER AND EXISTING GROUND (OUTSIDE OF TRENCHES 6-9, EASTERN PORTION OF TRENCH 5 AND CELLS A1-I2). BACKGROUND CONTOUR INTERVAL IS 2-FEET.
3. PERIMETER DITCH CROSS SECTIONS SHOWING DIMENSIONS, FLOW DEPTHS, ETC. ARE PROVIDED ON DRAWINGS III.A1.19 AND III.A1.20.
4. PERIMETER DITCH F IS NOT REPRESENTED IN CROSS SECTIONS. 25-YEAR STORM DEPTH IS 1.1 FT AND 100-YEAR STORM DEPTH IS 1.5 FT.

NORTH

0 200' 400'
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

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date	detailed
MARCH 2022	T. CAMMACK
designed	checked
T. SCHMIDT	T. KOLLER

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1522B PERMIT AMENDMENT

FINAL GRADING PLAN - EAST

project 107608 contract -
drawing III.A14.2 rev. 2
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file 107608III.A1.8.dwg

BURNS McDONNELL

Volume 5
Part IV Landfill Permit Amendment
Site Operating Plan
TCEQ MSW Permit No. 1522B

THE CITY OF VICTORIA TEXAS

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Volume 5
Part IV Landfill Permit Amendment
Site Operating Plan
TCEQ MSW Permit No. 1522B

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
amsl	above mean sea level
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
City	City of Victoria
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CP&L	Central Power and Light
CY	cubic yards
EPA	Environmental Protection Agency
FM	Farm to Market Road
ft	feet
ft^3	cubic feet
GLER	Geomembrane Liner Evaluation Report
GWSAP	Groundwater Sampling & Analysis Plan
Landfill	City of Victoria Landfill
lbs	pounds
LFG	Landfill Gas
mg/kg	milligrams per kilogram
MSW	Municipal Solid Waste
NHIW	Non-Hazardous Industrial Waste

Abbreviation	**Term/Phrase/Name**
NSPS	New Source Performance Standards
OSHA	Occupational Safety & Health Administration
PCB	polychlorinated biphenyls
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RACM	regulated asbestos containing material
RCRA	Resource Conservation Recovery Act
SDP	Site Development Plan
SLER	Soils and Liner Evaluation Report
SOP	Site Operating Plan
SPCC	Spill Prevention, Control, and Countermeasure
SWAP	Special Waste Acceptance Plan
SWP3	Stormwater Pollution Prevention Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPD	Tons per Day
TxDOT	Texas Department of Transportation
USC&GS	United States Coast & Geodetic Survey

1.0 INTRODUCTION

30 TAC §330.65, §330.65(a), §330.127

This Site Operating Plan (SOP) has been prepared for the City of Victoria (City) Landfill (Landfill) consistent with Title 30 Texas Administrative Code (TAC) §330.65 and §330.127. This SOP will supersede the existing SOP approved by the Texas Commission on Environmental Quality (TCEQ). The purpose of this SOP is to provide guidance to site management and operating personnel to meet the general and site-specific requirements of §330.127. This document also provides an operating guide for site management to maintain the facility in compliance with the engineering design and applicable regulatory requirements of the TCEQ. The SOP may also serve as a reference source and assist in personnel training. This SOP, the permit, and the current TCEQ regulations will be kept onsite throughout the facility's operating life.

Wherever the term "Executive Director" or "TCEQ" is used in this SOP, these terms shall refer to the Executive Director of the TCEQ or the designated representative of the TCEQ. References to information in the permit or permit application for this facility shall refer to the most current version of these documents, including any amendments, modifications, or revisions as approved.

If any questions arise regarding this SOP, City of Victoria Landfill personnel should consult with:

1. Texas Commission on Environmental Quality
   Municipal Solid Waste Section
   Austin, Texas
   Telephone: 512-239-2334
2. Texas Commission on Environmental Quality, Region 14
   Corpus Christi, Texas
   Telephone: 361-825-3100
3. Texas Spill Reporting Hotline
   Spill Reporting Telephone: 1-800-832-8224

2.0 RECORDKEEPING REQUIREMENTS

30 TAC §330.121(a), §330.123, §330.125(a) through (h), §330.675

The City will maintain the following at the facility:

- A Copy of the permit (including the approved Application and any approved permit modifications and amendments);
- Part III - Site Development Plan (SDP);
- Attachment III-3 – Leachate and Contaminated Water Plan;
- Attachment III-6 – Groundwater Sampling and Analysis Plan;
- Attachment III-8 – Landfill Gas (LFG) Management Plan;
- Attachment III-9 – Final Closure Plan;
- Attachment III-11 – Post-Closure Maintenance Plan;
- Part IV – Site Operating Plan; and
- A copy of all state and federal regulations referred to in this plan, and any other required plans or documents at the City of Victoria Landfill as approved by the TCEQ at all times during the active life of the facility.

Consistent with §330.125(c), the City will place all information listed above, as well as in Table 2-1 in the operating record. The City shall place this information in the operating record in accordance with §330.125(b) and maintain the operating record in an organized format which allows the information to be easily located and retrieved. All information contained in the operating record will be furnished upon request to the Executive Director and will be made available for inspection by the Executive Director.

Table 2-1: Recordkeeping Requirements

Item	Rule Citation
All location restriction demonstrations	§330.125(b)(1)
Inspection logs and records, training procedures, and notification procedures relating to excluding the receipt of prohibited waste	§330.125(b)(2)
Results from gas monitoring events and any remediation plans relating to explosive and other gases	§330.125(b)(3)
Unit design documentation for the placement of leachate or gas condensate in the landfill	§330.125(b)(4)
All inspection logs and reports and all demonstrations, certifications, findings, monitoring, testing, and analytical data relating to groundwater monitoring and corrective action.	§330.125(b)(5)
Closure and post-closure plans and any monitoring, testing, or analytical data relating to post-closure requirements.	§330.125(b)(6)

Item	Rule Citation
Cost estimates and financial assurance documentation relating to financial assurance for closure and post-closure care.	§330.125(b)(7)
Copies of all correspondence and responses relating to the operation of the facility, modifications to the permit, approvals, and other matters pertaining to technical assistance.	§330.125(b)(9)
Any and all documents, manifests, scale tickets, generator waste profile sheets, etc. involving special waste.	§330.125(b)(10)
Records of the application rate and total amount for any spray-applied alternative daily cover (ADC) material applied to the working face on those days in which ADC is applied	§330.125(b)(11)
All inspection documentation noted on Table 7-5 Site Inspection and Maintenance List	§330.125(b)(12)
Leachate sump level measurements	§330.125(b)(12)
Leachate disposal records	§330.125(b)(12)
Other documents as specified by the approved permit or by the Executive Director of the TCEQ	§330.125(b)(12)
Personnel training records in accordance with §335.586(d) and §335.586(e) and operator licenses.	§330.125(e) and §330.125(f)
Annual waste acceptance rate documentation including Quarterly and Annual Solid Waste Summary Reports required by §330.675	§330.125(h)
Load inspection records.	§330.127(5)(B)
Fire occurrence notices	§330.129
Access control breach and repair notices	§330.131
A record of each unauthorized material removal event	§330.133(b)
A record of alternate operations hours	§330.135(d)
Landfill marker and benchmark maintenance records	§330.143(a)
Landfill Gas Monitoring System inspection records	§330.159
Landfill Gas Extraction System inspection records	§330.159
Oil, gas, mineral, and water well notifications and plugging certifications	§330.161
Cover inspection record	§330.165(h)
RACM acceptance records	§330.171(c)(3)(B)
Fire protection plan including procedures for using the fire protection source, and employee training and safety procedures.	§330.221(c)

The items listed in Table 2-1 will be incorporated into the Site Operating Record within seven working days of the completion of the item/record or receipt of the analytical data in accordance with 30 TAC §330.125(b). The City will retain all information contained within the Site Operating Record and all plans listed in this Section 2.0 for the life of the facility including the post closure care period in accordance with 30 TAC §330.125(d). Consistent with §330.125(g) the Executive Director may set an alternative schedule for recordkeeping and notification.

The facility will provide the facilities and process reports required by 30 TAC §330.675 to the Executive Director. For disposal facilities and processes, a Municipal Solid Waste Fee Report is required to be submitted quarterly. The report to the Executive Director shall include information requested on the report form for the appropriate reporting period. Annually, the City shall submit a summary of the information to show the yearly totals and year-end status of the facility or process, as requested on the report form, for the appropriate reporting period.

In addition to the above, in accordance with 30 TAC §330.123, the City shall provide written notice in the form of a Soils and Liner Evaluation Report (SLER) and/or Geomembrane Liner Evaluation Report (GLER) detailing the construction and lining of a new disposal cell. The reports shall be submitted to the TCEQ for review 14 days prior to the placement of any waste in the new cell. With the exception of the initial opening of the landfill, if verbal or written response from the TCEQ is not provided by the end of the 14th day following TCEQ receipt of the report(s), placement of solid waste may begin. All SLER and GLER approvals will be maintained in the Site Operating Record.

In accordance with 30 TAC §330.125(h), if the annual waste acceptance rate exceeds the rate estimated in the landfill permit application and the waste increase is not due to a temporary occurrence, City shall file an application to modify the permit application, including the revised estimated waste acceptance rate, in accordance with 30 TAC §305.70(k) of this title (relating to Municipal Solid Waste Permit and Registration Modifications), within 90 days of the exceedance as established by the sum of the previous four quarterly reports.

3.0 PERSONNEL AND TRAINING

30 TAC §330.127(1), §330.127(3), §330.127(4)

3.1 Personnel [30 TAC §330.127(1), §330.127(3)]

This section describes the functions and minimum qualifications for each category of key personnel to be employed at the Landfill and for the supervisory personnel in the chain of command. In addition, a summary table noting the various site personnel and training requirements listed in the following sections is provided in Table 3-1.

3.1.1 Landfill Management Team

The landfill operation is under the direction of the City of Victoria's Director of Environmental Services. The City of Victoria has contracted its operations to Victoria Landfill TX, LP. Victoria Landfill TX, LP is a Delaware limited partnership qualified to do business in Texas. Victoria Landfill TX, LP's managing general partner is Allied Waste Landfill Holdings, Inc. which is an indirect, wholly owned subsidiary of Allied Waste Industries, Inc. (Allied).

The Regional Vice President has ultimate management and oversight responsibilities for all Allied hauling and disposal operations within the region that includes Texas. The District Manager is responsible for all hauling, transfer station, and landfill operations in the district that includes this facility. The District Manager's responsibilities include staff management, financial planning, as well as other management responsibilities. The District Manager reports to the Regional Vice President. The General Manager is responsible for operations oversight at landfill(s) in the district including the City of Victoria Landfill. The General Manager reports to the District Manager. Other corporate resources that are available to the City of Victoria Landfill management team are discussed in Section 3.1.8.

3.1.2 Landfill Manager/Site Manager/Facility Supervisor

The Landfill Manager (also known as Site Manager) is responsible for daily operations, administers the facility's SDP, SOP, and will also serve as the emergency coordinator. This person is responsible for assuring adequate personnel and equipment are available to provide facility operation in accordance with this SOP, the SDP, TCEQ regulations, and other applicable local, state, or federal regulations. The Landfill Manager will also be trained to implement the requirements listed in the site's Stormwater Pollution Prevention Plan (SWP3) and Spill Prevention, Control, and Countermeasure Plan (SPCC). The Landfill Manager will maintain an adequate level of competency, training, and experience to fulfill these duties. The Landfill Manager reports directly to the General Manager. The Landfill Manager will designate individual(s) to fulfill his/her duties during periods when the Landfill Manager is absent.

Wherever this SOP provides that responsibility or authority is assigned to the Landfill Manager, this responsibility or authority is automatically transferred to the individual(s) so designated by the Landfill Manager for this duty when the Landfill Manager is not present. The delegated individual will be trained by the Landfill Manager or General Manager so that they have a complete understanding of the contents of this SOP. The designated individual will have a minimum of six months of landfill operation experience or six months of on-the-job training by the Landfill Manager or General Manager. All onsite employees, which may include Scale House Staff, Equipment Operators, Mechanics, Spotters, and Laborers are under the supervision of the Landfill Manager or their designee. The Landfill Manager is responsible for hiring and terminating personnel in these positions.

As the facility supervisor, the Landfill Manager must hold a Class A License. The Landfill Manager must be familiar with the specific operating procedures set forth in this plan and will participate in training with other employees. The Landfill Manager, or their designee, is also responsible for routine site inspections as described herein.

The Landfill Manager's responsibilities include the following:

- Directing site personnel including Laborers, Spotters, Equipment Operators, Scale House Personnel, and Mechanics in the performance of tasks necessary for daily site operations.
- Identifying any additional equipment or personnel necessary for normal operations in the event of equipment breakdowns, changes in waste volumes accepted, or other circumstances.
- Performing inspections and completing inspection forms and checklists. The Landfill Manager may delegate this responsibility to other staff.
- Monitoring and evaluating the performance of employees with respect to assigned duties and compliance with regulatory requirements.
- Anticipating changes to the operating practices necessary due to changes in the weather, disposal location, or other conditions affecting site operations.
- Ensuring that inspections and monitoring (e.g., leachate collection system, gas collection and control system (GCCS), perimeter LFG monitoring, and groundwater monitoring) are completed on schedule and in accordance with all requirements.
- Monitoring and abating any nuisance conditions, such as litter, odor, dust, and mud tracking.

3.1.3 Scale House Staff

The primary job of the Scale House Staff, stationed at the site entrance, is to maintain complete and accurate records of vehicles and solid waste entering the facility. The Scale Attendant will be trained in site safety procedures, to visually check for unauthorized wastes, to weigh vehicles, collect waste disposal fees, and direct vehicles to the working face. The Scale Attendant reports to the Landfill Manager. Specifically, Scale House Staff are required to: (1) monitor the incoming vehicles for type of waste and exclude prohibited waste; (2) sample and/or inspect waste loads to confirm that they are authorized for disposal; (3) review manifests and other shipping documents: (4) record incoming waste loads; (5) review and confirm special waste documents; and (6) accept tipping fees. Scale House Staff shall direct visitors to their destination within the facility.

Scale House Staff receive training from the Landfill Manager or an outside source with respect to special waste evaluation and acceptance. Any questions regarding acceptance of special waste are to be addressed to the Landfill Manager, Special Waste Department, or the Special Waste Liaison/Compliance Coordinator as discussed in Section 3.1.8.

The minimum qualifications for the Scale House Staff include being able to fulfill the duties described in this section. In addition, a high school diploma, GED certificate, or equivalent academic training is required. Scale House Staff personnel will also complete a 90-day on the job training program administered by the Landfill Manager or General Manager.

3.1.4 Equipment Operators

The Equipment Operators report to the Landfill Manager. Equipment Operators are responsible for the safe operation of the equipment. As the personnel most closely involved with the actual landfill operation, these employees are responsible for being alert for potentially dangerous conditions, or careless and improper actions on the part of nonemployees and other persons while on the premises. Equipment operators monitor and direct unloading vehicles and are also responsible for maintenance, construction, litter abatement, and general site cleanup. Equipment Operators are also responsible for identifying prohibited wastes as discussed in Section 5.2. The Equipment Operators will intervene as necessary to prevent accidents. Equipment Operators will also report any operational problems to the Landfill Manager. Equipment Operators may also be required to assist in bird control activities under the supervision of the Landfill Manager or their designee. All equipment operators are required to wear safety equipment, as appropriate, for their work assignments.

The minimum qualifications for the Equipment Operators are being able to fulfill the duties described in this section. In addition, the Equipment Operators will have a minimum of six months of equipment operation experience or completion of a 90-day on the job training program administered by the Landfill Manager. Equipment Operators that are hired based on previous heavy equipment experience may be assigned to operate specific types of equipment without additional training. Upon their employment, all Equipment Operators without experience in the equipment assigned will receive on-the-job training and oversight from an experienced operator until the new operator becomes proficient on the piece(s) of equipment to which he has been assigned, or until he is reassigned to a different piece of equipment for which his previous training or experience is adequate.

3.1.5 Spotters and Laborers

Spotters and Laborers will be assigned to collect litter, direct waste vehicles at the working face, and perform other tasks as needed. Spotters are also responsible for identifying prohibited wastes as discussed in Section 5.2. Spotters and Laborers will either be Victoria Landfill TX, LP employees or contract employees. Laborers may also be required to assist in bird control activities under the supervision of the Landfill Manager or their designee.

Spotters and Laborers will be required to wear safety equipment, as appropriate for their work. Contract employees oversight will be by a Victoria Landfill TX, LP employee. Spotters and Laborers report to the Landfill Manager or their designee.

The minimum qualifications for the Spotters and Laborers are being able to fulfill the duties described in this section. Spotters and Laborers will also complete a 90-day on the job training program.

3.1.6 Mechanics

Mechanics perform necessary and routine maintenance on equipment. Mechanics may substitute as Equipment Operators, if needed, provided they have received the required training. Mechanics report to the Landfill Manager or their designee.

The minimum qualifications for the Mechanics include being able to fulfill the duties described in this section. Mechanics will also complete a 90-day on the job training program. The site may also use third party mechanics to perform maintenance on the equipment.

3.1.7 Other Site Personnel

Other Site Personnel or Laborers may be employed from time to time in categories such as maintenance, construction, litter abatement, and general site cleanup. Other Site Personnel and Laborers report to the Landfill Manager or their designee.

3.1.8 Other Corporate Resources

Allied possesses additional solid waste management and operational resources, including consulting and management resources which are available to site personnel, as needed. The Landfill Manager, or General Manager can contact appropriate personnel to provide additional assistance at any time.

The Special Waste Department will provide review and approval of pre-authorized requests for special wastes received at the site. The Special Waste Liaison/Compliance Coordinator may also provide this pre-authorization approval for special wastes and will provide oversight for special waste acceptance by the Scale Operators and assist with other site regulatory matters, as requested by the General Manager or Landfill Manager. The Special Waste Liaison/Compliance Coordinator shall have a minimum of six months of experience performing the duties described above as well as complete a 90-day on the job training program.

The Safety Manager and the Environmental Manager support the General Manager and Landfill Manager. The Environmental Manager is responsible for environmental compliance, engineering, and construction issues as well as verifying that the site is developed consistent with the SDP (minimum qualification is a degree from an accredited university).

3.2 Training [30 TAC §330.127(4)]

All facility employees and other persons involved in facility operations shall be qualified, trained, educated, and experienced to perform their duties to achieve compliance with this permit. The permittee shall comply with 30 TAC §335.586(a) and (c). The permittee shall further ensure that personnel are familiar with safety procedures, contingency plans, the requirements of the Commission's rules and this permit, commensurate with their levels and positions of responsibility, in accordance with the SDP (Part III) and SOP (Part IV).

The Landfill Manager and the Victoria Landfill management team will train the Equipment Operators, Scale House Staff, Mechanics, Laborers, and Spotters in the contents of this SOP as well as any operational requirements specified in this SOP, as applicable. City of Victoria Landfill personnel will be trained pursuant to any applicable TCEQ regulations regarding training of Municipal Solid Waste (MSW) facility personnel. Site personnel will receive training in safety procedures, contingency plans, and the requirements of the permit for this facility, as applicable. Site training and safety meetings will be scheduled at least once per month. If a regular monthly scheduled meeting is canceled, it will be rescheduled or combined with the scheduled training in the following month. Site personnel shall be scheduled for attendance at training sessions to allow site operations to continue during training sessions and in accordance with training requirements outlined in Table 3-1. Although training topics for each month may vary, training shall be conducted at least annually for each of the following topics:

- Load inspection procedures
- Detection and control of hazardous wastes, polychlorinated biphenyls (PCB) wastes, and other prohibited wastes
- Asbestos waste management
- Waste handling procedures (acceptable and prohibited wastes)
- Emergency Response
- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment, communications, or alarm systems.
- Health and Safety
- Fire Safety (e.g., fire extinguisher use, fire protection, fire prevention, and evacuation procedures)
- Litter control and windblown waste pick-up
- Record Keeping
- Odor Detection and Control
- Properties of methane gas and safety procedures for methane gas
- Response to groundwater contamination incidents (e.g., compliance with SPCC Plan)
- Shutdown of operations (i.e., end of day closure procedures)
- Safe operation of equipment on slopes steeper than 25% including awareness and spotting, angle of approach and operation, weather considerations, use of safe speed and appropriate track, etc.

In addition to the above, staff conducting random inspection procedures specified in this SOP will receive training on all aspects of the completion of random inspections and instruction on the identification of all special and prohibited wastes. Staff conducting random inspection procedures will maintain a thorough understanding of the SOP and will be trained in the following areas: (1) customer notification and load inspection procedures, (2) identification of regulated hazardous, PCB, and prohibited waste, (3) waste handling procedures, (4) health and safety, and (5) recordkeeping. These personnel will have knowledge of barrel types, possible types of liquids, and company names on trucks that could be industrial or hazardous waste generators or generators of other unauthorized waste. In addition, key on-site personnel may attend the Institute for Infrastructure in Environmental Development training course for Screening Unauthorized Waste or other TCEQ approved course.

Documentation of training will be maintained in the Site Operating Record. Additional training requirements are provided in Section 5.1, Section 5.2, Section 5.4, Section 6.2, Section 7.21.1.2, and Appendix IV-B - Section 7.0.

Table 3-1: Site Personnel and Training Summary

Position	Minimum Qualifications	Job Description	Required Training Topics												
			Site Orientation	Site Operations	Endangered Species	Prohibited Waste Identification	Safety	Fire Prevention	Load Inspection	SPCC	Emergency Response	Landfill License	Litter Control	Random Inspections	SWP3
Landfill Manager/Site Manager	Class A License	Refer to Section 3.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X
Scale House Staff	Fulfill the duties described in Section 3.1.3 as well as a high school diploma or equivalent and the completion of a 90-day on the job training program	Refer to Section 3.1.3	X			X	X	X	X		X			X	
Equipment Operators	Fulfill the duties described in Section 3.1.4 as well as a minimum of 6-months of experience or the completion of a 90-day on the job training program	Refer to Section 3.1.4	X			X	X	X	X	X	X		X	X	X
Spotters and Laborers[1]	Fulfill the duties described in Section 3.1.5 as well as the completion of a 90-day on the job training program	Refer to Section 3.1.5	X			X	X	X	X	X	X		X	X	X
Mechanics	Fulfill the duties described in Section 3.1.6 as well as the completion of a 90-day on the job training program	Refer to Section 3.1.6	X				X	X		X					

Position	Minimum Qualifications	Job Description	Required Training Topics												
Special Waste Department[2]	Special Waste Liaison/ Compliance Coordinator shall have a minimum of 6 months experience performing the duties described in Section 3.1.8	Refer to Section 3.1.8	X			X			X					X	

[1] Laborers that are only hired to collect windblown waste will only be required to receive training for the following items: Site Orientation, Safety, and Litter Control.
[2] The Special Waste Liaison/Compliance Coordinator may not be located at the site. This individual may be located at another Allied facility or office.

4.0 EQUIPMENT

30 TAC §330.127(2)

Sufficient quantity and quality of equipment will be provided onsite at the Landfill to conduct site operations in accordance with the volume of waste accepted at the facility, design, and permit conditions.

The equipment listed in Table 4-1 will be available for use at the facility. Equipment requirements may vary in accordance with the method of landfill operations or the waste acceptance rate at any given time. Additional equipment will be provided by Victoria Landfill TX, LP as required for increasing volumes of incoming solid waste. Other equivalent types of equipment by other manufacturers may be substituted on an as-needed basis, at the discretion of the Landfill Manager. The equipment and Scale House will be equipped with fire extinguishers. Backup equipment will be made available to City of Victoria Landfill on an as needed basis from other area Allied landfills or other sources. Backup equipment is available for each piece of equipment identified in Table 4-1.

Compactors will be used for spreading and compacting the refuse. An excavator and hauling trucks will be used for various purposes at the Landfill, including excavating the cover material used in site operations and in firefighting support. The dozer is mainly used to spread waste at the active face, spread cover material, and assist with waste compaction. The motor grader will be used for activities such as road maintenance, ditch construction, surface water control, and final grading of the completed fill areas. The water truck(s) will be used for dust control and moisture conditioning of soil materials, as necessary, and will be utilized, if necessary, in the event of a fire at the facility. The water truck(s) will be equipped with appropriate equipment to facilitate firefighting. The windscreens and temporary litter fencing will be used to control windblown waste and litter as discussed in Section 7.5. The maintenance truck will be used to provide service to the other site operating vehicles. In addition to the above, miscellaneous pick-ups, vans, and other light utility vehicles as well as instruments and safety and training equipment will be on-site as necessary to assist with site operations.

For information relating to methane monitoring at the Landfill, see Attachment III-8 - Landfill Gas Management Plan. For information relating to leachate monitoring, and the control of contaminated water, see Attachment III-3 - Leachate and Contaminated Water Plan. Other miscellaneous equipment will be required for the maintenance of the machinery and other duties. This equipment will be kept in a maintenance building at or near the Landfill and will include a compressor, power equipment, and tools.

Table 4-1: Equipment Dedicated to the City of Victoria Landfill

Equipment	Minimum Number of Equipment Needed for Each Range of Waste Volume[1]				Typical Size[1]	Function
	0 – 1,500 TPD[4]	1,500 – 3,000 TPD[4]	3,000 – 6,000 TPD[4]	6,000 – 10,000 TPD[4]		
Compactor(s)	1	2	2	3	70,000 lbs	Trash compaction
Dozer(s)	1	1	2	3	150 hp or 35,000 lbs	Movement and placement of refuse and soil. May also be used to assist with waste compaction.
Articulated Dump Truck	1	1	2	2	Up to 40 tons	Excavation and hauling of soil
Excavator	1	1	2	2	10 ft reach	Excavation of soil, firefighting support
Motor grader	1	1	2	2	50 hp	Maintenance of interior roads
Pickup Truck(s)	1	2	3	4	¼ ton	Personnel use for litter control, maintenance
Water Truck(s)	1	1	2	2	2,000 gallons	Dust control, compaction of earth fills, firefighting support
Maintenance Truck(s)[2]	1	1	2	2	¼ tons	Equipment maintenance
Pumps with Hose	1	1	1	1	2” to 6” diameter pump	Pumping of stormwater
Street Sweeper	1	1	1	1	5’ broom	Cleaning of site roads
Light Plant[3]	1	1	1	1	(2) 250 watt fixtures	Adequate lighting at active face
Wind Screens	6	8	10	15	8’x8’	Active face litter control
Temporary Litter Fencing	175 ft	275 ft	375 ft	425 ft	4 ft high	Active face litter control

[1] Number, types, and equipment manufacturers will vary based on operational needs. TPD = tons per day.
[2] As an alternative, the site may contract equipment maintenance with a third party. Under this scenario, maintenance equipment would only be on-site, as needed.
[3] Only needed if site operates during low or no natural light conditions.
[4] The waste volume will be determined by the sum of waste acceptance listed on the previous four TCEQ quarterly summary reports (as required by 30 TAC §330.125(h)).

5.0 PROHIBITED WASTES

30 TAC §330.127(5)

5.1 General

In accordance with the Environmental Protection Agency (EPA's) Resource Conservation and Recovery Act (RCRA) Subtitle D criteria, 40 Code of Federal Regulations (CFR) 258.20, and 30 TAC §330.127(5), the City of Victoria Landfill will implement a program to exclude prohibited wastes as defined in 30 TAC §330.15(e), including but not limited to, regulated hazardous waste as defined in 40 CFR 261 and PCB waste as defined in 40 CFR 761 and 30 TAC §330.3. Polychlorinated biphenyl (PCB) waste(s) as defined in 30 TAC §330.3, Class 2 industrial solid waste that interferes with site operations, radioactive wastes, lead-acid batteries, Chlorofluorocarbon (CFC)-containing equipment, whole tires, and used oil and oil filters will not be accepted at this facility. The program will include training site personnel to know in detail what the prohibited wastes are, how to perform a random inspection, how to control site access, what training will be provided for site personnel, and what procedures are required in the event of identification of prohibited wastes (as defined in Part I/II Section 2.4). The detection and exclusion program at the City of Victoria Landfill will include at least the following steps:

- Inform customers of the types of waste that are excluded from disposal.
- Inform vehicle drivers and transfer station operators of the wastes that are to be excluded.
- Random inspections of incoming loads.
- Records of all inspections.
- Training for facility personnel to recognize prohibited waste.
- Notification to TCEQ of any incident involving the receipt or disposal of regulated hazardous or PCB waste at the landfill.
- Provisions for remediation of the incident as described in Section 5.5.

5.2 Load Inspection Procedure

As noted in Section 7.2, Scale House Staff, Equipment Operators, Laborers, and Spotters will monitor the incoming waste. Should any indication of prohibited waste be detected, the Landfill Manager, or their designee, will conduct a thorough evaluation of the load. The driver will be directed to a load inspection area located at or near the working face where the load will be discharged from the vehicle. The inspector will break up the waste pile and inspect the material for any prohibited waste. If prohibited wastes are detected, they will be managed in accordance with Section 5.5.

In addition to inspecting suspicious loads, random inspections will be undertaken in accordance with 30 TAC §330.127(5)(A). Random inspections will be supervised by the Landfill Manager or designee. Random inspections of incoming loads will include the inspection of compactor vehicles. Staff conducting random inspections will receive training on the random inspection procedures in this plan and instruction on the recognition of regulated hazardous waste and PCB waste. Random inspections will be conducted at or near the working face to facilitate disposal of authorized waste after random inspections have been completed.

Except as provided herein, all waste loads will be subject to random inspections. At least one vehicle per full day that the site is in operation shall be scheduled for a random inspection. The Landfill Manager shall determine the procedure for the random selection of the waste hauling vehicle that will be selected. The following criteria shall be utilized in the development of the selection procedure:

- The random selection procedure shall objectively select a waste hauling vehicle each full day that the facility accepts waste.
- The random selection procedure shall ensure that waste hauling vehicles are selected at varying times during the appropriate days of each week.
- The random selection procedure shall apply to all non-excluded waste hauling vehicles that transport waste to the site.

If inclement weather or other conditions precludes the random inspection from being performed on the scheduled day, the delayed random inspection shall be performed at the same scheduled time on the next full day that the site is operating. Thus, if a scheduled random inspection is delayed, there will be two random inspections performed the next operating day.

The loads which are excluded from random inspections are listed below:

- Waste from transfer stations (meeting the criteria stated below)
- Regulated asbestos-containing materials (RACM)

The City of Victoria Landfill may accept waste from transfer stations. Wastes received from transfer stations will not be screened at the site if the transfer station is permitted or registered by the TCEQ and random screening procedures are conducted at the transfer station. Copies of the transfer station TCEQ permit or registration number and a letter certifying that random waste screening is conducted at the transfer station will be included in the documentation for transfer station loads excluded from random inspection procedures. Transfer station loads not meeting these criteria and vehicles containing special waste will be subject to random inspections.

Inspections at or near the working face will be conducted away from: 1) turn around areas and 2) normal travel routes. Spreading of the waste for inspection may be accomplished by using mechanized equipment or hand implements. Inspectors shall observe the waste materials from each load as the waste discharged from the truck is spread and separated. The waste shall be sufficiently spread to determine its character and composition. Inspectors shall wear appropriate personal protective equipment during the inspection which includes, at a minimum, the following:

- Gloves;
- Work boots;
- Clothing which minimizes contact of waste;
- High visibility clothing; and
- Hardhat.

Additional personal protective equipment will be used if regulated hazardous waste or PCB waste is identified. If regulated hazardous waste or PCB waste is identified during an inspection, waste inspection activities shall cease until inspection personnel obtain sufficient protective equipment, if needed. This additional equipment may include:

- Respirator with appropriate cartridge filters (e.g., organic vapor or particulate);
- Tyvek suit or coveralls; and
- Eye protection.

5.3 Recordkeeping

The Landfill Manager is required to maintain and include in the Site Operating Record the following:

- Load inspection reports;
- Reports on quantities and disposal of authorized waste;
- Records of regulated hazardous or PCB waste notifications sent to TCEQ; and
- Personnel training records.

Load inspection reports, recorded on standardized forms, will be completed for each inspected load. The reports should include; at a minimum, the date and time of inspection, the name and address of the hauling company and driver, the size of the load, indicators of prohibited waste (if any), and results of the inspection. A copy of an example load inspection report form is included in Appendix IV-A – Example Load Inspection Report Form. The actual form that will be used at the time of inspection may vary from the sample provided, but must contain at least the information specified in this paragraph.

The TCEQ will be notified within 24 hours whenever regulated hazardous or PCB waste is detected. Records of the notification will be kept in the Site Operating Record and will include the date and time of notification, the individual contacted, and the information reported.

5.4 Training

Individuals responsible for inspecting incoming loads shall receive at least annual training in the provisions and procedures of this section (refer to Section 3.2 for additional information). Training shall be conducted by site employees or contract personnel experienced in waste inspection and detection requirements. Training shall be scheduled, and attendance will be recorded. The training outline shall incorporate the requirements and procedures of this section. Training shall include state and federal laws and regulations for managing prohibited waste. The training will at a minimum include the following topics:

- Safety requirements during inspection procedures;
- Wastes prohibited from disposal at the site;
- Methods of identifying prohibited wastes;
- Various labels used for waste identification;
- Safety procedures if prohibited wastes are encountered; and
- Procedures for managing prohibited wastes encountered.

Documentation of training will be placed in the Site Operating Record.

5.5 Managing Prohibited Wastes

Unknown wastes undergoing analysis by Landfill personnel must be properly segregated and protected against the elements, secured against unauthorized removal, and isolated from other waste and activities.

Prohibited waste that is not discovered until after it is unloaded shall be promptly returned to the vehicle that delivered the waste. That party shall be responsible for the proper disposal of this rejected waste at a permitted facility. In the event the unauthorized waste is not discovered until after the vehicle that delivered it is gone, the waste shall be segregated and controlled to the extent possible. The unauthorized waste will be either (1) covered with soil and no additional filling will occur over that area until the unauthorized waste is removed and properly disposed; survey stakes or similar markings will be placed around the perimeter of the area that contains the unauthorized waste so that it is clear where the unauthorized waste is located or (2) the unauthorized waste may be segregated by placing the unauthorized waste into a roll-off or similar container. An effort shall first be made to identify the entity that deposited the prohibited waste and have them return to the site and properly dispose of the waste. If identification is not possible, the Landfill Manager (or other personnel identified or delegated by them) will notify the TCEQ and seek guidance on how properly to dispose of the waste within 24-hours.

If regulated hazardous waste or PCB wastes are detected, the TCEQ will be notified. The transporter will be required to remove the regulated hazardous waste or PCB waste from the site immediately upon detection. Prior to removal, the transporter must obtain an EPA identification number, package the waste in accordance with Texas Department of Transportation (TxDOT) regulations, and properly manifest the waste designating a permitted facility to treat, store, or dispose of the hazardous waste.

5.6 Managing Mishandled or Undeclared Special Waste

If a mishandled or undeclared special waste is not discovered until after it is unloaded, site personnel will notify the Landfill Manager. The special waste will be segregated and controlled by either (1) covering with soil and no additional filling will occur over that area until the special waste is removed and properly disposed; survey stakes or similar markings will be placed around the perimeter of the area that contains the special waste so that it is clear where the special waste is located or (2) the unauthorized waste may be segregated by placing the unauthorized waste into a roll-off or similar container. The Landfill Manager will then develop a plan to properly dispose of the mishandled or undeclared special waste material consistent with the approved special waste handling procedures outlined in Section 7.20.

6.0 FIRE PROTECTION PLAN

30 TAC §330.129

This Fire Protection Plan addresses each operational activity that stores, processes, or disposes of combustible materials. These areas at the City of Victoria Landfill include:

- Each unloading area (MSW or Class 1 Non-Hazardous Industrial Waste (NHIW) Unloading Area, and RACM Unloading Area);
- Vehicles and heavy equipment used at the site; and
- On-site structures (Scale House and Maintenance Building).

6.1 Working Face(s) Fire Protection Plan

6.1.1 Working Face Fire Protection Requirements

30 TAC §330.129 sets forth the following two methods for fire protection:

- Maintain a source of earthen material large enough to cover the working face with six-inches of earth material within one-hour of detecting a fire; or
- An alternate method that is approved by the Executive Director of the TCEQ.

The plan set forth in this section provides an alternate method to the prescriptive fire protection plan included in the first bullet listed above. This plan utilizes both water and earthen material (as well as fire extinguishers for small fires) to provide fire protection for each working face. This alternate plan provides a more comprehensive fire protection plan than the prescriptive plan. By keeping a water source at the working face, the site will be able to fight and control fires more effectively than just by covering working face fires with soil. For example, fires can be controlled much quicker with the application of water as soon as a fire is detected rather than having to move equipment to cover the burning area with soil.

6.1.2 Working Face Fire Fighting Plan

When a fire is detected within material at the working face, the spotter (or Equipment Operator) will first redirect incoming loads away from the affected area. Working face fires will be extinguished by one of the following techniques.

- If the area of burning waste is small (i.e., an area of 10 feet by 10 feet or less) and is a surface fire, it will be extinguished using a fire extinguisher located on the equipment at the working face. After the fire is extinguished, the affected portion of the working face will remain closed while the area is inspected to verify the fire is completely extinguished. Inspection of the fire area will be conducted by the Landfill Manager or their designee.

- The burning waste material will be removed (i.e., "cut out" of the working face by a dozer or similar equipment) from the working face to an area where it can be covered with six inches of soil. The water truck may also be used to extinguish the burning waste. The working face area in which the burning waste was removed will also be covered with six inches of soil. The affected portion of the working face will remain closed while the area is inspected to verify the fire is completely extinguished. Contaminated water will be managed as specified in Attachment III-3 - Leachate and Contaminated Water Plan. Inspection of the fire area will be conducted by the Landfill Manager or their designee.
- The burning waste material within the working face will be sprayed with water from one of the water trucks (or tanks) stationed at the working face. The working face area which contained the burning waste will be covered with six inches of soil to smother the fire. Upon extinguishing a fire at the working face through smothering with soil, that portion of the working face will remain closed while the area is inspected to verify the fire is completely extinguished. Water that is used to fight the fire will be contained by the contaminated water containment berm. Contaminated water will be managed as specified in Attachment III-3 - Leachate and Contaminated Water Plan. Inspection of the fire area will be conducted by the Landfill Manager or their designee.
- The burning waste material within the working face will be sprayed with water from one of the water trucks (or tanks) that will be in an area no more than two to three minutes from the working face. Then the burned (or burning) waste material will be removed from the working face to an area where it can be covered with six inches of soil. The working face area in which the burning waste was removed will also be covered with six inches of soil. The affected portion of the working face will remain closed while the area is inspected to verify the fire is completely extinguished. Water that is used to fight the fire will be contained by the contaminated water containment berm. Contaminated water will be managed as specified in Attachment III-3 - Leachate and Contaminated Water Plan. Inspection of the fire area will be conducted by the Landfill Manager or their designee.

In each case listed above, after the Landfill Manager or their designee confirms that the fire has been extinguished, then waste filling operations in that area may resume.

6.1.3 Water Trucks or Storage Tank Requirements

A water source will be maintained near each working face (either a water truck or storage tank) in accordance with the requirements in Table 6-1. The water truck or tank will be equipped with a water cannon and positioned to assist with the fighting of any potential working face fire.

Table 6-1: Requirements for Water by Working Face Size

Maximum Working Face Size[1] (width by length)	No. of Water Trucks or Tanks (minimum capacity of 2,000 gallons)
150 feet by 175 feet (or 26,250 sf)	1
250 feet by 325 feet (or 81,250 sf)	1
350 feet by 425 feet (or 148,750 sf)	2
450 feet by 525 feet (or 236,250 sf)	3

[1] See Table 7-1 for working face size based on incoming waste tonnage.

The water level in the tank(s) will be verified once per day to ensure that each tank(s) contains at least 2,000 gallons of water. Also, during periods of freezing temperatures, measures will be taken to ensure that the tank(s) remain operational.

As noted in Section 6.1.2, the water trucks or tanks will be used to both keep a fire from spreading and to extinguish fires. The additional water trucks used for site operations (refer to Table 4-1) will also be available to assist with firefighting activities. Each water truck or portable tank will be refilled, as needed, to provide a constant source of water at the working face for firefighting purposes.

6.1.4 Soil Stockpile Requirements

A soil stockpile will be maintained within 1,000 feet of each working face. The stockpile will be used to (1) smother burning waste material at the working face or (2) placed over burning waste material that has been cut out of the working face. The stockpile will be sized to cover 25 percent of the size of each working face. In addition, enough earthen material (i.e., soil stockpiles and soil within borrow areas) will be maintained on-site to cover the entire working face within 24-hours. The earthen material requirements are listed in Table 6-2.

Table 6-2: Requirements for Earthen Material by Working Face Size

Size of Working Face (square feet)	Earthen Material Volume Requirements		
	To Cover the Working Face Area with 6-inches of Soil	To Cover the Working Face Area with 6-inches of Soil	To be Maintained within 1,000 feet of the Working Face
26,250	13,125 ft^3	486 CY	122 CY

Size of Working	Earthen Material Volume Requirements		
81,250	40,625 ft^3	1,505 CY	377 CY
148,750	74,375 ft^3	2,755 CY	689 CY
236,250	118,125 ft^3	4,375 CY	1,094 CY

Old stockpiles, which have been replaced, may be used as daily cover or intermediate cover. At least monthly, the Landfill Manager, or their designee, will evaluate the maximum anticipated working face area for the current conditions (refer to Table 7-1 for the specified range of working face areas) and will evaluate the available soil stockpile volume and location for sufficiency. This evaluation (and the evaluation of needed equipment) will be maintained in the Site Operating Record. The maximum anticipated size of the working face shall be calculated and a minimum volume of earthen material (i.e., soil stockpiles or soil within borrow areas) shall be determined to cover the maximum anticipated working area for each working face, with at least one day application of six inches of daily cover. The volume of earthen materials available shall be estimated by determining the cubic yards of material hauled or placed during the creation of the stockpile or measuring the current stockpile or borrow area dimensions and applying appropriate geometric volume formulas. Each evaluation will be documented in the Site Operating Record. The minimum equipment listed in Table 4-1 will provide for sufficient equipment to transport and spread soil from the stockpile or borrow area to the working face.

6.2 Fire Protection Training

Within thirty days of initial employment and thereafter at least annually, all employees, except personnel with administrative duties only, will receive the following fire training and instruction:

- Detailed review and discussion of the Fire Protection Plan;
- Training on fire prevention and hazard awareness;
- Specific instruction on operation of a portable fire extinguisher;
- Instruction on the properties of methane gas and proper safety procedures; and
- Facility evacuation procedures.

Personnel with administrative duties only will receive annual fire protection training on facility evacuation procedures and fire prevention as designated by the Landfill Manager. Each training session for both operating and administrative personnel will be documented with a form identifying the type of training, topics covered, trainer, and attendees. Training records will be retained at the site.

6.3 Fire Protection Standards

6.3.1 Posted Information

The following fire protection information will be posted at the site:

- Emergency contact phone number(s) for site personnel at the main entrance to the site; and
- "No Smoking" signs posted at the entrance.

6.3.2 Fire Safety Rules

The following fire safety rules will be posted at the scale house:

- Do not attempt to fight fire alone;
- Be familiar with the use and limitations of fire-fighting equipment;
- Alert other facility personnel in the area;
- Assess extent of fire and likelihood that the fire will spread;
- Contact the local fire department at 911; and
- Attempt to contain or extinguish the fire until the fire department arrives if the fire can be safely fought with onsite fire-fighting equipment.

6.3.3 Burning Waste Loads (Hot Loads)

Steps will be taken to identify incoming "hot loads" prior to their being unloaded for disposal at the working face. The Scale House Staff, Equipment Operators, Laborers, and Spotters must be alert for signs of hot loads, such as smoke, steam, or heat being released from incoming waste loads.

Fire-fighting methods include smothering with soil, separating burning material from other waste, or spraying with water from the water truck. A small fire may be controlled with a hand-held extinguisher.

In the event of a fire within a vehicle, if possible, the vehicle will be brought to a safe stop away from any fuel storage area or exposed waste. The vehicle or equipment will be driven away from the working face and the load ejected in the hot load area, which is any space, preferably at least 50 feet away from a road, with either no waste deposited (e.g., a soil borrow area) or an approved waste fill area with at least six inches of soil cover. A water truck, bulldozer, or other equipment will be used to extinguish the burning waste load. The waste will be covered with an adequate amount of soil to ensure it is extinguished. The load will be inspected by the Landfill Manager, or their designee, before disposal. During inspection, if the soil is removed, which would allow oxygen to contact the waste, the load will be observed for hot spots or flare-ups. No smoldering or smoking waste will be placed in the working face area for permanent burial until all hot spots or flare-ups have been extinguished. The Landfill Manager will verify that (1) the waste is properly covered with six inches of daily cover if the hot load was ejected over an approved waste fill area or (2) all the waste and any water that contacted waste is removed from the hot load ejection area if this area was not over an approved waste fill area.

If it is not possible to move a burning vehicle away from fuel storage or exposed waste, the local fire department shall be called at 911. While awaiting the arrival of the local fire department, all reasonable measures should be employed to extinguish the fire and prevent it from spreading beyond the vehicle.

6.4 Accidental Fires

Open burning of waste at the site is not permissible. All fires will be extinguished using the protocols stated in this section. Proper compaction and earth cover will be used to minimize the potential for accidental fires.

6.5 Preventive Procedures

Fuel spills will be controlled immediately. Soil contaminated with spilled fuel will be excavated and, if authorized pursuant to Section 7.20.1, disposed of at the working face. Contaminated soils may be excavated using shovel or with heavy equipment.

Onsite brush and vegetation will be controlled through mowing at least annually to reduce the possibility of brush fires from spreading to the landfill or off-site.

The compaction of the waste as it is disposed, and the subsequent covering with daily soil cover, will reduce the potential for fires by reducing voids within the waste and the amount of oxygen available for combustion. The daily cover serves as a physical, non-combustible barrier to a fire.

In addition, equipment that is used at the working face will be routinely cleaned using high-pressure hot water or steam cleaners. The high-pressure hot water or steam cleaning will remove combustible waste and caked material which can cause equipment overheating and increase fire potential. The amount of water used to clean the equipment will be minimized.

Each piece of heavy equipment at the site will carry a portable fire extinguisher. Fire extinguishers will be inspected and certified at least annually. Once any extinguisher has been used, it will be refilled or replaced as soon as possible. The piece of equipment shall not be returned to normal service without a fire extinguisher installed.

6.6 Vehicle or Equipment Fire

If equipment or other site vehicles experience a fire, the operator will attempt to bring the vehicle or equipment to a safe stop, away from fuel supplies, uncovered solid wastes, and other vehicles. The operator will attempt to shut off the engine and engage the brake. Lowering of any implements should be attempted to prevent subsequent movement of the vehicle.

6.7 Structure Fire

The local fire department will be called at 911 for all structure fires. No site personnel will enter a structure on fire.

6.8 RACM Area

A soil stockpile of at least 50 cubic yards (yd^3) will be maintained within 100 feet of the RACM disposal area. This stockpile will cover the 50-ft by 50-ft maximum disposal area size with six inches of soil.

In the event of a fire at the facility, the Landfill Manager, or their designee, if needed, will call 911 or the local fire department, and report the fire. If firefighting assistance is needed from the local fire department, the Landfill Manager will also notify Scale House Staff, who will direct the fire department personnel to the scene of the fire.

If a fire occurs that is not extinguished within 10-minutes of detection, the TCEQ's Regional Office will be contacted no later than four hours after detection by telephone, and in writing within 14 days with a description of the fire and the resulting response.

During each calendar year, the Landfill Manager will invite the local fire department to tour the facility so that they may be informed about site operations and the facility's layout (e.g., familiarization with the location of access roads and water sources).

7.0 OPERATIONAL PROCEDURES

30 TAC §330.131 through §330.179, §335.585 through §335.589

7.1 Access Control [30 TAC §330.131]

Public access to the waste fill area is controlled by the entrance facility, which houses the Scale House Staff, located in the northwest portion of the facility. The site entrance facilities are staffed during hours of operation. The Scale House Staff controls access and monitors all vehicles entering and exiting the site.

7.1.1 Site Security

Site security measures are designed to prevent unauthorized persons from entering the site, to protect the facility and its equipment from possible damage caused by trespassers, and to prevent disruption of facility operations caused by unauthorized site entry.

Unauthorized entry into the site is minimized by controlling access with perimeter fencing (minimum four foot high, three strand barbed wire fences), gated entrance, and a closed-circuit television system that monitors the entrance and exit. Radio communications will be used around the site for security and operation purposes. The perimeter fence and gate will be inspected every week. Repairs and maintenance will be performed, as necessary. Refer to Section 7.23 for site inspection and maintenance schedule.

In the event of a breach of the access controls (i.e., a portion of a fence is impacted in a way that it no longer prevents access to the site), the TCEQ Regional Office, and any local pollution agency with jurisdiction that has requested to be notified (if any), will be notified within 24-hours of detection of the breach. The breached area will be temporarily repaired within 24-hours of detection and will be permanently repaired by the time specified to the TCEQ Regional Office when it was reported in the initial breach report. In this case, the TCEQ Regional Office will also be notified when the permanent repair is completed. If a permanent repair can be made within eight hours of detection, no notification to the TCEQ Regional Office is required. Temporary repairs may consist of a barbed wire fence, a three-foot-high earthen berm, a security guard posted in the area of the breach, or other barriers.

Entry to the active portion of the site will be restricted to designated personnel, approved waste haulers, and properly identified persons whose entry is authorized by City of Victoria Landfill management. Visitors will be allowed on the active area only when accompanied by a site representative (note that third party contractors and vendors completing construction or monitoring activities will not be considered visitors for the purpose of access control).

7.1.2 Traffic Control

Access to the Landfill is currently provided by Farm to Market Road (FM) 1686 via Texas Highway 185 or U.S. Highway 87. Texas Highway 185, and U.S. Highway 87 have no weight loading restrictions, beyond the legal limit of 80,000 pounds per vehicle as prescribed by law. The current load rating of FM 1686 is 58,420 pounds, which is adequate to handle existing waste vehicles which have a gross weight of approximately 45,000 to 54,000 pounds. The Landfill entrance facilities are located approximately 1.5 miles northeast of the intersection of FM 1686 and Texas State Highway 185. It is estimated that at peak filling rates, the maximum truck traffic to the site will be approximately 100 vehicles per day.

Solid waste transportation vehicles will be directed to appropriate fill areas by signs located along the Landfill haul road and access road. These vehicles will deposit their loads and depart the site. No private or commercial solid waste vehicles will be allowed access to any areas other than the active portion of the Landfill. Site personnel will provide traffic directions as necessary to facilitate safe movement of vehicles.

Within the site, signs will be placed along the Landfill haul road and access road, beginning at the gated entrance, at a frequency adequate for users to be able to understand where disposal areas are located, and which roads are to be used for ingress and egress. Roads not being used for access to disposal areas will be blocked or otherwise marked for no entry.

7.2 Unloading Wastes [30 TAC §330.133]

7.2.1 Unloading Areas

The City of Victoria Landfill accepts general municipal solid wastes as well as brush, rubbish, construction/demolition waste, and certain special wastes outlined in Section 7.20. Additionally, cells within the lateral expansion area (Cells A1 through I2) have the option to be constructed in accordance with 30 TAC §330.331(e) to accept Class 1 NHIW for below-grade disposal. Wastes are disposed of at the following unloading areas at the City of Victoria Landfill.

- MSW or Class 1 NHIW Unloading Area or Working Face. The working face includes areas where waste is being deposited for disposal and daily cover or alternative daily cover is being applied.
- RACM Unloading and Disposal Area. The RACM unloading area will be designated by the Landfill Manager as noted in Section 7.20.4.

Class 1 NHIW accepted at the facility will only be placed in dedicated cells which have been constructed in accordance with 30 TAC §330.331(e). The designated landfill personnel will identify appropriate locations for Class 1 disposal prior to unloading. An active working face for MSW and for Class 1 NHIW will be clearly identified by directional signs. Solid waste dumping is controlled to prevent disposal in locations other than those specified by site management.

7.2.2 Waste Excluded from Disposal at the Site

The following wastes (as defined in Appendix I/II-C – Waste Acceptance Plan) are specifically excluded from disposal at the site and unloading of these wastes will not be allowed:

- Untreated medical waste. This prohibition may be superseded by the executive director in writing when disposal of untreated medical waste is required to protect human health and the environment from the effects of a natural or man-made disaster [§330.171(c)(1), §330.3(85)];
- Lead-acid storage batteries [§330.15(e)(1)];
- Used motor vehicle oil [§330.15(e)(2)];
- Used oil filters from internal combustion engines except for used oil filters from households that have been processed as described in §330.171(d) [§330.15(e)(3)];
- Whole used or scrap tires [§330.15(e)(4)];
- Items containing CFCs that have not been handled in accordance with 40 CFR §82.156(f) [§330.15(e)(5)];
- Bulk or noncontainerized liquid waste unless the waste is household waste other than septic waste and as defined by the Paint Filter Test, EPA Method 9095 [§330.15(e)(6), §330.3(81)];
- Containers holding liquids unless: the container is similar in size to those found in household waste, the container is designated to hold liquids for other than storage, or the waste is household waste [§330.15(e)(6), §330.3(81)];
- Regulated hazardous waste [40 CFR §261.3] that is not excluded from regulation as a hazardous waste [40 CFR §261.4(b)] or that was not generated by a conditionally exempt small-quantity generator [§330.15(e)(7), §330.3(127)];
- Waste that exhibits the characteristics for hazardous waste [40 CFR §261.3] from oil, gas, and geothermal activities subject to regulation by the Railroad Commission of Texas [§330.15(e)(7)];
- Polychlorinated biphenyl (PCB) wastes, [40 CFR Part 761] unless authorized by the United States Environmental Protection Agency [§330.15(e)(8)]; and
- Radioactive materials, [Chapter 336] except as authorized in Chapter 336 or that are subject to an exemption of the Department of State Health Services [§330.15(e)(9)].

7.2.3 Waste Unloading Procedures

Scale House Staff, Equipment Operators, Laborers, and Spotters will monitor the incoming waste. Scale House Staff control site access and monitor incoming vehicles for unauthorized wastes by (1) receiving manifests and other shipping documents, (2) recording incoming waste loads, (3) completing a visual inspection of the vehicle (including a video camera inspection of the top of the vehicle's contents), and (4) interviewing the driver, as necessary. Any nonconforming issues will be reported to the Landfill Manager. The Landfill Manager will work with the Scale House Staff and other company resources (e.g., Special Waste Liaison/Compliance Coordinator or the Environmental Manager) to resolve any non-conforming issues. If the non-conforming issues involve Special or Industrial wastes, the Landfill Manager and Scale House Staff will review Sections 7.20 and 5.2 to verify that all requirements for acceptance of Special and Industrial waste have been met before the material is accepted for disposal. The procedures for handling prohibited waste that is not discovered until after it is unloaded are discussed in Section 5.6. Class 1 NHIW may be deposited only below the natural grade in cells in the lateral expansion area designated for Class 1 wastes.

Laborers, Spotters, Equipment Operators, or other field personnel will be always present at the working face to monitor each incoming load of waste. These personnel will be familiar with the rules and regulations governing the various types of waste that can or cannot be accepted into this facility and will be trained to identify prohibited wastes before being assigned to this task (refer to Section 3.2 for training procedures). The personnel will also be trained and have a basic understanding of both industrial and hazardous waste and their transportation and disposal requirements. The Spotters and Equipment Operators have the authority and responsibility to reject unauthorized loads, have unauthorized material removed by the transporter, and have the unauthorized material removed by on-site personnel or otherwise properly managed by the facility. A record of unauthorized material removal will be maintained in the operating record.

Solid waste unloading will be controlled to prevent disposal in locations other than those specified by site management. For example, random load inspections will be conducted as outlined in Section 5.2 of this SOP. Any allowable waste deposited in an unauthorized area will be immediately removed and disposed of properly at the current working face. The Spotters and Equipment Operators or other site personnel will actively investigate any approved waste haul vehicles that do not dispose of their waste in an authorized area. If an authorized load of waste has been deposited in an unauthorized area, site personnel will notify the Landfill Manager and the waste load will be promptly relocated to the authorized working face area.

7.2.4 Maximum Size of the Unloading Area

As discussed previously, the following unloading areas exist at the City of Victoria Landfill.

- MSW Unloading Area or Working Face;
- Class 1 NHIW Unloading Area or Working Face; and
- RACM Unloading and Disposal Area

The MSW and Class 1 NHIW unloading and working face areas are discussed below. The RACM unloading area is discussed in Section 7.20.4.

Control(s) will also be used to confine each working face to as small an area as practical consistent with the rate of incoming waste and safe and efficient working face operations. The maximum size of each working face will be limited to the area listed in Table 7-1 for a range of waste accepted at the facility.

Table 7-1: Maximum Working Face Size[1]

Incoming Waste[2] Accepted (TPD)	Maximum Working Face Size[3,4,5] (width by length)
0 – 1,500	150 ft by 175 ft (or 26,250 sf)[6]
1,500 – 3,000	250 ft by 325 ft (or 81,250 sf)[6]
3,000 – 6,000	350 ft by 425 ft (or 148,750 sf)[6]
6,000 – 10,000	450 ft by 525 ft (or 236,250 sf)[6]

[1] Typically only two working faces will be utilized (one for MSW and one for Class 1 NHIW). However, a third working face may be used in some cases (e.g., during a time when the active face is transitioned to a new cell). Additional equipment will be brought to the site if more working faces are in operation (e.g., one compactor, one dozer, additional wind screens will be used per working face).
[2] For the maximum working face size, the incoming waste tonnage accepted will be determined by the sum of waste acceptance listed on the previous four TCEQ quarterly summary reports.
[3] The working face maximum size listed above is based on the maximum area needed to spread and compact waste in uniform lifts. The working face does not include areas used to move waste from a MSW Tipper to the working face.
[4] During the placement of the first lift of MSW in a newly constructed cell. the maximum working face size listed above does not apply if odors, vectors, and windblown litter are controlled consistent with standard operating conditions.
[5] The maximum working face size listed above does not apply to areas that have less than a six-foot thick waste column left before the final permitted grades are achieved provided that odors, vectors, and windblown waste are controlled consistent with standard operating conditions.
[6] The width and length shown above is for guidance purposes only. The maximum working face size will be governed by the area listed above.

The working face includes areas where waste has been deposited for disposal and daily cover or alternative daily cover is being applied. The working face includes areas that are covered with daily cover (and/or ADC) and the area where waste collection vehicles deposit waste onto the working face. As discussed in Attachment III-3 – Leachate and Contaminated Water Plan, the working face area is surrounded by a contaminated water containment berm and stormwater diversion berm. The area within the containment and diversion berms includes the following.

- Working Face Area (as defined above);
- Waste Collection Vehicle Access Area (area where waste collection vehicles access the working face); and
- Contaminated Water Storage Area (as noted in Attachment III-3 – Leachate and Contaminated Water Plan, this area is designed to contain stormwater that has contacted the working face)

7.2.5 Prohibited Waste

Prohibited wastes are those discussed in Section 7.2.2 (as defined in Appendix I/II-C – Waste Acceptance Plan). Prohibited wastes will be excluded from disposal at the site and unloading of these wastes will not be allowed. Prohibited Wastes will be identified and managed consisted with the methods and procedures described in Section 5.0.

7.3 Hours of Operation [30 TAC §330.135]

The City of Victoria Landfill is permitted to be open for waste acceptance seven days a week from 7:00 am to 7:00 pm except on scheduled holidays. Hours of waste acceptance and heavy equipment operation may vary depending on incoming volumes of waste. The operating hours will be posted on the site entrance sign. Transportation of non-waste materials and heavy equipment operation can occur between the hours of 5:00 am and 9:00 pm seven days per week (this includes all construction-related activities).

The site may also operate up to five days per year with extended waste acceptance hours to accommodate additional waste inflow due to a holiday or special event. During these five days, the waste acceptance hours will be expanded to 5:00 am to 8:00 pm. These days are identified as the days after Christmas, New Year’s Day, Memorial Day, Labor Day, and the Fourth of July. Additional temporary waste acceptance or operating hours may be requested from the TCEQ Regional Office to address disasters, other emergency situations, or other unforeseen circumstances that could result in the disruption of waste management services in the area. The site will notify the TCEQ Regional Office prior to each extended hour day as well as record the dates and times of the extended hour day in the Site Operating Record.

7.4 Site Signs [30 TAC §330.137]

A sufficient number of signs that are readily visible will be utilized for proper management and operation of the City of Victoria Landfill. A sign will be displayed at the entrance to the site. This sign will be readable from the site entrance, will measure at least 4 feet by 4 feet, and have lettering of at least 3 inches in height that state the name of the site, type of site, hours, and days of waste acceptance, the TCEQ permit number, and local emergency fire department phone number. The sign displayed at the site entrance will also list emergency 24-hour contact phone number(s) that reach an individual with the authority to obligate the facility at all times that the facility is closed. The Landfill Manager will be responsible for the accuracy of the information posted on the site sign. An additional sign will be posted containing a description of all excluded wastes.

Within the site, signs will be placed along the Landfill haul road and access road, beginning at the gated entrance, at a frequency adequate for users to be able to understand where disposal areas are, and which roads are to be used. Roads not being used for access to the working face will be blocked or otherwise marked for no entry. Signs with directional arrows and/or portable traffic barricades will help to restrict traffic to designated disposal locations. Signs will be placed along the access route to the current disposal area or other designated disposal areas that may be established. In addition, rules for waste disposal and prohibited waste will be prominently displayed on signs at the site entrance.

7.5 Control of Windblown Wastes and Litter [30 TAC §330.139]

Windblown wastes will be controlled at the City of Victoria Landfill by the following methods.

- Waste transportation vehicles using this facility will be required to use adequate covers or other means of containment. The adequacy of covers or containment of incoming wastes will be checked at the facility entrance. The Scale House Staff will visually inspect each vehicle entering the site to verify that the load is secured. A sign will be posted at the entrance indicating that vehicles shall be covered (or secured) or an additional fee will be charged. Vehicles attempting to enter the site with unsecured loads will be documented and the list can be provided to law enforcement officials, if necessary. An additional fee will be demanded from unsecured vehicles.
- Daily cover (e.g., soil or ADC) will be applied at least once every 24-hours to assist with the control of windblown waste. The working face size may be reduced by the application of daily cover to assist with the control of windblown waste.
- Portable fencing will be used for the confinement of windblown material in the areas adjacent to the working face. Such fences shall be located along the downwind length of the working face. The litter control fences will be constructed of screens attached to portable frames or other appropriate anchor methods. The litter control fence will be at least eight feet in height and will be located as close as practical to the active area to control windblown waste and litter.
- Temporary fencing may also be installed on the downwind side of the working face. The purpose of secondary fencing is to catch windblown waste that escapes the portable fencing discussed

above. The temporary fence will either consist of additional portable fencing described above or will be constructed using metal or wooden posts and woven wire fence material, or netting. The secondary fence shall have a minimum height of four feet and a minimum length of at least one hundred fifty feet (or matching the length of the working face as noted in Table 7-1). The Landfill Manager, or their designee, shall determine the appropriate fence location and actual length. Additional fences may be used as necessary for effective litter control based on the actual filling location, filling direction, wind direction, and wind speed. Any litter control fencing which is damaged by equipment or traffic shall promptly be repaired or replaced.

- Tall perimeter fencing may be used for the control of windblown waste and litter. Tall perimeter fencing may be installed between any waste filling area and the permit boundary. The tall perimeter fence shall be at least fifteen feet in height. The actual length and height of the perimeter fencing used will be determined by the Landfill Manager or their designee, based on the need for this additional litter control measure, filling location, average wind direction, average wind speed, height of fill above natural ground surface, and proximity of working face to the permit boundary.
- As part of the overall site maintenance program, facility personnel will collect windblown waste materials that may have accumulated throughout the site, on fences and gates, and onsite access roads a minimum of once a day that the site is in operation. Such waste will be taken to and disposed of at the working face. The collection of windblown waste will be an ongoing activity at the site each day the site is in operation.

7.6 Easements and Buffer Zones [30 TAC §330.141]

7.6.1 Easements

There is one easement located within the permit boundary belonging to Central Power and Light (CP&L) as shown in Attachment III-1 - Drawing III.A1.2. No solid waste unloading, storage, disposal, or processing operations will occur within any easement at the City of Victoria Landfill. Also, no waste disposal is allowed within 25 feet of the centerline of an easement. Easements are or will be marked as specified in Section 7.7.

7.6.2 Buffer Zones

In accordance with §330.141(b), no solid waste unloading, storage, disposal, or processing operations will occur within any buffer zone at the City of Victoria Landfill. As shown in Attachment III-1 - Drawing III.A1.2, the buffer zones vary around the perimeter of the site, but in no case are they less than 50 feet between all storage, processing or disposal areas and the permit boundary for previously permitted airspace, and in no case are they less than 125 feet from the newly permitted airspace and the permit boundary. The buffer zones around the site will provide for the safe passage of firefighting and other emergency vehicles. All buffer zones will be clearly marked as specified in Section 7.7.

7.7 Landfill Markers and Benchmark [30 TAC §330.143]

Landfill markers will be installed to clearly mark significant features as described in §330.143(b). The markers will be steel (with plastic identification sleeves) or wooden posts (or other TCEQ approved material) and will extend at least six feet above the ground surface. The markers will not be obscured by vegetation and will be placed in sufficient numbers to clearly show the required boundaries. Markers will be installed with an offset where markers otherwise would not be visible. Markers that are removed or destroyed will be replaced within 15 days of their removal or destruction. Landfill markers will be inspected monthly to ensure they are installed and maintained in accordance with the requirements of this SOP and will be maintained and repaired as necessary. Refer to Section 7.23 for site inspection and maintenance schedule. Inspection results and repairs will be documented in the Site Operating Record. Markers will be repainted as needed to retain visibility. Guidelines for type, placement, and color-coding of markers are identified in Table 7-2.

Table 7-2: Landfill Markers

Marker	Color	Marker Placement
Site Boundary	Black	Placed at each corner of the site and along each boundary line at intervals no greater than 300 feet.
Buffer Zone	Yellow	Placed at each boundary corner and along each boundary line at intervals no greater than 300 feet.
Easement and Right-of-Way	Green	Placed along the centerline of an easement and along the boundary of a right-of-way at each corner within the facility and at the intersection of the facility boundary at intervals no greater than 300 feet.
Grid system	White	Placed no greater than 100 feet apart measured along perpendicular lines. Where markers cannot be seen from opposite boundaries, intermediate markers must be installed, where feasible.
SLER/GLER	Red	Placed so that all areas for which a SLER/GLER has been submitted and approved by the TCEQ are readily determinable.
Floodplain	Blue	Placed at intervals no greater than 300 feet or closer to retain visual continuity at any area within the 100-year floodplain.

The current site coordinate-based grid system will be used as shown in the Site Drawings package found in Attachment III-1. The grid system markers will be maintained during the active life of the site and will encompass at least the area expected to be filled within the next three-year period. The grid system must be installed unless written approval from the TCEQ has been received.

The SLER/GLER markers are to provide site workers immediate knowledge of the extent of approved disposal areas. These markers will be located so that they are not destroyed during operations until operations extend into the next SLER/GLER. The location of these markers will be tied into the landfill grid system. SLER/GLER markers will not be placed inside the constructed areas.

A permanent benchmark has been established at the site in an area that is readily accessible and will not be used for disposal. Coordinates and Elevation of Site Permanent Benchmark:

Latitude: 28° 41' 36" North
Longitude: 96° 54' 23" West
Elevation: 64.97 feet above mean sea level (amsl)

7.8 Control of Waste Spilled on Route to the Site [30 TAC §330.145]

The Landfill Manager or their designee will take steps to encourage that vehicles hauling waste to the working face or other unloading areas arrive on-site with a tarpaulin, net, or other means to properly secure the load (as discussed in Section 7.5). Signs stating this policy will be posted, and offenders may be reported to proper law enforcement by the Landfill Manager.

The City will be responsible for the cleanup of waste materials (e.g., solid waste material that has left the vehicle) along and within the right-of-way of all public access roads (i.e., FM 1686 and the portion of Texas State Highway 185 that is within two miles of the site entrance) serving the site for two miles in either direction from the entrance to the site. Cleanup for the spilled solid waste materials will be performed once per day that the site is open for waste acceptance. Laborers performing litter and spilled solid waste materials collection will be required to wear appropriate safety equipment.

The City will consult with TxDOT or other applicable local officials concerning cleanup of state highways and rights-of-way consistent with 30 TAC §330.145. The TxDOT District Office or other applicable local officials will be contacted to discuss the procedures for litter cleanup on, and within, rights-of-way along state highways in the vicinity of the site. If TxDOT will not allow access to their rights-of-way for litter cleanup, this documentation will be maintained in the Site Operating Record.

7.9 Disposal of Large Items [30 TAC §330.147]

Large, heavy, or bulky items may be disposed of at the working face or recycled at the large item salvage area. Items that can be classified as large, heavy, or bulky can include, but are not limited to, white goods (household appliances), air conditioner units, metal tanks, large metal pieces, and automobiles. Refrigerators, freezers, air conditioning units, or other items containing refrigerant (defined in 40 CFR §82.152) shall be handled in accordance with 40 CFR §82.156, as amended. Items containing refrigerants will not be accepted unless the generator or transporter provides written certification that the refrigerant has been evacuated from the unit. Items such as electrical equipment, which contains PCBs, will be excluded from waste fill. Procedures for detecting and excluding PCBs are provided in Section 5.0.

Large items will be reduced in size at the working face to the extent practical. Care will be taken during disposal of large items to ensure that: (1) large items are excluded from the initial five feet of waste placed over the liner system, (2) large items are placed so that they do not interfere with continued waste filling, and (3) that other, smaller municipal solid waste is placed and compacted around them.

Large, heavy, or bulky items which are not incorporated in the regular spreading, compaction, and covering operations of the Landfill will be recycled in a large-item salvage area. This area will be typically located near the site entrance. City of Victoria Landfill will remove recycled items as needed to prevent these items from becoming a nuisance and the discharging of any pollutants.

7.10 Air Quality and Odor Management Plan [30 TAC §330.149]

7.10.1 Air Quality

The site will comply with all the applicable air quality rules and regulations. The site is currently not required to operate and maintain the landfill gas collection and control system (GCCS) in accordance with the New Source Performance Standards (NSPS) for MSW landfills. However, a GCCS has been installed at the site.

The landfill is subject to TCEQ jurisdiction concerning outdoor burning and air pollution control. The site currently maintains an air operating permit (O-1451). The existing LFG flare was originally authorized by Standard Exemption No. 25191 approved by TCEQ on June 27, 1994.

Steps will be taken to limit the impact of the facility's operation on air quality. Among the measures to be employed are the following:

- Accidental fires will be controlled as outlined in Section 6.4.

- Open burning of waste will not be permitted at this facility.
- Incoming waste will be promptly compacted into the working face area. Daily cover will be placed consistent with the procedures specified in Section 7.18.2.
- Ponded water at the site will be controlled as detailed in Section 7.19.
- The GCCS will be expanded and operated in accordance with all applicable requirements.

The site management team (e.g., Landfill Manager, Environmental Manager, and General Manager) will verify that City of Victoria Landfill does not violate any applicable air quality and/or LFG requirements (refer to Attachment III-8 – Landfill Gas Management Plan for more information). The Environmental Manager is responsible for verifying and documenting compliance with the site's operating permit and any other applicable regulations. Current permits will be maintained in the Site Operating Record.

The site management team will maintain the required probe monitoring data and GCCS records as described in Attachment III-8 – Landfill Gas Management Plan.

7.10.2 Odor Management

Odors shall be controlled at the site and will be reduced if they occur in accordance with this Odor Management Plan. 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. Examples of these wastes include the following.

- Dead animals;
- Sludges; and
- Medical waste.

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 that may be employed to reduce potential odors are the following.

- Minimize the size of the working face;
- Increase the thickness of daily cover applied to the working face;
- Prevent ponded water, consistent with the procedures outlined in Section 7.19;

- Place daily and intermediate cover to the specified thickness over the fill area. The City or their designee will visually inspect daily and intermediate cover areas to confirm that no trash is exposed, and no significant erosion of cover material has occurred;
- Assess the effectiveness of the GCCS 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, including septage, grease trap waste, dead animals, and leachate. If the Scale House Staff notes a load with significant odors, they will notify the working face personnel. The load will be promptly covered with soil 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); and
- Evaluate the possible use or existing use of misters and chemical deodorizers when other controls do not reduce or eliminate significant odors. If it is determined that misters or deodorizers will help minimize odors, a permit modification will be submitted to TCEQ for approval.

The City or their designee will evaluate the perimeter of the site on days when the site is open for waste acceptance to assess the performance of site operations to control odors.

7.11 Disease Vector Control [30 TAC §330.151]

City of Victoria Landfill personnel will control on-site populations of disease vectors, which include rodents, excessive bird populations, flies, mosquitoes, and other insects or animals capable of transmitting diseases to humans. The primary means of control will be to prevent, inhibit, or deter vectors from coming into contact with deposited waste through proper waste compaction and daily cover application. Waste deposited at a working face area will be promptly compacted in accordance with Section 7.17. Daily cover will be applied at the end of each operating day in accordance with Section 7.18.2. A schedule of inspections is provided in Section 7.23 (refer to daily cover item which requires daily inspections of the working face for vectors).

If site inspections identify the need for additional vector controls, the site will implement a control program by contracting with a licensed commercial pesticide applicator, or other qualified pest control specialist to perform the following services:

- Develop a pest management program for the vectors identified;
- Implement the additional vector management practices;
- Assist in the development of vector specific awareness training materials for site personnel; and

- Assist the site in distributing these training materials and providing any necessary training activities on vector awareness and control for site personnel.

7.12 Maintenance of Site Access Roads [30 TAC §330.153]

The City of Victoria Landfill has an existing paved entrance road as shown in Attachment III-1 – Drawing III.A1.2. In addition, the landfill haul and access roads are constructed with a crushed-stone surface or similar material surface to provide for all weather access area from the unloading areas to public access roads. The paved entrance road and crushed-stone internal roads provide mud control for the waste hauling vehicles prior to exiting the site and returning to public access roads (i.e., mud on vehicles will “spin-off” on the access roads within the Landfill before the vehicle returns to the public access road). During wet weather conditions, the Landfill Manager or their designee will routinely inspect the site and implement measures to further minimize mud tracking onto public access roads, as necessary.

The landfill haul roads, and access roads will be maintained in a reasonable dust-free condition by periodic spraying from a water truck. During dry weather conditions, the Landfill Manager or their designee will routinely inspect the site and establish a frequency, if necessary, to spray the access roads with water to prevent nuisance conditions from developing.

Litter and other debris along the landfill haul and access roads will be removed and taken to the working face for disposal, consistent with the schedule requirements listed in Section 7.23 (i.e., litter or other debris will be picked up on a daily basis). Grading equipment will be used as necessary to control or remove mud accumulations on roads as well as minimize depressions, ruts, and potholes (at least once per week). In addition, all on-site and other access roadways will be maintained on a regular basis. Mud and assorted debris tracked onto public roadways will be removed once per day on days when mud and associated debris are being tracked onto public roadways to the extent that mud can be reasonably considered to be associated with landfill operations. A maintenance record regarding the inspection and regrading of the access roadways will be maintained by the Landfill Manager or their designee in the Site Operating Record. Refer to Section 7.23 for site inspection and maintenance list.

7.13 Salvaging and Scavenging [30 TAC §330.155]

For purposes of this SOP, salvaging is the removal of waste materials from the working face or waste hauling vehicles at the entrance for reuse or recycling. Salvaging will not be allowed to interfere with prompt sanitary disposal of solid waste or to create public health nuisances. Salvaging of Class 1 industrial or other special wastes received at the facility will not be salvaged.

Scavenging is the uncontrolled and unauthorized removal of materials at any point in the solid waste management system, including but not limited to, the removal of waste deposited at the working face or active disposal area. Scavenging will be prohibited at all times. Various site personnel (e.g., Equipment Operators and Spotters) will guard against scavenging and unauthorized salvaging activities.

7.14 Endangered Species Protection [30 TAC §330.157]

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 or cause or contribute to the taking 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 within 48-hours.

An assessment of the potential effects of the proposed Landfill on threatened and/or endangered species was conducted based upon data available from the US Fish and Wildlife Service's Information for Planning and Conservation and the Texas Parks and Wildlife Department's Texas Natural Heritage Program. The existing Landfill permit demonstrated "no presently known occurrences of special species or natural communities in the general vicinity of the landfill." The September 2018 Endangered Species report (updated in February 2021) targeted to the lateral expansion area is provided in Appendix I/II - F. The evaluation shows that potential occurrence of federally listed species is unlikely, and a determination of "No Effect" to federally listed threatened and endangered species is appropriate. Suitable habitat for bald and golden eagles were not present within the Landfill area; therefore, a determination of "No Impact" for the bald and golden eagles is appropriate. As such, the construction and operation of the facility shall not result in the destruction or adverse modification of the critical habitat or cause or contribute to the taking of endangered or threatened species.

7.15 Control of Landfill Gas [30 TAC §330.159]

The control and monitoring of landfill gas for the City of Victoria Landfill will be in accordance with Attachment III-8 – Landfill Gas (LFG) Management Plan (LFG Management Plan), which was developed in accordance with §330.371 and provides for required reports and other submittals to be included in the Site Operating Record and submitted to the Executive Director (refer to Section 2.0 for additional information).

As noted in the LFG Management Plan, monitoring for the presence of methane gas at the site will be conducted on a quarterly basis. In particular, the LFG monitoring probes will be monitored for the possibility of subsurface perimeter methane concentrations exceeding the lower explosive limit (LEL). Additionally, on-site structures will be checked to ensure that methane concentrations do not exceed 25 percent of the LEL. The allowable limits and details of gas recovery are more fully described in the LFG Management Plan.

Monitoring for combustible gas concentrations will be performed quarterly within all site structures and at the LFG monitoring probes. Required reports and other submittals will be included in the Site Operating Record and submitted to the executive director, as necessary.

In the event that methane levels that exceed allowable limits are detected (25 percent of the LEL for methane in facility structures or 100 percent of the LEL at LFG monitoring probes), the TCEQ will be notified and steps will be implemented to protect human health, in accordance with the contingency plan presented in LFG Management Plan. Documentation of the LFG measurements and of the protective measures implemented will be placed in the Site Operating Record within seven (7) days. A remediation plan for any methane gas exceedances as described in the LFG Management Plan will be implemented within 60 days of the methane detection. This remediation plan will be submitted to TCEQ to describe the proposed remediation activities.

7.16 Oil, Gas, and Water Wells [30 TAC §330.161]

There are two active water wells currently within the site boundary used as a non-potable source for the activities such as equipment washdown, dust control, fire suppression, and is not a drinking water source. Bottled water is provided for site personnel.

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

The Executive Director may approve any well used to supply water at the facility that is located within the permit boundary if it is determined that the well is outside the waste footprint, it is not impacted by landfill operations, it can be demonstrated that well design and installation will prevent any cross-contamination from the waste management unit to the water well production zone and between any water bearing zones, and an approved sampling plan to include frequency and parameters is in place.

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

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

In the event that an abandoned well causes a change to the liner installation plan, a permit modification will be submitted to the Executive Director in accordance with 30 TAC §330.161(d).

7.17 Compaction of Solid Waste [30 TAC §330.163]

Compaction of incoming waste facilitates efficient use of available space, minimizes settlement and consolidation, and promotes proper application of intermediate and final cover. Landfill compactors or similar equipment will be used to compact waste at the City of Victoria Landfill. Unless otherwise documented in the Site Operating Record, the Landfill Manager will instruct the Equipment Operators to spread waste in lifts that are approximately two-feet thick. The compactor will typically make two-passes to compact the waste. A pass is defined as one direction of travel. The Equipment Operators will be trained to determine whether the compaction equipment is functioning as designed to ensure that the waste lift is adequately compacted. The number of passes required may be increased depending upon the nature of the waste that is being compacted.

7.18 Soil Management, Placement, and Compaction of Daily, Intermediate, and Final Cover [30 TAC §330.165]

7.18.1 Soil Management

Soil will be obtained from onsite and offsite soil borrow sources as needed for facility operations. The earthen material for use as daily cover, intermediate cover, final cover, and other uses will be available for the site.

The earthen material will consist of soil that has not previously come in contact with waste and will be of sufficient volume to meet the fire protection requirements specified in Section 6.0. Both the volume of earthen material required to be maintained within 1,000 feet of each working face and the volume of earthen material to cover each working face with at least a one-day application of six-inches of daily cover will be documented on the Cover Application Log (refer to Section 7.18.6 and Section 6.1.4 for an example earthen material calculation).

7.18.2 Daily Cover

Daily cover of waste is used to control disease vectors, windblown waste, odors, fires, and scavenging and to promote runoff from the fill area. At the end of each operating day, the exposed solid waste fill area(s) will be covered by (1) at least six inches of well compacted soil cover material that has not been previously mixed with garbage, rubbish, or other solid waste, or (2) an approved Alternate Daily Cover (ADC) material.

An alternate daily cover operating plan is provided in Appendix IV-C – Alternative Daily Cover Operating Plan. Consistent with 30 TAC §330.165(d)(1) the plan addresses the following:

- Description and thickness of the alternative cover material;
- Its effect on vectors, fires, odors, and windblown litter;
- The application and operational methods to be utilized at the site when using the alternative material;
- The chemical analysis of the material and/or the Material Safety Data Sheet(s) for the alternative material; and
- any other pertinent characteristics, features, or other factors related to the use of this alternative material.

Alternative daily cover may only be allowed by a temporary authorization under 30 TAC §305.62(k)(1)(A) followed by a major amendment or a modification in accordance with §305.70(k)(1). A temporary authorization for the use of synthetic tarps as ADC was issued in March 2011 followed by a modification approved by TCEQ in August 2012. ADC is used to cover waste that will be filled again within a 24-hour period. ADC is only used in areas that are surrounded by the containment berm. This practice allows collection of runoff generated by an area covered with ADC to be contained and handled as contaminated water.

As mentioned above, ADC information is included in the Alterative Daily Cover Operating Plan. The remaining portion of this section details the procedures to be used if soil daily cover is utilized. To ensure that the soil daily cover soil will be adequate (i.e., minimize vectors, prevent contaminated stormwater runoff, prevent odors, etc.) the following procedures will be followed:

- The daily cover will be sloped to drain;
- The daily cover will be spread and compacted with a minimum of two passes with the dozer tracks to minimize infiltration of stormwater, graded to drain, and will not have any waste visibly protruding through it;
- The Landfill Manager, or their designee, will document where daily cover has been placed and visually inspect during placement that a minimum of six inches of daily cover soil has been placed and that no waste is exposed. The Landfill Manager, or their designee, shall document, on a daily basis, the daily cover placement area and indicate the thickness has been visually verified and condition in the Cover Application Log (discussed further in Section 7.18.6);
- The Landfill Manager, or their designee, will inspect all daily cover areas for erosion, exposed waste, or other damage each day that the site is in operation. Repairs will be made as necessary. Erosion gullies or washed-out areas will be repaired within 24-hours after the area is accessible (i.e., after the cover soils and slopes dry out enough to allow access by earth-moving equipment without causing excessive rutting of cover soils); and
- The Landfill Manager, or their designee, will inspect for seeps from daily cover. All seepage water from waste below the daily cover will be controlled by placement of soil berms and diverted to a contaminated water collection area. Contaminated water will be treated as outlined in Attachment III-3 – Leachate and Contaminated Water Plan.

Inactive areas with six inches of daily cover will be inspected each day the site is in operation for erosion, ponded water, seeps, protruding waste, or other detrimental conditions that may cause contaminated runoff from the daily cover. The Landfill Manager, or their designee, will place additional cover, as needed, to repair erosion, prevent ponded water and seeps, and cover protruding waste.

7.18.3 Intermediate Cover

All areas that receive waste and then become inactive for longer than 180 days will be covered with an additional six inches of well compacted cover material, for a total cover thickness of at least 12 inches. This 12-inch-thick layer of cover soil will be classified as "intermediate cover" and will be graded and maintained to prevent ponding. If the area becomes active again, the top six inches may be stripped off for use as daily cover in other areas. In addition, the top six inches of earthen material used for intermediate cover will be suitable for sustaining native plant growth and will be seeded or sodded following the placement of intermediate cover soils. Seeding will occur during a standard growing season when it is feasible to establish vegetation. The establishment of vegetation is desirable to reduce erosion, which helps to maintain the cover's integrity and improve the aesthetic appearance of the landfill, and aid in sediment control. Plant growth and other erosion control features will be maintained. Runoff from areas that have intact intermediate cover is not considered as having come into contact with the working face or leachate.

The sequence of intermediate cover placement with respect to waste placement is included in detail in Attachment III-1 – Site Drawing Package. The Landfill Manager or their designee will inspect intermediate cover at the site on a monthly basis. In addition, intermediate cover will be inspected at the City of Victoria Landfill within 72 hours of any rainfall event of 0.5 inches or more (i.e., 0.5 inches during a 24-hour storm). Erosion gullies or washed-out areas will be repaired within five days of detection by restoring the cover material, grading, compacting, and seeding, if necessary, unless the TCEQ Regional Office approves otherwise, based on the extent of the damage requiring more time to repair, or the repairs are delayed because of weather conditions.

In accordance with 30 TAC §330.165(e), the executive director may grant a temporary waiver for the requirements for daily, intermediate, and ADC if the owner or operator demonstrates that there are extreme seasonal climatic conditions that make meeting such requirements impractical.

7.18.4 Additional Cover Requirements for Class 1 Disposal Areas

In designated optional below-grade Class 1 disposal areas that have received Class 1 waste below natural grade, MSW and other waste types accepted at the facility will be placed above the Class 1 waste to meet above-grade final contours. In accordance with §330.457(b), the final below-grade Class 1 waste lift will be covered with a minimum of four feet of compacted clay-rich soil prior to waste placement above Class 1 wastes. Details are shown in Attachment III-1 – Drawing III.A1.18. Consistent with §330.547(b), the final cover to be placed over the aerial fill in these areas will include a synthetic membrane that has a permeability less than or equal to the permeability of any bottom liner system overlain by a clay-rich soil cover layer consisting of a minimum of 18 inches of earthen material with a coefficient of permeability no greater than 1×10^{-5} cm/sec. Details are shown in Attachment III-1 – Drawing III.A1.17.

7.18.5 Final Cover

Final cover placement will occur as areas of the site are filled to the design top-of-waste grades. Final cover placement over individual areas will be in accordance with Attachment III-9 – Final Closure Plan and will permit ongoing landfilling operations to continue until the time of final closure. Surface water will be managed throughout the active life of the site to minimize infiltration into the filled areas and to minimize contact with solid waste. Erosion of final or intermediate cover will be repaired within five days after the initial inspection by restoring the cover material, grading, compacting, and seeding unless the

TCEQ Regional Office approves otherwise, based on the extent of the damage requiring more time to repair, or the repairs are delayed because of weather conditions. An eroded area is considered to be deep enough to jeopardize the final or intermediate cover if it exceeds four inches in depth as measured from the vertical plane from the erosion feature and the 90-degree intersection of this plane with the horizontal slope face or surface. The date of detection of erosion and date of completion of repairs, including reasons for any delays, must be documented in the Cover Application Log (refer to Section 7.18.6). Such periodic inspections and restorations are required during the entire operational life and for the post closure maintenance period. Refer to Section 7.23 of this SOP for a Site Inspection and Maintenance List.

Final cover placement over completed portions of the site will consist of the following steps:

- Survey controls will be implemented to control the filling of solid waste to the bottom level of the final cover system.
- A surveyed grid system on 100-foot centers will be established, or other suitable surveying or plans will be used to control placement of the final cover.
- When the appropriate design landfill height of the proposed final cover is reached, the top of the landfill will be regraded and reshaped as needed.
- During the first growing season following application of the final cover system, the site will be vegetated with appropriate grasses to minimize erosion.
- The surface water protection system will be constructed as indicated in Attachment III-2 – Groundwater and Surface Water Protection and Drainage Plan.
- The final cover system layers will be constructed. Testing of the various components of the final cover system will be performed in accordance with Attachment III-9 – Final Closure Plan.
- A final cover certification report complete with an as-built survey will be prepared by an independent licensed professional engineer and submitted to the TCEQ for approval.
- The TCEQ-approved final cover certification report will be maintained in the Site Operating Record and the final cover construction log (see Section 7.18.6) will be updated to reflect the area where final cover has been placed, the date final cover was constructed, and the thickness applied that date. The TCEQ Regional Office will also be notified that final cover placement has occurred at the site.

The final cover system, including the erosion control structures (drainage swales and chutes) will be maintained during and after construction. During the active life of the site, the Landfill Manager or their designee will inspect the final cover system on a weekly basis. In addition, during the active life of the landfill, inspections of the final cover will occur within 72 hours of a rainfall event of 0.5 inches or more (i.e., 0.5 inches during a 24-hour period). Post Closure care inspection procedures are outlined in Attachment III-11 – Post Closure Plan.

7.18.6 Cover Application Log

Throughout the landfill operation, a Cover Application Log will be maintained by the Landfill Manager, or their designee, and be readily available for inspection in accordance with §330.165(h). For intermediate cover and daily cover, the log will specify the date cover (no exposed waste) was accomplished, the area covered (by use of the grid system), how it was placed, when it was completed, and the last area covered. For final cover, the log will show the final cover area, specify the area covered, the date cover was applied, the thickness applied that date, and reference the final cover certification report for each area. The signature of the Landfill Manager, or other on-site supervisor, will certify each entry that the work was accomplished as stated in the log. Repairs will be documented in the log. The date of detection of erosion, or other repair issue, date of completion of repair (including reasons for any delays) will be included to document the report. In addition, both the volume of the earthen material required to be maintained within 1,000 feet of each working face and the volume of earthen material to cover the working face with at least one day application of six inches of daily cover will be recorded each day on the Cover Application Log.

7.19 Prevention of Ponded Water [30 TAC §330.167]

Site grading and maintenance will prevent the ponding of water over areas containing waste. Should ponding occur, the water will be removed as soon as practicable from areas not designated as stormwater collection areas in Attachment III-1 – Drawings III.A1.7 and III.A1.8. Records of ponding preventive and corrective activities will be kept in the Site Operating Record. The depressions will be filled and regraded as quickly as possible, but no later than seven days from the end of the rainfall event (i.e., the end of the rainfall event is equivalent to the term "occurrence" as defined by 30 TAC §330.167). If the ponded water has come into contact with waste, leachate, or contaminated soils, it will be treated as contaminated water and handled in accordance with Attachment III-3 – Leachate and Contaminated Water Plan. Contaminated water will be removed via a vacuum truck and transported to an off-site permitted treatment facility (refer to Section 3.0 of Attachment III-3 – Leachate and Contaminated Water Plan).

The site will be inspected weekly to verify that no unauthorized ponded water areas exist. Ponded water that is not contaminated in areas not over waste, such as in excavations, and detention ponds or basins (this does not include approved lined areas; ponded water on approved liners is prohibited), is not prohibited so long as ponding in other areas does not cause or contribute to nuisance conditions. Ponding in these areas will be monitored to prevent nuisance odors. In addition, excavations will be pumped out as necessary to maintain the area as accessible to earth-moving equipment. Detention ponds and basins will be maintained to perform as designed. Uncontaminated water contained in basins or excavations may be used for dust control.

7.20 Disposal of Special Wastes [30 TAC §330.171]

The facility may only accept special wastes that are specifically addressed in the SOP (wastes under 330.173(c) and (d)), or which acceptance will be authorized by the permittee following an approved Special Waste Acceptance Plan (SWAP). An application for an approved SWAP is provided in Appendix IV-B. Once approved, the SWAP will be maintained in the Site Operating Record. As specified in 30 TAC §330.171(b)(2), requests for approval to accept certain types of special wastes (not specifically identified in 30 TAC §330.171(c) or (d) or in 30 TAC §330.173) shall be submitted to the TCEQ or to the facility with an approved plan and shall include the following:

- A complete description of the chemical and physical characteristics of each waste, a statement as to whether or not each waste is a Class 1 industrial waste as defined in 30 TAC §330.3, and the quantity and rate at which each waste is produced and/or the expected frequency of disposal.
- A hazardous waste determination as required by 30 TAC §335.6(c) for all Class I industrial waste.
- If special handling instructions are required, they will be provided as part of the pre-approval process; including, the proposed procedures for handling waste and listing required protective equipment for operating personnel and onsite emergency equipment.
- Procedures and responsibilities for containment and cleanup of any accidental spills occurring during the delivery and/or disposal operation will be conducted.
- When special wastes are to be disposed of at the City of Victoria Landfill, a complete transporter and generator profile will be required prior to acceptance of the special wastes. This profile includes:
    - A written declaration by the generator that the waste stream is non-hazardous waste.
    - A written declaration by the generator that the waste is not Class I Nonhazardous Industrial Solid Waste.
    - An estimate of the anticipated quantity, rate, and frequency of disposal for each special waste.

Approval by the TCEQ will not obligate the facility to accept the waste. The above-listed information will be maintained in the Site Operating Record.

A waste discrepancy report or similar documentation will be placed in the Site Operating Record when one or more of the following occurs:

- A special waste arrives without a waste manifest or required shipping document.
- An industrial or special waste arrives, and the waste material does not match the description on the waste manifest or other shipping document.
- An industrial or special waste arrives, and the waste differs from the approved waste based upon Quality Assurance/Quality Control (QA/QC) review or other monitoring.
- The volume of the waste is not consistent with the information on the shipping documents.

The Scale House Staff, Landfill Manager, Special Waste Liaison, or Environmental Manager will attempt to resolve any waste discrepancies. If the discrepancy can be resolved, the waste may be accepted, and the discrepancy report will be filed to document the resolution of the discrepancy in the Site Operating Record. If the discrepancy cannot be resolved, the waste shipment will be rejected, and a discrepancy report prepared and filed for the rejected waste shipment.

In addition, the special wastes identified in Sections 7.20.1 through 7.20.9 may be accepted at the facility without prior written authorization in accordance with 30 TAC §330.171(c). Approvals will be waste-specific and/or site-specific and will be granted only to appropriate facilities operating in compliance with Chapter 330. TCEQ may authorize the receipt of special waste with a written concurrence from the facility, however, the facility operator is not required to accept the waste. TCEQ may revoke an authorization to accept special waste if the owner or operator does not maintain compliance with the rules or conditions imposed in the authorization to accept special waste. Waste classification and testing for all special wastes will be done in accordance with TCEQ Regulatory Guidance 022: Guidelines for the Classification and Coding of Industrial and Hazardous Wastes.

Table 7-3 summarizes the handling and disposal procedures for each of the special wastes identified in Sections 7.20.1 through 7.20.9.

Table 7-3: Special Waste Handling and Disposal Procedures Summary

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Class 1 industrial hazardous waste	2,400 tons per year[2]	Any industrial solid waste or mixture of industrial solid wastes that because of its concentration or physical chemical characteristics is toxic, corrosive, flammable, a strong sensitizer or irritant, a generator of sudden pressure by decomposition, heat, or other means or may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or disposed of or otherwise managed, as further defined in 30 TAC §335.505 (relating to Class 1 Waste Determination).	Process knowledge will be used to identify the Constituents of Concern (COC). As applicable, analytical testing will be performed for the identified COCs to determine if the material is eligible for disposal in the non-Class 1 area. The SWAP and RG-22 will be used to determine additional constituents to test for when process knowledge alone does not ensure proper classification of wastes.	Disposed of at the active face below natural grade consistent with Section 7.2 (Unloading Wastes).	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Soils contaminated by petroleum products, crude oils, or chemicals in concentrations of greater than 1,500 mg/kg total petroleum hydrocarbons	2,500 tons per year	Materials as defined in 30 TAC §335.1 (relating to definition of petroleum substances) or chemicals listed in §335.521(a)(1) (relating to constituents of concern and their maximum leachable concentrations)	This material will be disposed of in a non-Class 1 area if the TPH concentration is less than 1,500 mg/kg and disposed of in the Class 1 area if TPH is greater than 1,500 mg/kg, or if the material is contaminated by constituents of concern that exceed the concentrations listed in Table 1 in 30 TAC §335.521(a)(1) (consistent with §330.171(b)(4)).	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.
Medical wastes from health care related facilities that have been treated in accordance with 30 TAC §330.171(c)(1)	5,500 tons per year	Medical wastes from health care related facilities	Medical wastes that have been treated in accordance with 30 TAC Chapter 326 will be accepted in accordance with 30 TAC §330.171(c)(1). Medical waste that has not been treated will not be accepted unless authorized in writing by the TCEQ.	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Dead animals and slaughterhouse wastes (accepted in accordance with 30 TAC §330.171(c)(2) and Section 7.20.3 of the SOP)	100 tons per year	Dead animals (other than single household pets and other single small animals) and slaughterhouse wastes	Dead animals and slaughterhouse wastes will be buried at the active face and covered with a minimum of three feet of other solid waste or a minimum of two feet of soil immediately upon receipt. Additional waste or soil will be added over the dead animals if objectionable odors are created by the dead animals or slaughterhouse wastes.	Verify a minimum of 3 feet of solid waste or 2 feet of soil is placed over landfilled dead animals or slaughterhouse wastes	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Regulated asbestos-containing material (RACM) (accepted in accordance with Title 30 TAC §330.171(c)(3) and Section 7.20.4 of the SOP)	500 tons per year	Materials that contain regulated asbestos-containing materials	RACM will be accepted at the site only if it is contained in tightly closed containers or bags or wrapped with at least six-mil-thick polyethylene. Class 1 RACM must be accompanied by a waste manifest document completed by the generator and transporter that accompanies the driver of each waste load. The facility will verify pre-authorization for disposal.	Disposed of consistent with Section 7.2 of the SOP (Unloading Wastes) and Section 9.3 of Appendix IV-B (Regulated Asbestos Containing Materials) and 30 TAC §330.171(c)(3)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1. In the event that bags or containers that contain RACM rupture, they will be immediately contained by spraying the area with water to prevent the spread of RACM. Also, earthen dikes, berms, or other appropriate measures will be constructed to contain the spill. The contingency plan included in Section 9.3.1 of Appendix IV-B will be followed in the case of an emergency.
Discarded materials containing asbestos (non-RACM) (accepted in accordance with Title 30 TAC §330.171(c)(4) and Section 7.20.5 of the SOP)	200 tons per year	Materials that contain non-regulated asbestos-containing materials (e.g., shingles)	Non-RACM may be accepted for disposal provided the wastes are placed on the active working face and covered in accordance with Section 7.18.	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes) and 30 TAC §330.171(c)(4)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Nonhazardous empty containers (accepted in accordance with 30 TAC §330.171(c)(5) and Section 7.20.6 of the SOP)	1,000 tons per year	Empty containers, which have been used for pesticides, herbicides, fungicides, or rodenticides	Nonhazardous empty containers will be accepted provided they meet the criteria outlined in Section 7.20.6.	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes) and 30 TAC §330.171(c)(5)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.
Hazardous waste from conditionally exempt small quantity generators (CESQG) (accepted in accordance with 30 TAC §330.171(c)(6))	5,000 tons per year	Hazardous waste from conditionally exempt small quantity generators meeting the requirements of 30 TAC §330.3(148)(A)	Municipal hazardous waste from a CESQG will be accepted provided the amount of waste does not exceed 220 pounds (100 kilograms) per month per generator and provided the Landfill Manager or their designee authorizes the acceptance of the waste.	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes) and 30 TAC §330.171(c)(6)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.
Municipal wastewater treatment plant sludges	1,000 tons per year	Materials regulated under Chapter 312 – related to sludge use, disposal, and transportation and those sludges other than those regulated under Chapter 312 (relating to sludge use, disposal, and transportation)	Tested in accordance with Method 9095B (Paint Filter Liquids Test) as described in “Test Methods for Evaluation of Solid Wastes, Physical/Chemical Methods” (EPA Publication number SW-846 as amended and certified to contain no free liquids.	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

Special Waste	Estimated Disposal Quantity[1]	Description	Testing/Acceptance Requirements	Handling Procedures	Onsite Emergency Equipment
Grease and grit trap waste (accepted in accordance with 30 TAC §330.17l(c)(7) and Section 7.20.8 of the SOP)	200 tons per year	Grease and grit trap material, typically produced by restaurants	Paint Filter Test	Disposed of at the active face consistent with Section 7.2 of the SOP (Unloading Wastes)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.
Used oil filters from internal combustion engines (accepted in accordance with 30 TAC §330.171(d)(1)(B)	100 tons per year	Oil filters from internal combustion engines	This material will not be intentionally and knowingly accepted for disposal unless the filter has been crushed to less than 20 percent of its original volume or processed by a method other than crushing to remove all free-flowing used oil. Used oil filters that have been crushed and/or processed to remove free-flowing oil will not be intentionally or knowingly accepted from any non-household generator for disposal.	Disposed of at the active face consistent with Section 4.2 of the SOP (Unloading Wastes)	No specific equipment is required for the disposal of this material. Standard landfill equipment is listed in Table 4-1.

[1] – The expected quantity and rate of disposal is an estimated value based on historic data or anticipated quantities and is not limited to these disposal rates. Estimated quantity and rate of disposal for Class 2 and 3 NHIW (total) is 20,000 tons per year based on historic data.

[2] – Class 1 NHIW will not be disposed "in excess of 20 percent of the total amount of waste (not including Class 1 wastes) accepted during the current or previous year." (30 TAC §330.173(e))

7.20.1 Petroleum Contaminated Soil

Soils contaminated by petroleum products, crude oils, or chemicals in concentrations of greater than 1,500 milligrams per kilogram (mg/kg) total petroleum hydrocarbons; or contaminated by constituents of concern that exceed the concentrations listed in Table 1, Constituents of Concern and their Maximum Leachable Concentrations in 30 TAC §335.521(a)(1) must be disposed in dedicated cells that meet the requirements of 30 TAC §330.331(e).

7.20.2 Medical Waste

Medical wastes from health care related facilities that have been treated in accordance with the procedures specified in 30 TAC Chapter 326 will be accepted in accordance with 30 TAC §330.171(c)(1). Medical waste that has not been treated will not be accepted unless authorized in writing by the TCEQ. The TCEQ may provide authorization for untreated medical waste for unique situations in order to protect the human health and environment from the effects of a natural or man-made disaster.

7.20.3 Dead Animals or Slaughterhouse Wastes

The City of Victoria Landfill may receive dead animals or slaughterhouse wastes in accordance with 30 TAC §330.171(c)(2). Dead animals and slaughter-house wastes will be buried at the active face and covered with a minimum of three feet of other solid waste or a minimum of two feet of soil immediately upon receipt. Additional waste or soil will be added over the dead animals if objectionable odors are created by the dead animals or slaughterhouse wastes.

7.20.4 Regulated Asbestos-Containing Material (RACM)

RACM as defined in 40 CFR 61 may be accepted at the facility in accordance with 30 TAC §330.171(c)(3). The Landfill Manager will dedicate a specific area of the site for receipt of RACM and notify the TCEQ in writing of the designated area. RACM disposal locations will be identified by surveying and marked by a registered professional land surveyor on a current site drawing maintained at the site and submitted to the TCEQ upon completion. Each load of RACM that arrives on site will be documented. This documentation will include the volume of material, and the location and depth of its disposal. As the operation continues, the Landfill Manager will notify the TCEQ by the means stated above of any new dedicated areas for RACM. The RACM disposal area will not be larger than 50 feet by 50 feet.

Delivery of RACM will be coordinated by the Landfill Manager so that the waste will arrive during times that it can be properly managed by site personnel. A trained staff person will be present where the waste in being unloaded to direct and observe unloading.

RACM will be accepted at the site only if it is contained in tightly closed containers or bags or wrapped with at least six-mil-thick polyethylene.

RACM will be placed in landfill cells such that it will not be exposed as a result of erosion or weathering. At a minimum, the RACM will be placed below natural grade level. Where this is not possible or practical, RACM that is placed above natural grade must be located in the landfill unit such that it is, at closure of the landfill unit, at least 20 feet away from exterior final sideslopes and at least 10 feet below final grade. During unloading and placement of RACM in the waste fill, care will be exercised to prevent breaking open the bags or containers. One foot of soil cover or three feet of asbestos-free municipal solid waste will be placed over the RACM immediately after it is placed in the landfill. Care must be exercised in the application of the cover so that the bags or containers are not ruptured.

RACM that has been designated as Class 1 industrial solid waste, will be disposed of in accordance with 30 TAC §330.173(c) and in accordance with this section.

Shipments of Class 1 RACM must be accompanied by a waste manifest document. The waste manifest is to be completed by the generator and transporter and shall accompany the driver of each waste load. The facility will then verify pre-authorization for disposal and complete the destination section of each manifest and return one copy of the completed manifest to the driver. One copy of the completed waste manifest will also be returned to the waste generator within 30 days after receipt of the waste. Manifests are prepared in quadruplicate and the remaining copy will be filed in the Site Operating Record for a minimum of three years. Acceptable manifests will include at least the following information:

- Identity and telephone number of the generator;
- Type and quantity of waste obtained from the generator;
- TCEQ registration number and TCEQ waste code (if applicable); and
- Specific site for disposal.

A waste discrepancy report or similar documentation will be completed when:

- Class 1 RACM arrives without a properly completed waste manifest;
- Class 1 RACM arrives, and the waste material does not match the description on the waste manifest;
- Class 1 RACM arrives and the information on the manifest is determined to be incorrect; or
- Class 1 RACM arrives which does not match the information given in the original approval submitted by the generator.

The Scale House Staff, Landfill Manager, Special Waste Liaison, Environmental Manager, or General Manager will attempt to resolve any waste discrepancies. If the discrepancy can be resolved, the waste may be accepted, and the discrepancy report will be filed to document the resolution of the discrepancy. If the discrepancy cannot be resolved, the waste shipment will be rejected, and a discrepancy report prepared and filed for the rejected waste shipment.

The Landfill Manager, or their designee, will contact the transporter and/or generator and notify them of the identification of any unauthorized waste. The transporter and/or generator will be required to take all necessary steps to determine the origin and to assure that in the future such wastes are either not collected or are taken to a facility approved to accept such waste. The appropriate state agency will also be contacted to provide the name and contact information of the transporter and to report measures taken to resolve the arrival of unauthorized waste (e.g., returned to the transporter or disposed of by the City of Victoria Landfill at an approved facility). Multiple instances of unauthorized wastes found from the same transporter or generator may result in the City of Victoria Landfill refusing to accept waste from that transporter or generator.

All information and documents pertaining to Class 1 RACM profiled for disposal and delivered to the landfill for disposal including but not limited to, all records concerning measurements and analyses performed at the site, shall be retained in the Site Operating Record.

Additionally, the TCEQ Monthly Waste Receipt Summary will be prepared by the Landfill Manager, or their designee, and submitted to the TCEQ no later than the 25th day of the month following the month that the waste was received. Reports will be on forms provided by the TCEQ and submitted to the Registration and Reporting Section. The facility will file reports including those months in which they receive no Class 1 RACM at the facility unless the TCEQ grants an exception. The reports will summarize the quantity, character, generator identity, and the method of storage, processing, and disposal of each Class 1 RACM shipment received and itemizes by manifest document number as required by the TCEQ.

In addition, and according to 30 TAC §330.675, a Quarterly Municipal Solid Waste Fee Report will be submitted to the TCEQ on a form provided by the TCEQ. In addition to a statement of the amount of Class 1 RACM received for processing or disposal, the report will contain other information requested on the form, typically including amount of other wastes received, the facility operator's name, address, and phone number, the permit number, and other information as requested. The required quarterly report will be submitted to the TCEQ within the timeframe required by the TCEQ.

In the event that bags or containers that contain RACM rupture, the procedures listed in Appendix IV-B - Special Waste Acceptance Plan will be followed.

Upon closure of the facility, a notation indicating that the site accepted RACM will be placed in the real property records of Victoria County. This notation will indicate where the RACM was disposed of on the property by showing its location on a site diagram. A copy of this documentation will be provided to the TCEQ.

7.20.5 Nonregulated Asbestos-Containing Materials

Non-regulated asbestos-containing materials (non-RACM) may be accepted for disposal in accordance with 30 TAC §330.171(c)(4) provided the wastes are placed on the active working face and covered in accordance with Section 7.18. Under no circumstances shall any material containing non-RACM be placed on any surface or roadway which is subject to vehicular traffic or disposed of by any other means by which the material could be crumbled into a friable state.

7.20.6 Empty Containers

Empty containers, which have been used for pesticides, herbicides, fungicides, or rodenticides will be accepted and disposed of in accordance with 30 TAC §330.171(c)(5) and as outlined below.

- These containers may be disposed of at the landfill active face provided that:
  - the containers are triple rinsed prior to receipt at the site;
  - the containers are rendered unusable prior to or upon receipt at the site; and
  - the containers are covered by the end of the same working day they are received.
- Those containers for which triple-rinsing is not feasible or practical (e.g., paper bags, cardboard containers) may be disposed of by placing them at the working face and covering them with three feet of waste by the end of the day they were received.

7.20.7 Municipal Hazardous Waste from a Conditionally Exempt Small Quantity Generator (CESQG)

In accordance with 30 TAC §330.171(c)(6), municipal hazardous waste from a CESQG will be accepted at this facility provided the amount of waste does not exceed 220 pounds (100 kilograms) per month per generator and provided the Landfill Manager or their designee authorizes the acceptance of the waste.

7.20.8 Sludges and Grease and Grit Trap Waste

Sludges, grease trap waste, grit trap waste or liquid waste from municipal sources will be accepted if the material has been treated or processed (at a permitted off-site facility) and has passed the paint filter liquids test (Test Method 9095) and is certified to contain no free liquid, as prescribed in §330.17l(c)(7).

7.20.9 Used Oil Filters

Used oil filters from internal combustion engines must not be intentionally and knowingly accepted for disposal at the City of Victoria Landfill unless the filter has been (1) crushed to less than 20 percent of its original volume to remove all free-flowing used oil; or (2) processed by a method other than crushing to remove all free-flowing used oil (as described in 30 TAC §330.171(d)(1)(B). Used oil filters (to include filters that have been crushed and/or processed to remove free-flowing used oil) will not be intentionally or knowingly accepted from any non-household generator for landfill disposal.

7.21 Disposal of Industrial Wastes [30 TAC §330.173, §330.179, §335.585 through §335.589]

7.21.1 Class 1 NIHW

Class 1 NIHW will be accepted for below-grade disposal in cells designated for Class 1 wastes at the facility in accordance with this section. Class 1 NIHW that is defined as Class 1 only because of its asbestos content will be accepted in accordance with Section 7.20.4. The operator may not accept Class 1 NIHW without written approval and a manifest per 30 TAC §335.10. Requests for authorization to accept Class 1 NIHWs must be submitted in writing to the TCEQ and include each of the following:

- A complete description of chemical and physical characteristics of the waste per 30 TAC §335.587, a hazardous waste statement, and the quantity, rate, and frequency of disposal.
- An operating plan containing the proposed procedures for handling the waste, a listing of required personnel protective equipment, and on-site emergency equipment. This plan will become part of the site operating plan.
- Written contingency plan meeting the requirements 30 TAC §335.589. This plan will become part of the site operating plan.

Consistent with 30 TAC §330.173(e), Class 1 NIHW will not be disposed of "in excess of 20 percent of the total amount of waste (not including Class 1 wastes) accepted during the current or previous year." The amount of waste may be determined by volume or by weight, but the same unit of measure must be used for each year, unless a variance is authorized by TCEQ.

In accordance with 30 TAC §330.173(f), any authorization to accept Class 1 NIHW is subject to the site operating in compliance with 30 TAC §330.173 and any specific conditions required under any letter(s) of authorization. Failure to operate the site in compliance with 30 TAC §330.173 or any special conditions imposed by the Executive Director may result in revocation of the authorization to accept Class 1 NIHW.

Shipments of Class 1 NHIW must be accompanied by a waste manifest document. The waste manifest is to be completed by the generator and transporter and shall accompany the driver of each waste load. The facility will then verify pre-authorization for disposal and complete the destination section of each manifest and return one copy of the completed manifest to the driver. One copy of the completed waste manifest will also be returned to the waste generator within 30 days after receipt of the waste. Manifests are prepared in quadruplicate and the remaining copy will be filed in the Site Operating Record for a minimum of three years. Acceptable manifests will include at least the following information:

- Identity and telephone number of the generator;
- Type and quantity of waste obtained from the generator;
- TCEQ registration number and TCEQ waste code (if applicable); and
- Specific site for disposal.

Additionally, the TCEQ Monthly Waste Receipt Summary will be prepared by the Landfill Manager, or their designee, and submitted to the TCEQ no later than the 25th day of the month following the month that the waste was received. Reports will be on forms provided by the TCEQ and submitted to the Registration and Reporting Section. The facility will file reports including those months in which they receive no Class 1 NHIW at the facility unless the TCEQ grants an exception. The reports will summarize the quantity, character, generator identity, and the method of storage, processing, and disposal of each Class 1 NHIW shipment received and itemizes by manifest document number as required by the TCEQ.

In accordance with 30 TAC §330.179, the requirements of 30 TAC §335.585 through §335.589 are described in the following subsections. Compliance with 30 TAC §335.590(24) related to design standards of the Class 1 facility are provided in Part III – Section 2.2.1, Section 4.3, Table 4-1, and Section 4.6.

7.21.1.1 General Inspection Requirements [30 TAC §335.585]

The Landfill will be inspected in accordance with Section 7.23, which includes a written schedule for inspecting monitoring equipment, safety and emergency equipment, and operating and structural equipment (such as dykes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards. Consistent with 30 TAC §335.585(b)(1), this inspection schedule will be maintained at the Landfill. In addition, the schedule specifies the types of problems to look for during Class 1 waste inspection. The inspection schedule includes the items and frequencies specified in 40 CFR §264.303 for hazardous waste landfills. Areas subject to spills, such as loading and unloading areas, must be inspected daily when in use.

If any deterioration or malfunction of equipment or structures is revealed during the inspection, the facility must provide a remedy on a schedule that ensures that the problem does not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.

The operator will maintain inspection logs and retain these records in accordance with 30 TAC §335.113(2) (relating to Reporting of Emergency Situations by Emergency Coordinator). At a minimum, these records will include date/time of inspection, inspectors name, observations made, and date and nature of repairs, consistent with 30 TAC §335.585(d).

7.21.1.2 Personnel Training [30 TAC §335.586]

Landfill personnel will successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance in accordance with Section 3.2. This training shall be provided by a person trained in waste management procedures and must include instruction that teaches facility personnel waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

The training shall be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems. Procedures will be provided for using, inspecting, repairing, and replacing emergency and monitoring equipment, communications or alarm systems, response to fires or explosions, response to groundwater contamination, and shutdown of operations.

Personnel training must be completed within six months of employment and facility personnel must take part in an annual review of initial training. Personnel records required in 30 TAC §335.586(d) will be maintained in the site operating record, which include the job title of each position and employee name in that position, job description, description of type and amount of training for each position, records of training and job experience. Training records on current personnel must be kept until closure of the facility and training records on former employees must be kept for at least three years from the date the employee last worked at the facility.

7.21.1.3 Waste Analysis [30 TAC §335.587]

The Landfill personnel will follow the waste analysis requirements as specified in 30 TAC §335.587. Before treating, storing, or disposing of any waste, a chemical and physical analysis of the representative sample of the waste shall be obtained. At a minimum, the analysis must contain all the information that must be known to treat, store, or dispose of the waste. A waste generator's records of historic analyses performed or studies conducted on waste generated from processes similar to that which generated the waste to be managed may be included in the information. The generator of the waste will supply the information required upon request from the Landfill Manager. If the generator does not supply the information, and Landfill Manager chooses to accept a waste, the Landfill Manager will be responsible for obtaining the information required.

The waste analysis must include data developed under Subchapter R of Chapter 335 (relating to Waste Classification), and existing published or documented data on a waste or on such waste generated from similar processes. The analysis must be repeated as necessary to ensure that it is accurate and up to date and at a minimum:

- When the owner or operator is notified, or has reason to believe, that the process or operation generating the waste has changed; and
- When the results of the inspection required below indicate that the waste received does not match the waste designated on the accompanying manifest or shipping paper.

Each waste received shall be inspected and, if necessary, analyzed to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper.

7.21.1.4 General Requirements for Ignitable, Reactive, or Incompatible Wastes [30 TAC §335.588]

Precautions shall be taken to prevent accidental ignition or reaction of wastes that are ignitable or reactive as defined in 30 TAC §335.505 (relating to Class 1 waste determination). This waste must be separated and protected from sources of ignition and reaction including, but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, smoking and open flame shall be confined to specially designated locations. "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

Precautions will be taken to prevent reactions which:

- Generate extreme heat or pressure, fire or explosions, or violent reactions;
- Produce uncontrolled toxic mists, dusts, fumes, or gases in sufficient quantities to threaten human health or the environment;
- Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion;
- Damage the structural integrity of the devices or facility; or
- Through other like means threaten human health or the environment.

The Landfill Manager will maintain documentation of compliance with this section when required. This documentation may be based on references to published scientific or engineering literature, data from trial tests (e.g., bench scale or pilot scale tests), waste analyses as specified in Section 7.21.1.3, or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.

7.21.1.5 Contingency Plan [30 TAC §335.589]

This Class 1 waste contingency plan has been developed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of Class 1 waste or constituents of such waste to air, soil, or surface water. The provisions of the plan must be carried out immediately whenever there is a fire, explosion, or release of waste or constituents of such waste that could threaten human health or the environment.

A copy of this Class 1 waste contingency plan and all revisions to the plan must be maintained at the facility and submitted to the local providers that may be called upon to provide emergency services (as identified subsequently in this plan).

This Class 1 waste contingency plan must be reviewed and updated, if necessary, whenever:

1. The facility permit affecting Class 1 waste operations is revised;
2. The plan fails in an emergency;
3. The facility changes in its Class 1 waste design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions or releases of Class 1 waste or constituents of such waste, or changes the response necessary in an emergency; or
4. The list of emergency equipment materially changes.

7.21.1.5.1 Emergency Contacts

The Landfill Manager or his designee will maintain a list of names, addresses, and phone numbers (office and home) of persons qualified to act as Emergency Coordinator (as discussed subsequently in this plan), and this list must be kept up-to-date and at the facility. Where more than one person is listed as the Emergency Coordinator, one must be named as primary Emergency Coordinator and others must be listed in the order in which they will assume responsibility as alternatives.

The facility is within the coverage area of the following emergency service providers:

- Victoria City Police Department;
- Victoria Fire Department;
- DeTar Hospital North; and
- Texas Department of Public Safety (Emergency Spill Response).

7.21.1.5.2 Emergency Equipment

Class 1 waste related emergencies at the facility could potentially involve spills or fires. Accordingly, the emergency equipment related to Class 1 waste and its location on-site is listed below.

Table 7-4: Emergency Equipment

Item	Location	Capabilities
Class A/B/C Fire Extinguishers	One per piece of heavy equipment involved in Class 1 waste operations (e.g., excavator, bulldozer)	Extinguish small combustion fires
Site Two-Way Telecommunication Radios or Cellular Phones	One per site personnel assigned to Class 1 waste operations, including Landfill Manager or his designee	Maintain contact among site personnel; inform personnel or emergency situations

This list of emergency equipment must be kept up to date.

7.21.1.5.3 Evacuation Plan

In the event the facility needs to be evacuated, the following actions will be taken:

- The Emergency Coordinator (discussed subsequently in this contingency plan) will designate emergency response team leaders, who will notify all personnel at the facility to evacuate the site immediately.
- The scale house located in the southeastern portion of the site near the main entrance/exit will be the primary evacuation rally point for facility personnel to gather during the evacuation. The evacuation routes to reach this rally point are via the main site haul roads and perimeter roads.
- Emergency response team leaders will take a head count of facility personnel once they arrive at the designated rally point. Each response team leader will report back to the Emergency Coordinator of whether their personnel are accounted for.

7.21.1.5.4 Emergency Coordinator

The Landfill Manager or his designee will serve as the primary Emergency Coordinator, so that there is an Emergency Coordinator either on the facility premises or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. The Emergency Coordinator will be thoroughly familiar with this Class 1 Waste Contingency Plan, operations and activities at the facility, the location of records within the facility, and the facility layout. In addition, this person has the authority to commit the resources needed to carry out this Class 1 Waste Contingency Plan.

7.21.1.5.5 Emergency Procedures

Whenever there is an imminent or actual emergency such as a release, fire, or explosion that could threaten human health or the environment, the Emergency Coordinator will immediately:

- Notify appropriate facility personnel in person or by phone (two-way site telecommunications).
- Assess the situation by identifying the character, exact source, amount, and areal extent of any released materials. The Emergency Coordinator may do this by observation or review of facility records or manifests, and, if necessary, by chemical analysis. This assessment will consider possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any surface run-off from water or chemical agents used to control fire and heat-induced explosions).

- If help is needed, notify appropriate state or local agencies with designated response roles. If the Emergency Coordinator determines that the facility has had a release, fire, or explosion that could threaten human health or the environment outside the facility, the following applies:
  If the Emergency Coordinator's assessment indicates that evacuation of local areas may be advisable, the Emergency Coordinator will immediately notify appropriate local authorities, and must be available to help appropriate officials decide whether local areas should be evacuated. This includes an immediate notification of the National Response Center (using their 24-hour toll free number 1-800-424-8802). The report must include:
  - name and telephone number of person making report;
  - name and address of facility;
  - time and type of incident (e.g., release, fire);
  - name and quantity of material(s) involved, to the extent known;
  - the extent of injuries, if any; and
  - the possible hazards to human health, or the environment, outside the facility.
- During an emergency, the Emergency Coordinator will take reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other waste at the facility. These measures must include, where applicable, stopping operations, collecting and containing released waste, and removing or isolating containers. Further details are presented in the bullets that follow.
- Should any accidental spill of Class 1 wastes occur at the facility, it will be immediately contained by earthen dikes, berms or by other appropriate measures. The Landfill Manager or his designee will be promptly notified of the spill and will coordinate the collection and disposal of the spilled material. The spilled wastes will be picked up mechanically or by employees wearing proper protective equipment and managed according to procedures for handling the special waste.
- For larger spills, or where there is potential for the waste to impact waters of the state, the Emergency Coordinator will assess the situation and determine the appropriate means to contain and collect the material. If spilled material threatens to impact storm water discharge from the site, the Landfill 'Manager or his designee will use booms or diversionary dikes, or excavate holes or pits as needed to contain the spilled material. Equipment typically available for spill response includes excavators, backhoes, dozers, pumps, and haul trucks. In the event of a spill that cannot be picked up using hand-held tools, this equipment will be used as needed to contain and collect spilled material. For larger spills of liquid wastes that cannot be adequately cleaned up with on-site equipment, a qualified emergency cleanup contractor or vacuum truck company will be contacted to assist with cleaning up the spill. Once the liquids are removed, a visual inspection of

the spill area will be made, and soils observed to be potentially impacted will be over-excavated and disposed with the collected material as described below.

- Should an incident occur where hazardous wastes, radioactive waste, or other prohibited wastes are suspected or discovered, the waste will not be authorized for disposal but instead will be isolated until the material can be adequately identified to determine the proper disposition/remediation of the material and the appropriate handling procedures. During this identification process, the generator's representative will be contacted to determine the identity of the material, and the planned disposition/ remediation of the material. The proper disposition/remediation of the prohibited waste will be specific to the waste and will be implemented.
- Immediately after an emergency incident, the Emergency Coordinator will provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility. The owner or operator will classify all recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility in accordance with TCEQ rules.
- The Emergency Coordinator will ensure that in the affected area(s) of the facility:
  - no waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and
  - emergency equipment listed in this Contingency Plan is cleaned and fit for its intended use before operations are resumed

7.21.2 Class 2 and Class 3 Industrial Waste

Class 2 and Class 3 industrial solid wastes will be accepted at the facility provided the acceptance does not interfere with facility operation. Industrial waste (nonhazardous) is defined by 30 TAC §330.3 as solid waste resulting from or incidental to any process of industry or manufacturing, or mining or agricultural operations, classified as follows:

- Class 2 Industrial Solid Waste - any industrial solid waste or combination of industrial solid wastes that cannot be described as Class I or Class III, as defined in 30 TAC §335.506 (relating to Class II waste determination). Examples of Class II Industrial Waste include "plant trash" or waste originating in the facility offices or plant production areas that are composed of paper and/or wooden packaging materials, glass, aluminum foil, aluminum cans, aluminum scrap, stainless steel, steel, iron scrap, plastics, Styrofoam, rope, twine, uncontaminated rubber, uncontaminated wooden materials, equipment belts, wiring, uncontaminated cloth, metal buildings, empty containers with a holding capacity of five gallons or less, uncontaminated floor sweepings, or food packaging, that are produced as a result of plant production.

- Class 3 Industrial Solid Waste - any inert and essentially insoluble industrial solid waste, including materials such as rock, brick, glass, dirt, and certain plastics and rubber, etc. that are not readily decomposable as defined in 30 TAC §335.507 (relating to Class III waste determination).

7.22 Visual Screening of Daily Operations [30 TAC §330.175]

TCEQ may require visual screening of disposal operations at the Landfill. Existing vegetation in the buffer zones will be maintained, where possible, to provide visual screening of disposal operations from public view. A landscaped area will be provided at or near the entrance to the site and other areas as determined by the Landfill Manager. The facility will be operated in a manner that will provide the maximum screening possible within the requirements of the design. Upon completion of filling, additional landscape berms and foliage will be installed. Final landscaping, consisting of grass seeding on the fill final cover, will be performed upon the completion of each sector.

7.23 Site Inspection and Maintenance List

Table 7-5: Site Inspection and Maintenance Requirements

Item	Task	Frequency	Inspector	Inspection Documentation
Fence/Gates	Inspect perimeter fence and gates for damage. Make repairs if necessary.	Weekly	Landfill Manager or Designee	Document inspection in the Site Operating Record. Notification to Regional Office of a breach (if any).
Wind Blown Waste	Police working fence area, wind fences, access roads, entrance area, and perimeter fence for loose trash. Clean up as necessary	Daily as specified in Section 7.5.	Landfill Manager or Designee	Document inspection in the Site Operating Record
Waste Spilled on Route to Site	Police the entrance areas and all roads at least two miles from the site entrances for loose trash. Clean up as necessary.	Daily as specified in Section 7.8.	Landfill Manager or Designee	Document inspection in the Site Operating Record
Landfill Markers	Inspect all landfill markers for damage, color-coding, and general location. Correct or replace damaged markers within 15 days of discovery.	Monthly	Landfill Manager or Designee	Document inspection in the Site Operating Record
Site Access Road	Inspect site access road for damage from vehicle traffic, erosion, or excessive mud accumulation. Maintain as needed with crushed rock or stone. Grading equipment will be used at least once per week to control or remove mud accumulations on roads as well as minimize depressions, ruts, and potholes.	Daily or more often during wet weather or extended dry weather periods.	Landfill Manager or Designee	Document inspection and repairs in the Site Operating Record
Daily Cover	Inspect for proper placement, thickness, and compaction. Correct problems as needed. Verify that vectors are not an issue	Daily at the active face. All daily cover areas will be inspected within 72-hours of a rainfall event of 0.5 inches or more.	Landfill Manager or Designee	Document inspection in the Site Operating Record

Item	Task	Frequency	Inspector	Inspection Documentation
Intermediate Cover	Inspect for proper placement, thickness, erosion, compaction and for presence of waste or other contamination. Correct problems as needed.	Weekly and within 72-hours of a rainfall event of 0.5 inches or more.	Landfill Manager or Designee	Document inspection in the Site Operating Record
Final Cover	Inspect for proper placement, thickness, compaction, slope, settlement, and erosion. Maintenance will be ongoing throughout post-closure care period. Correct problems as needed.	Weekly and within 72-hours of a rainfall event of 0.5 inches or more.	Landfill Manager or Designee	Document inspection in the Site Operating Record
Leachate	Measure depth of leachate in sump, as required.	Weekly	Landfill Manager or Designee	Document inspection in the Site Operating Record
Site Signs	Inspect all site signs for damage, general location, and accuracy of posted information.	Weekly	Landfill Manager or Designee	Document inspection in the Site Operating Record
Ponded Water	Inspect site for unauthorized ponded water areas as described in Section 7.19. Correct problems as needed.	Weekly and within 72-hours of a rainfall event of 0.5 inches or more.	Landfill Manager or Designee	Document inspection in the Site Operating Record
Odor	Inspect the perimeter of the site to access the performance of site operations to control odor.	Daily	Landfill Manager or Designee	Document in the Site Operating Record.
Perimeter Channels	Inspect perimeter channels to verify that they are functioning as designed (e.g., excess sediment removed, outlet structures intact, erosion control measures intact)	Weekly and within 72-hours of a rainfall event of 0.5 inches or more.	Landfill Manager or Designee	Document in the Site Operating Record.
Surface Drainage Systems	Inspect ponds and basins, perimeter ditches, swales, and berms to verify they are functioning as designed (e.g., excess sediment removed, outlet structures intact, erosion control measure intact)	Weekly and within 72-hours of a rainfall event of 0.5 inches or more	Environmental Manager or Designee	Document inspection in the Site Operating Record
GCCS	Verify GCCS is operating and maintained in accordance with all applicable requirements.	Monthly	Environmental Manager or Designee	Document in the Site Operating Record

8.0 SEQUENCE OF DEVELOPMENT

The sequence of development of the City of Victoria Landfill is provided in Attachment III-1 – Drawing III.A1.3 (Landfill Cell Expansion Plan). The Site will be constructed and filled starting in the northern portion of the site and moving to the southern part of the site. The order of development for the southern portion of the site is shown in Attachment III-1 – Drawing III.A1.4 (Waste Placement Phasing Plan). The area method of excavation will be used for the remainder of the site where practical.

As shown in Attachment III-1 - Drawing III.A1.4, site development in the lateral expansion area will begin with Cell G2 and move southwest to Cell A1. Composting operations will continue in the existing location and these wells will be maintained consistent with the requirements in 30 TAC §330.61(l)(1) as demonstrated in Part III SDP. Site development after Cell A1 will continue with Cell H1 and move northeast to Cell I2. Compost facility relocation to a new parcel will occur prior to affected expansion development through the TCEQ registration process for composting operations.

9.0 SAFETY

9.1 General Site Safety

Properly trained personnel using well-maintained equipment to perform standard work procedures in accordance with Occupational Safety & Health Administration (OSHA) guidelines will promote site safety. Limiting access to the active areas to only authorized personnel will enhance site safety. In the event of an emergency, planned emergency response procedures will be followed.

All site personnel will receive appropriate site-specific training in at least the following areas:

- Safe work practices
- Equipment and vehicle safety
- Site access controls
- Hazardous material communication
- Fire safety
- Emergency response
- Employee rights and responsibilities

A record of training will be maintained to confirm that each employee has received the proper training (refer to Section 3.2 for additional information).

Well-maintained equipment is vital to the safe conduct of daily landfilling operations. Therefore, all site equipment will be maintained in proper working order and all safety guards, backup alarms, and engine kill switches will be operational. Equipment Operators will perform an equipment check at the beginning of each workday. Fire extinguishers will be inspected routinely (refer to Section 6.0 for additional information).

Access to the site will be limited to authorized personnel as described in Section 7.1 of this SOP. Access is controlled by a combination of signs and physical barriers. Site personnel are responsible to be alert for the entrance of unauthorized personnel or the entrance of authorized personnel into prohibited areas.

In the event of an emergency, site personnel will assess the situation, notify the Landfill Manager or designee, and take appropriate actions such as rendering aid, calling for assistance, or closing access to the emergency scene. Emergency numbers will be posted, which include:

- Ambulance 911

- Fire 911
- Sheriff/Police 911

9.2 Preparedness and Prevention Measures

Preparedness and prevention measures have been developed to minimize both frequency and severity of accidents and emergency situations threatening human health and the environment. Preparedness and prevention measures depend largely on the attentiveness and state of readiness of facility personnel. Preparedness and prevention measures have been developed for one general category and two specific areas of the site: the Scale House and the onsite access routes. These preparedness and prevention measures are detailed in the following sections.

9.2.1 General

General preparedness and prevention measures that will be followed at the City of Victoria Landfill are:

- Access controls will provide for the safety of non-landfill personnel.
- Routine preventive maintenance of equipment will be provided.
- A management representative will perform site inspections as noted in Section 7.23.
- Appropriate personnel safety equipment will be kept onsite and maintained in good repair.
- Adequate turning area for hauling vehicles will be provided.
- Salvaging and scavenging will not be allowed.
- Waste unloading will be restricted to designated areas only.
- Site personnel will be alert for possible hazardous or other unauthorized wastes.
- Nonapproved wastes will be controlled or contained and removed, as necessary.

9.2.2 Scale House

Preventive measures that will be implemented at the Scale House include the following:

- Visually screening all incoming loads for unauthorized wastes.
- Monitor incoming wastes to ensure that all wastes loads are adequately covered, or otherwise secured or contained.
- Visually observe incoming vehicles for evidence of improper operation, faulty equipment, or other conditions that could be hazardous to personnel or other persons on site.
- Maintain access to appropriate emergency equipment and first-aid materials.
- Provide emergency telephone numbers that are conspicuously posted in the scale house, office (if separate from the scale house), and the breakroom.

9.2.3 Landfill Haul Road and Access Road

Preventive measures that will be implemented for the landfill haul road and access road include:

- Display speed limit, directional, and other precautionary signs on-site.
- Provide road passage for two-way traffic.
- Maintain roadway free from obstructions.
- Enforce requirements for safe operation of vehicles onsite.

10.0 LEACHATE AND CONTAMINATED WATER

Leachate and contaminated water will be controlled consistent with the Attachment III-3 Leachate and Contaminated Water Plan.

Leachate and gas condensate will only be recirculated if authorized. Only leachate and gas condensate will be recirculated into the waste. Consistent with 30 TAC §330.177, recirculation of leachate or gas condensate will only occur over the areas underlain by a composite liner system with leachate collection system. Leachate may be recirculated by methods such as surface spraying at the working face. Leachate will be distributed with a water truck or similar equipment to distribute leachate within the working face area contained by the working face containment berm. Recirculation of gas condensate will follow the same procedures as recirculation for leachate. To maintain compliance with 30 TAC §330.991, leachate and gas condensate will be recirculated at a rate not to exceed 100,000 gallons per day, and in accordance with 30 TAC §330.177. Air emissions are authorized from leachate and gas condensate stored in tanks in accordance with 30 TAC §330.991(7).

The rate of recirculation will be controlled to not result in seeps or ponding, and will cease over a specific area if the leachate flow rate to the sump approaches the capacity of the sump pump. If ceased, recirculation may move to a different trench (i.e., areas sharing a sump). Additionally, leachate recirculation will not occur during times immediately before, during, or immediately after rainfall events; during high wind events; or during freezing periods that could affect the holding capacity of the waste.

While the Landfill does not currently use recirculation to manage leachate, if leachate recirculation is used, excess leachate will be directed to the leachate storage tanks.

APPENDIX IV-B – SPECIAL WASTE ACCEPTANCE PLAN

Part IV-Appendix B Special Waste Acceptance Plan

City of Victoria, Texas

City of Victoria Landfill Lateral and Vertical Expansion
Project No. 107608

Revision 2, November 18, 2022

Part IV-Appendix B Special Waste Acceptance Plan

prepared for

City of Victoria, Texas
City of Victoria Landfill Lateral and Vertical Expansion
Victoria County, Texas

Project No. 107608

Revision 2, November 18, 2022

prepared by

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Austin, Texas
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PROFESSIONAL ENGINEER
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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
mg/kg	Milligrams per kilogram
mg/L	Milligrams per Liter
MSW	Municipal solid waste
NRG	National Response Center
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyls
QA/QC	Quality Assurance / Quality Control
RACM	Regulated Asbestos Containing Materials
RRCT	Railroad Commission of Texas
SDS	Safety Data Sheets
SWAA	Special Waste Acceptance Authorization
SWAP	Special Waste Acceptance Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TSCA	Toxic Substances Control Act
U.S.	United States

1.0 PURPOSE AND SCOPE

The Texas Commission on Environmental Quality (TCEQ) municipal solid waste (MSW) regulations currently define a special waste as a "solid waste or combination of solid wastes that because of its quantity, concentration, physical or chemical characteristics, or biological properties requires special handling and disposal to protect the human health or the environment (30 TAC §330.3(154))." The specific waste streams considered to be special wastes are listed in §330.3(154)(A)-(S), and numerous wastes that are routinely managed at MSW landfills (Landfills) are included within this definition.

The receipt of those special wastes identified in 30 TAC §330.171(c)-(d) do not specifically require written approvals for acceptance if handled in accordance with the waste management provisions noted in those regulations. The acceptance and/or disposal of all special wastes not identified in 30 Texas Administrative Code (TAC) §330.171(c)-(d) require prior written approval from the executive director. Requests for approval to accept special wastes shall be submitted by the generator to the Executive Director or to a facility with an approved plan. All requests shall include an operational plan containing the proposed procedures for handling each waste and listing required protective equipment for operating personnel and on-site emergency equipment. Requests shall also include a Contingency Plan outlining responsibility for containment and clean-up of any accidental spills occurring during the delivery or disposal of the waste. Special wastes requiring written approval from the Executive Director will not be accepted unless the generator first provides the written acceptance to the City.

This Special Waste Acceptance Plan (SWAP) has been prepared with the intent of becoming an approved SWAP. Once approved, the SWAP will be maintained in the Site Operating Record.

According to 30 TAC 330.171(b)(l), approvals will be waste specific and/or site specific. This plan has been developed in order to receive site-specific authorization to accept special waste including non-industrial special wastes and Class 1, 2 or Class 3 industrial wastes.

Soils contaminated by petroleum products, crude oils, or chemicals in concentrations of greater than 1,500 milligram per kilogram (mg/kg) total petroleum hydrocarbons; or contaminated by constituents of concern that exceed the concentrations listed in Table 1, Constituents of Concern and Their Maximum Leachable Concentrations in 30 TAC §335.521(a)(1) must be disposed in dedicated cells that meet the requirements of 30 TAC §330.331(e).

The executive director may authorize the receipt of special waste with a written concurrence from the facility, however, the facility operator is not required to accept the waste. The executive director may