MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT-2ND NOD RESPONSE

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: March 2023

Prepared by:

PROJECT NUMBER: 150051.05.01

PROJECT CONTACT: Julie Morelli

EMAIL: Julie.Morelli@powereng.com

PHONE: 210-951-6424

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

REDLINE/STRIKETRHOUGH VERSION

NOD ID	MRI ID	App. Part	Citation	Location	2nd NOD Type	NOD Description	Response
NT1	12	General	330.57(d)	Parts I through IV	Format	Where referring to earlier work carried over to 1848A from the existing permit 1848 (for example, work by Snowden), provide complete reference with page number to location where information can be found in 1848 application.	We added references to the original application where appropriate.
2	12	General	330.57(d)	Part I Form	Incomplete	Provide attachment to Part I form showing identity and location of easements within proposed facility boundary.	This is included as Figure I-5 in Attachment 5 of Part I.
3	22	General	330.57(g)(3)	Parts I through IV	Incomplete	Revise application master table of contents to include all Part III, Attachment E appendices, and appendices to other attachments that are not listed.	The Table of Contents has been updated to include all application appendices.
4	24	General	330.57(g)(5)	Parts I through IV	Inconsistent	Provide a page number and revision date on all pages in the application. Use a consistent numbering system. Include application part and attachment identifier in page numbers. Provide page numbers on pages in included historical reports.	Additional page numbers have been added.
5	70	Part I	330.59(b)(1); 305.45(a)(1)	Form 0650, Section 12	Inconsistent	Verify benchmark latitude, longitude, and elevation. Revise Part I form, Core Data Form, drawings, and text accordingly.	The forms and drawings were reviewed and we have added the Lat/Long information to Drawing D-1 where we had state plane coordinates before.
6	148	Part II	330.61(j)(1)	Part II, Attachment G	Incomplete	Add references to geologic map and fault map in application.	Added to Part II, Attachment 6, General Geology page 2-19 and Geologic Fault Assessment page 2-21).
7	148	Part II	330.61(j)(3)	Part II, Attachment G	Incomplete	Provide seismic impact zone map showing landfill location in Part III, Attachment E, and reference the map.	Added a graphic in Part II.
8	152	Part II	330.61(k)(1)	Part II, Attachment H	Incomplete	In second paragraph, clarify that “MW” refers to groundwater monitor well.	Added Figure 3-8 Seismic Impact Zone and reference in Part, II, Attachment G.
9	152	Part II	330.61(k)(1)	Part II, Attachment H	Incomplete	Reference a figure that shows the location of groundwater monitor wells.	Added stated that to include MW refers to Monitor Wells.
10	152	Part II	330.61(k)(1)	Part II, Attachment H	Incomplete	Clarify the statement “annual detection monitoring events rotate around the Landfill from MW-A to MW-G and then in a counterclockwise rotation.”	Part III, Attachment D1, Figure D1.1 Site Layout Plan
11	N/A	Part II	330.61(g)	Part II, Attachment D		Provide a key to codes shown on zoning map. Provide full text of the link to the map source in the footnote (https://schertz.maps.arcgis.com/apps/webappviewer/index.html?id=1750bcfcad3642eeac482bddcbad3d91).	Adding a new Figure 2-4 to depict zoning information on a separate figure. Other figures have been renumbered accordingly. Requested information has been added.
12	291 and 292	Part III	330.305(b) and 330.305(c)	Attachment D6, Figure D6-A	Incomplete	Note that one foot of freeboard for the 25-year, 24-hour rainfall event shall be provided pursuant to 30 TAC 330.207(b). Provide design calculations, including cross-sectional details for the containment berms.	Figure D6-A has been revised to show one foot of freeboard for the containment berms. The design calculations and cross-section for the proposed berms is shown on this figure.

13	294	Part III	330.305(d)(1)	Attachment C, Section 1.1	Incomplete	Provide calculations to show that the estimated velocities will be less than the permissible non-erodible velocities at the top surfaces, and on the slopes during all phases of landfill operation.	Sheet flow velocity calcs have been added to Appendix C1-F for operational and intermediate cover conditions that shown the sheet flow velocities will be less than 6 ft/sec and therefore non-erosive. Sheet flow velocity calcs have been added to Appendix C1-E for final cover conditions that shown the sheet flow velocities will be less than 6 ft/sec and therefore non-erosive.Erosion calculations were proved in Appendix C1-G for the intermediate cover condition and Appendix C1-E for the final cover condition.
14	296	Part III	330.305(e)	Appendix C1-E and C1-F	Incomplete	a) Revise Surface Water Drainage Report to maintain consistency for calling out names of drainage structures (e.g, berm, swale, bench, perimeter channel, chute/down chute, etc.)	The report has been revised to be more consistent with the names used for drainage features.
						b) Provide calculations to demonstrate that low non-erodible velocities will be maintained in section of each perimeter berm, side slope bench and top deck bench.	The velocity calculation for the worst-case perimeter berm is included on Page C1-D-5. A velocity calculation for the worst-case sideslope bench has been included on Page C1-E-5 and the worst-case velocity is 10.41 ft/sec, and the bench is protected with erosion control matting. A velocity calculation for the worst-case downchute has been included on Page C1-E-7 and the worst-case velocity is 10.94 ft/sec.
15	298	Part III	330.305(e)(2)	Appendix C1-F	Incomplete	a) Revise Appendix C1-G to provide design calculations, including cross-sections for temporary berms/benches on the slopes, letdowns, perimeter berms, and detention pond/ sedimentation basin for the interim phase of landfill operation.	Cross-section information has been added for the temporary berms and was already included for the temporary downchutes. Rational Method calculations have been added for each of these features to establish a maximum contributing drainage area for each of them.
						b) Describe for the dimensions (e.g., 10', 14', 22', etc.), as indicated for cross-section of Typical Perimeter Berm (Figure C1-2A), and for Typical Bench (Figure D3.1).	Typical Perimeter Berm on Sheet C1-2A: 2' is the top width of the berm and the height of the berm. 10' is the top width and height of the additional soil dike being constructed to protect the waste from the floodplain. See Figure D-2 for additional information on proposed 10' high soil dike. Typical Bench on Sheet D3.1: 7' is the width of the portion of the bench sloping back toward the landfill at 7:1. 22' is the total width of the bench.
16	299	Part III	330.305(f)(1)	Attachment C1	Incomplete	Revise the chute design calculations using Rational Method for the worst-case flow conditions, as the largest contributing area appears to be 66.3 acres, or include discussion in narrative application to justify using HEC-HMS for designs of chutes.	A Rational Method Calculation for this downchute has been added to Appendix C1-E. The calculated peak 25 year flow via the Rational Method is 338.8 cfs. A new Flowmaster calculation for this downchute that utilizes the Rational Method flowrate has been inserted in Appendix C1-E.
17	302	Part III	330.305(g)	Attachment D6, Section 2.2	Incomplete	Provide design details for storage areas with one foot of freeboard for the contaminated water with regard to size, locations, and methods.	Section 2.2 has been revised to reference the requirement for one foot of freeboard and to state that the berms will be made of clay soil and utilize the berm cross-section shown on Figure D6-A. The temporary berm locations will be chosen based on areas where contaminated water needs to be stored within the lined disposal area.

18	306	Part III	330.63(c)(1)(B)	Appendix C1-D	Incomplete	Provide velocities, and flowline elevations along the entire length of the perimeter berm.	Flowline elevations for the entire length of the perimeter berm are provided on Drawings C1-2A through C1-2F. The velocity along each berm is constantly changing as additional drainage area is being collected and it not practicle to provide velocities along the entire length. We have provided the worst-case velocity for all the perimeter berms on Page C1-D-5 and the velocites along all other sections of the berms are lower than this value.
19	311	Part III	330.63(c)(1)(D)(ii)	Appendix C1-B and Appendix C1-C	Incomplete	Provide hydraulic calculations and designs for interim phases of landfill operation, including for sizing the berm/benches on slopes, chutes, and for sedimentation/detention facilities.	The design information for the temporary features is included in Appendix C1-G. Rational Method calculations have been added for temporary berms and downchutes as part of a response to a previous comment. There is no interim configuration for the detention pond.
20	313	Part III	330.63(c)(1)(D)(iv)	Appendix C1-D and C1-E	Incomplete	Provide designs (including cross-sectional details) for intersections of chutes and berms/benches on slopes, and perimeter berm. Note that the slopes of the sides and toe will be graded in such a manner as to minimize the potential for erosion.	New details for the tie-in between the perimeter berm and the downchutes and the benches and the downcute have been included as Figure C3-2A.
21	316	Part III	330.63(c)(2)(C)	Attachment C2	Incomplete	a) Provide information detailing the specific flooding levels and other events (e.g., design hurricane projected by Corps of Engineers) that impact the flood protection of the facility.	The predicted flooding in this area is not based on a design hurricane. It is devloped based on predicted rainfall in the Cibolo Creek watershed. The rainfall levels that create the 100-year flooding levels are included in Attachment C1.
						b) Correct the legend information for the permit boundary, waste footprint, and for 100-yr flood plain affected areas on Figure C2-1 to identify each of them.	Figure C2-1 is the existing FEMA map, the only information added to this map was the permit boundary and the landfill footprint, which are both correct. The extents of the 100 year floodplain are part of the map and we did not edit them.
						c) Include cross-sections of landfill levees shown tied into contours.	The perimeter dike cross-section(s) are shown tied into the existing contours on Figures D2-1 and D2-2 in Attachment D2.
						d) Include correspondences with FEMA, or with other agencies in Appendices for the record.	FEMA correspondence has been added to Appendix C2.
22	318	Part III	301.33(a)(1)	Part III-Attachment D, Figure D-2, and Attachment C2	Incomplete	Include the 1st NOD response in an appropriate section of the application.	An Application Correspondence section has been added after the initial table of contents and a copy of the fist NOD response letter will be placed there.
23	335	Part III	330.63(c)(2)(D)	Attachment C2	Incomplete	a) Provide a Conditional Letter of Map Amendment from FEMA.	A Conditional Letter of Map Amendment is not the appropriate mechanism to revise the floodplain for this site. The perimeter berm around the landfill was incorporated into the current FEMA model as a blocked obstruction. Now that the berm has been completely constructed, a Letter of Map Revision (LOMR) is the appropriate mechanism to revise the floodplain. The proposed pond has been authorized as a no-rise condition by the local floodplain administrator and additional authorization from FEMA is not required.

						b) Since the detention pond construction is proposed in the floodway, provide a Corps of Engineers Section 404 Specification of Disposal Sites for Dredged or Fill Material permit.	Based on the information provided in Part II, Attachments J & K there are no wetlands or other federally jurisdictional features in the area near the proposed pond, so a permit for dredging or filling under Section 404 is not required.
24	351	Part III	330.63(d)(4)(E)	Attachment D2	Incomplete	Soil borings, groundwater monitoring wells, and gas monitoring probes were not found along the sections on Figures D2-1 and D2-2.	We have included the closest groundwater and methane monitoring wells to the sections, where appropriate.
25	352	Part III	330.63(d)(4)(E)	Attachment D2	Incomplete	Label the slurry wall on Figures D2-1 and D2-2.	The slurry wall is labeled on the left side of each cross-section.
26	356	Part III	330.63(d)(4)(F)	Attachment D3	Incomplete	Figure D3.1. Provide details for the tie-in from the final cover to the existing perimeter berm and the tie-in between the proposed perimeter berm and the existing perimeter berm.	Figure D3.2 has been created to show this information.
27	397	Part III	330.339(a)	Attachment D7	Incomplete	Define the construction of the proposed perimeter berm in the SLQCP.	Section 3.5 has been added to Attachment D7 to add requirements for the perimeter berm construction.
28	399	Part III	330.339(a)(1)	Attachment D7	Omitted	Define the lift thickness on the drawing.	The maximum lift thickness was added to Figure D3.1 in Attachment D3.
29	413	Part III	330.339(c)(4)(A)	Attachment D7	Incomplete	The procedure for addressing failing permeability tests was not found in Section 4.5.	We have added a sentence at the end of Section 4.8.2 to address failing permeability tests, since Section 4.5 is primarily referring to density tests.
30	421	Part III	330.339(c)(9)	Attachment D7	Incomplete	The requirement to complete clay liner construction prior to placing protective cover was not found in Section 5.1.	A sentence was added to the first paragraph of Section 5.1 to clarify that protective cover will not be placed until clay liner construction is complete.
31	474	Part III	330.63(e)	Attachment E	Inconsistent	Update section numbering in table of contents; list figures, tables, and appendices.	Document formatting updated.
32	474	Part III	330.63(e)	Attachment E	Inconsistent	Correct inconsistent section and figure numbering, and references in text.	Document formatting updated.
33	474	Part III	330.63(e)	Attachment E	Inconsistent	Revise appendix titles or references in text for consistency.	Document formatting updated.
34	474	Part III	330.63(e)	Attachment E	Inconsistent	Revise Section 1.0, regarding prior documents, to clarify the documents are included in the appendices to this application.	Complete
35	474	Part III	330.63(e)(1)(B)	Attachment E	Inconsistent	Show approximate position of facility on regional stratigraphic cross section in Figure 3-3.	The Regional Cross Section bisects Guadalupe County at Seguin. Added highlight to county where approximate location of Landfill lies relative to the Regional Section. Facility Cross Section provided in Appendix E-4.
36	474	Part III	330.63(e)(2)	Attachment E	Inconsistent	Provide better quality fault map for Figure 4. Show facility location and features mentioned in the text.	Updated Figure 3-4 with a dataset from USGS, zooming in and cross referencing against the Text.
37	474	Part III	330.63(e)(3)	Attachment E	Incomplete	In discussion of historical groundwater information at bottom of page E-8, reference where the data are located in the application.	Added the reference to Part III, Attachment F, Appendix F-1
38	474	Part III	330.63(e)(3)	Attachment E	Incomplete	Expand radius in Figure 3-5 to show recharge areas within 5 miles of the proposed facility boundary.	Figure 3-5 is updated with a five mile radius
39	474	Part III	330.63(e)(3)	Attachment E	Incomplete	Provide better quality copy of potentiometric surface map in Figure 3-6. Provide a map based on data more recent than 1974 or explain why the map based on data from 1974 is used.	The 1974 map (republished in 1986) represents the current mapped groundwater direction. A more current map was not found. Additional information on the seasonal and local Leona Aquifer has been added to this Attachmentt, but no mapped potentiometric surfaces were identified.

40	474	Part III	330.63(e)(4)	Attachment E, Section 3.1.3	Incomplete	Revise first paragraph of Section 3.1.3 to clarify whether "supplemental borings" refers to borings drilled in 2020, or earlier borings.	Corrected. Supplemental borings referred to those adavnced in 2020.
41	474	Part III	330.63(e)(4)	Attachment E, Section 3.1.3	Incomplete	Indicate where in Part III, Attachment D-5 the original geotechnical analysis and supplemental borings referenced in Section 3.1.3 are located.	Added reference to Part III, Attachment D-5, Appendix C
42	494	Part III	330.63(e)(4)(G)	Attachment E, Section 3.1.4	Incomplete	Provide geologic cross sections through the facility prepared from recent and historical borings.	Completed for recent borings. Historical information is being interpreted.
43	501	Part III	330.63(e)(5)(B)(iii)	Attachment E, Section 3.1.5	Incomplete	Add column for sample elevations to tables of grain-size analyses and moisture content.	Elevation data was not included with original boring data. Information will be interpreted, as feasible, on cross sections.
44	504	Part III	330.63(e)(5)(D)	Attachment E	Incomplete	Provide complete historical groundwater elevation data for all monitoring wells, piezometers, and other borings.	Piezometers are not monitored, therefore no information is available.
45	506	Part III	330.63(e)(5)(E)	Attachment E	Incomplete	In Section 330.63(e)(5)(E), indicate when groundwater monitoring began, and provide complete reference to location of table in Part III, Attachment F.	Added reference to Part III, Attachment F, Appendix F-2
46	506	Part III	330.63(e)(5)(E)	Attachment E	Incomplete	Include historical groundwater sampling results for volatile organic compounds in the data summary in Attachment F.	Monitoring well information has been added.
47	506	Part III	330.63(e)(5)(F)	Attachment E	Incomplete	In Section 330.63(e)(5)(F), clarify if Leona Aquifer is present at the site. Clarify which unit is the uppermost aquifer.	Clarified that the Leona has been mined out and that the uppermost aquifer in its absence would be the Edwards.
48	508	Part III	330.63(f)	Attachment F	Inconsistent	Revise the permit number to 1848A throughout Attachment F.	This change has been made
49	508	Part III	330.63(f)	Attachment F	Incomplete	List figures and tables in the table of contents.	Added
50	508	Part III	330.63(f)	Attachment F	Incomplete	Revise table numbers and section references throughout Attachment F to be consistent with document structure.	Added
51	508	Part III	330.63(f)	Attachment F	Incomplete	Revise installation date listed in Table 3-1 for MW-D and PZ-D to be consistent with dates on data sheets.	Including the new logs from Jedi provided by Beck on 3/9
52	508	Part III	330.63(f)	Attachment F	Incomplete	Provide a map in Attachment F showing the proposed permit boundary, landfill unit boundary, and existing and proposed groundwater monitor well locations.	
53	508	Part III	330.63(f)	Attachment F	Incomplete	Provide groundwater gradient map reference in Section I.	The requested information has been added
54	508	Part III	330.63(f)	Attachment F	Incomplete	Revise the last paragraph of Section IV to indicate that purge water may not be disposed of in the landfill.	complete
55	508	Part III	330.63(f)	Attachment F	Incomplete	Delete the phrase "It is the Commission's opinion . . . than 'total' metals, and" from Section VI.	complete
56	508	Part III	330.63(f)	Attachment F	Incomplete	Revise the list of analytical parameter in Section VII to indicate metals analyses will be for total metals, not dissolved.	complete

57	508	Part III	330.63(f)	Attachment F	Incomplete	Revise Section IX to clarify when background samples were taken for existing wells, and how background sampling will be conducted for new wells.	The requested information has been added
58	508	Part III	330.63(f)	Attachment F	Incomplete	Revise Tables 2 and 3 in Section IX to specify reporting limits that are consistent between the two tables, and which do not exceed the Initial MSW PQL listed in the May 25, 2010, letter to Type I and Type IV landfill owners and operators, available at https://www.tceq.texas.gov/downloads/permitting/waste-permits/msw/docs/msw-pqls.pdf.	Table 3 is background.
59	508	Part III	330.63(f)	Attachment F	Incomplete	Explain why there are two sets of Well Purging Field Data Collection Forms in Attachment 1 and how they are to be used.	Noted
60	556	Part III	330.403(a)	Attachment F	Inconsistent	Revise monitor well data sheet to show current well configurations and elevations of surface completion components.	Idenfitied updated sheets and added.
61	556	Part III	330.403(a)	Attachment F	Incomplete	Revise monitor well data sheets to show the casing stick up above the surface, and protective lockable collar.	Idenfitied updated sheets and added.
62	556	Part III	330.403(a)	Attachment F	Incomplete	Provide a discussion explaining what the single State of Texas Well Report represents.	Complete
63	638	Part III	330.421(a)(1)(D)	Attachment F, Section 3.1.4	Incomplete	Provide boring logs for monitor wells, sealed, and dated by a licensed professional geoscientist or engineer who is familiar with the geology of the area.	Complete
64	652	Part III	330.63(g)	Attachment G	Incomplete	List figures and tables in the table of contents. Provide figure numbers on the figures, beginning at 1.	Figures G-1 and G-2 along with new Figure G-3 have been added to the table of contents.
65	652	Part III	330.63(g)	Attachment G	Incomplete	Provide sealed date on sealed drawings.	The seal date of September 10, 2019 has been added to Figures G-1 and G-2.
66	656	Part III	330.371(f)	Attachment G	Incomplete	Reference a drawing that shows the location of trenches and easements for utility pipelines that cross the facility boundary.	Figure G-3 shows the locations of utilities that cross the permit boundary.
67	658	Part III	330.371(g)	Attachment G	Incomplete	Provide a discussion detailing how landfill gas monitoring will be performed. Provide a sample field data sheet showing what information and measurements will be taken and recorded. Include procedures for determining and recording water levels in probes.	Section 3.0 of Attachment G includes monitoring procedures including measuring of water levels. A sample field monitroing sheet is included in Appendix G-B.
68	658	Part III	330.371(g)	Attachment G	Incomplete	Include procedures for notifying landowners, residents, and tenants within 1000 ft of a probe that exhibits a methane exceedance.	Section 4.0 of Attachment G includes procedures for notifying adjacent landowners within 1,000 feet of a probe with high methane levels.
69	666	Part III	330.371(g)	Attachment G	Incomplete	Provide gas vents in utility trenches that cross the facility boundary and procedures for monitoring the vents.	Proposed gas vents are shown on Figure G-3 and procedures for monitoring the vents is included in Section 3.0 of Attachment G.

70	680	Part III	330.453(a) and (b)	Attachment D8 - Final Cover Quality Control Plan	Inconsistent	The compaction specification in Section 4.5 does not match the compaction specification in Section 4.8.1.	The compaction specification listed in Section 4.8.1 is used to determine the suitability of the soil for final cover construction. It has been intentionally set slightly lower than the minimum compaction specification in Section 4.5 to perform an intial evaluation of the soil. If the laboratory soil sample in Section 4.8.1 is able to meet the permeability specification at 85% of standard proctor, than the cover constructed in the field should be able to meet the permeability specification using the higher 95% of standard proctor minimum compaction specification.
71	764	Part IV	330.123	Part IV, Section 1.4	Incomplete	Provide written notice in the form of a soil liner evaluation report as described in §330.341.	All liner at the facility has previously been constructed and the current permit does not require submission of Soil Liner Evaluation Reports. Cell Construction Notifications have been submitted to the TCEQ as each area was developed as stated in Section 1.4 of the SOP.

BECK LANDFILL
GUADALUPE COUNTY, TEXAS
TCEQ PERMIT APPLICATION NO. MSW 1848A

APPLICATION MASTER TABLE OF CONTENTS

TRANSMITTAL LETTER

APPLICATION MASTER TABLE OF CONTENTS

APPLICATION CORRESPONDENCE

PART I – SITE AND APPLICATION INFORMATION

1 TCEQ PART I FORM/TCEQ CORE DATA FORM

2 SUPPLEMENTARY TECHNICAL REPORT

3 FACILITY LOCATION

4 MAPS

5 PROPERTY OWNER INFORMATION

6 LEGAL AUTHORITY

7 EVIDENCE OF COMPETENCY

8 APPOINTMENTS

9 APPLICATION FEES

10 SUPPLEMENTAL INFORMATION

PART II – EXISTING CONDITIONS AND CHARACTER OF THE FACILITY AND SURROUNDING AREA

1 TCEQ PART II FORM 20885

ATTACHMENT A EXISTING CONDITIONS SUMMARY

ATTACHMENT B WASTE ACCEPTANCE PLAN

ATTACHMENT C MAPS

ATTACHMENT D FACILITY IMPACT AND EXISTING CONDITIONS

ATTACHMENT E TxDOT COORDINATION

ATTACHMENT F AIRPORT IMPACTS AND FAA COORDINATION

ATTACHMENT G GENERAL GEOLOGY AND SOILS STATEMENT

ATTACHMENT H GROUNDWATER AND SURFACE WATER

ATTACHMENT I ABANDONED OIL AND WATER WELLS

ATTACHMENT J FLOODPLAINS AND WETLANDS

ATTACHMENT K UPDATE ON WETLANDS

ATTACHMENT L ENDANGERED AND THREATENED SPECIES

ATTACHMENT M TEXAS HISTORICAL COMMISSION REVIEW

ATTACHMENT N COUNCIL OF GOVERNMENTS AND LOCAL GOVERNMENT REVIEW

PART III – FACILITY INVESTIGATION AND DESIGN

ATTACHMENT A – SITE DEVELOPMENT PLAN

1 INTRODUCTION

2 GENERAL FACILITY DESIGN

3 FACILITY SURFACE WATER DRAINAGE DESIGN

4 WASTE MANAGEMENT UNIT DESIGN

5 GEOLOGY REPORT

6 GROUNDWATER SAMPLING AND ANALYSIS PLAN

7 LANDFILL GAS MANAGEMENT PLAN

8 CLOSURE PLAN

9 POSTCLOSURE PLAN

10 COST ESTIMATES FOR CLOSURE AND POSTCLOSURE CARE

APPENDIX A1 – ORIGINAL PERMIT APPROVAL LETTER

ATTACHMENT B – GENERAL FACILITY DESIGN

1 FACILITY ACCESS

2 WASTE MOVEMENT

3 STORAGE AND PROCESSING UNITS

4 SANITATION

5 WATER POLLUTION CONTROL

6 ENDANGERED SPECIES PROTECTION

7 BENCHMARK

APPENDIX B1 – WASTE MOVEMENT DIAGRAM

ATTACHMENT C – FACILITY SURFACE WATER DRAINAGE REPORT

NARRATIVE

ATTACHMENT C1 – DRAINAGE ANALYSIS AND DESIGN

APPENDIX C1-A
Drainage Maps and Existing/Post-development Comparison

APPENDIX C1-B
Existing Condition Hydrologic Calculations

APPENDIX C1-C
Post-development Hydrologic Calculations

APPENDIX C1-D
Perimeter Drainage System Design

APPENDIX C1-E
Final Cover Drainage Structure Design

APPENDIX C1-F
Intermediate Cover Erosion and Sedimentation Control Plan

APPENDIX C1-G
Intermediate Cover Erosion Control Structure Design

ATTACHMENT C2 – FLOOD CONTROL ANALYSIS

APPENDIX C2-A
LOMR Application

APPENDIX C2-B
No-Rise Certification for Proposed Stormwater Pond

ATTACHMENT C3 – DRAINAGE SYSTEM PLANS AND DETAILS

ATTACHMENT D – WASTE MANAGEMENT UNIT DESIGN

1 WASTE MANAGEMENT UNIT DESIGN

2 STORAGE AND TRANSFER UNITS

3 LANDFILL UNIT

ATTACHMENT D1 – SITE LAYOUT PLAN

ATTACHMENT D2 – CROSS-SECTIONS

ATTACHMENT D3 – CONSTRUCTION DESIGN DETAILS

ATTACHMENT D4 – SITE LIFE

ATTACHMENT D5 – GEOTECHNICAL DESIGN

1 GEOTECHNICAL TESTING

2 SUBSURFACE MATERIALS

3 EARTHWORK

4 CONSTRUCTION BELOW THE GROUNDWATER TABLE

5 SETTLEMENT AND HEAVE ANALYSIS

6 SLOPE STABILITY ANALYSES

7 LINER CONSTRUCTION

8 COVER CONSTRUCTION

APPENDIX D5-A – SETTLEMENT ANALYSIS

APPENDIX D5-B – SLOPE STABILITY ANALYSES

APPENDIX D5-C – PREVIOUS GEOTECHNICAL REPORTS

ATTACHMENT D6 – CONTAMINATED WATER MANAGEMENT PLAN

1 INTRODUCTION

3 CONTAMINATED WATER MANAGEMENT

APPENDIX D6-A – RUNON/RUNOFF BERM DESIGN

ATTACHMENT D7 – LINER QUALITY CONTROL PLAN

1 INTRODUCTION

2 LINER SYSTEM

3 EARTHWORK

4 COMPACTED SOIL LINER

8 DOCUMENTATION

ATTACHMENT D8 – FINAL COVER QUALITY CONTROL PLAN

1 INTRODUCTION

2 FINAL COVER SYSTEM

3 INTERMEDIATE COVER AND GRADING

4 INFILTRATION LAYER

5 EROSION LAYER

6 DOCUMENTATION

ATTACHMENT E – GEOLOGY REPORT

LIST OF TABLES

1 REGIONAL GEOLOGIC/HYDROGEOLOGIC DATA

2 LOCAL GEOLOGIC PROCESSES

3 REGIONAL AQUIFERS

4 SUBSURFACE CONDITIONS

5 GEOTECHNICAL DATA

6 ARID EXEMPTION

~~**APPENDIX E-1 APPROVED SUPPLEMENTAL BORING PLANS**~~

APPENDIX E-1~~2~~ SNOWDEN, 1989 ATTACHMENT 3C-WATER WELLS~~PREVIOUS GEOLOGY AND GEOTECHNICAL INVESTIGATIONS~~

APPENDIX E-2 APPROVED SUPPLEMENTAL BORING PLAN(S)

APPENDIX E-3 CROSS-SECTIONS

ATTACHMENT F – GROUNDWATER CHARACTERIZATION REPORT

GROUNDWATER MONITORING SYSTEM DESIGN CERTIFICATION

APPENDIX F1 – MONITOR WELL INSTALLATION INFORMATION ~~AND HISTORIC GROUNDWATER DATA~~

APPENDIX F2 – HISTORIC GROUNDWATER DATA

APPENDIX F~~2~~3 – GROUNDWATER SAMPLING AND ANALYSIS PLAN

ATTACHMENT G – LANDFILL GAS MANAGEMENT PLAN

1 INTRODUCTION

2 LANDFILL GAS MANAGEMENT PLAN

3 LANDFILL GAS MONITORING PROCEDURES

4 LANDFILL GAS MONITORING EXCEEDANCE RECORD KEEPING AND REPORTING

APPENDIX G-A-Gas Probe Installation Report

APPENDIX G-B-Typical Gas Monitoring Data Form

ATTACHMENT H – CLOSURE PLAN

1 INTRODUCTION

2 FINAL COVER SYSTEM

3 CLOSURE PROCEDURES

4 CLOSURE SCHEDULE

5 CLOSURE COST ESTIMATE

ATTACHMENT I – POSTCLOSURE PLAN

1 INTRODUCTION

2 POSTCLOSURE CARE ACTIVITIES

3 PERSON RESPONSIBLE FOR CONDUCTING POSTCLOSURE CARE ACTIVITIES

4 POSTCLOSURE LAND USE

5 POST-CLOSURE CARE COST ESTIMATE

ATTACHMENT J – COST ESTIMATES FOR CLOSURE AND POSTCLOSURE CARE

1 INTRODUCTION

2 CLOSURE COST ESTIMATE

3 POSTCLOSURE CARE COST ESTIMATE

4 COST ESTIMATE ADJUSTMENTS

5 FINANCIAL ASSURANCE

APPENDIX J1 – CLOSURE COST ESTIMATE CALCULATIONS

APPENDIX J2 – POSTCLOSURE CARE COST ESTIMATE CALCULATIONS

APPENDIX J3 – EVIDENCE OF FINANCIAL ASSURANCE

PART IV – SITE OPERATING PLAN

1 INTRODUCTION

2 RECORDKEEPING REQUIREMENTS

3 PERSONNEL AND TRAINING

4 EQUIPMENT

5 DETECTION AND PREVENTION OF DISPOSAL OF PROHIBITED WASTES

6 SITE SAFETY

7 FIRE PROTECTION PLAN

8 OPERATIONAL PROCEDURES

9 SEQUENCE OF DEVELOPMENT

10 RECYCLING ACTIVITIES

BECK LANDFILL
GUADALUPE COUNTY, TEXAS
TCEQ PERMIT APPLICATION NO. MSW 1848A

APPLICATION CORRESPONDENCE

March 2023

Municipal Solid Waste Permit NO. 1848A
Beck Landfill
Table of NODs and Responses
1/2/2023

NOD ID	MRI ID	App. Part	Citation	Location	1st NOD Type	NOD Description	*Response*
NT1	12	General	330.57(d)	See Application Parts I through IV	Format	Revise discussions in Parts II and III to consolidate the historical information and updates, and to include references to drawings that show the features described in the statements.	***Historical information has been consolidated in Parts II and Part III - Attachment E Geology Report.***
						Revise rule citations to be consistent with rule format; use lower-case case letters where rule letter is lower case.	***Corrected lower-case letters throughout.***
NT2	18	General	330.57(f)(2)	See Application Parts I through IV	Format	Provide signature and seal date on all sealed items.	***Pages have been sealed and dated as appropriate.***
NT3	21	General	330.57(g)(2)	See Application Parts I through IV	Format	Revise all title pages with new application number, date prepared and submittal dates	***The pages have been revised as requested.***
NT4	22	General	330.57(g)(3)	See Application Table of Contents	Format	Revise all Table of Contents with consistent numbering and labels	***Table of Contents have been updated.***
NT5	24	General	330.57(g)(5)	See Application Parts I through IV	Incomplete	Provide page number (including application part and appendix) and date on all pages.	***Page numbers and dates have been added.***
NT6	31	General	330.57(h)(4)(D)	See Application Parts I through IV	Incomplete	Provide PE seal on Part II of the application.	***Mr. Adam Mehevec's PE seal has been added to the cover sheet of Part II.***
NT7	63	General	330.59(h), 330.671, 330.675	Part III, Attachment A, Section 1.0	N/A	Rectify Nido LTDs delinquent fee amount of $3,243.25	***We have contacted TCEQ and we are not currently showing any deliquent fees.***
T8	70	Part I	330.59(b)(1); 305.45(a)(1)	Form 0650, Section 12	Inconsistent	Verify coordinates and elevation of facility permanent benchmark, show location and coordinates on site layout plan (Figures 2-1 and D1.1), and use benchmark coordinates in text and on drawings throughout the application wherever facility location is represented.	***The benchmark information has been included on Figure D.1.1 and the Part I form.***
T9	82	Part I	330.59(c)(2)	Part I, Attachment 4	Inconsistent	Review permit boundary provided in application. It is inconsistent with approved boundary from previous application.	***There were incorrect values for the existing permit boundary acreages in Attachments A and D. These values have been corrected to reflect that the existing permit boundary is 212 acres and the proposed boundary is 256.9 acres. While we are proposing an increase in the permit boundary acreage, the disposal footprint of the landfill is remaining the same as the current permit.***
T10	85	Part I	330.59(d)(1)(A)	Part I, Attachment 5	Inconsistent	The stated acreages within the permit boundary for the existing permit and for the proposed expansion are not consistent throughout the application, and not consistent with the acreage for existing permit 1848.	***The survey for the permit boundary included as Attachment 5 reflects the correct proposed acreage of 256.9 acres.***
T11	87	Part I	330.59(d)(1)(C)	Part I, Attachment 5	Incomplete	Provide boundary metes and bounds description.	***These documents are now included as Attachment 5 to Part I.***
T12	88	Part I	330.59(d)(1)(D)	Part I, Attachment 5	Incomplete	Provide drawing of boundary metes and bounds description.	***These documents are now included as Attachment 5 to Part I.***

T13	148	Part II	330.61(j)(1)	Part II, Attachment G	Inconsistent	Revise the general geology and soils statement to consolidate the historical information and updates, and to include references to drawings that show the features described in the statement.	***This section has been updated as requested.***
T14	152	Part II	330.61(k)(1)	Part II, Attachment H	Incomplete	Revise the groundwater and surface water statement to include references to drawings that show the features described in the statement.	***This section has been updated as requested.***
NT15	157	Part II	330.61(l)(1)	Part II, Attachment I	Incomplete	Revise the general geology and soils statement to consolidate the historical information and updates, and to include references to drawings that show the features described in the statement.	***This section has been updated as requested.***
NT16	180	Part II	330.61(c)(10)	See Part II, Attachment B	Incomplete	Provide drawings showing locations and boundaries of easements, and information identifying where the easements are recorded in the county property records.	***This information is shown on Drawing I-5 in Part I.***
NT17	187	Part II	330.61(d)(3)	Part III, Attachment D1, Figure D1.1	Ambiguous	Revise Figure 2-4 to clarify there is a piezometer inside the slurry trench and a separate monitor well outside the slurry trench at each location.	***Drawings have been revised to show piezometers***
T18	196	Part II	330.61(d)(9)(D)	Part III, Attachment D1, Figure D1.2	Omitted		***Cells have been dimensioned on Figure D1.1***
NT19	275	Part III	330.63(b)(2)(D)	Attachment B, Section 3.0	Inconsistent	Revise access control citation from Part IV-section 4.1 to Part IV section 8.1, on page B-4.	***Reference has been revised***
T20	290	Part III	330.305(a)	Attachment C	Incomplete	Clarify if HEC Modeling System was used for the drainage calculations in the existing permit with similar sub-drainage areas. Explain for using HEC Modeling System, instead of Rational Method for peak flow calculations for the sub-drainage areas of less than 200 acres.	***HEC modeling program was not used in the current permit and the current permit does not include landfill run-off calculations. HEC-HMS was utilized for the development of the overall drainage calculations since the modeled drainage area is greater than 200 acres as recommended in TCEQ Technical Guidance Section 1.4.1.1. This section states that the 200 acre maximum for use of the Rational Method includes the total area of the landfill permit boundary and upland areas. The Rational Method was used to design individual drainage controls such as benches and berms (See Appendix C1-D and C1-E) since they have smaller contributing areas. The downchutes and ponds were designed using HEC-HMS since the routing of the flows is vital in determining the sizing of these features.***

T21 and T22	291 and 292	Part III	330.305(b) and 330.305(c)	Attachment D6, Figure D6-A	Incomplete	Provide sample design calculations, including cross-sectional details for the containment berms with a freeboard.	***A sample calculation for the containment berm height has been added to Figure D6-A. There are no freeboard requirments for temporary containment berms and 100% run-off has been assumed and the berm height has been rounded up to the nearest half foot to provide a contingency for the berm height.A cross-section of the typical diversion berm is shown at the top of Figure D6-A.***
T23	294	Part III	330.305(d)(1)	Attachment C, Section 1.1	Incomplete	Provide sample calculations for estimated peak velocities, and demonstrate that the estimated velocities will be less than the permissible non-erodible velocities at the top surfaces, and on the slopes during all phases of landfill operation.	***Universal soil loss equation calculations for the top deck and sideslopes have been provided in Appendices C1-E and G1-G for the final and interim condition.***
T24	296	Part III	330.305(e)	Appendix C1-E and C1-F	Incomplete	Provide i) sample design calculations and ii) cross-sections for berms, swales, letdowns, channels, and ponds.	***The perimeter ditches have been replaced by perimeter berms. Profiles of the perimeter berms are provided on Figures C1-2A through C1-2F and the flow depths for each bench are included on Figure C1-2A. A typical cross-section for the berms is also included on Figure C1-2A. Typical cross-sections for the benches and downchutes are shown on Figures D3-1 and C3-2 and sample calculations are provided in Appendix C1-E. Details for the pond are provided on Figure C3-1 and the pond design is incorporated in the calculations provided in Appendic C1-C for the proposed landfill condition and also in Appendic C1-D.***
T25	298	Part III	330.305(e)(2)	Appendix C1-F	Incomplete	Provide i) sample design calculations and ii) cross-sections for berms, swales, letdowns, channels, and sediment collection pond for the interim phase of landfill operation.	***These temporary structures are discussed in Appendix C1-G and sample calculations for capacity and celocity are included for each of these features.***
T26 and T27	299 and 300	Part III	330.305(f)(1) and 330.305(f)(2)	Attachment C1	Incomplete	Explain for not using Rational Method for drainage calculations for the sub-drainage areas of less than 200 acres.	***HEC-HMS was utilized for the development of the overall drainage calculations since the modeled drainage area is greater than 200 acres as recommended in TCEQ Technical Guidance Section 1.4.1.1. This section states that the 200 acre maximum for use of the Rational Method includes the total area of the landfill permit boundary and upland areas. The Rational Method was used to design individual drainage controls such as benches and berms (See Appendix C1-D and C1-E) since they have smaller contributing areas. The downchutes and ponds were designed using HEC-HMS since the routing of the flows is vital in determining the sizing of these features.***

T28	302	Part III	330.305(g)	Attachment D6, Section 2.2	Incomplete	Provide sample calculations for the containment berm design, including cross sectional details with the freeboard.	***A sample calculation for the containment berm height has been added to Figure D6-A. There are no freeboard requirments for temporary containment berms and 100% run-off has been assumed and the berm height has been rounded up to the nearest half foot to provide a contingency for the berm height.A cross-section of the typical diversion berm is shown at the top of Figure D6-A.***
T29	303	Part III	330.63(c)(1)(A)	Attachment C1	Incomplete	Provide a drainage map to indicate flow directions for each sub-drainage areas.	***Figure C1-2 has been revised to show flow arrows on final cover systemcap.***
T30	304	Part III	330.63(c)(1)(B)	Appendix C1-D	Incomplete	Provide designs and cross-sections of all the proposed drainage facilities within the facility area, including for typical designs.	***A typical cross-section for the diversioon berms is shown on Figure C1-2A, typical cross-sections for the benches and downchutes are shown on Figure D3-1.***
T31	305	Part III	330.63(c)(1)(B)	Appendix C1-D	Incomplete	Provide cross sectional details for the ditch, and ditch grades for entire length of the ditch.	***The perimeter ditches have been replaced by perimeter berms. Profiles of the perimeter berms are provided on Figures C1-2A through C1-2F and the flow depths for each bench are included on Figure C1-2A. A typical cross-section for the berms is also included on Figure C1-2A.***
T32	306	Part III	330.63(c)(1)(B)	Appendix C1-D	Incomplete	Provide flow rates, water surface elevation, velocities, and flowline elevations along the entire length of the ditch.	***The perimeter ditches have been replaced by perimeter berms. Profiles of the perimeter berms are provided on Figures C1-2A through C1-2F and the flow depths for each bench are included on Figure C1-2A. A hydraulic calculation for the worst-case berm is included in Appendix C1-D in Attachment C1, which lists the calculated velocity.***
T33	307	Part III	330.63(c)(1)(C)	Attachment C1	Incomplete	Provide sample calculations to demonstrate that the existing drainage patterns will not be adversely altered.	***These calculations are provided in Appendices C1-B and C1-C in Attachment C. They are also summarized on page C-2 of Attachment C.***
T34	308	Part III	330.63(c)(1)(D)	Attachment C1	Ambiguous	Justify for using HEC Modeling Systems to estimate peak flow rates and runoff volumes for sub-drainage areas with less than 200 acres.	***HEC-HMS was utilized for the development of the overall drainage calculations since the modeled drainage area is greater than 200 acres as recommended in TCEQ Technical Guidance Section 1.4.1.1. This section states that the 200 acre maximum for use of the Rational Method includes the total area of the landfill permit boundary and upland areas. The Rational Method was used to design individual drainage controls such as benches and berms (See Appendix C1-D and C1-E) since they have smaller contributing areas. The downchutes and ponds were designed using HEC-HMS since the routing of the flows is vital in determining the sizing of these features.***

T35	311	Part III	330.63(c)(1)(D)(ii)	Appendix C1-B and Appendix C1-C	Incomplete	Provide sample hydraulic calculations for sizing berm, down chute, and pond, including for interim phases of landfill operation.	***The pond calculations are provided as part of the final configuration calculations. The temporary stromwater structures are discussed in Appendix C1-G and sample calculations for capacity and celocity are included for each of these features.***
T36	312	Part III	330.63(c)(1)(D)(iii)	Attachment C	Incomplete	Since each of the comparison points/outfall points would receive runoff from sub-drainage areas with less than 200 acres, justify for using HEC Modeling System for drainage calculations.	***HEC-HMS was utilized for the development of the overall drainage calculations since the modeled drainage area is greater than 200 acres as recommended in TCEQ Technical Guidance Section 1.4.1.1. This section states that the 200 acre maximum for use of the Rational Method includes the total area of the landfill permit boundary and upland areas. The Rational Method was used to design individual drainage controls such as benches and berms (See Appendix C1-D and C1-E) since they have smaller contributing areas. The downchutes and ponds were designed using HEC-HMS since the routing of the flows is vital in determining the sizing of these features.***
T37	313	Part III	330.63(c)(1)(D)(iv)	Appendix C1-D and C1-E	Incomplete	Provide, i) sample design calculations, and ii) cross sectional details for berms, swales, perimeter channels, and ponds.	***The perimeter ditches have been replaced by perimeter berms. Profiles of the perimeter berms are provided on Figures C1-2A through C1-2F and the flow depths for each bench are included on Figure C1-2A. A typical cross-section for the berms is also included on Figure C1-2A. Typical cross-sections for the benches and downchutes are shown on Figures D3-1 and C3-2 and sample calculations are provided in Appendix C1-E. Details for the pond are provided on Figure C3-1 and the pond design is incorporated in the calculations provided in Appendic C1-C for the proposed landfill condition.***
T38	314	Part III	330.63(c)(2)(A)	Attachment C1, Figures C1-1 and C1-2	Incomplete	a) Provide figures as indicated in the Table of Contents of Attachment C2. b) Provide LOMR issued by FEMA for showing the facility boundary out of the 100-yr floodplain.	***Figures C2-1 and C2-2 have been included in this submittal***
T39	315	Part III	330.63(c)(2)(B)	Attachment C2	Incomplete	Provide drawing(s) showing the facility boundary on floodplain map with appropriate legend information.	***See Figure C2-1***
T40	316	Part III	330.63(c)(2)(C)	Attachment C2	Incomplete	a) Provide information detailing the specific flooding levels. Include data as required by 30 TAC Sections 301.33 - 301.36). Also, include cross-sections or elevations of landfill levees shown tied into contours. b) Ensure that this information is provided in the application for TCEQ review, and correspondences with FEMA, or with other agencies are included in Appendices for the record.	***Figure C2-1 and C2-2 show the current floodplain elevations and existing levee heights. The existing levee is higher than the floodplain in all areas and the secondary soil berm is being constructed to provide additional freeboard above the flood elevations. See also Figure D-2 in Attachment D.***

T41	318	Part III	301.33(a)(1)	Part III-Attachment D, Figure D-2, and Attachment C2	Incomplete	Provide the details to address the rule requirements for the existing and proposed levees.	***The existing levee and the proposed pond construction have been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3) which states:*** ***(h) Subsection (a) of this section does not apply to:...*** ***(3) a levee or other improvement within the corporate limits of a city or town provided: (a) plans for the construction or maintenance or both must be approved by the city or town as a condition precedent to starting the project and (b) the city or town requires that such plans be in substantial compliance with rules and standards adopted by the commission;***
T42	319	Part III	301.33(a)(2)	Attachment C, Section 1.2	Incomplete	Clarify if Cibolo Creek is the only watercourse that would be affected by the proposed landfill expansion. Also, provide the course of the creek indicating the direction of flow.	***Cibolo Creek is the only affected waterway. Flow arrows have been added to Figure C1-2.***
T43	320	Part III	301.33(a)(3)	Attachment C2, Page C2-1	Omitted		***The existing levee and the proposed pond construction have been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3) which states:*** ***(h) Subsection (a) of this section does not apply to:...*** ***(3) a levee or other improvement within the corporate limits of a city or town provided: (a) plans for the construction or maintenance or both must be approved by the city or town as a condition precedent to starting the project and (b) the city or town requires that such plans be in substantial compliance with rules and standards adopted by the commission;***
T44	321	Part III	301.33(a)(4)(A)	N/A	Omitted		***The proposed pond construction has been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3). No other construction is proposed within the floodplain or floodway.***

T45	322	Part III	301.33(a)(4)(B)	Will be provided at conclusion of LOMR review	Omitted		***The proposed pond construction has been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3). No other construction is proposed within the floodplain or floodway.***
T46	323	Part III	301.33(b)(1)	Attachment C2	Omitted		***The proposed pond construction has been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3). No other construction is proposed within the floodplain or floodway.***
T47	324	Part III	301.33(b)(2)	Attachment C2	Omitted		***The proposed pond construction has been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3). No other construction is proposed within the floodplain or floodway.***
T48	325	Part III	301.33(b)(3)	not plausible with the existing creek section	Omitted		***The proposed pond construction has been reviwed and approved by the City of Schertz (see Attachment C2) and is exempt from the requirements of 30TAC301 pursuant to 301.2(3)(A) and Texas Water Code Section 16.236(h)(3). No other construction is proposed within the floodplain or floodway.***
T49	326	Part III	301.34(1)	Attachment D5, Appendix D5-B	Incomplete	Provide stability analyses for perimeter berm under rapid drawdown case.	***This analysis has been added to Appendix D5-B.***
T50	327	Part III	301.34(2)	Attachment C2	Omitted		***30TAC301.34(1) is not applicable to the perimeter berm in this application since the existing landfill berm pre-dates Chapter 301 and there is no propsed levee construction around the perimeter of the landfill.***
T51	328	Part III	301.34(3)	Attachment C2	Omitted		***30TAC301.34(1) is not applicable to the perimeter berm in this application since the existing landfill berm pre-dates Chapter 301 and there is no propsed levee construction around the perimeter of the landfill.***
T52	331	Part III	301.34(6)	Attachment C2	Incomplete	Provide cross sectional details to show a minimum freeboard of three feet above the 100-yr design flood hydraulic gradient.	***The existing berm is above the current floodplain elevation and the ranges for the top of berm and floodplain elevation are shown on Figure D2. The proposed 10' high perimeter berm will provide the required freeboard above the floodplain.***

T53	334	Part III	301.36	See Part III	Omitted		***This section is not applicable since no new levee construction regulated by Chapter 301 is proposed.***
T54	335	Part III	330.63(c)(2)(D)	Attachment C2	Incomplete	Include (i) approval from the governmental entity with jurisdiction under Texas Water Code, Sections 16.236. (ii) a floodplain development permit. (iii) a Conditional Letter of Map Amendment from FEMA. (iv) a Corps of Engineers Section 404 Specification of Disposal Sites for Dredged or Fill Material permit for construction of all necessary improvements (e.g., pond construction).	***Approval from City of Schertz is included in Attachment C2. Approval from FEMA will be provided upon receipt, and a USACE 404 permit is not required since no wetlands or Waters of the US are affected by the proposed improvements.***
T55	341	Part III	330.63(d)(1)(B)	Attachment D6	Incomplete	Provide details for the control and containment of spills and contaminated water in the processing and recovery areas. Provide sample calculations supporting the design shown on Drawing D6-A.	***Provisions related to management of spills in the processing and recovery areas have been added to Section 2.2 of Attachment D6. Sample calculations are shown on Drawing D6-A.***
T56	342	Part III	330.63(d)(1)(C)	Attachment B, Section 3.0	Incomplete	Specify the maximum allowed period of time for processed and unprocessed wood waste and recyclable materials to remain in their areas. Provide details related to 330.63(d)(8) or remove the reference.	***Section 2.0 has been revised to indicate that material will only be stored in these areas for a maximum of 180 days. The reference to 330.63(d)(8) has been removed.***
T57	347	Part III	330.63(d)(4)(A)	Attachment D, Section 3.1	Ambiguous	Clarify whether "TxDOT approved traffic controls" refers to a traffic control plan approved by TxDOT.	***The text has been revised to clarify that a traffic control plan approved by TxDOT will be utilized.***
T58	349	Part III	330.63(d)(4)(C)	Attachment D, Section 1.0	Inconsistent	Delete references to the EPA and Subtitle D. Provide a consistent minimum elevation of landfill excavation throughout the application. Identify typical 150-ft by 150-ft processing and recovery area locations on Figures D-1and D1.3 through D1.5.	***The references to EPA and Sub-Title D have been removed. The minimum excavation elevation is shown as 640 feet MSL. The processing and recovery areas will be located within the landfill footprint and will move as the waste fill progresses. These areas do not appear on Figure D-1 since this drawing reflects the landfill at after completion of the final cover. For Drawings D1.3 through D1.5 the processing and recovery areas will be posistioned within the areas identified on each of these drawings.***
T59	351	Part III	330.63(d)(4)(E)	Attachment D2	Incomplete	Provide a typical location on Figure D-1 for the berm shown in Figure D-2. Show soil borings, groundwater monitoring wells, and gas monitoring probes along the sections on Figures D2-1 and D2-2.	***A typical perimeter berm section location has been added to Figure D1.1. The detail shown on Figure D-2 is representative of the entire perimeter of the landfill footprint.***
T60	352	Part III	330.63(d)(4)(E)	Attachment D2	Incomplete	Label the positions of waste and the perimeter road on Figure D-2 relative to the perimeter berm. Label the slurry wall, existing perimeter berm, and proposed perimeter berm for the vertical expansion on Figures D2-1 and D2-2.	***The extents of waste and the perimeter road have been shown on Figure D-2. The requested features have been labled on Drawings D.2-1 and D.2-2.***
T61	356	Part III	330.63(d)(4)(F)	Attachment D3	Incomplete	Revise the sidewall liner detail to reflect the existing perimeter berm with clay core and slurry wall. Provide a detail of the new berm and cover system relative to the existing perimeter berm with clay core and slurry wall.	***Figure D3.1 has been revised to show the optional sidewall liner in relation to the existing berm and slurry wall. Figure D-2 depicts the proposed perimeter berm in relation to the existing berm and slurry wall.***

T62	356	Part III	330.63(d)(4)(F)	Attachment D3	Incomplete	Provide details of in situ and compacted soil liners that meet 330.331(d) for Type IV landfills. Revise the erosion layer in the final cover detail to match the erosion layer defined in the Surface Water Drainage Report.	***Requirements for the in-situ and compacted soil liners have been added to Figure D3.1 and Section 1.1 of Attachment D7. The proposed final cover system is based on the requirements of 330.457. The description in the Surface Water Drainage Report has been modified to comply with 330.457 and match the other sections of the application.***
T63	397	Part III	330.339(a)	Attachment D7	Incomplete	Address the in situ clay liner, protective cover, the existing perimeter berm and its clay core, and the proposed perimeter berm for the vertical expansion. In Section 2.1, define the in situ soil liner and compacted soil liner that meet 330.331(d) for Type IV landfills.	***A discusion related to the in-situ liner, existing perimeter berm, and proposed additional compacted soil berm has been added to Section 2.1 of Attachment D7. The entire liner system for the landfill has been previously constructed, but details of a constructed clay liner, that would only be used in an unforseen condition where a portion of theliner needs to be removed and replaced, have been added to Section 2.1 of Attachment D7.***
T64	399	Part III	330.339(a)(1)	Attachment D7	Omitted		***A typical liner detail is included on Figure D3.1. Lift thicknesses are specified in Section 4.4 and compaction percentage is included in Section 4.5 of Attachment D7.***
T65	401	Part III	330.339(a)(2)	Attachment D7	Incorrect	In Section 2.2, revise "should be on site during liner construction" to "will be on site during construction."	***The requested revision has been made.***
T66	403	Part III	330.339(b)(1)	Attachment D7	Incorrect	In Section 3.4, delete the reference to stability analyses for interim slopes or provide those analyses. Replace "should not" with "will not". Revise "unless additional slope stability analyses are performed" to "unless the permit is revised."	***The requested revision has been made.***
T67	404	Part III	330.339(b)(2)	Attachment D7	Incomplete	In Section 4.7, define the allowable slope or step for earthwork tie-ins.	***The allowable slope and step dimensions have been added to Section 4.7.***
T68	405	Part III	330.339(b)(2)(A)	Attachment D7	Omitted		***A typical liner detail is included on Figure D3.1. Lift thicknesses are specified in Section 4.4 and compaction percentage is included in Section 4.5 of Attachment D7.***
T69	413	Part III	330.339(c)(4)(A)	Attachment D7	Incomplete	Provide a procedure to address failing permeability tests.	***Procedures for failing permeability tests are included in Section 4.5 of Attachment 7.***
T70	418	Part III	330.339(c)(7)	Attachment D7	Omitted		***Permeabilites will be tested using ASTM D5084 as stated in Section 4.8.2. ASTM D5084 is an approved equivalent method to ASTM D5093.***
T71	420	Part III	330.339(c)(8)	Attachment D7	Incomplete	Provide testing to verify the in-situ liner	***All in-situ liner has been previously constructed.***
T72	421	Part III	330.339(c)(9)	Attachment D7	Omitted		***This requirement has been added to Section 5.1 of Attachment 7.***
NT73	474	Part III	330.63(e)&(1)(A)	Attachment E	Incomplete	Restructure the report to begin section numbering at 1.	***Updated***
T74	494	Part III	330.63(e)(4)(G)	Attachment E, Section 3.1.4	Incomplete	Provide geologic cross sections prepared from the borings.	***The updated cross sections are being prepared. They will be partially submitted with this NOD and we will continue working on them.***

T75	501	Part III	330.63(e)(5)(B)(iii)	Attachment E, Section 3.1.5	Incomplete	Provide discussion explaining why grain size analyses do not add up to 100%.	***Terracon runs sieves on the first samples, then on subsequent samples only run the #4 and #200. Therefore, any percentages not represented as #4 or #200 are greater than #4 in size, but not further analyzed.***
T76	504	Part III	330.63(e)(5)(C)	N/a	Incomplete	Provide complete historical groundwater elevation data for all monitoring wells, piezometers, and other borings.	***Updated for legibility.***
NT77	506	Part III	330.63(e)(5)(E)	N/a	Format	Provide legible tables and charts of groundwater monitoring data.	***Updated for legibility.***
T78	508	Part III	330.63(f)	N/a	Incomplete	Revise discussions in Groundwater Characterization Report to consolidate the historical information and updates, and to include references to drawings and tables in the application that show or detail the features described.	***330.63(f) is the GWSAP Attachment E is in the Water Report Please clarify if this comment applied to Attachment E. Historical information in Att. E has been consolidated.***
NT79	508	Part III	330.63(f)	N/a	Incomplete	Restructure the report to begin section numbering at 1.	***Updated***
T80	508	Part III	330.63(f)	N/a	Incomplete	Provide a map showing the waste area, property boundary, and groundwater monitor wells.	***This infomration is shown on Figure D1.1.***
T81	508	Part III	330.63(f)	N/a	Incomplete	Revise the Overview of the Groundwater Sampling and Analysis Plan (GWSAP) in Appendix F-2 to indicate the GWSAP is part of the Site Development Plan (SDP).	***Updated***
NT82	508	Part III	330.63(f)	N/a	Incomplete	Provide the missing GWSAP Attachments 1,2, and 3.	***Included attachments 1) Purging and Sampling Form, 2) Chain of Custody, and 3) QAP for SATL.***
NT83	556	Part III	330.403(a)	Attachment F	Incomplete	Annotate the monitor well data sheets in Appendix F1 to indicate which sheets are for monitor wells and which for piezometers.	***This change has been made.***
NT84	556	Part III	330.403(a)	Attachment F	Incomplete	Revise sheets for monitor wells to show the show the casing stick up above the surface, and protective lockable collar.	***This change has been made.***
NT85	556	Part III	330.403(a)	Attachment F	Incomplete	Annotate sheets for piezometers to clarify that there is not a concrete surface pad.	***This change has been made.***
NT86	556	Part III	330.403(a)	Attachment F	Incomplete	Provide a discussion explaining what the single State of Texas Well Report represents.	***Discussion added to Attachment F related to the well report.***
NT87	556	Part III	330.403(a)	Attachment F	Incomplete	Annotate the casing drawings in Appendix F1 to identify whether they represent the monitor wells or the piezometers.	***This change has been made.***
NT88	557	Part III	330.403(a)(1)	Attachment F, Section 3.1.1	Incomplete	Provide tables and charts of groundwater monitoring that are legible.	***Updated for legibility.***
T89	638	Part III	330.421(a)(1)(D)	Attachment F, Section 3.1.4	Incomplete	Provide boring logs for monitor wells, sealed, and dated by a licensed professional geoscientist or engineer who is familiar with the geology of the area.	***Per TCEQ, the Report has been sealed, however the original borings and information provided was through a different geoscientist. No guarantees of his work are made, but the report contains best available information.***
NT90	652	Part III	330.63(g)	Attachment G	Inconsistent	Revise titles and references in text and page headers to refer to Landfill Gas Management Plan.	***The headers and section titles have been revised as requested.***
NT91	652	Part III	330.63(g)	Attachment G	Inconsistent	Provide the drawings referenced in the text.	***The figures have been provided. They were inadvertantly removed during the Admin NOD revision.***
NT92	652	Part III	330.63(g)	Attachment G	Inconsistent	Remove references to specific brands or models of methane monitoring equipment, which may change if specified equipment becomes unavailable or better equipment is selected.	***The brand name of the monitoring instrument hass been removed.***
T93	656	Part III	330.371(b)(1)(D)&(E)	Attachment G, Section 1.0	Incomplete	Reference a drawing that shows the facility structures referenced in the text.	***A reference to Figure D1-1 has been added to Section 1.0.***

T94	656	Part III	330.371(b)(1)(D)&(E)	Attachment G, Section 1.0	Incomplete	Reference a drawing that shows the location of trenches and easements for utility pipelines that cross the facility boundary.	***Figure I-5 in Part I shows the easements on the site. The exact locations of the utilitiy lines discussed in Attachment G are not known.***
T95	658	Part III	330.371(c)-(1)	N/a	Incomplete	Revise reporting procedures in Section 3.0 to indicate that actions will be taken if methane concentration in any gas probe exceeds the levels in 330.371(a) (1.25% in facility structures and 5% at the facility boundary).	***The requirements have been revised as requested.***
T96	666	Part III	330.371(f)	Attachment G, Section 2.0	Incomplete	Provide gas vents in utility trenches that cross the facility boundary and procedures for monitoring the vents.	***The exact locations of the utilities discussedin Attachment G are unknow. If methane levels in the nearby probes exceed the regulatory level, the utilities will be physically located and vents installed.***
T97	680	Part III	330.453(a) and (b)	Attachment D8 - Final Cover Quality Control Plan	Incomplete	In Section 2.1, revise the erosion layer to match the erosion layer defined in the Surface Water Drainage Report. In Section 4.7, define the allowable slope or step for cover tie-ins. In Section 4.8, provide a procedure to address failing permeability tests.	***The proposed final cover system is based on the requirements of 330.457. The description in the Surface Water Drainage Report has been modified to comply with 330.457 and match the other sections of the application. Section 4.7 has been revised to list the allowable slope/steps for the final cover tie-ins and procedures to address failing permeability tests have been added to Section 4.8.***
T98	681	Part III	330.453(c)	Attachment D5, including Appendix D5-B	Incorrect	a. Clarify whether the slope stability analyses use total or effective stress parameters.	***Section 6 of Attachment D5 has been revised to indicate that the analyses use effective stress parameters.***
						b. Revise the slope stability analyses to delete the in-situ clay liner along the side slopes above the shale.	***The slope stability runs have been revised as requested.***
						c. Provide a stability analysis for a 3H:1V excavation side slope.	***This anaylisis is provided in Appendix D5-B.***
						d. In Section 6: Remove the reference to interim waste slope stability analyses or provide the analyses.	***The reference has been removed from Section 6.***
						e. Revise "will necessitate that the slope stability analyses be revised to reflect the changed conditions" to "will require that the permit be revised."	***This revision has been made.***
						f. Revise "unless additional slope stability analyses are performed" to "unless the permit is revised. "	***This revision has been made.***
						g. In Section 8.2, revise the erosion layer to match the erosion layer defined in the Surface Water Drainage Report.	***The proposed final cover system is based on the requirements of 330.457. The description in the Surface Water Drainage Report has been modified to comply with 330.457 and match the other sections of the application.***
T99	681	Part III	330.453(c)	Attachment D5, Appendix D5-A	Incomplete	Provide a cross-section and sample 10-layer settlement calculation. Identify the effect of waste settlement on the 6% final cover slopes and the drainage bench flowlines.	***The requested settlement calculation has been provided in Appendix D5-A.***
T100	758	Part IV	330.65(a)	Part IV	Inconsistent	Revise SOP for new current permit number 1848A, and new application submittal date September 2022	***Updated permit reference and submittal date***
T101	764	Part IV	330.123	Part IV. Section 1.4	Inconsistent	Revise Part IV section 1.4 to satisfy rule requirement	***Section 1.4 is the PreOperation Notice Requirements; SOP is almost verbatim to the rules.***
NT102	787	Part IV	330.127(1)	Part IV. Section 3.2	Incomplete	Missing Table 3.1	***Included Table 3.1***

NT103	788	Part IV	330.127(2)	Part IV. Section 4.0	Incomplete	Missing Table 4.1	***Included Table 4.1***
NT104	789	Part IV	330.127(2)	Part IV. Section 4.0	Incomplete	Missing Table 4.1	***Indcluded Table 4.1***

MUNICIPAL SOLID WASTE PERMIT MAJOR AMENDMENT

Part I Application for Permit Amendment

(TAC Title 30 Rule §330.59)

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022

Prepared by:

POWER ENGINEERS

PROJECT NUMBER: 150051.05.01

PROJECT CONTACT: Julie Morelli

EMAIL: Julie.Morelli@powereng.com

PHONE: 210-951-6424

REVISED ~~JANUARY 3~~MARCH 17, 2023

Formatted: Font: 8 pt

TABLE OF CONTENTSTABLE OF CONTENTS

~~1.0 FORM TCEQ-0650 (305.45(a)(1-(5)) 1~~

~~1.1 CORE DATA FORM 17~~

~~1.2 PERMITS OR CONSTRUCTION APPROVALS (305.4(A)(7)) 19~~

~~2.0 SUPPLEMENTARY TECHNICAL REPORT (305.45(a)(8)) 20~~

~~2.1 GENERAL DESCRIPTION OF THE FACILITY (305.45(A)(8)) 20~~

~~3.0 FACILITY LOCATION (330.59(b)) 0~~

~~4.0 MAPS (330.59(c)) 0~~

~~5.0 PROPERTY OWNER INFORMATION (330.59(d)) 0~~

~~5.1 UPDATED LANDOWNER TRACTS 0~~

~~5.2 PROPERTY OWNER AFFIDAVIT – CIBOLO INDUSTRIES, LTD 0~~

~~5.3 PROPERTY OWNER AFFIDAVIT – NIDO, LTD 0~~

~~6.0 LEGAL AUTHORITY (330.59(e)) 0~~

~~7.0 EVIDENCE OF COMPETENCY (330.59(f)) 0~~

~~8.0 APPOINTMENTS (330.59(g)) 0~~

~~9.0 APPLICATION FEE (330.59(h)) 0~~

~~10.0 SUPPLEMENTAL INFORMATION 0~~

Part I Application for New Permit, Permit Amendment or Registration for MSW Facility (Form TCEQ-00650 (rev. 06-30-22)

ATTACHMENT 1.0 TCEQ CORE DATA FORMS

ATTACHMENT 2.0 SUPPLEMENTAL TECHNICAL REPORT

ATTACHMENT 3.0 MAPS

Formatted: TOC_Env

Formatted: Line spacing: Multiple 3 li

ATTACHMENT 4.0 LAND OWNERSHIP INFORMATION

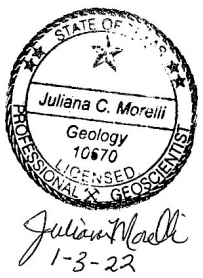
ATTACHMENT 5.0 FACILITY LEGAL DESCRIPTION

ATTACHMENT 6.0 VERIFICATION OF LEGAL STATUS

ATTACHMENT 7.0 EVIDENCE OF COMPETENCY

ATTACHMENT 8.0 APPOINTMENTS

'MENT RECEIPT



~~1.0~~ FORM TCEQ-0650 (305.45(a)(1-(5))

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

ATTACHMENT 1

Formatted: Font: Times New Roman, 11 pt, Not Bold, Not All caps

Core Data Form

Formatted: Heading 2, Indent: Left: 0", Hanging: 0.75"

~~1.1~~

Formatted: Normal

ATTACHMENT 2

Supplemental Technical Report

1.2 Permits or Construction Approvals (305.4(a)(7))

Formatted: Heading 4

The following permits or construction approvals and regulatory programs were reviewed as they relate to Beck Landfill and are found to be not applicable:

- Hazardous Waste Management Program under the Texas Solid Waste Disposal Act;

Formatted: Heading 4, No bullets or numbering

- 30 TAC §331.121: No Class I Wells are present on-site or will be installed on-site;
- 30 TAC §331.122: No Class III Wells are present on-site or will be installed on-site;
- 30 TAC §305.50: The Beck Landfill is not applying for a hazardous or industrial solid waste permit or a post-closure order; therefore, this regulation does not apply.
- 30 TAC §305.48: The Beck Landfill is not applying for a wastewater discharge permit;
- 30 TAC §305.54: The Beck Landfill is not applying for a radioactive materials disposal license;
- 30 TAC §336.207: The Beck Landfill is not applying for a radioactive materials disposal license;
- 30 TAC §336.513: The Beck Landfill is not applying for a permit covering the disposal of radioactive material;
- 30 TAC §336.617: The Beck Landfill is not applying for a permit covering the disposal of radioactive material;
- Beck landfill is not regulated under the Prevention of Significant Deterioration Program under the Federal Clean Air Act (FCAA);
- No additional requirements associated with a Nonattainment Program under the FCAA apply to Beck Landfill.
- National emission standards for hazardous air pollutants preconstruction approval under the FCAA are not applicable to Beck Landfill.

- **Ocean dumping permits under the Marine Protection Research and Sanctuaries Act does not apply to Beck Landfill.**

- **No dredge or fill permits under the FCAA;**

- **No licenses under the Texas Radiation Control Act;**

No subsurface area drip dispersal system permits under Texas Water Code, Chapter 32.

Other environmental permits and programs that apply at Beck Landfill include;

- **30 TAC §330 Subchapter E: As a solid waste landfill facility, the Beck Landfill has developed an SOP in compliance outlining the facility's methods for complying with 30 TAC §330 Subchapter D. The Beck Landfill does not operate a separately authorized solid waste storage or processing activity at the landfill as described in 30 TAC §330.201; therefore, this regulation does not apply.**

- **30 TAC §305.48: Beck Landfill is authorized to discharge stormwater associated with industrial activities under the Texas Pollutant Discharge Elimination System (TPDES) Multi-Sector General Permit, Sector L (landfills) issued August 2021.**

Formatted: Heading 4

Formatted: Heading 4, Indent: Left: 0"

Formatted: Heading 4, No bullets or numbering

~~2.0 Supplementary Technical Report (305.45(a)(8))~~

~~2.1~~ General Description of the Facility (305.45(a)(8))

Beck Landfill is located on approximately 163 acres in Schertz, Texas. The Landfill is operated in accordance with the existing Municipal Solid Waste (MSW) Permit Number 1848A as a Type IV construction and demolition debris disposal site. Waste loads are inspected at the entrance to the landfill and approved loads, transported by third-party haulers, are weighed and directed to the active, working face of the Landfill. Loads containing unauthorized waste streams are rejected and are directed off the premises. Access to the site is controlled through a lockable gate and manned scale office. Appropriate signage is posted to instruct haulers regarding permitted activities.

The majority of industrial activities are conducted outdoors. Outdoor activities include the occasional use of a screening plant, operation of a Type IV landfill, a truck scale, a ticket office, equipment parking, and material storage areas. Soil cover on the working face is applied weekly or more frequently, as needed. Rainwater that comes into contact with the active working face is captured and isolated to prevent a discharge. Liquids derived from areas where trash is placed is collected and pumped back to the working face for dust control. No discharge or removal of leachate is performed.

Following unloading, haul trucks return to the scale to determine the weight of material disposed. Haulers are issued a ticket to track the costs and quantities associated with the disposal. Windblown trash is collected daily, or as needed, to prevent nuisance conditions.

Beck Landfill does not operate a collection or transportation service for waste disposed at the Landfill. Beck does not perform treatment of wastes prior to disposal. No injection activity occurs on-site or is planned to occur on-site in the future.

~~3.0~~ Facility location (330.59(b))

Beck Landfill is located off of Farm to Market Road (FM) 78 in Schertz, Guadalupe County, Texas. Travel west along FM78, approximately 2.6 miles from East Loop 1604 in San Antonio, Texas. The Landfill is located on the south side of FM78, next door to the Sonic Drive-In.

The coordinates to the entrance of the landfill are: -98.2645733º North, 29.5545795º West

ATTACHMENT 3

Maps

~~4.0 MAPS (330.59(C))~~

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

Formatted: Body Text

General location maps and land ownership maps are included as attachments to Part I of this Application in conformance with 30 TAC 305.46 and 335.59(c). Part I of this major modification application includes General Location Maps showing the property boundary, latitudes and longitudes, and other required information. In addition, Part I includes the Land Ownership Map. Additional information is provided in Section 5.0 below.

ATTACHMENT 4

Land Ownership Map, Landowner List & Mailing Labels

LANDOWNERS LIST

The following table lists the names and mailing addresses of the adjacent and potentially affected landowners around the landfill's permit boundary (and easement holders located within the landfill permit boundary). The list is based on the Guadalupe County Appraisal District records and includes all property owners within 1/4 mile of the site (as of April 2022). Refer to the Figure IB-1, Land Ownership Map, for location of the properties. The numbering of this list corresponds to the numbers of the Land Ownership Map.

Number	Name	Address
1	CIBOLO INDUSTRIES LTD	126 E TURBO DR. SA TX 78216
2	NIDO INC	C/O JIM UPTMORE 606 HASKIN DR SA TX 78209
3	PECAN GROVE TX LLC	C/O PARKLAND VENTURES INC
4	HYATT GAIL A	3116 FM 1518, SCHERTZ, TX 78154
5	GUERRERO EDUARDO	6606 FM 2538 MARION, TX 78154
6	DELRU LLC	218 N CHERRY ST SA, TX 78202
7	TRANG YEN MY	203 MILL ST SCHERTZ, TX 78154
8	DAVIS JANE	293 MALTA AVE, BALLSTON SPA, NY 12020
9	DEEN WALTER M	301 SECOND ST, SCHERTZ, TX 78154
10	PARDEE TRACY E & DIANA	303 SECOND ST SCHERTZ, TX 78154
11	YAMIN DARLENE & RANDY J BAKER	302 2ND ST SCHERTZ, TX 78154
12	JOHNSON BETTY	307 SECOND ST SCHERTZ, TX 78154
13	ULBRICH JANIE	309 SECOND ST SCHERTZ, TX 78154
14	ARISPE ROSE	410 MILL ST SCHERTZ, TX 78154
15	GAITAN BLANCA	1229 FREDERICKSBURG TD NB, TX 78130
16	PRIETO RUDY J & G	109 TOMAHAWK CIBOLO, TX 78108
17	MYERS CAROLYN J	211 ZUEHL ST, SCERTZ, TX 78154
18	MORALES LUIS A & ESTHER D	4518 NEER, SAN ANTONIO, TX 78213
19	SORE LONNIE	1256 ABBOTSBURY, UNIVERSAL, TX 78148
20	LAUNDRY JOSEPH A	415 FIRST ST, SCHERTZ, TX 78154-2136
21	FEY GERALD J & KAREN R	1109 VIVKI LYNN, SCERTZ, TX 78154
22	HUTCHINS RYAN	411 1ST ST, SCHERTZ, TX 78154-2136
23	OUTDOOR PROPERTY TRUST I	410 N SCOTTSDALE STE 1600, TEMPE, AZ 85281
24	SANCHEZ JOHNNY C & JO ANN	306 2ND ST, SCHERTZ, TX 78154
25	WILSON CHRIS & LINDA	6575 PFEIL ROAD, SCHERTZ TX 78154
26	GIBSON MICHELLE BENVAIDEZ & DANTONIA G	407 1ST ST, SCHERTZ, TX 78154
27	HARDEN THERESA	308 2ND ST, SCERTZ, TX 78154

28	GODINES JEANETTE EVELYN	308 CHURCH STREET, SCHERTZ, TX 78154
29	GEMBAROWSKI DANIEL J & DIANNE M	401 FIRST ST, SCHERTZ, TX 78154
30	SOSA SOFIA F	302 CHURCH ST, SCHERTZ, TX 78154
31	CARRANZA EMILIO	304 CHURCH STREET, SCHERTZ, TX 78154
32	JOROGADA ENTERPRISES INC	PO BOX 296, CONVERSE, TX 78109
33	RAUCH WARREN G JR	203 ZUEHL RD, SCHERTZ, TX 78154
34	DENHAM WILLIAM D	509 AERO ST SCHERTZ TX 78154
35	VILLALOBOS JOE, HILDA ETAL	410 FIRST ST, SCHERTZ, TX 78154
36	STEWART RANDY L & JUNE	4308 CROWN OAK PASS, SCHERTZ, TX 78154
37	SAENZ MELISSA	207 DOWMAN, SCHERT, TX 78154
38	CONTRERAS LEANDRO & 2	408 FIRST ST, SCHERTZ, TX 78154
39	MYERS JEFF J & SARAH ELIZABETH	2421 COUNTRY GRACE, NEW BRAUNFELS, TX 78130
40	SILBERMAN JESSICA G	406 FIRST ST, SCHERTZ, TX 78154
41	DRANSELKA WILLIAM F & DALE	211 GRAYCLIFF, SAN ANTONIO, TX 78233
42	OATES VALERIE J	402 FIRST ST SCHERTZ, TX 78154
43	LABERMEYER LISA SUSAN	113 ZUEL, SCHERTZ, TX 78154
44	KRAUSE DEBRA K	210 DOWMAN ST, SCHERTZ, TX 78154
45	JOHNSON JEFFERSON	208 DOWMAN ST, SCHERTZ, TX 78154-2134
46	BEARD JONATHAN	202 DOWMAN ST, SCHERTZ, TX 78154
47	SECRETARY OF HOUSING & URBAN DEVELOPMENT	2000 N CLASSEN E110, OK CITY, OK 73106
48	ROUCHON MICHELLE D	108 CHURCH ST, SCHERTZ, TX 78154
49	BLAKE GREG T	8190 STATE ROUTE 13, BLOSSVALE, NY 13308-3321
50	BURCH MICHAEL C & STEPHANIE LUCIO	104 CHURCH ST SCHERTZ TX 78154
51	CITY OF SCHERTZ TEXAS	1400 SCHERTZ PARKWAY, SCHERTZ, TX 78154
52	KRM WEALTH MANAGEMENT LLC	4705 W 18TH PL, KENNEWICK, WA 99338
53	MAZEY ANGELA	3261 FM 1303, FLORESVILLE, TX 78114-6004
54	JOHNSON ROBERT	103 CHURCH ST, SCHERTZ, TX 78154
55	RASPINO DARRYL W & P	105 CHURCH ST, SCHERTZ, TX 78154
56	BETTCHER LARRY EDWARDS	107 CHURCH ST, SCHERTZ, TX 78154-2127
57	ARENAS DENA D	109 CHURCH ST, SCHERTZ, TX 78154
58	GONZALES RENE & ROSE	111 CHURCH ST, SCHERTZ, TX 78154

59	PHILIP ELIZABETH PROPERTIES LLC, C/O WILLIAM K APPIAH-SIRIBOE	11230 WEST AVE STE 1207, SAN ANTONIO, TX 78213
60	PHILIP ELIZABETH PROPERTIES LLC, C/O WILLIAM K APPIAH-SIRIBOE	8006 WEST AVE STE 2 CASTLE HILLS, TX 78213
61	CHILDREN OF GOD CHURCH INC	201 CHURCH ST, SCHERTZ, TX 78154
62	301 FIRST STREET LLC	301 FIRST ST, SCHERTZ, TX 78154
63	RITCHIE RALPH F & PATRICIA A	206 LEE, SCHERTZ, TX 78154
64	PEREZ PEDRO & FRANCISCO REVOCABLE TRUST	212 LEE ST, SCHERTZ, TX 78154-2113
65	GUERRERO MARIANO & LINDA P	214 LEE ST, SCHERTZ, TX 78154-2113
66	PEREZ ARMANDO Z	216 LEE ST, SCHERTZ, TX 78154
67	BRINK MICHAEL L	311 CHURCH ST, SCHERTZ, TX 78154
68	PEREZ PEDRO JR & VIKI	307 CHURCH ST, SCHERTZ, TX 78154
69	SCHLESMAN DILLON J & MARISSA G	10646 GLADY'S AVE, CIBOLO, TX 78108
70	GUTIERREZ JORGE RAMON	303 CHURCH ST, SCHERTZ, TX 78154
71	SOARIN PROPERTIES LLC	204 MILL ST SCHERTZ, TX 78154
72	SD APPLE PROPERTIES III LLC	13355 NOEL ROAD SUITE 1645, DALLAS, TX 75240-6835
73	MATIN JOSHUA	824 CROSS, TX 78154
74	E S SCHERTZ 78 LLC	3834 SPICEWOOD SPRINGS ROAD, SUITE 102, AUSTIN, TX 78759
75	SANCHEZ ERNEST	PO BOX 1126, CIBOLO, TX 78108
76	FAULTERSACK STEVEN ADAM & ENILDA MARY FAULTERSACK	949 BLUEFOREST DRIVE, SCHERTZ, TX 78154
77	UAMD LLC	18114 RANSOM HILL, SAN ANTONIO, TX 78258
78	LNG PROPERTIES INC	216 FM 78, SCHERTZ, TX 78154
79	QUIRING GEORGEANNE HELEN	22 SPRINGDALE CIR, DALEVILLE, AL 36322
80	BURCH ROBERT R	110 FM 78, SCHERTZ, TX 78154
81	LCH INSURANCE GROUP LLC	3723 SUNSET HEIGHTS, SAN ANTONIO, TX 78261
82	TRES ANGELES LLC	206 FM 78, SCHERTZ, TX 78154
83	H P PRINTING HUBER LEE & DICK PERRA	104 FM 78SCHERTZ, TX 78154
84	PENTECOSTAL LIFE CHURCH INC	PO BOX 113, SCHERTZ, TX 78154
85	A01B01 LLC	1209 SAN DARIO AVE STE 7-1999
86	SOUTHERN PACIFIC, AD VALOREM TAX DEPT	1400 DOUGLAS STREET STOP 1640, OMAHA, NE 68179-1640
87	JOHN GANNON INC	525 PARK GROVE, KATY, TX 77450
88	426 MAIN ST LLC	8215 TRAINER HALE, SCHERTZ, TX 78154
89	MARTINEZ ALFONSO R	519 FAITH DR, SAN ANTONIO, TX 78228

90	LOPEZ DANY EDUARDO DBA MELANIES CAFE	3655 WOSNIG RD, MARION, TX 78124
91	WALTEL LLC	506 MAIN ST, SCHERTZ, TX 78156
92	TWITERO FAMILY TRUST, C/O TRENT J & ANGELA TWITERO TRUSTEES	2161 TERMINAL LOOP RD, MC QUEENEY, TX 78123-3340
93	CHERRINE RICHARD L & SUE A	530 MAIN ST, SCHERTZ, TX 78154
94	CHERRINE RICHARD L & S A	534 MAIN ST, SCHERTZ, TX 78154
95	RAMIREZ RICARDO & ARACELI ARRIAGA	6607 BARTON ROCK RD SA, TX 78239
96	BUCKNER DONALD MARK & SUSAN HARRIS BUCKNER	15 FAITH HILL DEDHAM MA 02026
98	MACINT LLC,	614 LOWER VALLEY LN, CIBOLO, TX 78108
99	GARCIA ALFREDO C, OLD MAIN SHERTZ LLC	132 ROUND TREE DR, SCHERTZ, TX 78154
100	HSMR INC	708 MAIN ST, SCHERTZ, TX 78154
101	ZAMORA ELIDA	710 MAIN ST, SCHERTZ, TX 78154
102	VESCOTT INVESTMENTS LLC	3736 BEE CAVES RD SUITE 1166, AUSTIN, TX 78746
103	MGC LEGACY LLC	802 MAIN STREET SCHERTZ, TX 78155
104	GOMAZ JESUS CASTELLANOS & MARIA A	607 CURTISS AVE, SCHERT, TX 78154
105	MOBUD LLC	1055 EASTSIDE DR, CANYON LAKE, TX 78133
106	PKM VENTURES LLC, MWBDLR LIMITED LIABILITY COMPANY	P O BOX 284, CIBOLO, TX 78154
107	1017 HOLDINGS LLC, MM STX LLC	603 MAIN ST, SCHERTZ, TX 78154
108	KIBLER PAUL & LISA	200 SCHERTZ PARKWAY, SCHERTZ, TX 78154
109	PORTER MARK A & ROSEMARIE V	714 SILVER FOX, CIBOLO, TX 78108
110	GADDIEL & JAZIEL HOLDINGS LLC	695 GRUENE RIVER DRIVE NEW BRAUNFELS, TX 78132
111	O'ROURKE GENE	909 BECK ST, SCHERTZ, TX 78154
112	ROMAN NICOLE	913 BECK ST SCHERTZ TX 78154
113	HUDKUND JEAN A	3829 ARBORLAWN DR, FT WORTH, TX 76109
114	HARRELL BRIAN R & TINA L	921 BECK STREET, SCHERTZ, TX 78154
115	LYSAGHT GREGORY & ROBERT L HAMILTON	201 ROBLEDO VERDE ST, HOLLYWOOD PARK, TX 78232-1113
116	NEEDHAM TAMIE	1818 BURR OAK LN, ADKINS, TX 78101
117	PERRILL ROBERTO & IRMA N	931 BECK ST, SCHERTZ, TX 78154
118	TALAMANTEZ ORLANDO	3728 HIGHWAY 281, GORGE WEST, TX 78022-4058

119	BECK LESLIE BECK FAMILY PARTNERS LTD	941 BECK STREET, SCHERTZ, TX 78154
121	GRINDLE DIANA	706 CURTISS AVE, SCHERTZ, TX 78154
122	MASON LENA SUE	1016 GETTYSBURG DR, SCHERTZ, TX 78154
123	RIVERA CARLOS JR & MAGDALENA	1012 GETTYSBURG DR, SCHERTZ, TX 78154
124	PADGETT THOMAS J & JENNIFER A	304 2ND ST, SCHERTZ, TX 78154
125	BLAHOWSKI MICHAEL	206 MALBEC COURT, ASUTIN TX 78738
126	MARTINEZ SERAFIN & MARGUERITE	1000 GETTYSBURG DRIVE, SCHERTZ, TX 78154
127	ENNIS ALGIE H & L A	201 WESTCHESTER DR, SCHERTZ, TX 78154
128	GREENWALD LIVING TRUST DTD, KENNETH W GREENWALD & THELMA R GREENWALD TRUSTEES	205 WESTCHESTER, SCHERTZ, TX 78154
131	HOLMES PATRICIA A	1013 GETTYSBURG DR, SCHERTZ, TX 78154
132	REICH CHRISTINA ANN JENETTE & ERICK DANYON BOSWELL	1009 GETTYSBURG DR, SCHERTZ, TX 78154
133	BUDY JOHN & GLENNDA S	304 ROANOKE DR, SCHERTZ, TX 78154
134	VICKNAIE ZEBULON	1001 GETTYSBURG DR, SCHERTZ, TX 78154
135	WOLFGANG DEBORAH M	15854 BELLISTER ST, SELMA, TX 78154
136	KENNEY DAVID W	213 WESCHESTER DRIVE, SCHERTZ, TX 78154
137	GARCIA RAUL A & D A	217 WESTCHESTER DR, SCHERTZ, TX 78154
138	SEIGAL LYDIA	221 WESTCHESTER DR, SCHERTZ, TX 78154
139	LIZCANO JUAN JR & M G	1000 RICHMOND DR, SCHERTZ, TX 78154
140	MANSELLE MARGARET A & CARL C & JANAE R DENNIS	1004 RICHMOND, SCHERTZ, TX 78154
150	RODRIGUEZ LUCINDA S	305 WESTCHESTER, SCHERTZ, TX 78154
151	HOUSING AUTHORITY OF CITY OF SCHERTZ	204 SCHERTZ PARKWAY, SCHERTZ, TX 78154
152	GEIER CLAUDIA	10839 LA GRANGE AVE, LOS ANGELES, CA 90025
153	GUADALUPE VALLEY ELECTRIC CO-OP	PO BOX 118, GONZALED, TX 78629
154	SGA PROPERTIES LLC	2624 TREE CROWN, SCHERTZ, TX 78154

166	SCHERTZ CIBOLO UNIVERSAL CITY ISD	1060 ELBEL RD SCHERTZ TX 78154
167	SILVERS JIM W & CONNIE B SOTA JULIA	525 CURTISS AVE, SCHERTZ, TX 78154
168	COLGATE INVESTMENTS LLC	PO BOX 908, COLUMBUS, TX 78934
169	CONTRERAS ALFREDO(ESTATE OF) & V, C/O VICTORINAS CONTRERAS	815 MAIN ST, SCERTZ, TX 78154
170	GARCIA ALCIA, LONGORIA MINISTRIES INC	281 W SAN ANTONIO, MARION, TX 78124
171	SELF EMILIE JEAN	806 EXCHANGE AVE, SCHERTZ, TX 78154
172	ALEWEL JOHN H & BARBARA J	804 EXCHANGE, SCHERTZ, TX 78154
173	LUNA JORGE & MICHELLE D	802 EXCHANGE AVE, SCHERTZ, TX 78154
174	GOLDICK JEROME & JUDY	1316 BLACK OAK DR, SCHERTZ, TX 78154
175	JRY ENTERPRISES LLC	2793 VALENCIA LANE, SCHERTZ, TX 78154
176	FARQUHAR FRANK M	2661 TERMINAL LOOP RD, MC QUEENEY, TX 78123-3368
177	ARREOLA HARRY JAMES	304 KOCH ST, SCHERTZ, TX 78154
178	SKROBARCZYK LA DONNA & ROBERT	1050 WINDY HILLS RD, DRIPPING SPRINGS, TX 78620
179	BOSTIAN JOHN E & B A	816 CURTISS AVE, SCHERTZ, TX 78154
180	BARDEN BRIAN WADE	814 CURTISS AVE, SCHERTZ, TX 78154
181	PEREZ GENARO & MARTA A	810 CURTISS AVE, SCHERTZ, TX 78154
182	COVEY ROGER G & PAULA	804 CURTISS AVE, SCHERTZ, TX 78154
183	CASTILLO OSCAR DANIEL	395 EAST FAUST, NEW BRAUNFELS, TX 78130
184	HANSON-CHIPMAN KATHLEEN	201 WINBURN AVE, SCHERTZ, TX 78154
185	PADILLA JULIO C & CINDY LOPEZ	303 KOCH RD, SCHERTZ, TX 78154
186	DURAN RAYMOND & HELEN	301 KOCH ST, SCHERTZ, TX 78154
187	THE MAPUS INVESTMENT GROUP NO 2 LTD	361 N SANTA CLARA RD, MARION, TX 78124
188	BARTELUCCI JOAN M & CYNTHIA MARIE JOHNSON	134 RHONDA DR, UNIVERSAL CITY, TX 78148-3420
189	RODRIGUEZ JAIME	181 BRIDLE PATH, SPRING BRANCH, TX 78070
190	PEREZ AMANDA RAE	700 CURTISS AVE, SCHERTZ TX 78154
191	ARCE FAUSTINO P & M	302 PFEIL, SCHERTZ, TX 78154
192	MC KENZIE KENNETH J	711 1/2 EXCHANGE AVE, SCHERTZ, TX 78154
193	GAWLIK DAVID WILLIAM & MICHELLE SUZANNE	704 EXCHANGE AVENUE, SCHERTZ, TX 78154

194	CALDWELL THOMAS MARK	745 ROBERT ST, SEGUIN, TX 78155
195	MILLER DWAYNE M	709 EXCHANGE, SCHERTZ, TX 78154
196	ZIGMOND VIRGIL A	707 EXCHANGE, SCHERTZ, TX 78154
197	ZIGMOND ANTHONY P SR & MARY M, LIVING TRUST	705 EXCHANGE, SCHERTZ, TX 78154
198	MORGA STEPHEN V & MARY A	1700 ISAAC CREEK CR, NEW BRAUNFELS, TX 78132-3593
199	FAJARDO OSCAR D & JOHANNA	720 COMMUNITY DR, NEW BRAUNFELS, TX 78132-3593
200	BURDETTE MARY A & STEPHEN R	608 EXCHANGE AVE, SCHERTZ, TX 78154
201	WIEDERSTEIN RONALD W & BETTY BIESENBACH	318 E BYRD, UNIVERSAL CITY, TX 78148-4507
202	WISSMANN DAVID & PAMELA E	707 MAIN ST, SCHERTZ, TX 78154
203	COLOMBO MELONY A & MICHAEL W	611 MAIN ST, SCHERTZ, TX 78154
204	JOHNSON DENNIS WAYNE	806 GLENWOOD CT, MC KINNEY, TX 75071
205	LUENSMANN MARJORIE	609 MAIN ST, SCHERTZ, TX 78154
206	CORONADO FRANCISCO H & L T	607 MAIN ST, SCHERTZ, TX 78154
207	CANTONOVA GROUP LLC	5003 WALZEM RD 419 SA TX 78217
208	PENNELL JACK D & NANCY W	301 WILLIAMS AVE, SCHERTZ, TX 78154
209	LAMBERT MARIANNE R	607 EXCHANE AVE, SCHERTZ, TX 78154
210	ROBINSON LAURA NEHRING	605 EXCHANGE AVENUE, SCHERTZ, TX 78154
211	MICHAEL KIRBY	1319 CEDAR ELM ST, NEW BRAUNFELS, TX 78132-4716
212	WEIGOLD ROBERT L & B	302 RANDOLPH AVE, SCHERTZ, TX 78154
213	RIOS FRANCISCO A & IRMA	139 SIOUX CIRCLE, CIBOLO, TX 78108
214	REED PATRICK HENRY	306 RANDOLPH AVE, SCHERTZ, TX 78154
215	SPOON SAMMY B & I	9702 SPRUCE RIDGE DR, CONVERSE, TX 78109-2783
216	FLORES ELIDA C	610 CURTISS AVE, SCHERTZ, TX 78154
217	RISLEY SUE SABO & & PAUL ALLEN	608 CURTISS AVE, SCHERTZ, TX 78154
218	GEIER CHRIS	10839 LA GRANGE AVE APT B, LOS ANGELES, CA 90025
219	JOHLE TOMMIE A	602 CURTISS AVE, SCHERTZ, TX 78154
220	SANCHEZ BERTHA RUIZ	310 RANDOLPH AVE, SCHERTZ TX 78154
221	WOLTER WAYNE & JUDY E	9111 GOTHIS DR, UNIVERSAL CITY, TX 78148-2853
222	MARSHALL EDWARD E III	522 WRIGHT AVE, SCHERTZ, TX 78154
223	NAVARRO ADOLFO & ERNESTINA	605 CURTISS AVE, SCHERTZ, TX 78154

224	MCCUMBER CARLOS	601 CURTISS AVE, SCHERTZ, TX 78154
237	YBARRA JULIAN R & T E	529 CURTISS AVE, SCHERTZ, TX 78154
238	KNIGHT BILL & BARBARA C RLT, BILL & BARBARA C KNIGHT LIFE ESTATE	808 MITCHELL AVE, SCHERTZ, TX 78154
239	EADS KAREN M	521 CURTISS STREET, SCHERTZ, TX 78154
240	KRUGER JEFFERY L	519 CURTISS AVE, SCHERTZ, TX 78154
246	SEIDEL GEORG M REVOCABLE LIVING TRUST	9507 E VALLEY VIEW LN, SAN ANTONIO, TX 78217
247	SOLLUNA PROPERTIES LLC	1106 BRANCH SPRING, SAN ANTONIO, TX 78258
248	CARRIAGA LUZ & MEREJILDO ESTATES OF & ROGER CARRIAGA, C/O ROGER CARRIAGA	522 CURTISS AVE, SCHERTZ, TX 78154
249	ORTIZ FRANCISCA L & JESSE SALAZAR ORTIZ	520 CURTISS AVE, SCHERTZ, TX 78154
250	KNEUPPER KEVIN & MARY	8926 GARDEN RIDGE DR, SAN ANTONIO, TX 78266
251	M2P2 INVESTMENTS LLC	25674 LEWIS RANCH, NEW BRAUNFELS, TX 78132
252	MARTINEZ FELIX JR & GLORIA	12321 SCHAEFER RD, SCHERTZ, TX 78108-4020
253	GUZMAN GERARDO & DINA KAREN	506 CURTISS AVE, SCHERTZ, TX 78154
254	ALCALA CHRISTIAN	504 CURTISS AVE SCHERTZ, TX 78154
255	FRIESENHAHN G L & C A	502 CURTISS AVE, SCHERTZ, TX 78154
256	ZAMORA DAVID A	500 CURTISS AVE, SCHERTZ, TX 78154
257	GUADARRAMA CYNTHIA APRIL	524 EXCHANGE AVE, SCHERTZ, TX 78154
258	MAIN STREET LEGACY LLC	534 MISSON HILL RUN, NEW BRAUNFELS, TX 78132-4766
260	MARTINEZ RAY JR	307 RANDOLPH AVE, SCHERTZ, TX 78154
261	SANCHEZ ALBERT C	521 EXCHANGE AV, SCHERTZ, TX 78154
262	ARENAS BRIDGET C	519 EXCHANGE AVE, SCHERTZ, TX 78154
263	HOLLINGSWORTH RODNEY & BETTY - ESTATE OF C//O RHONDA SUE HOLLINGSWORTH	9811 AUTUMN ARCH, CONVERSE, TX 78109
264	DORADO MICHAEL & YADIRA MARTINEZ	513 EXCHANGE AVE, SCHERTZ, TX 78154
265	FRANCO AURELIO A & NANETTE A	1004 WHITE WING, SCHERTZ, TX 78154
266	BURTON JOHN CLYDE	1209 NEWTON STREET, AUSTIN, TX 78704

267	CHRISTOPHERSON ANNETTE L	509 EXCHANGE AVE, SCHERTZ, TX 78154
268	REICHERZER HUGO J & N, C/O GARY W REICHERZER	1248 THORTON RD, HOUSTON, TX 77018
269	SCHERTZ BANK & TRUST	519 MAIN ST, SCHERTZ, TX 78154
270	RANDOLPH LODGE #1268	BOX 284, SCHERTZ, TX 78154
282	HEWELL SARAH	420 CURTISS AVE, SCHERTZ, TX 78154
289	GRANGER REALTY & INCESTMENTS LLC	137 THOMAS EDISON DRIVE, SCHERTZ, TX 78154
290	DEL TORO FAMILY PARTNERSHIP LTD	816 MAIN ST, SCHERTZ, TX 78154
291	DAILEY BALIS E JR	419 EXCHANGE AVE, SCHERTZ, TX 78154
292	6K PROPERTIES LLC	3121 CAMERON RIVER, SCHERTZ, TX 78108
293	LUCAS FRANK M	P O BOX 2455, UNIVERSAL CITY, TX 78148
294	KAPADIA JAGDISH	415 MAIN ST, SCHERTZ, TX 78154
295	HUERTA JOE & FRANCES HUERTA & JOLEAN HUERTA	P O BOX 1898, SAN MARCOS, TX 78666
296	VIDAL RANDAL J & MELISSA K	5322 MAPLE VISTA, SAN ANTONIO, TX 78249
297	AMAYA ROSARIO CESAR	900 FM 78, SCHERTZ, TX 78154
298	MOY SCHERTZ LLC	10839 DEEP WATER BAY, SAN ANTONIO, TX 78251
299	VETERANS OF FOREIGN WARS #8315	1000 FM 78, SCHERTZ, TX 78154
300	BK 515 INVESTMENTS LLC	3122 RUNNING FAWN, SA, TX 78261
301	OWENS BEVERLY J	1028 FM 78 SCHERTZ, TX 78154
302	HOLMAN ERIC	201 GREENTREE SCHERTZ, TX 78154
303	MANGHAM TOMMIE C	3390 ALTERNATE 90, SEGUIN, TX 78155-0909
304	CHAVEZ MARTIN	25919 COPPERAS LN, SAN ANTONIO, 78260-2465
305	HOLMAN ERIC, RACVINPROPERTIES LLC	201 GREENTREE, SCHERTZ, TX 78154
306	ARANAS JEROME	133 BEECHWOOD AVE UNIVERSAL CITY, TX 78148
307	GONZALES ROMULO & ESTELLA	10725 ELVIRA AVE, SCHERTZ, TX 78108-3216
308	GONZALES SANJUANA, GONZALES MANUELITA R	12376 ERSTEIN VLY, SELMA, TX 78054-3735
309	CIBOLO CREEK MUNICIPAL AUTHORITY	PO BOX 930, SCHERTZ, TX 78154-0930
310	BEXAR COUNTY	100 DOLOROSA STE 120E, SAN ANTONIO, TX 78205-3087
311	HUNT LARRY W	9265 SCHOENTHAL RD, GARDEN RIDGE, TX 78266-2620

312	YSJUNKIE LLC	129 MOSSRIDGE UNIVERSAL CITY, TX 78148
313	RIVAS CLARA	11910 E FM 1518 N, CIBOLO, TX 78108-3454
314	ALANIZ RICARDO & GLORIA	11904 E FM 1518 N, COBOLO, TX 78108-3322
315	ARENAS JOSE	12081 AZTEX WAY, SCHERTZ, TX 78108-3314
316	PEREZ TONY C & MARY F	PO BOX 545, SCHERTZ, TX 78154-0545
317	STATE OF TEXAS	PO BOX 29928 SA TX 78229
318	GARZA MARIA R	PO BOX 170 SCHERTZ TX 78154
320	DELEON MIKE T	10735 GLADYS AVE SCERTZ TX 78108
322	MARTINEZ JERRY	905 VRENSHAW CT CIBOLO, TX 78108
323	SEMERSKY JIMMY & GUADALUPE	410 RIVER RD SCHERTZ TX 78154
324	NARANJO ROBERTO	10710 GLADYS AVE SCHERTZ TX 78108
325	CASTILLO CARLOS & CARMEN G	10748 ELVIRA AVE SCHERTZ TX 78108
326	GONZALEZ AVELINO M	10745 ELVIRA AVE SCHERTZ TX 78108
327	CORONADO MIGUEL A & SANDRA	10741 ELVIRA AVE SCHERTZ TX 78108
328	UNITED STATES AIR FORCE DEPT	2261 HUGHS AVE STE 155, LACKLAND AIR FORCE BASE, TX 78236
329	UNITED STATES GOVERNMENT, UNION SQUARE BLDG	10101 REUNION PL, SAN ANTONIO, TX 78216-4160
330	KNOTTS MICHAEL A	11481 E FM 1518 N, SCHERTZ, TX 78154-6216
331	GARZA HENRY D JR & JANET	11485 E FM 1518 N, SCHERTZ, TX 78154-6216
332	DIAZ JUAN ANTONIO	11497 E FM 1518 N, CIBOLO, TX 78108-3320
333	MAY SCOTT DEMPSEY	11491 E FM 1518 N, SCHERTZ, TX 78154-6216
334	BARAJAS MARTHA	1802 KENTUCKY DERBY DR, CORPUS CHRISTI, TX 78417-3120
335	CANCINO ERNESTO & DORA L	11575 E FM 1518 N, CIBOLO, TX 78108-3319
337	WHIPPLE JOHN L SR	647 BURWOOD LN, SAN ANTONIO, TX 78213
338	TX OPERATIONS LP	2710 WYCLIFF RD RALEIGH, NC 27607
339	WILLIAMS THOMAS H & ETAL	PO BOX 127, SCHERTZ, TX 78154-0127
340	t & M AUTO PARTS LTD	PO BOX 127 SCHERTZ, TX 78154
341	CHEAP LELAND L & JODY M	10890 E FM 1518 N, SCHERTZ, TX 78154-6208
342	GIBSON JANIE RUTH	10925 LISA MDWS, SCHERTZ, TX 78108-3913
343	HAWTHORNE JANIS	11732 VOGES PASS, SCHERTZ, TX 78108-4027

344	ALBERT MCCOY REVOCABLE TRUST	12531 WARE SEQUIN ROAD SA, TX 78154
345	JACKS AUTO PARTS TRUST	1006 HOLBROOK RD, SAN ANTONIO. TX 78218
346	CEMETERY	
347	CORONA MARTIN	11269 E FM 1518 N UNIT 1R, SCHERTZ, TX 78154-3332
348	STOLL RICHARD M & MARICIA G REV LIVING TRUST	10004 WURZBACH #343, SAN ANTONIO, TX 78230
349	MARKS JOSEPH D JR	11170 E FM 1518 N, SCHERTZ, TX 78154-6211
350	HATCHITT ESTATES INC	PO BOX 460091, SAN ANTONIO, TX 78246-0091
351	PARKER ALEX E & FIELDER THELMA	548 MAPLE DR, SCHERTZ, TX 78154-1612
352	RAWLS ROBBIE L	11015 E FM 1518 N, SCHERTZ, TX 78154-6210
353	RODRIGUEZ JOAQUIN & MARIA D	11011 E FM 1518 N, SCHERTZ, TX 78154-6210
354	CARROLL CHRISTINE O & MONTY GLEN SR	11007 E FM 1518 N, SCHERTZ, TX 78154-6210
355	WOODS ELIZABETH K	11005 E FM 1518 N UNIT 2, SCHERTZ, TX 78154-6223
356	SHARROW FRANK W & JANET C	11004 E FM 1518 N, SCHERTZ, TX 78154-6209
357	BURGESS CLAUDINE MAE V, CIRCLE DOVE ENTERPRISES	208 WISTERIA, SAN ANTONIO, TX 78213
358	LUGO DONNA	1627 VOGES PASS
359	JOHNSON ELIZABETH JO	PO BOX 104, CIBOLO, TX 78108-0104
360	BARTH JERRY L JR & CAROLYN B	12121 VOGES PASS, SCHERTZ, TX 78108-4040
361	BORTH MARVIN G & CONSUELO	VOGES PASS, SCHERTZ, TX 78108-4041
362	MAYER HARVEY ET AL	8331 WOODCLICFF BLVD, SELMA, TX 78154-3335
363	MONILAW THOMAS D & NORMA JEAN	10810 E FM 1518 N SCHERTZ, TX 78154
364	BORTH CONSUELO	11933 VOGES PASS SA, TX 78108
365	Schertz Church of Christ	PO BOX 312 SCHERTZ TX 78154
367	WALL DAVID D	PO BOX 296, CONVERSE, TX 78109-0296
368	VILLEGAS GROUP LLC	408 SALT FORK CIBOLO, TX 78108

NORTH

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
9-9-2022

NULL

MATCHLINE - SEE NEXT SHEET

NOTES

1.

LEGEND

LANDFILL PERMIT BOUNDARY

QUARTER MILE OFFSET BOUNDARY

SCALE IN FEET

0 400 400

REVISION RECORD		
NO	DATE	DESCRIPTION
1	-	-
2		
3		
4		

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

BECK COMPANIES

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

I.B-ADJACENT LANDOWNERS (SHEET 1 OF 3)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	I-4
DATE:	03/24/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653		

P:\310-000\311-653\-CADD\Dwg\SW01\311653-BECK LANDFIL Adjacent Properties.dwg[PROPERTIES 11] LS:(4/18/2022 - amehevec) - LP: 8/28/2022 5:56 PM

NORTH

MATCHLINE - SEE PREVIOUS SHEET

313
NULL
340
339
339
338
337
336
336
NULL
016
016
032
335
343
334
343
343
332
332
331
344
344
330
345
329
CEMETERY
329
003
003
003
343
360
343
361
362

MATCHLINE - SEE NEXT SHEET

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
9-9-2022

NOTES

1.

LEGEND

LANDFILL PERMIT BOUNDARY

QUARTER MILE OFFSET BOUNDARY

SCALE IN FEET

0 400 400

REVISION RECORD		
NO	DATE	DESCRIPTION
1	-	-
2		
3		
4		

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

BECK COMPANIES

NIDO, LTD
BECK LANDFILL
GUADALUPE COUNTY, TEXAS

IB-ADJACENT LANDOWNERS (SHEET 2 OF 3)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	I-4
DATE:	03/24/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653		

P:\310-000\311-653\-CADD\Dwg\SW01\311653-BECK LANDFIL Adjacent Properties.dwg|PROPERTIES 2| LS:(4/18/2022 - amehevec) - LP: 8/28/2022 6:04 PM

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
9-9-2022

NOTES

1.

LEGEND

LANDFILL PERMIT BOUNDARY

QUARTER MILE OFFSET BOUNDARY

SCALE IN FEET

0 400 400

REVISION RECORD		
NO	DATE	DESCRIPTION
1	-	-
2		
3		
4		

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
GUADALUPE COUNTY, TEXAS

IB-ADJACENT LANDOWNERS (SHEET 3 OF 3)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	I-4
DATE:	03/24/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653		

P:\310-000\311-653\-CADD\Dwg\SW01\311653-BECK LANDFIL Adjacent Properties.dwg[PROPERTIES 3] LS:(4/18/2022 - amehevec) - LP: 8/28/2022 6:03 PM

ATTACHMENT 5

FACILITY LEGAL DESCRIPTION, FACILITY METES AND BOUNDS, AND ON-SITE EASEMENTS DRAWING

NORTH

SCALE IN FEET
0 200' 400'

POINT OF COMMENCING

POINT OF BEGINNING

S30°50'45"E 197.85'

NIDO, LTD
CALLED 2.319 ACRES
DOC. NO. 202299020104
O.P.R.G.C.T.

FARM-TO-MARKET ROAD 78
(RIGHT-OF-WAY WIDTH VARIES)

GAIL A. HART
CALLED 2.9800 ACRES
DOC. NO. 9018120
O.R.G.C.T.

S25°25'44"E 164.51'

5/8-INCH

JANE DAVIS-TOERNER
CALLED 0.231 ACRES
BY DIVORCE DECREE
DOC. NO. 10-0728-CV
O.P.R.G.C.T.

TRANG VAN LE
CAM NGOC NGUYEN
CALLED 0.694 ACRES
VOL. 1046, PG. 330
O.P.R.G.C.T.

PECAN GROVE TX LLC
CALLED 101.911 ACRES
VOL. 2822, PG. 584
O.P.R.G.C.T.

S29°54'42"E 5716.26'

VARIABLE WIDTH
SANITARY SEWER EASEMENT
CIBOLO CREEK MUNICIPAL AUTHORITY
VOL. 1116, PG. 899
O.P.R.G.C.T.

NIDO, LTD
CALLED 35.079 ACRES
DOC NO. 202299020105
O.P.R.G.C.T.

60' WIDE INGRESS
EGRESS EASEMENT
VOL. 2360, PG. 860
O.P.R.G.C.T.

LEE STREET

MILL STREET (RIGHT-OF-WAY WIDTH VARIES)

CHURCH STREET

2ND STREET

1ST STREET

DONNAMAN STREET

ZUEHL STREET (50' WIDE RIGHT-OF-WAY)

GUADALUPE VALLEY ELECTRIC
CO-OP
VOL. 230 PG. 593
O.R.G.C.T.

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S30°50'45"E	150.09'
L2	S61°00'28"W	90.10'
L3	S27°24'37"E	469.98'
L4	S25°55'56"E	980.91'
L5	S12°27'09"E	340.07'
L6	S7°11'04"E	199.76'
L7	S31°41'11"E	253.23'
L8	S41°41'06"E	467.30'
L9	N47°35'44"E	95.83'
L10	S50°42'54"E	266.95'
L11	S72°29'53"E	145.31'
L12	S65°19'43"E	203.17'
L13	S61°38'55"E	1152.29'
L14	S26°42'29"W	1012.85'
L15	N73°48'41"W	1665.71'
L16	N62°59'43"W	1019.52'
L17	N69°39'15"W	789.07'
L18	N78°46'42"W	203.90'
L19	N68°38'56"W	1223.90'
L20	N61°38'14"W	236.81'
L21	N6°45'43"W	979.40'
L22	N60°40'06"E	744.28'
L23	S28°48'36"E	142.35'
L24	N61°11'24"E	47.60'
L25	N28°48'36"W	142.79'
L26	N60°40'06"E	461.90'
L27	N28°45'36"W	801.90'
L28	N61°38'03"E	156.04'
L29	N21°38'34"W	25.60'
L30	N62°34'52"E	1547.18'

SURVEYOR'S NOTES:

1. THE BASIS OF BEARINGS SHOWN HEREON IS THE TEXAS COORDINATE SYSTEM, NSRS 2011(2012A), SOUTH CENTRAL ZONE, UTILIZING THE LEICA SMARTNET CONTINUALLY OPERATING REFERENCE NETWORK.
2. THE TRACT SHOWN HEREON LIES WITHIN ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP NOS. 48201C1005M AND 48201C1010M, BOTH DATED MAY 2, 2019 AND BOTH FOR HARRIS COUNTY, TEXAS AND INCORPORATED AREAS, AND FLOOD INSURANCE RATE MAP NO. 48157C0305M, DATED JANUARY 29, 2021 FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS.
3. THIS SURVEY DOES NOT REPRESENT A LAND TITLE SURVEY OF ANY KIND AND IS NOT TO BE USED FOR ANY TYPE OF CONVEYANCE PURPOSES. EASEMENTS SHOWN HEREON ARE BASED UPON REFERENCES IN PRIOR SURVEYS AND MAY OR MAY NOT BE COMPREHENSIVE OF ALL CURRENT ENCUMBRANCES

LEGEND:

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- ● 1/2-INCH IRON ROD FOUND UNLESS OTHERWISE NOTED
- △ CALCULATED POINT
- O.P.R.G.C.T. OFFICIAL PUBLIC RECORDS, GUADALUPE COUNTY, TEXAS
- O.R.G.C.T. OFFICIAL RECORDS, GUADALUPE COUNTY, TEXAS
- O.P.R.B.C.T. OFFICIAL PUBLIC RECORDS, BEXAR COUNTY, TEXAS
- DOC. NO. DOCUMENT NUMBER
- VOL., PG. VOLUME, PAGE

PECAN GROVE TX LLC
CALLED 101.911 ACRES
DOC. NO. 20090240625
O.P.R.B.C.T.

BEXAR COUNTY
GUADALUPE COUNTY

JERRY L. BARTH, JR. AND SPOUSE, CAROLYN B. BARTH
CALLED 10.526 ACRES
VOL. 7091, PG. 1231
O.P.R.B.C.T.

JANIS HAWTHORNE
CALLED 10.526 ACRES
VOL. 5279, PG. 709
O.P.R.B.C.T.

MARVIN BORTH AND WIFE, CONSULO R. BORTH
CALLED 10.549 ACRES
VOL. 2467, PG. 1272
O.P.R.B.C.T.

MAYER HARVEY ET AL

APPROXIMATE CENTERLINE OF CIBOLO CREEK AND COUNTY LINE

DONNA LUGO

NIDO, INC.
CALLED 53 9/10 ACRES
VOL. 1561, PG. 323
O.P.R.G.C.T.

G. MALPAZ SURVEY NO. 67, ABSTRACT NO. 221

CIBILO INDUSTRIES, INC.
CALLED 211.173 ACRES
VOL. 2340, PG. 151
O.P.R.G.C.T.

BECK LANDFIL LEASE AREA

256.935 ACRES
(11,192,089 SQUARE FEET)

ANGELA MAZEY
CALLED 3.099 ACRES
VOL. 4149, PG. 398
O.P.R.G.C.T.

RICARDO ALANIZ AND GLORIA ALANIZ
CALLED 9.37 ACRES
DOC. NO. 201902225492
O.P.R.B.C.T.

RICARDO ALANIZ AND GLORIA ALANIZ, HUSBAND AND WIFE
CALLED 6.283 ACRES
DOC. NO. 20050146856
O.P.R.B.C.T.
VOL. 11489, PG. 1845
O.P.R.G.C.T.

GUADALUPE COUNTY
BEXAR COUNTY

APPROXIMATE CENTERLINE OF CIBOLO CREEK AND COUNTY LINE

JANIS HAWTHORNE
CALLED 0.62 ACRES
VOL. 4854, PG. 1873
O.P.R.B.C.T.

FARM-TO-MARKET ROAD 1518
(RIGHT-OF-WAY WIDTH VARIES)

JESSE AND BARBARA K SHERROD

ERIC M. HOLMAN
CALLED 0.497 ACRES
DOC. NO. 20130002941
O.P.R.B.C.T.

JOROGADA ENTERPRISES, INC.
CALLED 1.326 ACRES
DOC. NO. 201502250422
O.P.R.B.C.T.

JANIS HAWTHORNE
CALLED 2.241 ACRES
VOL. 4314, PG. 938
O.P.R.B.C.T.

ALBERT L. MCCOY, TRUSTEE OF THE ALBERT L. MCCOY REVOCABLE TRUST
CALLED 1.45 ACRES
DOC. NO. 202106005[illegible]
DOC. NO. 202106005[illegible]
O.P.R.B.C.T.

PHILIP M. ROSS, TRUSTEE
JACK'S AUTO PARTS TRUST
CALLED 8.20 ACRES
DOC. NO. 20200038934
O.P.R.B.C.T.

CEMETERY

THOMAS W. ROACH AND LINDA K. ROACH, TRUSTEES OF THE MARIN POINT TRUST
CALLED 2.92 ACRES
DOC. NO. 202103500[illegible]
O.P.R.B.C.T.

APPROXIMATE CENTERLINE OF CIBOLO CREEK AND COUNTY LINE

STATE OF TEXAS
REGISTERED
Sydney Smith Xinos
5361
PROFESSIONAL
LAND SURVEYOR

REVISION RECORD

NO	DATE	DESCRIPTION

CEC

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096 www.cecinc.com
Texas Registered Engineering Firm F-58
Texas Registered Surveying Firm 10194419

LEASE BOUNDARY SURVEY
BECK LANDFILL
550 FM 78
CITY OF SCHERTZ
GUADALUPE COUNTY, TEXAS

NIDO, INC. AND CIBOLO INDUSTRIES, INC.
DOC. NOS. 202299020104, 202299020105,
VOL. 2340, PG. 151 AND VOL. 1561 PG. 323
GUADALUPE COUNTY, TEXAS

DATE:	JANUARY 03, 2023
DRAWN BY:	APV
DWG SCALE:	1"=200'
CHECKED BY:	ESH
PROJECT NO.:	317-935
APPROVED BY:	SSX

DRAWING NO.: I-5

SHEET 1 OF 1

P:\317-935\317-6531-Survey\Dwg\317-653 BECK OVERALL LEASE AREA EXHIBIT 2 EASEMENTS.dwg(EXHIBIT) LS(1/3/2023 - ehipsley) - LP: 1/3/2023 1:34 PM

~~5.0 PROPERTY OWNER INFORMATION (330.59(D))~~

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

~~5.1 Updated Landowner Tracts~~

Nido, LTD and Cibolo Industries, LTD are now the two legal entities owning all parcels within the permitted boundary for MSW Permit #1848A. The recently executed deeds are provided herein. The records at the Guadalupe County Appraisal District (GCAD) are still updating, so GCAD Maps do not represent the current ownership.

ATTACHMENT 5

VERIFICATION OF LEGAL STATUS

Verification of legal status (30 TAC §218.5 and §330.59(e))
Attach to this form verification of legal status. This may be a one-page certificate of incorporation (Certificate of Fact), issued by the Texas SOS. If providing an alternative document documenting legal status, attach that form instead. In addition, provide a list of all persons having over 20% ownership in this facility in the table below (attach additional pages as necessary):

Nido LTD dba Beck Landfill:

Name	Title	Contact Information
Nido, Ltd.	Owner/Operator	210-349-2491
Cibolo Industries, Ltd.	Owner (landowner)	210-349-2491

~~5.2~~ Property Owner Affidavit – Cibolo Industries, LTD

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

Property Owner Affidavit
Complete the form below. If the individual signing the affidavit is the property owner of record, enter the name on the "Printed Signatory Name" line only and omit the "Signatory Capacity" and "Printed Name of Property Owner of Record" lines. Otherwise, complete this form in its entirety.
For Landfill Facilities:

"I/We, _____, as _____

(Printed Signatory Name) (Signatory Capacity)

As authorized signatory for _____

(Printed Name of Property Owner of Record)

acknowledge that the State of Texas may hold me either jointly or severally responsible for the operation, maintenance, and closure and post-closure of the facility. For a facility where waste will remain after closure, I acknowledge that I have a responsibility to file with the county deed records an affidavit to the public advertising that the land will be used for a solid waste facility prior to the time that facility actually begins operating as a municipal solid waste landfill facility, and to file a final recording upon completion of disposal operations and closure of the landfill units in accordance with Title 30 Texas Administrative Code §330.19, Deed Restriction. I further acknowledge that I or the operator and the State of Texas shall have access to the property during the active life and post-closure care period."

_____ _____

(Property Owner Signature) (Date)

Formatted: Indent: Left: 0", Hanging: 0.75"

~~5.3~~ Property Owner Affidavit – Nido, LTD

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

Property Owner Affidavit
Complete the form below. If the individual signing the affidavit is the property owner of record, enter the name on the "Printed Signatory Name" line only and omit the "Signatory Capacity" and "Printed Name of Property Owner of Record" lines. Otherwise, complete this form in its entirety.
For Landfill Facilities:

"I/We, _____, as _____

(Printed Signatory Name) (Signatory Capacity)

As authorized signatory for _____

(Printed Name of Property Owner of Record)

acknowledge that the State of Texas may hold me either jointly or severally responsible for the operation, maintenance, and closure and post-closure of the facility. For a facility where waste will remain after closure, I acknowledge that I have a responsibility to file with the county deed records an affidavit to the public advertising that the land will be used for a solid waste facility prior to the time that facility actually begins operating as a municipal solid waste landfill facility, and to file a final recording upon completion of disposal operations and closure of the landfill units in accordance with Title 30 Texas Administrative Code §330.19, Deed Restriction. I further acknowledge that I or the operator and the State of Texas shall have access to the property during the active life and post-closure care period."

_____ _____

(Property Owner Signature) (Date)

6.0 LEGAL AUTHORITY (330.59(E))

Verification of legal status (30 TAC §218.5 and §330.59(e))
Attach to this form verification of legal status. This may be a one-page certificate of incorporation (Certificate of Fact), issued by the Texas SOS. If providing an alternative document documenting legal status, attach that form instead. In addition, provide a list of all persons having over 20% ownership in this facility in the table below (attach additional pages as necessary):

Nido LTD dba Beck Landfill:

Name	Title	Contact Information
Nido, Ltd.	Owner/Operator	210-349-2491
Cibolo Industries, Ltd.	Owner (landowner)	210-349-2491

ATTACHMENT 7

EVIDENCE OF COMPETENCY

~~7.0 EVIDENCE OF COMPETENCY (330.59(f))~~

~~**Evidence of Competency:**~~

Provide the below information per 30 TAC §330.59(f) as applicable to the facility (attach additional sheets as needed).

List of all Texas solid waste sites that the owner and operator have owned or operated within the last ten years:

Site Name	Site Type	Permit/Reg No.	County	Dates of Operation
Beck Landfill	MSW Type IV	1848	Guadalupe	1985-Now

List of all solid waste sites in all states, territories, or counties in which the owner and operator have a direct financial interest:

Site Name	Location	Dates of Operation	Regulatory Agency (Provide Name and Address)
Beck Landfill	Guadalupe County	1985-Now	TCEQ 12100 Park 35 Circle, Austin, TX

Names of the principals and supervisors of the owner's and operator's organization, together with previous affiliations with other organizations engaged in solid waste activities.

Name	Previous Affiliation	Other Organization
Ben Davis, Principal/Owner	30+ years Beck Landfill, Nido, LTD (MSW Permit #1848)	None
Ken McCarty, Principal/Owner	30+ years Beck Landfill, Nido, LTD (MSW Permit #1848)	Multi-Source Sand and Gravel Company, Ltd.
Lee McCarty, Principal/Owner	30+ years Beck Landfill, Nido, LTD (MSW Permit #1848)	Multi-Source Sand and Gravel Company, Ltd.
Grant Norman, Managing Director	30+ years of waste industry and landfill operations experience Beck Landfill, Nido, LTD (MSW Permit # 1848)	Browning Ferris Industries Type I Landfill: Industrial Waste and Landfill Operations Waste Management Type I Landfill: Industrial Waste Operations Texas Disposal Systems Type I Landfill: Environmental Management and Sales Management

Formatted: Space After: 0 pt

For landfill permit applications only, evidence of competency to operate the facility shall also include landfilling and earthmoving experience if applicable, and other pertinent experience, or licenses as described in 30 TAC 30 possessed by key personnel. The number and size of each equipment type to be dedicated to facility operation should be specified in greater detail on Part IV of the application within the site operating plan.

Beck Landfill Equipment List

Equipment Description	Number of Units per CU Yards		Equipment Size	Equipment Function
	≤1.5 million cubic yards/year	>1.5 million cubic yards/year		
Landfill compactor	1	2	Minimum weight of 50,000 pounds	Waste compaction and fire protection
Bulldozer	1	1	Caterpillar D6 or equivalent	Waste spreading, waste compaction, cover soil spreading, slope maintenance and fire protection
Excavator	1	1	Minimum weight of 20,000 pounds	Cover soil excavation, cell excavation, construction and fire protection
Front End Loader	1	2	John Deere 544 equivalent or larger	Loading of soil, fire protection, retrieval of recyclable materials and removal of non-conforming wastes from the working face, road maintenance
Dump Truck	1	2	Minimum heaped capacity of 10 cubic yards	Hauling of cover soil, hauling of excavated cell materials, and fire protection
Motor Grader/Maintainer	1	1	Minimum eight of 10,000 pounds	Site road maintenance, slope maintenance
Water Pump	1	1	4” or 6” Pump	Removal of below grade stormwater and perched groundwater
Water Truck	1	1	Minimum 1,500-gallon tank capacity	Site maintenance, dust control, and fire protection
Sweeper	1	1	Minimum 4ft broom width	Site maintenance, hard surface sweeping, dust and mud control

Landfill Staffing Levels

Landfill Position	**Name(s)**	**License/Certification and Expiration**
Landfill Facility Manager (LFM)	Grant Norman	MWSOL MSW Operator A No. SW0005998 Exp. 6/20/2023
Landfill Supervisor (LS)	1	Working on Operator A licensing
Equipment Operators	3 – 5	N/A
Gate Attendants	1 – 2	N/A
Landfill Spotters	2 – 5	N/A
Other Personnel (laborers)	1 – 3	N/A

ATTACHMENT 8

APPOINTMENTS ~~(330.59(G))~~

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

ATTACHMENT 9

Formatted: Normal

Formatted: Normal, Border: Top: (Single solid line, Auto, 0.5 pt Line width), Tab stops: 6.5", Right

Formatted: Normal

~~8.0~~ APPLICATION FEE (330.59(H)~~)~~

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

Formatted: Normal, Border: Top: (Single solid line, Auto, 0.5 pt Line width), Tab stops: 6.5", Right

Formatted: Normal

9.0 SUPPLEMENTAL INFORMATION

UPDATES TO MSW PERMIT 1848A ARE PROPOSED TO INCORPORATE ALL PRIOR MINOR AND MAJOR MODIFICATIONS AND AMENDMENTS TO THE CURRENT MSW PERMIT NO. 1848A. IN ADDITION, THIS FACILITY PROPOSES A VERTICAL EXPANSION OF THE LANDFILL THAT WILL INCREASE CAPACITY AND ADDRESS RECENT CHANGES TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) ATLAS 14 (VOLUME 8 VERSION 2).

Formatted: Indent: Left: 0", Hanging: 0.75", No bullets or numbering

Formatted: Heading 1, Indent: Left: 0", Hanging: 0.75"

Formatted: Normal, Border: Top: (Single solid line, Auto, 0.5 pt Line width), Tab stops: 6.5", Right

Formatted: Normal

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

Part II Application for Permit Amendment

(TAC Title 30 Rule §330.61)

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022

Prepared by:

POWER ENGINEERS

PROJECT NUMBER: 150051.05.01
PROJECT CONTACT: Julie Morelli
EMAIL: Julie.Morelli@powereng.com
PHONE: 210-951-6424

TABLE OF CONTENTS

TCEQ FORM 20885 APPLICATION FOR MSW PERMIT, PART II

ATTACHMENT A EXISTING CONDITIONS SUMMARY (§330.61(A))

ATTACHMENT B WASTE ACCEPTANCE PLAN

ATTACHMENT C MAPS

ATTACHMENT D FACILITY IMPACT AND EXISTING CONDITIONS (§330.61(H))

ATTACHMENT E TXDOT COORDINATION (§330.61(I)(4))

ATTACHMENT F AIRPORT IMPACTS AND COORDINATION WITH FAA (§330.61(I)(5))

ATTACHMENT G GENERAL GEOLOGY AND SOIL STATEMENT (§330.61(J))

ATTACHMENT H GROUNDWATER AND SURFACE WATER (§330.61(K))

ATTACHMENT I ABANDONED OIL AND WATER WELLS (§330.61(L))

ATTACHMENT J FLOODPLAINS AND WETLAND STATEMENT (§330.61(M))

ATTACHMENT K WETLANDS

ATTACHMENT L ENDANGERED OR THREATENED SPECIES (§330.61(N))

ATTACHMENT M TEXAS HISTORICAL COMMISSION REVIEW (§330.61(O))

ATTACHMENT N COUNCIL OF GOVERNMENTS AND LOCAL GOVERNMENT REVIEW (§330.61(P))

TCEQ FORM 20885 APPLICATION FOR MSW PERMIT, PART II

ATTACHMENT A EXISTING CONDITIONS SUMMARY (§330.61(A))

Beck Landfill is an existing Type IV landfill that is in operation at 550 FM 78 in Schertz, Guadalupe County, Texas. This facility was initially authorized in 1989 by the Texas Department of Health (TDH) in accordance with the design standards of the Municipal Solid Waste Management Regulations adopted in December 1986. The original Site Development Plan (hard copy only) includes the solid waste and design data required by Section 325.74, Technical Information Required for Landfill Sites Serving 5000 Persons or More. The TCEQ (formerly the Texas Natural Resource Conservation Commission (TNRCC)) took jurisdiction over Type IV Landfills in Texas in October 1993. Revisions to MSW regulations have occurred over time, the most significant of which occurred in 2006. Part IV of MSW Permit No. 1848 was modified to conform with relevant regulatory updates.

Necessary revisions to MSW Permit No. 1848 have occurred over time, and as a result, the applicant and TCEQ acknowledge that a formal update to the format of the permit will be useful for the successful operation and compliance tracking for the facility. We further acknowledge that this existing facility was constructed prior to the current site selection and design criteria. To the extent practicable, this application conforms with 30 TAC 330.61, as applicable.

At the time of the 1989 application to the TDH, the applicant documented that waste disposal was taking place “in the southwest end of the site, and in the northwest portion of the site. These areas contain the ancient fill from Randolph Air Force Base, and part of the fill which has been placed while operating under the "Grandfather Status" set out in the compliance letter from the Texas Department of Health Bureau of Solid Waste Management dated October 16, 1985.

ATTACHMENT B WASTE ACCEPTANCE PLAN

ATTACHMENT C MAPS

General Location Maps (§330.61(c))

A General Location Map has been prepared and are included as **Attachment C, Figures 2-1 through 2-8** of Part II of the application. These General Location Maps are provided in addition to those provided in Part I of the application and accurately show the following surrounding features:

- the prevailing wind direction with a wind rose;
- all known water wells within 500 feet of the proposed permit boundary with the state well numbering system designation for Water Development Board "located wells";
- all structures and inhabitable buildings within 500 feet of the proposed facility;
- schools, licensed day-care facilities, churches, hospitals, cemeteries, ponds, lakes, and residential, commercial, and recreational areas within one mile of the facility;
- the location and surface type of all roads within one mile of the facility that will normally be used by the owner or operator for entering or leaving the facility;
- latitudes and longitudes;
- area streams;
- airports within six miles of the facility;
- the property boundary of the facility;
- drainage, pipeline, and utility easements within or adjacent to the facility;
- facility access control features; and
- archaeological sites, historical sites, and sites with exceptional aesthetic qualities adjacent to the facility.

Facility Layout Maps (§330.61(d))

Facility Layout Maps have been prepared and are included **Part III, Attachment D-1** of the application. These Facility Layout Maps accurately show the following surrounding features:

- the outline of the units;
- general locations of main interior facility roadways, and for landfill units, the general locations of main interior facility roadways that can be used to provide access to fill areas;
- locations of monitor wells;
- locations of buildings;
- any other graphic representations or marginal explanatory notes necessary to communicate the proposed construction sequence of the facility;
- fencing;
- provisions for the maintenance of any natural windbreaks, such as greenbelts, where they will improve the appearance and operation of the facility and, where appropriate, plans for screening the facility from public view;
- all site entrance roads from public access roads; and
- for landfill units:
    - sectors with appropriate notations to communicate the types of wastes to be disposed of in individual sectors;
    - the general sequence of filling operations;
    - sequence of excavations and filling;
    - dimensions of cells or trenches; and
    - maximum waste elevations and final cover.

General Topo Maps (§330.61(e))

A General Topographic Map has is included as **Part I, Attachment C, Figure 1-1B** of the application. This map is excerpted from a United States Geological Survey 7 1/2-minute quadrangle sheets or equivalent for the facility. The scale is at least one inch equals 2,000 feet.

Aerial Photography (§330.61(f))

An Aerial Photograph is included in **Part II, Attachment C, Figure 1-1C** of the application. This map is excerpted an aerial photograph approximately nine inches by nine inches with a scale within a range of one inch equals 1,667 feet to one inch equals 3,334 feet and showing the area within at least a one-mile radius of the site boundaries. The site boundaries and actual fill areas are marked.

Land-Use Map (§330.61(g))

A Land-Use Map depicting the actual land-use within the facility and those properties within one-mile of the facility is included as **Part II, Attachment C, Figure 2-3.** As shown on the land-use map, Cibolo Creek flows roughly parallel to the southwestern, southeastern and a portion of the northeastern property line, and at some locations crosses into the facility property.

Samuel Clemens High School and Schertz Elementary School are shown to be located approximately 0.61 miles and 0.33 miles north of the facility, respectively. The Allison L. Steele Enhanced Learning Center, a drop-out prevention high school, is located approximately 0.42 miles northwest of the facility. Randolph Elementary School (Randolph Airforce Base), in Bexar County, is 0.78 miles southwest of the facility. Rose Garden Elementary School is located slightly southeast of the facility property boundary, approximately 0.51 miles.

Three cemeteries are located within one mile of the facility. Schneider Memorial Cemetery is the closest and abuts the northern portion of the northeastern facility property line. The Jacob Christian Seiler Cemetery and Seiler Cemetery are family cemeteries located approximately 0.17 and 0.42 miles, respectively, northeast of the northern portion of the facility. Five parks, Palm (0.18 miles) Cut Off (0.30 miles), Veterans (0.32 miles), Pickrell (0.49 miles) and Thulemeyer (0.72 miles), are located north and northwest of the facility. Randolph Airforce Base is located approximately 0.6 miles southwest of the facility boundary at its nearest point.

Nine church/chapel buildings were found to be located within one mile of the facility boundaries. Seven are located north of the facility, one to the northwest, and one lies to the southwest on Randolph Airforce Base. **Table C-1** listed the names of these churches/chapels, distance from the facility boundaries, and compass direction from the facility.

TABLE C-1 COMMUNITY FEATURES WITHIN ONE MILE OF THE FACILITY BOUNDARY

CHURCH NAME	DISTANCE FROM FACILITY BOUNDARY IN MILES	COMPASS DIRECTION FROM FACILITY
Church of the First Born	0.70	Northwest
First Baptist Church of Schertz	0.42	North
Grace Community Center Bible Church	0.06	Southwest
New Covenant Family Church	0.40	North
Pentecostal Life Church	0.2	North
Randolph AFB Chapel	0.96	Southwest
Salvation and Deliverance Church of Texas	0.14	North
Schertz Church of Christ	0.27	North
The Vineyard Followship Church	0.19	North

Four licensed daycare facilities are located within one mile of the landfill facility. These four day-cares are the First Baptist Church of Schertz listed in Table 2-1 above; the Brighter Futures Learning Center located approximately 0.95 miles northeast of the landfill facility; Mary's Little Lambs situated approximately 0.91 miles to the northwest, and A2Z Alphabet Alley Learning Center located approximately 0.19 miles northwest of the facility boundary.

ATTACHMENT D FACILITY IMPACT AND EXISTING CONDITIONS (§330.61(H))

Beck Landfill operates the existing facility to avoid adverse impacts to human health or the environment. The following sections demonstrate both historical and forward-thinking information regarding likely impacts of the facility on cities, communities, groups or property owners, or individuals by analyzing the compatibility of land use, zoning in the vicinity, community growth patterns, and other factors associated with the public interest.

Zoning and Governing Jurisdiction

The facility is in Guadalupe County adjacent to the county line shared with Bexar County, parts of which are within two miles of the facility. The facility property is now located entirely within the City of Schertz corporate limits which has local authoritative jurisdiction over the facility. Other than the City of Schertz, portions of the cities of Universal City and Cibolo are also located within two miles of the facility boundary.

The site was originally authorized by the Texas Department of Health in 1989. At that time, the Landfill was totally within Guadalupe County and the service area of the Cibolo Creek Municipal Authority. The site was only partially within the City of Schertz, Texas. The additional political boundaries of Bexar County and the partial corporate limits of Universal City and Cibolo were within one mile of the original Landfill boundary, as well as a large portion of Randolph Air Force Base. The City of Schertz was however the only local municipality having an authoritative jurisdiction relevant to the site.

The City of Schertz enacted zoning, in the form of “use districts”, in the 1960's. Major revisions of the use districts have subsequently occurred in the 1970's and 1980's as corporate limits were extended. The Landfill, in general, was predominately zoned pre-development. A portion of the access road to this site was zoned general business. The balance of the site was not within the City of Schertz' city limits, and therefore, was not zoned. None of the above conditions restricted the site's use as a landfill.

As shown on the Schertz zoning map below, the facility property is zoned for heavy manufacturing (M-2). The frontage along FM-78, zoned “General Business” (GB) has been excluded from the permit boundary. Most of the properties within the City of Schertz located north of the landfill facility are zoned for residential, planned development or public uses. Some commercial use and pre-development zoned properties are interspersed with the residential zoned areas, but most are located along or near the corporate limits shared with Universal City, along Highway 78, F.M. 3009. Properties located within the City of Schertz corporate limits that lie south, east and west of the facility property are zoned mainly as residential, public use and pre-development with intermingled commercial zoned properties and non-zoned unincorporated properties. A large portion of a military installation, Randolph Air Force Base, falls within two miles of the western side of the facility property. A published zoning map for the base is not available.

Figure 2-3 City of Schertz Zoning Map (2022)

1 City of Schertz Zoning Map (https://schertz.maps.arcgis.com/apps/webappviewer/index.html?id=1750bcfcad3642eeac482bddcbad3d91).

Zoned properties located within the corporate limits of the City of Cibolo lie within two miles east of the landfill facility. Most of the Cibolo properties are zoned for residential use. Much of the commercial and industrial zoned properties are located along Highway 78 between Borgfeld Road and E. Schaefer Road. Some agricultural zoned land is present south of E. Schaefer Road and adjoins Cibolo Creek. Those properties that lie within the corporate limits of Universal City and two mile west of the landfill facility are mostly zoned for residential use and open spaces. Commercial zoned properties are located mainly along FM 218 and Universal City Boulevard.

Character of Surrounding Land Use within One Mile

The current character of the surrounding land use within one mile of the facility property can be described as follows:

- Land located north of Highway 78, which borders the northern most facility property line, is mainly use for residential purposes, parks/open spaces and civic services (e.g., schools, police department, fire department).

[1] The City of Schertz (arcgis.com)

- South of Highway 78, the land is used mainly for agriculture and military (Randolph Airforce Base) uses with scattered residential and civic (school) uses.

Growth Trends within Five Miles

The area within five miles of the facility boundary extends beyond the northern and western county lines of Guadalupe County into Bexar and Comal countries. Population growth projections specific to this five-mile coverage area are not available. Therefore, census data for the cities of Schertz, Cibolo and Universal City and the three referenced counties, as well as growth projections from a 2021 regional water plan were used to represent the potential population growth trend for the coverage area. Census data for the years 2010 and 2020 and percent population increase for the cities of Schertz, Cibolo and Universal City and the counties of Guadalupe, Bexar and Comal are listed below in **Table D-1**. As shown on this table, the population within the three cities and all three counties did increase with the highest percent increase occurring with the City of Cibolo.

TABLE D-1 2010 AND 2020 POPULATION

CITY OR COUNTY	2010 POPULATION	2020 POPULATION	PERCENT INCREASE
Schertz	31,465	42,002	33.5
Cibolo	15,349	32,276	110.3
Universal City	18,530	19,720	6.4
Bexar	1,714,773	2,009,324	17.2
Comal	109,472	161,501	47.5
Guadalupe	131,533	172,706	31.3

Population growth projections for Guadalupe, Bexar and Comal counties were obtained from the Texas Water Development Board (TWDB) 2021 South Central Texas Regional Water Plan. The population projections for these three counties are listed below in **Table D-2**. The projected population data listed in Table 2-3 indicates that a positive growth can be expected within the five-mile coverage area through the Year 2070.

TABLE D-2 POPULATION PROJECTIONS

COUNTY	PROJECTED POPULATION BY DECADE				
	2030	2040	2050	2060	2070
Bexar	2,231,550	2,468,254	2,695,668	2,904,319	3,094,726
Comal	193,188	234,515	276,239	317,682	357,464
Guadalupe	235,318	276,064	315,934	356,480	396,261

Residential and Other Uses within One Mile of the Facility

Beck Landfill is an existing facility. The online mapping and screening tool, EJScreen, which is maintained by the US Environmental Protection Agency (USEPA) was used obtain information regarding the of residences within a one-mile radius of the facility. Based on that information, there are approximately 4,014 housing units within a mile of the facility. The nearest residence abuts the western

side of the facility boundary near the entrance to the facility off Highway 78. The population density within the coverage radius is approximately 1,340 per square mile. Numerous commercial establishments are also present within one mile of the facility boundary. The nearest commercial business is the CEMEX Concrete Plant which is located at the northern portion of the facility property (co-located). Other land uses (e.g., schools, cemeteries, churches) within the one-mile coverage radius and the proximity of the closest specific uses are as follows:

- Five schools of the Schertz-Cibolo-Universal City Independent School District are located within one mile of the landfill facility. The closest of these schools is Schertz Elementary School located approximately 0.33 miles north of the facility property. Other land uses (e.g., schools, cemeteries, parks) within the one-mile coverage radius and the closest
- Three family cemeteries are within one mile of the landfill facility. Schneider Memorial Cemetery is the closest and abuts the northern portion of the northeastern facility property line.
- Five parks are located to the north and northwest of the facility. The closest is Palm Park, a city park, that is within approximately 0.18 miles of the landfill boundary.
- A large area of Randolph Airforce Base is located approximately 0.6 miles southwest of the facility boundary at its nearest point. Most on the runway on the eastern side of the base is within the one-mile land use radius.
- Nine church/chapel buildings were identified to be present within one mile of the facility boundaries. Eight of the nine are located north of Highway 78. The ninth lies to the southwest on Randolph Airforce Base. The closest of these church buildings is Grace Community Center Bible Church, located approximately 0.06 miles southwest of the northern leg of the facility property.
- Four licensed daycare facilities were identified within one mile of the landfill facility. The closest day-care facility to the landfill is A2Z Alphabet Alley Learning Center, which lies approximately 0.19 miles to the northwest.

Wells Within 500 feet

The online TWDB Groundwater Data Viewer and Texas Commission on Environmental Quality (TCEQ) Water Well Report Viewer were reviewed for information pertaining to existing water wells within 500 feet of the facility boundary. Two water wells were found to be within 500 feet of the facility boundaries. These wells are identified as 75’ feet and 55’ deep, respectively, for domestic water supply, in the Leona Formation, as noted in **Table D-3**, below.

TABLE D-3 WATER WELLS WITHIN ONE MILE OF THE BECK LANDFILL BOUNDARIES

TWDB WELL REPORT NUMBER	LOCATION	BORE DEPTH (FT.)	USE	AQUIFER NAME
68306D	29.550645° -98.268163°	75	Domestic	Leona
68314	29.555336° -98.264186°	55	Domestic	Leona

ATTACHMENT E TXDOT COORDINATION (§330.61(l)(4))

As an existing facility served by existing roadway infrastructure, the Beck Landfill does not anticipate the need for roadway improvements to FM-78 as part of this permit amendment. The Beck Landfill's management has coordinated with TxDOT and the City of Schertz regarding traffic and location restrictions for the facility and that no roadway improvements will be requested. Documentation of coordination with TxDOT and the City of Schertz are included with this submittal as **Attachment E**.

ATTACHMENT F AIRPORT IMPACTS AND COORDINATION WITH FAA (§330.61(l)(5))

Beck Landfill re-evaluated the potential need for coordination and construction constraints with the United States Department of Transportation (DOT), Federal Aviation Administration (FAA) for the proposed alteration described in the 2020 Amendment. Airspace Designations are "A" to "G" where "A" is most restrictive. The nearest airspace to Beck Landfill is Randolph Air Force Base which has an Airspace "D" Designation, as noted in the Air Traffic Organization Policy, Subj: Airspace Designations and Reporting Points Order J.O. 7400-11C (Last Updated: August 13, 2018):

ASW TX D San Antonio, Randolph AFB, TX
San Antonio, Randolph AFB, TX
(lat. 29°31'47"N., long. 98°16'44"W.)

That airspace extending upward from the surface to and including 3,300 feet MSL within a 4.4-mile radius of Randolph AFB excluding that airspace within the San Antonio International Airport, TX, Class C airspace area. This Class D airspace area is effective during the specific dates and times established by a Notice to Airmen. The effective date and time will thereafter be continuously published in the Airport/Facility Directory.

AMENDMENTS 06/23/94 59 FR 24344 (Revised)
https://www.faa.gov/documentLibrary/media/Order/JO_7400.11C.pdf
Additional information regarding Class D Airspace was reviewed in Title 14 Chapter I Subchapter E Part 71 Subpart D—Class D Airspace:

§71.61 Class D airspace.
The Class D airspace areas listed in subpart D of FAA Order 7400.11C (incorporated by reference, see §71.1) consist of specified airspace within which all aircraft operators are subject to operating rules and equipment requirements specified in part 91 of this chapter. Each Class D airspace area designated for an airport in subpart D of FAA Order 7400.11C (incorporated by reference, see §71.1) contains at least one primary airport around which the airspace is designated.

An Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) is required for proposed off-airport construction or alteration to promote air safety and efficient use of the navigable airspace. The affecting regulations included 14 CFR Part 77, Advisory Circular 70/7460-1L Change 2 (re: obstruction marking and lighting), and Forms 7460-1 and 7460-2. Forms will be submitted electronically through this website: NEW USER REGISTRATION

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc., In accordance with 14 CFR Part 77.9, Beck Landfill filed notice with the FAA on June 21, 2022. Aeronautical Study Number(s) (ASN): 2022-ASW-13343-OE, 2022-ASW-13344-OE, 2022-ASW-13345-OE, and 2022-ASW-13342-O have been assigned. An approved FAA study is required for construction of surface extending outward and upward at any of the following slopes:

- 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in 14 CFR 77.9(d) with its longest runway more than 3,200 ft. in actual length, excluding heliports
- 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in 14 CFR 77.9(d) with its longest runway no more than 3,200 ft. in actual length, excluding heliports
- 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in 14 CFR 77.9(d)

Beck Landfill has conducted an in-person interview with Randolph Air Force Base and obtained site-specific constraint requirements and will conform with these requirements. A figure depicting the FAA constraints is provided as **Attachment F**.

NOTE: An online tool is available to facilitate an initial review of potential to obstruct. Based on the following inputs, our project would require analysis and coordination with FAA.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	29 Deg 33 M 7.87 S N
Longitude:	98 Deg 15 M 44.3 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	703 (nearest foot)
Structure Height :	800 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	(•) No ( ) Yes
	Submit

Results

You exceed the following Notice Criteria:

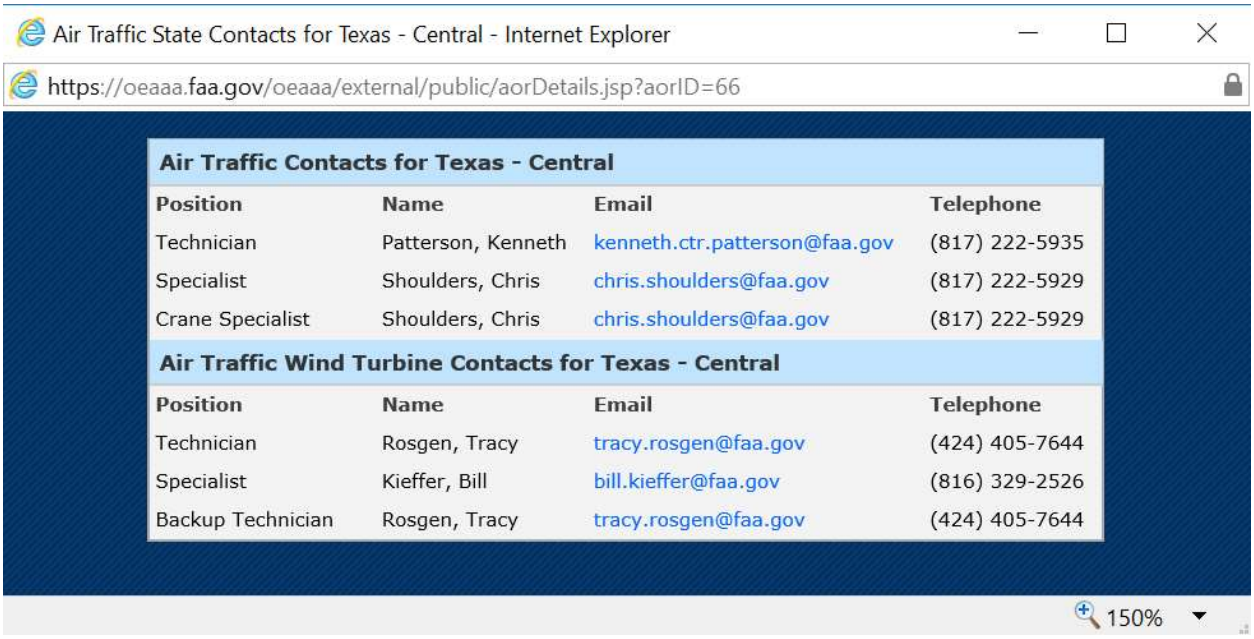
Your proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception. The FAA, in accordance with 77.9, requests that you file.

77.9(a) by 600 ft.

77.9(b) by 706 ft. The nearest airport is RND, and the nearest runway is 15L/33R.

The FAA requests that you file

NOTE: Following the Analysis of the potential to obstruct airspace for the offsite airport construction, coordinate with the FAA representative of their state and region. Randolph AFB is in the Central Texas Region and the contacts provided by FAA (https://oeaaa.faa.gov/oeaaa/external/public/aorMap.jsp) *are below:*


Air Traffic State Contacts for Texas - Central - Internet Explorer

https://oeaaa.faa.gov/oeaaa/external/public/aorDetails.jsp?aorID=66

Air Traffic Contacts for Texas - Central

Position	Name	Email	Telephone
Technician	Patterson, Kenneth	kenneth.ctr.patterson@faa.gov	(817) 222-5935
Specialist	Shoulders, Chris	chris.shoulders@faa.gov	(817) 222-5929
Crane Specialist	Shoulders, Chris	chris.shoulders@faa.gov	(817) 222-5929

Air Traffic Wind Turbine Contacts for Texas - Central

Position	Name	Email	Telephone
Technician	Rosgen, Tracy	tracy.rosgen@faa.gov	(424) 405-7644
Specialist	Kieffer, Bill	bill.kieffer@faa.gov	(816) 329-2526
Backup Technician	Rosgen, Tracy	tracy.rosgen@faa.gov	(424) 405-7644

150%

As a facility located within 10,000 feet of an airport runway end utilized by turbojet aircraft, the Beck Landfill maintains operations such that bird hazards to arriving and departing aircraft are not created. The waste accepted for disposal at the Beck Landfill is Type IV, non-putrescible waste only. No putrescible wastes that may serve to attract birds to the facility are accepted for disposal at the Beck Landfill. Putrescible wastes including general plant trash and lunch wastes that are generated on-site are managed through the strict requirement for employees to dispose of such wastes in covered and regularly emptied waste receptacles for off-site disposal. Employees are provided regular training on good housekeeping practices, including the proper management of wastes on-site. The Beck Landfill provide notice of the proposed vertical expansion to all airports within a six-mile radius as indicated on **Part II, Attachment C, Figure 2-2.**

ATTACHMENT G GENERAL GEOLOGY AND SOIL STATEMENT (§330.61(J))

General geology and soils were originally discussed in several sections of the Snowden, 1989 permit application, including the Geotechnical Investigation in Attachment 11 and Soils Section (Snowden, 1989). Attachment 11 is included in **Part III, Attachment G** of this amendment application. Supplemental geotechnical borings were drilled at the southern and northern ends of the landfill site during two separate investigations in 2020 (see **Part III, Attachment D5- Geotechnical Reports**). The principal findings of these investigations regarding site geology, soil stratigraphy, and soil properties are summarized below.

General Geology

A review of historical and supplemental geotechnical information identified strata having characteristics matching the Pleistocene-age fluviatile terrace deposits overlying the undivided Cretaceous-age Navarro Group and Marlbrook Marl strata. Several of the geotechnical borings also penetrated discontinuous strata that may be Leona Formation deposits, or possibly basal terrace deposit beds.

The general area encompassing the project site is situated upon an alluvial deposit overlying shale of the Navarro and Taylor Formations. According to the Geologic Database of Texas, the Beck Landfill is wholly situated on an outcrop of Pleistocene Series fluviatile terrace deposits (Qt)[2]. These terrace deposits are comprised of gravel, sand, silt, and clay that were laid down as point bars, oxbows, and abandoned channel segments in low terrace deposits mainly above flood level along entrenched streams. The Pleistocene Series terrace deposits overlie the older Pleistocene Series Leona Formation, which outcrops adjacent to the terrace deposits near the landfill site. Calcareous silt that grades down into coarse gravel make up the Leona Formation. Where the Leona Formation was removed by erosion prior to fluviatile terrace deposition, the terrace deposits directly overlie the undivided Cretaceous Series Navarro Group and Marlbrook Marl (upper Taylor Group). The Navarro Group and Marlbrook Marl strata are comprised of marl, clay, sandstone, and siltstone. The undivided Navarro and Marlbrook outcrop several miles south, east and west of the landfill site (See **Figure 3-1**).

The stratigraphy is extremely variable within the Alluvial Deposit and somewhat variable in the Navarro and Taylor Deposits due to historic erosion of Cibolo Creek. The lithologies and corresponding formations initially encountered at the Beck Landfill site are as follows. The sand and gravel deposits are removed at the time of this application and waste placement has occurred within the active permit footprint of the landfill.

Formation or Group Name	Depth Range in Feet[3]	Lithology
Pleistocene Series Fluviatile Terrace Deposits	0 to 38	High Plasticity Clay, Low Plasticity Clay and Sandy Clay, Clayey Sand and Clayey Gravel

[2] USGS, Texas Geology Web Map Viewer. Accessed online at txpub.usgs.gov/txgeology/ on June 5, 2020.
[3] Below ground surface

Formation or Group Name	Depth Range in Feet[3]	Lithology
Pleistocene Series Leona Formation	20 to 35	Clayey Gravel
Cretaceous Series Navarro Group and Marlbrook Marl	0 to 50+	High Plasticity Clay, Low Plasticity Clay and Clay-Shale

Soil Information

The landfill sits within Black Land Prairie which is the beginning of the Coastal Plains that extend from Mexico into New England. According to the Web Soil Survey of the Natural Resources Conservation Service (NRCS), soils underlying the landfill include the following:

- Sunev loam 0 to 1 percent slopes – the majority of the landfill was underlain by these soils, though nearly all removed as result of operations.
- Barbarosa silty clay, 0 to 1 percent slopes – located north of the landfill embankment dike.

The following soils are primarily located adjacent to the Cibolo Creek.

- Lewisvile silty clay, 0 to 1 percent slopes
- Patrick soils, 1 to 3 percent slopes, rarely flooded
- Tinn and Frio soils, 0 to 1 percent slopes, frequently flooded
- Bosque and Seguin soils, frequently flooded

The National Hydric Soil List and Web Soil Survey identifies the soil map unit Bosque and Seguin soils, frequently flooded (BO) as having the potential to contain hydric soil components. This soil map unit is mapped in association with an NHD-mapped stream adjacent to and within the Cibolo Creek. **Figure 2-8** contains a graphic representation of the soils mapped with the permit boundary.

Geologic Fault Assessment

The Beck Landfill site is located along the extreme southeastern edge of the northeast trending Balcones Fault Zone. The Balcones Fault Zone is generally comprised of a series of slip-drip normal faults with downward displacements to the southeast. Movement along these faults has displaced the Cretaceous-age strata outcrops within the general area of the Beck Landfill site. Movement along Balcones faults occurred primarily during the Miocene Epoch.

According to the Bureau of Economic Geology San Antonio Sheet, no mapped Balcones faults are located within or within 200 feet of the Beck Landfill. The nearest mapped fault is located approximately 1.5 miles to the northwest with a northeast-southwest trend. However, a fault located about 3 miles northeast of the landfill site does trend towards the southern end of the Beck Landfill. The southwestern extent of this fault has not been mapped due to the deposition of Quaternary-age sediments over the faulted Cretaceous formations covering any surficial evidence of fault line (**see Part III, Attachment E,**

Figure 3-4). A review of the USGS Quaternary Fault and Fold Database[4] using the agency's Quaternary Faults Web Application found no reported Holocene displacement of faults within the Balcones Fault System.

Prior to construction, a geologic fault assessment was performed for the landfill site in accordance with subparagraph 325.74(b)(5)(J) of the Municipal Solid Waste Management Regulations. The work involved during the conduct of this study includes the following elements:

1. Review of geologic literature documenting surface fault evidence;
2. Analysis of topographic and subsurface structure contour maps for geomorphic features which are resultant of the manifestation of fault activity;
3. Site general area reconnaissance to locate physical evidence of distress which may be caused by fault activity; and
4. Preparation of a report presenting our findings and opinions based on the data obtained above (Snowden Attachment 11).

As any faulting would be associated with the inactive Balcones System, no movement associated with faults should be anticipated in the area of the landfill site. A joint trend as theorized in Snowden's Attachment 11 and as described therein would likewise have no effect upon the landfill substructure.

Analysis

The topographic map (one-foot contour) was analyzed to identify geomorphic features often associated with faulting. These features include minor topographic scarps, aligned drainage, or aligned natural ponds. None of these features were recognized within and surrounding the project site due to the overlying mantle of Alluvial Deposits.

A reconnaissance of the proposed Type IV landfill site and the surrounding area was performed to document physical evidence of possible geologic fault activity. Area roads were examined for pavement breaks. Building structures were examined for structural damage, and drainage ditches and area streams were examined for features which might be fault-related. No evidence of surface displacements which could be related to fault activity were identified within the site or the immediate surrounding area.

Conclusion

Assessment of this site based on our professional evaluation, geologic data gathered and experience with fault related features, indicates general geologic conditions favorable to development as a landfill site. Along with the proposed slurry trench design the site should be capable of development into an adequate Type IV Landfill. The geologic evaluations rendered in this report meet the standard of care of our profession. No other warranty or representation, either expressed or implied, is included or intended.

[4] USGS Quaternary Faults Web Application accessed online at usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf on April 13, 2021

Seismic Impact Zones (§330.557)

30 TAC 330.557 defines a seismic impact zone 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, will exceed 0.10g in 250 years. A review of the 2018 National Seismic Hazard Model for the conterminous United States found that the Beck Landfill site is not located in an area having a 10% or greater probability that the peak horizontal acceleration will exceed 0.10g. Additionally, the Beck Landfill is located within an area of the State where Holocene displacement of faults has not occurred.

The image below depicts the Federal Emergency Management Agency (FEMA) Earthquake Hazard Map of the W~~w~~estern United States, include Guadalupe County. The Beck Landfill is located within Zone A with a "very small probability of experiencing damaging earthquake effects", as noted by the blue triangle below. See Part III, Attachment G, **Figure 3-8** for the FEMA National Risk Index Map for earthquakes.

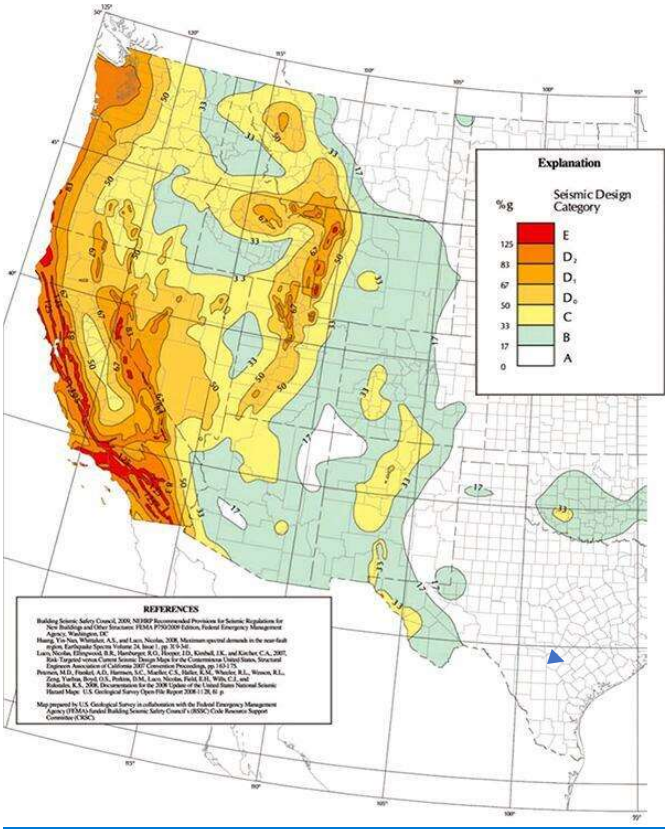


Image from "fema_hazard_maps_western-map_graphic.jpg (600×744)"

Data on Unstable Areas (§330.559)

30 TAC 330.559 defines an unstable area as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of a landfill's structural components responsible for preventing releases from the landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movement, and karst terrains. The owner or operator shall consider the following factors, at a minimum, when determining whether an area is unstable:

(1) on-site or local soil conditions that may result in significant differential settling;
(2) on-site or local geologic or geomorphologic features; and
(3) on-site or local human-made features or events (both surface and subsurface).

The Beck Landfill excavates through Pleistocene-age terrace deposits (clay, sand and gravel) and into the undivided Cretaceous-age Navarro Group and Marlbrook Marl, which consist of clay and shale material (impermeable). No on-site geologic or geomorphologic features have been observed. No on-site or local human-made features or events are observed to have created unstable conditions. The Beck Landfill does not appear to meet the definition of an "unstable area".

ATTACHMENT H GROUNDWATER AND SURFACE WATER (§330.61(K))

Site Specific Groundwater Conditions

The uppermost groundwater-bearing unit at The Beck Landfill is encountered within the Pleistocene Series Leona Formation. The undivided Cretaceous Series Marlbrook Marl and Navarro Group are not known to produce groundwater within Guadalupe County (see Part III, Attachment E - Geology Report). Groundwater Detection monitoring events have been conducted in accordance with the requirements of MSW Permit No. 1848 since August 2000. Based on a review of the historical detection monitoring water level measurement record and water level observations recorded on landfill geotechnical boring logs, it appears that the uppermost groundwater-bearing unit is in an unconfined condition. Evaluation of the historical detection monitoring water level measurements and historical rainfall events found that groundwater levels in the uppermost unit are highly influenced by rainfall amounts and the fluctuation of water levels within the adjacent Cibolo Creek. This finding strongly suggests that the uppermost unit is hydraulically connected to the creek and that Cibolo Creek may receive discharge from the uppermost groundwater-being unit (effluent stream).

Generally, groundwater flow is from the northwest to southeast towards Cibolo Creek further supporting the likelihood that groundwater from the uppermost unit discharges to the creek. Five monitor wells (MW) are installed at Beck Landfill. Due to the southerly groundwater flow direction and depth to groundwater being shallowest at MW-A and deepest at MW-F, annual detection monitoring events begin at ~~rotate around the Landfill from~~ MW-A ~~t~~, moving counterclockwise around the Landfill (MW-C, MW-D, MW-F, and~~o~~ MW-G~~) and then in a counterclockwise rotation~~. Monitor wells are depicted in Part III, Attachment D1, Figure D1.1 Site Layout Plan. Average historical well readings from the five monitor wells indicate that the average saturated thickness within the groundwater-bearing unit at the monitor wells ranges from approximately 5 feet to approximately 11 feet. Monitor wells MW-F and MW-G typically purge “dry” before three well volumes can be removed. However, recharge occurs within 24 hours such that sample volumes are typically obtained as required. This slow recharge rate suggests that the hydraulic conductivity of the uppermost unit variable across the site and possibly low. Historical water-level elevations at the Beck Landfill are presented in Part III, Attachment F of this application.

Surface Water at or near the Site

The Beck Landfill is surrounded to the west, south, and east by the Mid Cibolo Creek (TCEQ Stream Segment ID. No. 1913). The Mid Cibolo Creek flows from a point 100 meters (110 yards) downstream of IH-10 in Bexar/Guadalupe County to the Missouri-Pacific Railroad bridge west of Bracken in Comal County. This perennial, freshwater stream is not listed as impaired on the EPA-approved 2020 Texas Integrated Report Index of Surface Water Quality. Aquatic life use (ALU) is defined as “limited”.

TPDES Stormwater Permits

The Beck Landfill has an active Texas Pollutant Discharge Elimination System (TPDES) Multi-Sector General Permit (MSGP) that authorizes discharges of stormwater associated with industrial activities. A site-specific Stormwater Pollution Prevention Plan (SWPPP) has been written and is implemented at the Facility. Sector-specific compliance practices are described for Sector L (Activity Code LF: Landfill) and Sector J (SIC Code 1442: construction sand and gravel). The Permit No. is **TXR05AW45**. Upon expiration, Beck Landfill will renew its authorization by submitting required documentation to the TCEQ. Copies of the SWPPP and permit correspondence are maintained at the Landfill and are available upon request.

Stormwater that comes in contact with solid waste will be treated as contaminated water and will be retained on-site. This water may be used as dust suppression on within the landfill working face but will not be applied in areas where solid waste is not exposed.

Stormwater that falls within the future excavations, outside of the dikes below the active waste, will be treated as uncontaminated stormwater and be diverted to site drainage systems and ultimately used for dust control on areas of the site where solid waste is not exposed, such as haul roads and within the sand and gravel mining operation footprint.

This permit amendment represents a vertical change within the existing landfill footprint on-site and no exceedances of state water quality standards, applicable effluent limitations, or non-compliances under the Clean Water Act are anticipated.

ATTACHMENT I ABANDONED OIL AND WATER WELLS (§330.61(L))

As noted in the original application for this permit, the Texas Department of Health (TDH) guidelines for drinking water protection stated that water wells located within 500 feet of actual disposal areas should be evaluated to show that adequate protection to drinking water sources is provided. Texas Water Commission records indicate no water wells to exist within 500 feet of the proposed disposal site[5].

At the time of initial permitting, two recorded water wells Kx 68 - 30 6A and Kx 68 - 30 - 9A were known to be completed in Alluvial Aquifers similar to that anticipated at this site but each were located on the opposite side of Cibolo Creek which creates a hydraulic divide within the aquifer water system. Water wells within approximate 1000-foot radius at the time of application included Kx 68 - 30 - 603 completed in September 1956 producing from the Edwards Aquifer at depths of' 535 to 550 feet.

Interconnection with the Edwards Aquifer is precluded by the Navarro/Taylor shales. The review of other water wells within a one-mile radius of the site indicates one additional alluvial well and several municipal Edwards wells. The landfill operation is not expected to endanger the water supplies of any existing wells due to the differing aquifers and the divide created by Cibolo Creek.

The municipal waters for each of the surrounding Municipalities, including Randolph Air Force Base, are derived from Edwards Aquifer wells. All of the municipal wells with the exception of Randolph's wells, are in excess of three miles upgradient from the landfill site. Randolph's wells are located just beyond a one-mile radius in an upgradient segment of the Edwards Aquifer. The intake of surface waters intended for human consumption does not occur within any reasonable proximity to the site. The nearest application of surface waters for such purposes occurs at New Braunfels and Seguin each approximately 15 miles from the site along the Guadalupe River.

Sources of drinking water should thus in no way be impacted by the landfill development. The Alluvial Aquifer is further considered adequately protected by naturally occurring characteristics and the application of the slurry trench wall.

On-Site Oil or Water Wells

The locations of all existing and abandoned wells have been re-evaluated for this amendment application. A current list of identified existing and abandoned wells near the Beck Landfill is depicted in **Table I-1** below. The on-site wells are utilized for groundwater quality monitoring in accordance with the existing MSW permit. No other active or historical wells within the Beck Landfill facility are depicted on the Texas Water Development Board (TWDB) Groundwater Data Viewer (TWDB, accessed June 8, 2020).

[5] (Appendix A of Attachment 11 Geotechnical Investigation**,** 1989 – see **Part III, Attachment G**)

TABLE I-1 – WATER WELLS AT THE BECK LANDFILL

WELL	USE	LATITUDE AND LONGITUDE
MW-A	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.548880°, -98.268411°
MW-C	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.544524°, -98.265643°
MW-D	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.543768°, -98.258393°
MW-F	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.547263°, -98.260227°
MW-G	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.551674°, -98.262166°
Piezometer A	Groundwater monitoring of leachate inside of the landfill dike-line	29.548868°, -98.268394°
Piezometer C	Groundwater monitoring of leachate inside of the landfill dike-line	29.544557°, -98.265645°
Piezometer D	Groundwater monitoring of leachate inside of the landfill dike-line	29.543796°, -98.258427°
Piezometer F	Groundwater monitoring of leachate inside of the landfill dike-line	29.547273°, -98.260264°
Piezometer G	Groundwater monitoring of leachate inside of the landfill dike-line	29.551662°, -98.262213°

No existing or abandoned on-site crude oil, natural gas wells, or other mineral recovery infrastructure regulated by the Railroad Commission of Texas (TXRRC) are present on-site (TRRC Public GIS Viewer, accessed June 8, 2022).

ATTACHMENT J FLOODPLAINS AND WETLAND STATEMENT (§330.61(M))

At the time of application, the minimum required separating distance of 50 feet to be maintained between disposal operations and the boundary of the site to allow area for visual screening (it needed), surface drainage facilities, flood protection facilities, and a safety margin for methane gas and leachate monitoring will, in most cases, actually be exceeded due to the location of the flood protection levees. Upon completion of the landfill, the access roads will be widened, it necessary, onto completed portions of landfill. A minimum 3.5-foot tall barbed wire fence, or higher barrier marking the site perimeter, will be installed and maintained by the landfill supervisor, after construction of the dike.

A buffer zone of 200 feet, from the center line of the dike, is used parallel to Zuehl Street. This zone is deemed adequate as the 100-year flood plain dike to be constructed and the existing vegetation will totally screen the operation. In addition, the area in question is the area of long existing fill which the department is requiring be encapsulated and protected by the trench. It seems therefore reasonable that as fill already exists at a distance of less than 300 yards and prevents construction of the encapsulation trench and dike any further from Zuehl Street, a variance needs to be granted waving the required 300 yard buffer set out in the regulations, Section 325.42(4), and is so requested of the TDH (*excerpted from "Buffer Zones" (Snowden, 1989)*.

Buffer Zones

No solid waste unloading, storage, disposal, or processing operations are anticipated to impact buffer zones, easements, or rights-of-way on-site. This permit amendment represents a vertical change within an existing landfill footprint on-site that does not cross these features. All on-site landfill activities will continue to be conducted within the existing landfill footprint.

Floodplains

Data associated with floodplains in accordance with Chapter 301, Subchapter C of this title (relating to Approval of Levees and Other Improvements are reviewed and addressed in **Part III, Attachment C-2** of this Application.

ATTACHMENT K WETLANDS

An on-site field investigation to identify surface waters and wetlands and to assess their potential for regulation as waters of the United States (WOTUS), was conducted on September 27 and 28, 2021. No impacts to wetlands or WOTUS regulated by the U.S. Army Corps of Engineers (USACE) are anticipated as a result of this vertical expansion and permit modification. Results of a literature review and field survey are included in **Attachment L** to this Part.

ATTACHMENT L ENDANGERED OR THREATENED SPECIES (§330.61(N))

As noted in the original application (*"Protection of Endangered Species" (Snowden, 1989),* the existence of any listed or proposed endangered species in the general area of the landfill is not anticipated. Migratory foul and other animals utilizing the creek system as a habitat corridor are however occasionally reported in the proximity of the site. The development of the proposed landfill is not anticipated to have any adverse effect on the existing wildlife.

A review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation was (IPaC) tool was performed on December 29, 2021. An on-site field investigation by qualified biologists was conducted on September 27 and 28, 2021. Based on the background literature review and the on-site field investigation, suitable habitat for federally listed species was observed for one species: the monarch butterfly. As a candidate species, the monarch butterfly does not currently have protections under the Endangered Species Act. The Project occurs within the primary migration corridor for the whooping crane, however, suitable habitat for the whooping crane, as well as other federally-listed bird species, was not observed during the on-site investigation. The ability of federally-listed birds to migrate through the Project Area is possible, however, these species are not anticipated in the Project Area due to the lack of suitable habitat.

No impacts listed threatened or endangered species nor their habitat are anticipated as a result of this vertical expansion (permit modification). See **Attachment L** to this Part for the full report.

ATTACHMENT M TEXAS HISTORICAL COMMISSION REVIEW (§330.61(O))

Historic Sites and Cultural Resources

On January 14, 2022, POWER performed a file review to identify cultural resources recorded within and near the Project Area. The file review included data from the online restricted-access Texas Historical Commission's Texas Archeological Sites Atlas and Texas Historic Sites Atlas (THC 2022a and 2022b); National Park Service databases (NPS 2022a and 2022b); and the Texas Department of Transportation's NRHP Listed and Eligible Bridges database (TxDOT 2022a) and Historic Districts and Properties of Texas database (TxDOT 2022b). No cultural resources are recorded within or adjacent to the Project. The nearest recorded cultural resources, archeological site 41BX565 and the Rittiman Addition Cemetery are 435 feet and 135 feet, respectively, from the Project boundary.

Due to the lack of cultural resources recorded within the Project, POWER concludes the Project will have no effect on known cultural resources. However, the Project has not undergone a cultural resources survey. A survey may be required if Project permitting requires compliance with Section 106 of the National Historic Preservation Act or the Texas Antiquities Code. If cultural resources are encountered during construction of the Project, all activities at the location should be halted until the Texas Historical Commission is notified and an appropriate course of action is determined. See **Attachment M** to this Part for the full report.

ATTACHMENT N COUNCIL OF GOVERNMENTS AND LOCAL GOVERNMENT REVIEW (§330.61(P))

Alamo Area Council of Governments (AACOG)

Parts I and II of this application were submitted to AACOG on September 12, 2022. A review letter was requested as part of the submission. A response has not been received as of the submittal of this application. Records of correspondence with AACOG are included in **Attachment N** of this application.

City of Schertz Approval Letter

Parts I and II of this application were submitted to the City of Schertz on September 12, 2022. A review letter was requested as part of the submission. A response has not been received as of the submittal of this application. Records of correspondence with the City of Schertz are included in **Attachment N** of this application.

Cibolo Creek Municipal Authority (CCMA)

Parts I and II of this application were submitted to the CCMA on September 12, 2022. A review letter was requested as part of the submission. A response has not been received as of the submittal of this application. Records of correspondence with the CCMA are included in **Attachment N** of this application.

Schertz Fire Department Letter

Parts I and II of this application were submitted to the Schertz Fire Department on September 12, 2022. A review letter was requested as part of the submission. A response has not been received as of the submittal of this application. Records of correspondence with the Schertz Fire Department are included in **Attachment N** of this application.

BECK LANDFILL

APPENDIX C1-E
FACILITY SURFACE WATER DRAINAGE REPORT
FINAL COVER DRAINAGE STRUCTURE DESIGN

Includes pages C1-E-1 through C1-E-7~~5~~

NARRATIVE

30 TAC §§330.303 AND 330.305

This appendix presents the supporting documentation for evaluation of the final cover erosion layer and drainage structures.

FINAL COVER PLAN

The final cover plans depict the proposed final cover drainage system, which consists of a series of benches and downchutes designed to convey the flow of surface water produced during the 25-year storm event. The locations of the sideslope benches and downchutes ~~chute~~ are shown on Drawing C1-2. Final cover details are included in Attachment D3.

EROSION LAYER EVALUATION

The erosion layer evaluation is based on the Universal Soil Loss Equation (USLE) following Natural Resource Soil Conservation Service (NRCS) procedures. The evaluation is based on a 25-year storm event. The proposed 12-inch thick erosion layer is shown to provide sufficient erosion protection. Calculations are included beginning on page C1-E-2.

DRAINAGE BENCH DESIGN

The drainage bench design calculations are presented for the typical proposed bench flowline slope of 2 percent. The procedures in the TxDOT Hydraulic Design Manual, September 2019 were used to determine the flow depth, bench capacity, and contributing drainage area. The largest contributing area to any bench occurs in the western portion of DA-P02 and is 9.7 acres. Using the Rational Method procedures described in Attachment C1-D, the calculated peak flowrates for the worst-case bench for the 25-year and 100-year storms are 59.8 cfs and 75.4 cfs, respectively. The Flowmaster program was utilized to determine the full-flow capacity of the bench, which is 275.8 cfs. Therefore, the selected downchutes have abundant capacity to convey the 25-year and 100-year runoff flows. The output from the Flowmaster calculation is included below.

DOWNCHUTE DESIGN

The drainage ~~chute~~downchute design calculations are presented for the typical proposed ~~chute~~downchute flowline slope of 25 percent. The HEC-HMS model was used to calculate the 25-year flow for the worst-case downchute. The largest contributing area to a downchute is DA-P03 (66.3 acres). The 25-year flow from the HEC-HMS model for this downchute is 274.2 cfs and the 100-year flow is 404.4 cfs. The Flowmaster program was utilized to determine the full-flow capacity of the downchute, which is 802.2 cfs. Therefore, the selected downchutes have abundant capacity to convey the 25-year and 100-year runoff flows. The output from the Flowmaster

calculation is included below. The downchutes were also evaluated using the Rational Method. The worst-case downchute has a drainage area of 66.3 acres and a time of concentration of 18 minutes. The 25-year intensity is therefore 7.3 inches/hour. The worst-case Rational Method flow is determined by:

Q_{25} = CIA

= (0.7)(7.3 in/hr)(66.3 Acres)

= 338.8 cfs

A Flowmaster calculation is provided below for this condition.

EROSION LAYER EVALUATION

This discussion presents the supporting documentation for evaluation of the thickness of the erosion layer for the final cover system at Beck Landfill. The evaluation is based on the premise of adding excess soil to increase the time required before maintenance is needed as recommended in the EPA Solid Waste Disposal Facility Criteria Technical Manual (EPA 530-R-93-017, November 1993).

The design procedure is as follows:

1. The minimum thickness of the erosion layer is based on the depth of frost penetration, or six inches, whichever is greater. For Guadalupe County, the approximate depth of frost penetration is less than five inches.
2. Soil loss is calculated using the Universal Soil Loss Equation (USLE) by following NRCS procedures. The TCEQ Surface Water Drainage and Erosional Stability Guidelines for a Municipal Solid Waste Landfills, states that acceptable soil erosion for the final cover condition is 3 tons/acre/year. The calculated erosion rates for the top deck and sideslope areas are both less than 3 tons/acre/year. These results show that the thickness of the proposed 6-inch erosion layer is a sufficiently conservative design.
3. Vegetation for the site will be native and introduced grasses with root depths of 6 inches to 8 inches.
4. Native and introduced grasses will be hydroseeded with fertilizer on the disked (parallel to contours) erosion layer upon final grading. Temporary cold weather vegetation will be established if needed. Irrigation may be employed for 6 to 8 weeks or until vegetation is well established. Erosion control measures such as silt fences and straw bales will be used to minimize erosion until the vegetation is established. Areas that experience

erosion or do not readily vegetate after hydroseeding will be reseeded until vegetation is established.

5. Slope stability information is included in Attachment D5 -Geotechnical Design.

MAXIMUM ALLOWABLE BENCH SPACING CALCULATION

Based on the discussion in the TCEQ Surface Water Drainage and Erosional Stability Guidelines for a Municipal Solid Waste Landfills, acceptable soil erosion for the final cover condition is 3 tons/acre/year. The USLE equation was utilized to calculate the bench spacing on the top deck and sideslope required to meet this value. For the top deck, the bench seperation can be up to 1,000 feet, so no benches are required. For the sideslopes, a horizontal bench spacing of 120 feet provides a calculated erosion rate of 2.7 tons/acre/year. The 120 horizontal bench spacing has been used for the Beck landfill.

SIDESLOPE BENCH SEPARATION CALCULATION

SOIL EROSION (RUSLE)

A = R*K*L*S*C*P	
R	265
K	0.32
LS	5.3
C	0.006
P	1
A (tons/acre/year)	**2.697**
Bench Seperation	**120.000**

Figure 2-1 Isoerodent Map, USDA 1997
Monsic Clay Loam (more conservative than clay factor in Schertz Texas)
Using the value of LS that you find go to table 4-3 and use the LS and slope to find bench distance.
(should be different for Intermediate and Final Cover) (Type D, 90% grass - 0.006)
Usually 1 for landfills (conservative case from the table provided in "P" Tab)
50 tons/ac/yr max for Intermediate Cover, 3 tons/ac/yr max for final cover
Required Bench Horizontal Spacing

TOP DECK BENCH SEPARATION CALCULATION

SOIL EROSION (RUSLE)

A = R*K*L*S*C*P	
R	265
K	0.32
LS	3.3
C	0.006
P	1
A (tons/acre/year)	**1.679**
Bench Seperation	**1000**

Figure 2-1 Isoerodent Map, USDA 1997
Monsic Clay Loam (more conservative than clay factor in Schertz Texas)
Using the value of LS that you find go to table 4-3 and use the LS and slope to find bench
(should be different for Intermediate and Final Cover) (Type D, 90% grass - 0.006)
Usually 1 for landfills (conservative case from the table provided in "P" Tab)
50 tons/ac/yr max for Intermediate Cover, 3 tons/ac/yr max for final cover
Required Bench Horizontal Spacing

Between the proposed benches, the run-off condition will be sheet flow and TxDOT Figure 5-4 below demonstrates that sheet flow from the 6% top deck and 25% sideslopes will travel at a velocity less than six feet per second, which will prevent significant erosion from occurring. For

areas with final cover, it is assumed that the soil layer will have vegetation equivalent to "short grass pasture and lawns" and the calculated sheet flow velocity for the top deck is 1.9 ft/sec while the calculated sheet flow velocity for the sideslopes is 3.1 ft/sec.

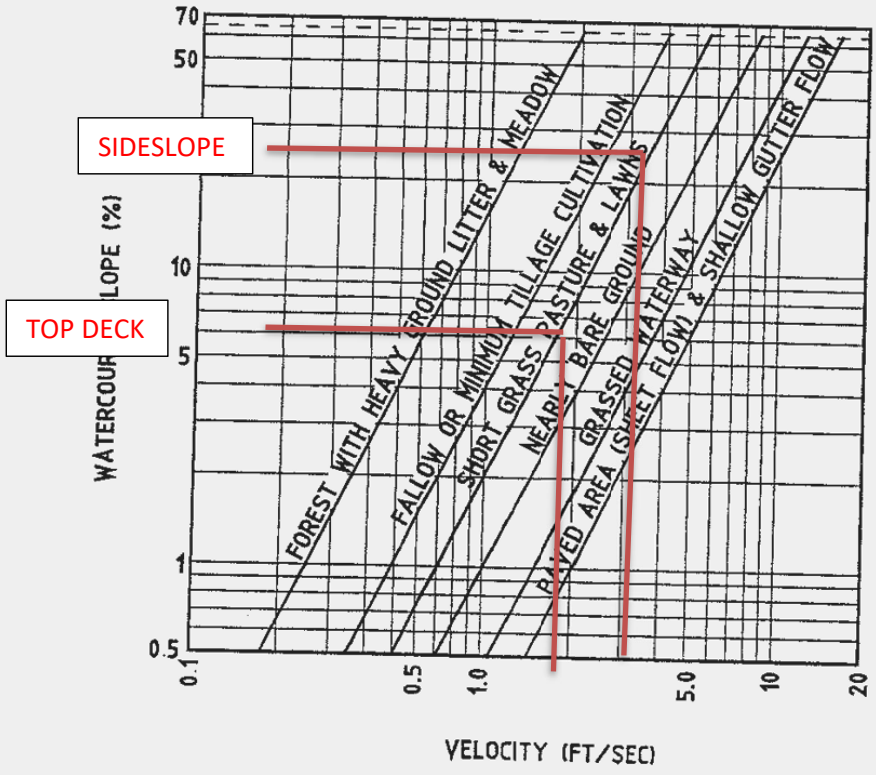


Figure 5-4. Velocities for Upland Method of Estimating Time of Concentration--English (Adapted from the National Engineering Handbook Volume 4)

FINAL COVER BENCH FULL-FLOW CALCULATION

Full-Flow Bench

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.020 ft/ft
Normal Depth	2.6 ft

Section Definitions

Station (ft)	Elevation (ft)
0+00	10.00
0+04	8.00
0+08	7.43
0+20	10.40

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 10.00)	(0+20, 10.40)	0.025

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Discharge	275.75 cfs
Roughness Coefficient	0.025
Elevation Range	7.4 to 10.4 ft
Flow Area	26.5 ft²
Wetted Perimeter	19.2 ft
Hydraulic Radius	1.4 ft
Top Width	18.38 ft
Normal Depth	2.6 ft
Critical Depth	3.1 ft
Critical Slope	0.008 ft/ft
Velocity	10.41 ft/s
Velocity Head	1.68 ft
Specific Energy	4.25 ft
Froude Number	1.529
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 ft

Beck Hydraulic Calcs.fm8
8/28/2022

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

FlowMaster
[10.03.00.03]
Page 1 of 2

FINAL COVER DOWNCHUTE FULL-FLOW CALCULATION

Worst-Case Downchute Full Flow Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.069
Channel Slope	0.250 ft/ft
Normal Depth	2.0 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	20.00 ft

Results	
Discharge	802.22 cfs
Flow Area	56.0 ft²
Wetted Perimeter	36.5 ft
Hydraulic Radius	1.5 ft
Top Width	36.00 ft
Critical Depth	3.0 ft
Critical Slope	0.055 ft/ft
Velocity	14.33 ft/s
Velocity Head	3.19 ft
Specific Energy	5.19 ft
Froude Number	2.025
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.0 ft
Critical Depth	3.0 ft
Channel Slope	0.250 ft/ft
Critical Slope	0.055 ft/ft

FINAL COVER DOWNCHUTE RATIONAL METHOD

WORST-CASE CALCULATION

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.069	
Channel Slope	0.250	ft/ft
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Bottom Width	20.00	ft
Discharge	339.00	cfs

Results		
Normal Depth	1.2	ft
Flow Area	31.0	ft²
Wetted Perimeter	30.2	ft
Hydraulic Radius	1.0	ft
Top Width	29.93	ft
Critical Depth	1.8	ft
Critical Slope	0.063	ft/ft
Velocity	10.94	ft/s
Velocity Head	1.86	ft
Specific Energy	3.10	ft
Froude Number	1.896	
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	ft
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.2	ft
Critical Depth	1.8	ft
Channel Slope	0.250	ft/ft
Critical Slope	0.063	ft/ft

BECK LANDFILL

APPENDIX C1-F
FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE COVER
EROSION AND SEDIMENTATION CONTROL PLAN

Includes pages C1-F-1 through C1-F-~~87~~ 87

CONTENTS

Narrative 1
Erosion And Sediment Control Landfill Cover Phases ..... 2~~2~~
Best Management Practices ..... 4~~4~~
Soil Stabilization and Vegetation Schedule ..... 6~~6~~
Stormwater System Maintenance Plan ..... 7~~7~~

NARRATIVE

This appendix presents temporary erosion and sediment control structures for the intermediate cover phase of landfill development. "Temporary", for the purposes of this narrative, is defined as the time between the construction of intermediate cover and the construction of final cover or the placement of additional waste, as the case may be. Intermediate top slope surfaces and external sideslopes, for the purposes of compliance with 30 TAC §330.305(d), are those above-grade slopes that:

a) Drain directly to the site perimeter stormwater management system (i.e., areas where the stormwater directly flows to a perimeter channel or detention pond),

b) Have received intermediate or final cover, and

c) Have either reached their permitted elevation, or will subsequently remain inactive for longer than 180 days.

Slopes that drain to ongoing waste placement, pre-excavated areas, areas that have received only operational cover, or areas under construction that have not received waste are not covered under this appendix and do not contribute to offsite runoff.

EROSION AND SEDIMENT CONTROL LANDFILL COVER PHASES

The purpose of this section is to define the landfill cover phases and where they are addressed throughout the Beck Landfill Site Development Plan:

Operational Cover- Operational cover is defined in §330.165(a), except that for Type IV landfills it is required weekly. Operational cover consists of 6 inches of well-compacted earthen material not previously mixed with garbage, rubbish, or other solid waste applied as required in the Site Operating Plan. The placement and erosion control practices for operational cover areas are defined in Part IV- Site Operating Plan and in the Best Management Practices Section of this appendix.

Intermediate Cover - Intermediate cover is defined in §330.165(c). Intermediate cover consists of at least 12 inches of suitable earthen material and is graded and maintained to prevent erosion and ponding of water. The placement requirements and erosion control practices for intermediate cover areas are defined in this appendix.

Final Cover - Final cover is defined in Subchapter K. The placement and erosion control practices for final cover areas are defined in Attachment C1, Appendix C1-E. Final cover at Beck Landfill will be managed as provided for in the closure and post-closure plan required by 30 TAC 330 Subchapter K, Closure and Post-Closure.

During all phases of operation, the goal is keep all run-off from the sideslopes and top dome areas as sheet flow to reduce the formation of erosion rills. Based on the TxDOT Figure 5-4 below, sheet flow from the 6% top deck and 25% sideslopes will travel at a velocity less than six feet per second, which will prevent significant erosion from occurring. For areas with operational and intermediate cover, it is conservatively assumed that the soil layer will be “nearly bare ground” and the calculated sheet flow velocity for the top deck is 2.5 ft/sec while the calculated sheet flow velocity for the sideslopes is 5.0 ft/sec. In order to maintain sheet flow conditions, temporary structural controls should be placed at 300 to 400 feet maximum spacings. Based on the USLE calculations provided in Appendix C1-F, no temporary structural controls are required on the top deck to maintain allowable erosion levels, and temporary structural controls are required at a maximum spacing of 400 feet for the sideslopes.

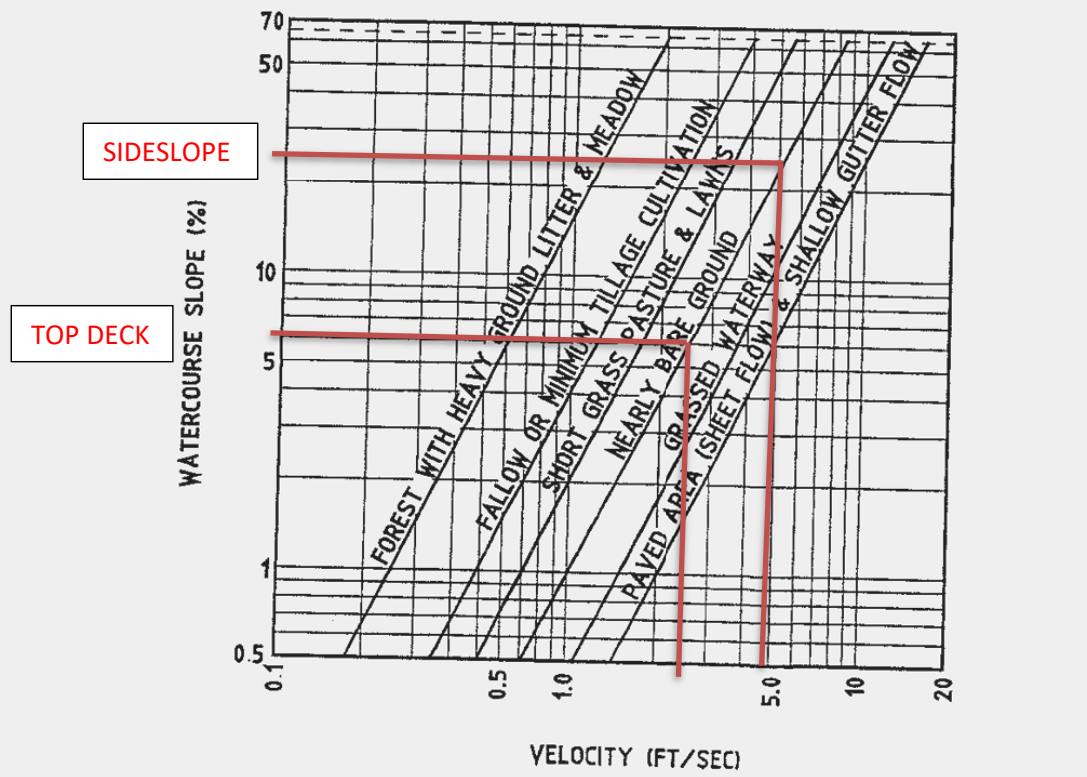


Figure 5-4. Velocities for Upland Method of Estimating Time of Concentration--English (Adapted from the National Engineering Handbook Volume 4)

BEST MANAGEMENT PRACTICES

Vegetation and temporary erosion control structures provide the most effective means of reducing the amount of soil loss during operation of the landfill. Best management practices utilized for erosion and sediment control may be broadly categorized as nonstructural and structural controls. Nonstructural controls addressing erosion include the following:

- Minimization of the disruption of the natural features, drainage, topography, or vegetative cover features
- Phased development to minimize the area of bare soil exposed at any given time
- Disturbing only the smallest area necessary to perform current activities
- Confining sediment to the construction area during the construction phase
- Scheduling of construction activities during the time of year with the least erosion potential, when applicable
- Stabilization of exposed surfaces in a timely manner
- Structural controls are preventative and also mitigative since they control erosion and sediment movement. In the event that additional soil stabilization or erosion control measures are deemed necessary, one or more of the following measures will be implemented:
- Vegetative and Non-Vegetative Stabilization. A soil stabilization and vegetation schedule is provided in this appendix.
- Check Dams. Check dams shall be constructed using gravel, rock, gabions, compost socks, or sand bags to reduce flow velocity and therefore erosion in a perimeter channel or detention pond.
- Filter Berms. Filter berms shall be constructed of mulch, woodchips, brush, compost, shredded wood waste, or synthetic filter materials. Mesh socks shall be filled with compost, mulch, woodchips, brush, or shredded wood waste. Filter berms or filled mesh socks shall be installed at the bottom of slopes, throughout the perimeter drainage system, and on sideslopes. The maximum drainage area to the filter berm or filled mesh sock will not exceed two acres. Specifications for the filter berms are provided on Drawing C3-3.
- Baled Hay, Hay bales, straw bales, or baled hay shall be approximately 30 inches in length and be composed entirely of vegetable matter. Hay bales shall be embedded in the soil a minimum of four inches.

- Sediment Traps. Sediment traps are small, excavated areas that function as sediment basins. Sediment traps allow for the settling of suspended sediment in stormwater runoff. Sediment traps shall be constructed in perimeter channels, temporary internal channels, and at entrances to detention ponds. The maximum drainage area contributing to a sediment trap will not exceed 10 acres.
- Temporary Sediment Control Fence or Silt Fence. Silt fences or fabric filter fences shall be used where there is sheet flow and sediment transport. The maximum drainage area to the silt fence will not exceed the manufacturer's specification, but will in no case be greater than 0.5 acre per 100 feet of fence. To ensure sheet flow, a gravel collar or level spreader may be used upslope of the silt fence.
- Berms. These structures will be constructed of earthen material with the top six inches capable of sustaining native plant growth. Rolled erosion control mats or blankets made from natural materials or synthetic fiber, grass, or compost/mulch/straw may be used as erosion protection along the flowline. These structures direct the flow to the drainage system. These structures decrease downslope velocities of runoff that could cause erosion on the intermediate cover slopes.
- Benches. These structures will be constructed out of the waste material and covered with intermediate cover. Rolled erosion control mats or blankets made from natural materials or synthetic fiber, grass, or compost/mulch/straw may be used as erosion protection along the flowline. These structures direct the flow to the drainage system. These structures decrease downslope velocities of runoff that could cause erosion on the intermediate cover slopes.
- ~~Letdown Chutes~~Downchutes. ~~Letdown~~ downchutes are bermed conveyance structures constructed on the intermediate cover slopes. Flow will be directed to the ~~letdown~~ downchutes via swales, then conveyed to the perimeter drainage system. The ~~letdown~~ downchutes will be lined with an FML geomembrane, turf reinforcement mats, Maccaferri gabion mattresses, concrete, gabions, crushed concrete, or stone.

SOIL STABILIZATION AND VEGETATION SCHEDULE

The soil stabilization and vegetation schedule is as follows:

- Areas that will remain inactive for greater than 180 days will receive intermediate cover.
- Intermediate cover on slopes will be stabilized by tracking into the slope. Soil stabilization can be enhanced by mulching, the addition of soil tackifiers, or a combination of these measures. The intermediate cover will be graded to provide positive drainage.
- Temporary erosion control structures will be installed within 180 days from when intermediate cover is constructed.
- The intermediate cover area will be seeded or sodded as soon as practical, following placement of intermediate cover and will be documented in the site operating record. All intermediate cover areas will be managed to control erosion and achieve a predicted soil loss of less than 50 tons per acre per year. A 60 percent vegetative cover will be established over the intermediate cover areas within 180 days from intermediate cover construction unless prevented by climatic events (e.g., drought, rainfall, etc.). Additional temporary erosion control measures will be implemented during these events to promote establishment of vegetative cover.
- Mulch, woodchips, or compost may be used as a layer placed over the intermediate cover to protect the exposed soil surface from erosive forces and conserve soil moisture until vegetation can be established. The mulch, woodchips, or compost will be used to stabilize recently graded or seeded areas. The mulch, woodchips, or compost will be spread evenly over a recently seeded area and tracked into the surface to protect the soil from erosion and moisture loss, if required to promote the establishment of vegetation. These materials are not required for the establishment of vegetation on the intermediate cover; however, they may be used if Beck Landfill determines they are needed to promote vegetative growth or to provide additional erosional stability to the intermediate cover surface. These materials will vary in thickness but will not be placed to a thickness to inhibit vegetative growth.
- The intermediate cover and temporary erosion control structures will be maintained as detailed in the Stormwater System Maintenance Plan.
- Final cover will be constructed as the site develops. Temporary erosion control features will be removed as permanent erosion control structures are constructed.

STORMWATER SYSTEM MAINTENANCE PLAN

Beck Landfill will restore and repair temporary stormwater systems such as channels, benches, drainage swales, chutes, and flood control structures in the event of washout or failure. In addition, the BMPs discussed in this appendix will also be replaced or repaired in the event of failure. Excessive sediment will be removed, as needed, so that the drainage structures function as designed. Site inspections by facility personnel will be performed weekly or within 48 hours of a rainfall event of 0.5 inches or more. The final cover system and the erosion sediment control structures will be maintained throughout the site life and post-closure period.

The following items will be evaluated during the inspections:

- Erosion of intermediate cover areas, perimeter ditches, temporary chutes, swales, detention ponds, berms, and other drainage features
- Settlement of intermediate cover areas, final cover areas, perimeter ditches, chutes, swales, and other drainage features
- Silt and sediment build-up in perimeter ditches, chutes, swales, and detention ponds
- Presence of ponded water on intermediate cover or behind temporary erosion control structures
- Obstructions in drainage features
- Presence of erosion or sediment discharge at offsite stormwater discharge locations
- Temporary erosion and sediment control features

Maintenance activities will be performed to correct damaged or deficient items noted during the site inspections. These activities will be performed as soon as possible after the inspection. The time frame for correction of damaged or deficient items will vary based on weather, ground conditions, and other site-specific conditions.

Maintenance activities will consist of the following, as needed:

- Placement of additional temporary or permanent vegetation
- Placement, grading, and stabilization of additional soils in eroded areas or in areas which have settled
- Replacement of gabion mattresses or other structural lining
- Removal of obstructions from drainage features
- Removal of silt and sediment build-up from the temporary erosion control structures

- Removal of ponded water on the intermediate cover or behind temporary erosion control structures
- Repairs to erosion and sedimentation controls
- Installation of additional erosion and sedimentation controls
- Documentation and training requirements are discussed below:
- Site inspections by facility personnel will be performed weekly or within 48 hours of a rainfall event of 1.5 inches or more.
- Documentation of the inspection will be included in the site operating record.
- Documentation of maintenance activities that were performed to correct damaged or deficient items noted during the site inspections will be included in the site operating record.
- Facility personnel will be trained to perform inspections, and to install and maintain temporary erosion control structures.

BECK LANDFILL

APPENDIX C1-G
FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE COVER
EROSION CONTROL STRUCTURE DESIGN

Includes pages C1-G-1 through C1-G-7

CONTENTS

Narrative 1
Intermediate Cover Evaluation 2
Temporary Drainage Berm Design 3
Temporary Drainage Letdown Design 4
Design Summary 5

NARRATIVE

This appendix presents the supporting documentation to evaluate and design temporary erosion and sediment control structures for the intermediate cover phase of landfill development.

INTERMEDIATE COVER PLAN

As intermediate cover is constructed, benches, temporary chutes and berms will be constructed to prevent erosion and sedimentation. Erosion control features (i.e., filter berms, rock check dams, hay bales, or equivalent) may be constructed at the toe of filled areas to minimize erosion and prevent disturbance of the existing grassed slopes. Otherwise, temporary erosion and sediment control features will be installed within 180 days from when the intermediate cover is constructed. An existing conditions summary and Best Management Practices are included in Appendix C1-F. Example intermediate cover drainage calculations are included in this appendix for use in site operations.

INTERMEDIATE COVER EVALUATION

The intermediate cover evaluation is based on the Universal Soil Loss Equation (USLE) following Natural Resource Conservation Service (NRCS) procedures. The evaluation is based on a 12-inch thick intermediate cover layer with 60 percent vegetated cover. Calculations for the soil loss for intermediate cover on external 6 percent and 25 percent slopes have been provided below.

TEMPORARY DRAINAGE BERM DESIGN

The temporary drainage berms are designed for typical drainage areas and flowline slopes. The procedures in the TxDOT Hydraulic Design Manual, September 2019, were used to determine peak flow, flow depth, flow velocity, and ~~swale~~ capacity. The Rational Method and the Manning's Equation were used to calculate the design parameters.

TEMPORARY DIVERSION CHANNEL DESIGN

The temporary diversion channels are designed for typical drainage areas and flowline slopes. The procedures in the TxDOT Hydraulic Design Manual, September 2019, were used to determine peak flow, flow depth, flow velocity, and diversion channel capacity. The Rational Method and the Manning's Equation were used to calculate the design parameters.

TEMPORARY DRAINAGE ~~LETDOWN~~ DOWNCHUTE DESIGN

The temporary drainage ~~letdowns~~ downchutes are designed for typical drainage areas on a 25 percent external side slope. The procedures in the TxDOT Hydraulic Design Manual, September 2019, were used to determine peak flow, flow depth, flow velocity, and ~~letdown~~ downchute

capacity. The Rational Method and the Manning's Equation were used to calculate the design parameters.

INTERMEDIATE COVER EVALUATION

SOIL LOSS

This section presents the supporting documentation for evaluation of the potential for intermediate cover soil erosion loss at Beck Landfill. The evaluation is based on the premise of adding excess soil to increase the time required before maintenance is needed as recommended in the EPA Solid Waste Disposal Facility Criteria Technical Manual (EPA 530-R-93-017, November 1993).

The design procedure is as follows:

1. Minimum thickness of the intermediate cover is evaluated based on the maximum soil loss of 50 tons per acre per year.
2. Soil loss is calculated using the Universal Soil Loss Equation (USLE) by following NRCS procedures. The soil loss is based on 60 percent vegetative cover as recommended in the TCEQ, Use *of the Universal Soil* Loss *Equation in Final Cover/Configuration Design Procedural Handbook* (October 1993). These results of the calculations show that erosion controls must be placed on maximum 400 feet spacing on the sideslopes.

SOIL EROSION (RUSLE)

A = R*K*L*S*C*P	
R	265
K	0.32
LS	13.53
C	0.042
P	1
A (tons/acre/year)	**48.188**
Control Seperation	**400**

Figure 2-1 Isoerodent Map, USDA 1997
Monsic Clay Loam (more conservative than clay factor in Schertz Texas)
Using the value of LS that you find go to table 4-3 and use the LS and slope to find bench distance.
(should be different for Intermediate and Final Cover) (Type G, 60% grass - 0.042)
Usually 1 for landfills (conservative case from the table provided in "P" Tab)
50 tons/ac/yr max for Intermediate Cover, 3 tons/ac/yr max for final cover
Required Berm, Bench, or Other Control Horizontal Spacing

3. Temporary vegetation for the intermediate cover areas will be native and introduced grasses with root depths of six inches to eight inches.

Native and introduced grasses will be hydroseeded, drill seeded, or broadcast seeded with fertilizer on the disked (parallel to contours) intermediate cover layer as soon as practical following placement of intermediate cover and will be documented in the site operating record. All intermediate cover areas will be managed to control erosion and achieve a predicted soil loss of less than 50 tons per acre per year. Temporary erosion and sediment control features (including at least 60 percent vegetative cover) will be installed within 180 days from when the intermediate cover is constructed. Areas that experience erosion or do not readily vegetate will be reseeded and

additional temporary erosion control measures will be implemented until vegetation is established or the soil will be replaced with soil that will support the grasses.

TEMPORARY DRAINAGE BERM DESIGN

The temporary drainage berm design for intermediate cover areas is presented for the typical berm flowline of 2 percent. The procedures in the TxDOT Hydraulic Design Manual were used to determine peak flow, flow depth, flow velocity, and berm capacity. The temporary berms will be located on the intermediate cover to prevent erosion as follows:

All temporary berms shall be designed to minimize erosion and provide a maximum flow depth of two feet. The total height of the berms at the flowline is a minimum of three feet. As noted in the calculations, the velocities in the berms are less than permissible non-erodible velocities. If sustained erosion is observed, facility management will evaluate and construct additional temporary drainage berms. Example drainage berm calculations for a grassed intermediate cover are provided below.

Berms	
Bottom width	0 ft
Side slope 1 (horiz./vert.)	4/1
Side slope 2 (horiz./vert.)	3/1
Manning roughness, n	0.03
Channel slope	2%
Flow depth	2 ft

Results		
Flow area	14	ft^2
Wetted perimeter	14.57	ft
Hydraulic radius	0.96	ft
Velocity, v	6.82	ft/sec
Flow, Q	95.49	cfs
Velocity head, h_v	0.72	ft
Top width, T	14	ft

The cross-sections for the temporary berms is three feet height, two feet top width, 3:1 sideslopes. Based on the Rational Method parameters developed in Appendix C1-D, the maximum drainage area allowable for a temporary berm is 15 acres.

$Q_{25} = CIA$

95 cfs= (0.7)(8.8 in/hr)(A)

A= 15 acres

TEMPORARY DRAINAGE ~~LETDOWN~~ DOWNCHUTE DESIGN

The temporary ~~letdown~~ downchute design is applicable for external side slopes of the landfill with intermediate cover. Temporary ~~letdown~~ downchutes will typically consist of channels lined with erosion control material. The flow capacity of the ~~letdown~~ downchute structures was determined based on the Manning's Equation. The maximum flow calculated from the Manning's Equation is used to determine the maximum drainage area based on the NRCS Method. The design calculations presented below represent typical calculations for temporary ~~letdown~~ downchutes on a 25 percent slope. If sustained erosion is observed, facility management will evaluate the use and construction of temporary letdowns.

Chute Design		
Bottom	ft	20
Depth	ft	2
Side slope	%	25
Channel slope	%	25
Roughness	Natural channel, very poor condition	0.06

Parameters		
Flow area	56.00	ft^2
Wetted perimeter	36.49	ft
Hydraulic radius	1.53	ft
Velocity, v	16.47	ft/sec
Flow, Q	922.54	cfs
Velocity head, h_v	4.22	ft
Top width, T	36.00	ft

Capacity (max)		
Q	cfs	922.54
V	fps	16.47
D	ft	2

The cross-sections for the temporary downchutes is shown above. Based on the Rational Method parameters developed in Appendix C1-D, the maximum drainage area allowable for a temporary berm is 149 acres.

$Q_{25} = CIA$

922.5 cfs= (0.7)(8.8 in/hr)(A)

A= 149 acres

DESIGN SUMMARY

Beck Landfill will implement the erosion and sediment control features on the intermediate cover as the landfill develops. The following items will be implemented, as filling operations are ongoing:

- Intermediate cover will be established on all areas that have received waste but will remain inactive for periods greater than 180 days.
- Sufficient permanent and temporary erosion and sediment control features shall be constructed to redirect surface water and prevent erosion.
- Temporary erosion and sediment control features shall be constructed within 180 days of placement of intermediate cover.
- Temporary erosion control structures (e.g., rock check dams, filter berms) may be established along the toe of existing vegetated intermediate cover areas with approximately 70-90 percent coverage.
- Final cover may be constructed as the site develops. Temporary erosion control features will be removed as permanent erosion controls are constructed.

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT C2 - FLOOD CONTROL ANALYSIS

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: Revised ~~January~~ March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

TABLE OF CONTENTS

Discussion of 100 Year Floodplain……..……..……..……..C2-1

Figure C2-1 Effective FEMA Flood Insurance Rate Map (FIRM)

Figure C2-2 Topographic Work Map from LOMR Application Showing Revised Floodplain

Signature Page from City of Schertz for LOMR Application

APPENDIX C2-A

LOMR Application

APPENDIX C2-B

No-Rise Certification for Proposed Stormwater Pond

APPENDIX C2-C

FEMA Correspondence

BECK LANDFILL
APPENDIX C2-C
FEMA Correspondence

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT C3
DRAINAGE SYSTEM PLANS AND DETAILS

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: ~~September 2022~~Revised March 2023

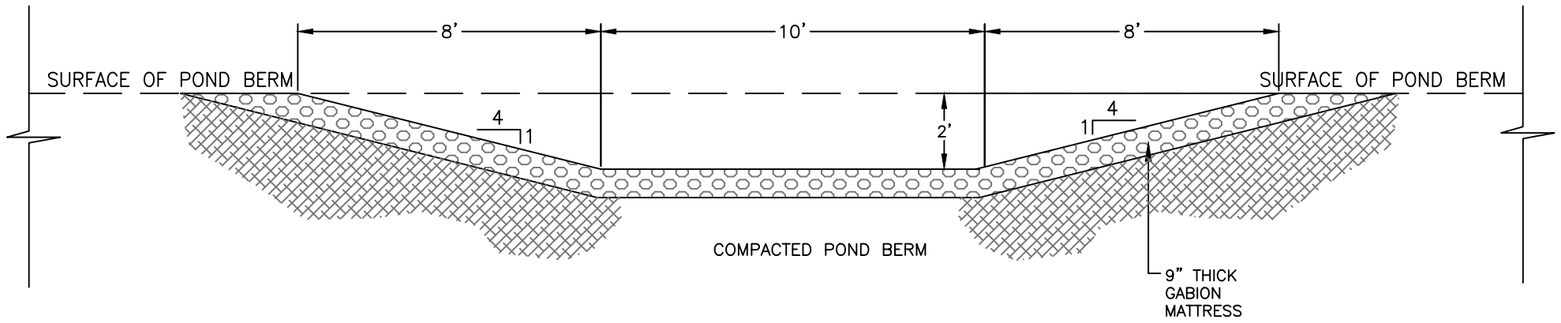
Prepared by:

Civil & Environmental Consultants, Inc.

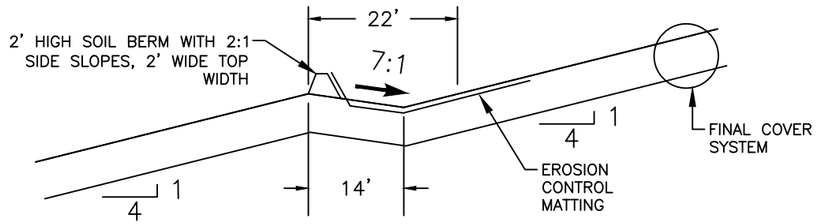
Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

LIST OF FIGURES

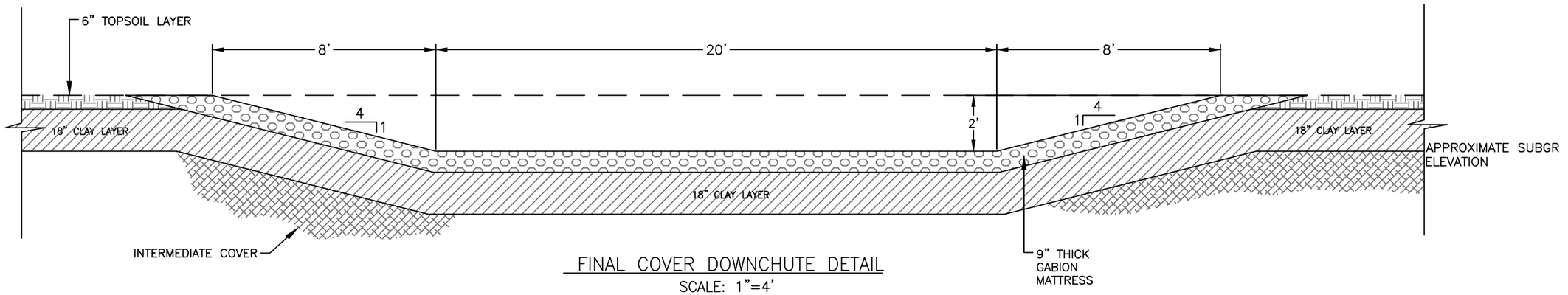
FIGURE C-1 DETENTION POND PLAN
FIGURE C-2 DRAINAGE DETAILS
FIGURE C-2A DRAINAGE DETAILS
FIGURE C-3 DRAINAGE DETAILS



STORM WATER POND INLET / OUTLET CHANNEL PROTECTION

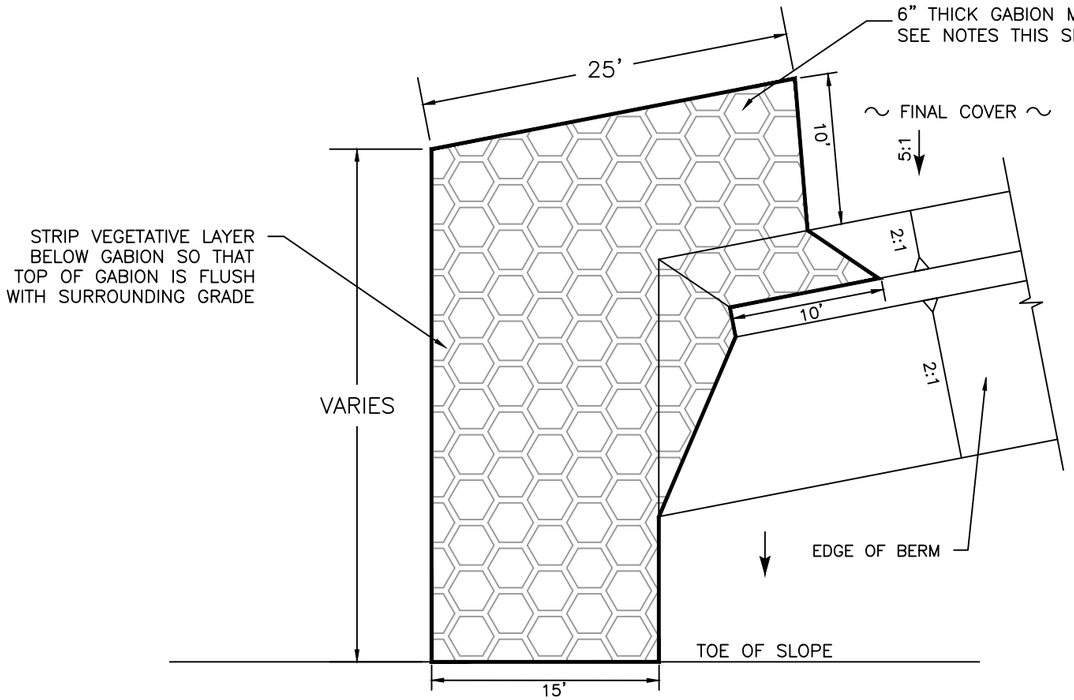


TYPICAL FINAL COVER BENCH



FINAL COVER DOWNCHUTE DETAIL

SCALE: 1"=4'



FINAL COVER PERIMETER BERM TOE OF SLOPE TERMINATION DETAIL

SCALE: 1"=10'

GABION (RENO) MATTRESS NOTES:

1) GABION MATTRESSES SHALL BE MADE OF 6x8 DOUBLE TWISTED HEXAGONAL WOVEN STEEL WIRE MESH PER ASTM A975-97.
2) MESH SHALL HAVE A NOMINAL OPENING SIZE OF 2.5 INCHES.
3) WIRE FOR MESH SHALL HAVE A MINIMUM DIAMETER OF 0.087.
4) ALL WIRE USED IN GABION MATTRESS CONSTRUCTION SHALL HAVE A MINIMUM TENSILE STRENGTH OF 75,000 PSI AND SHALL BE GALVANIZED WITH A MINIMUM ZINC COATING OF 0.7 OZ/FT^2.
5) SELVEDGE WIRE FOR GABION ASSEMBLY SHALL HAVE A MINIMUM DIAMETER OF 0.106 INCHES.
6) ALL FASTENERS SHALL COMPLY WITH ASTM A975-97.
7) GABIONS SHALL BE FILLED WITH 3" TO 5" LIMESTONE AGGREGATE.
8) GABIONS TO BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND SHALL BE AS MANUFACTURED BY MACCAFERRI, INC. OR ENGINEER APPROVED EQUAL.

REVISION RECORD		
NO	DATE	DESCRIPTION
1	03/17/2023	TECH NOD 2
2		
3		
4		

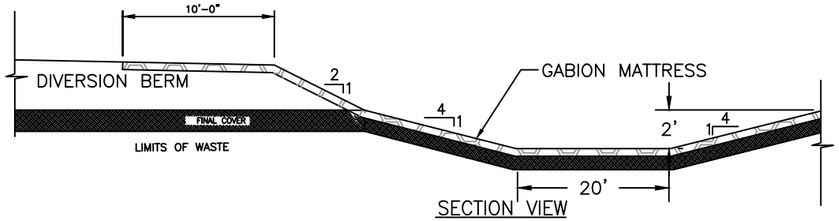
Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
GUADALUPE COUNTY, TEXAS

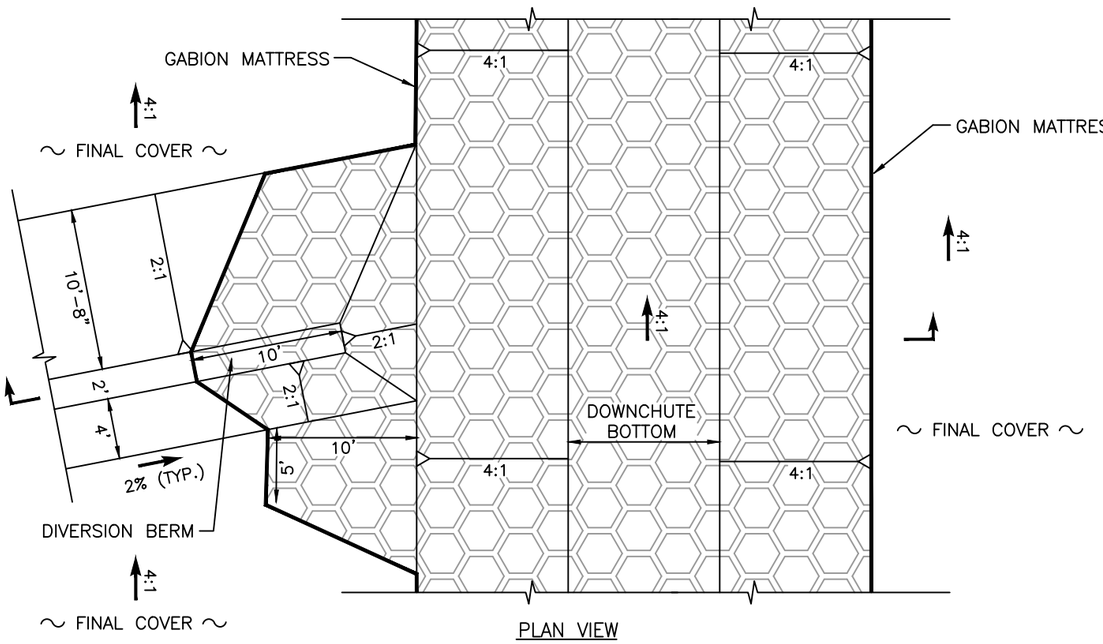
DRAINAGE DETAILS

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	08/2022	DWG SCALE:	AS SHOWN	PROJECT NO:	311-653

FIGURE NO.: **C3-2**



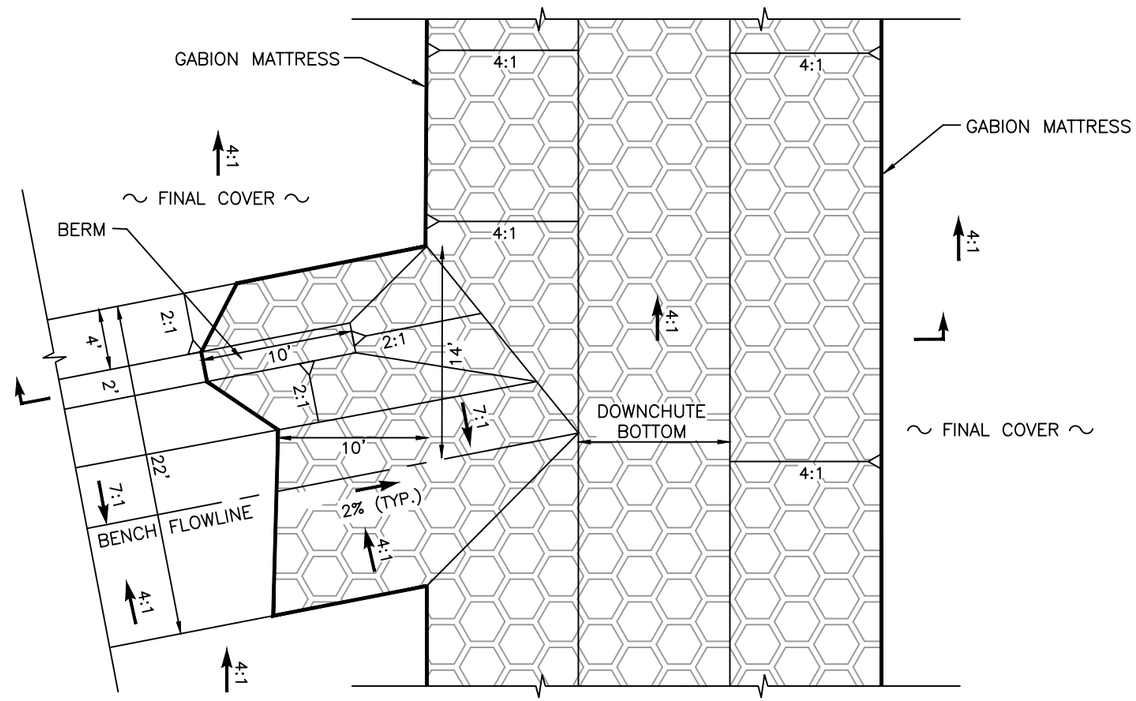
SECTION VIEW



PLAN VIEW

PERIMETER BERM/DOWNCHUTE TIE-IN DETAIL

SCALE: 1"=10'



PLAN VIEW

BENCH/DOWNCHUTE TIE-IN DETAIL

SCALE: 1"=10'

REVISION RECORD		
NO	DATE	DESCRIPTION
1	03/17/2023	TECHNICAL NOD 2
2		
3		
4		

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
GUADALUPE COUNTY, TEXAS

DRAINAGE DETAILS

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	C3-2A
DATE:	03/2023	DWG SCALE:	AS SHOWN	PROJECT NO:	311-653		

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D2
CROSS SECTIONS

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: ~~September 2022~~Revised March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D3
CONSTRUCTION DESIGN DETAILS

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: ~~September 2022~~Revised March 2023

Prepared by:

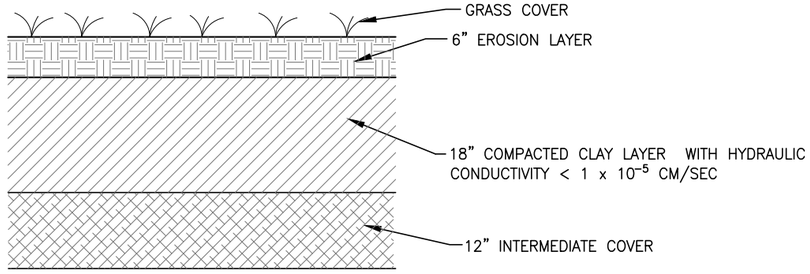
Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

List of Figures

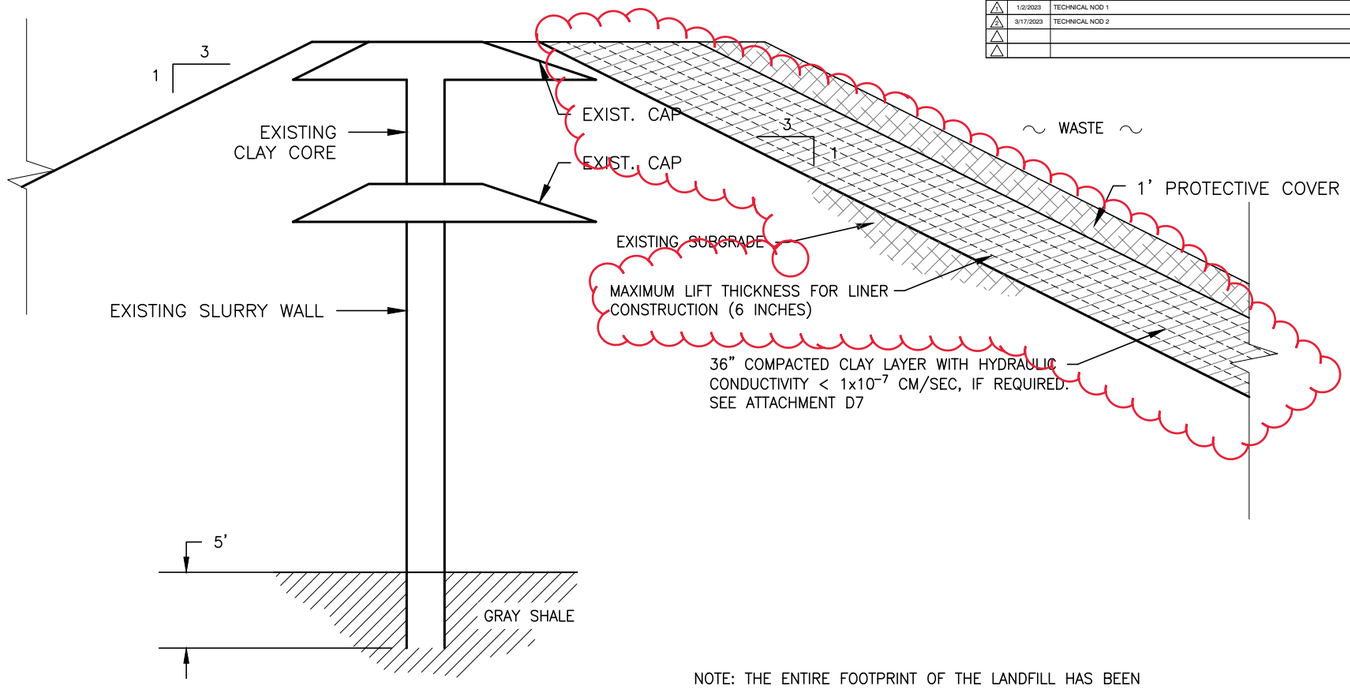
D3.1 Final Cover and Liner Details
D3.2 Final Cover Tie-In Detail

NOTE: THE IN-SITU LINER HAS AT LEAST FOUR FEET OF IN-SITU SOIL BETWEEN THE DEPOSITED WASTE AND GROUNDWATER. THE IN-SITU SOIL CONSTITUTES AN IN-SITU LINER AND MEETS ALL THE PHYSICAL PROPERTIES FOR A CONSTRUCTED LINER AS DETAILED IN §330.339(C)(5). THE IN-SITU LINER WAS EXCAVATED TO THE DEPTH NECESSARY TO ENSURE THAT IT DID NOT EXHIBIT PRIMARY OR SECONDARY PHYSICAL FEATURES SUCH AS JOINTING, FRACTURES, BEDDING PLANES, SOLUTION CAVITIES, ROOT HOLES, DESICCATION SHRINKAGE CRACKS ETC., THAT HAVE A COEFFICIENT OF PERMEABILITY GREATER THAN $1x10^{-7}$ CM/SEC;



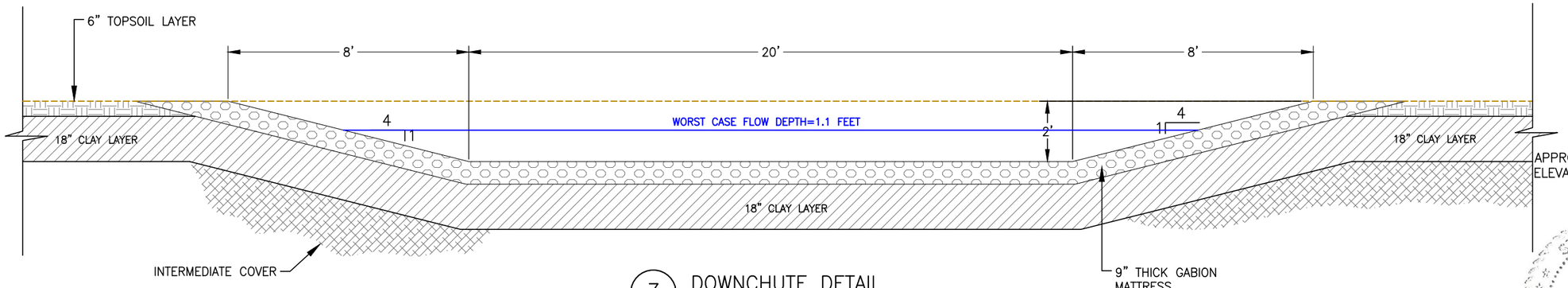
NOTE: SEE FIGURE D3-2 FOR TIE-IN BETWEEN FINAL COVER AND PERIMETER BERM

1 FINAL COVER DETAIL
N.T.S.

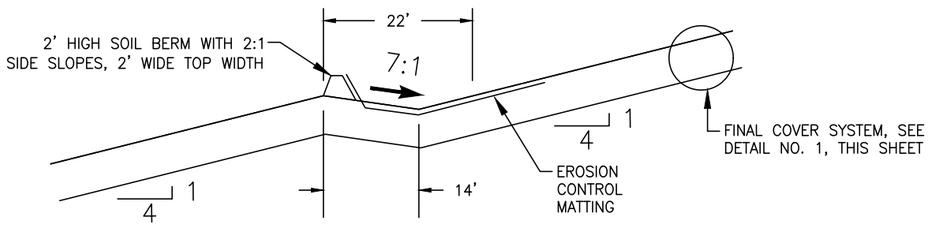


NOTE: THE ENTIRE FOOTPRINT OF THE LANDFILL HAS BEEN PREVIOUSLY CONSTRUCTED AND HAS WASTE IN PLACE. THIS DETAIL WILL ONLY BE USED IF THERE IS A NEED TO EXCAVATE A PORTION OF THE LINER AND RECONSTRUCT IT.

2 OPTIONAL SIDEWALL LINER DETAIL
N.T.S.



3 DOWNCHUTE DETAIL
SCALE: 1"=4'



4 TYPICAL BENCH

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
3-17-2023

REVISION RECORD

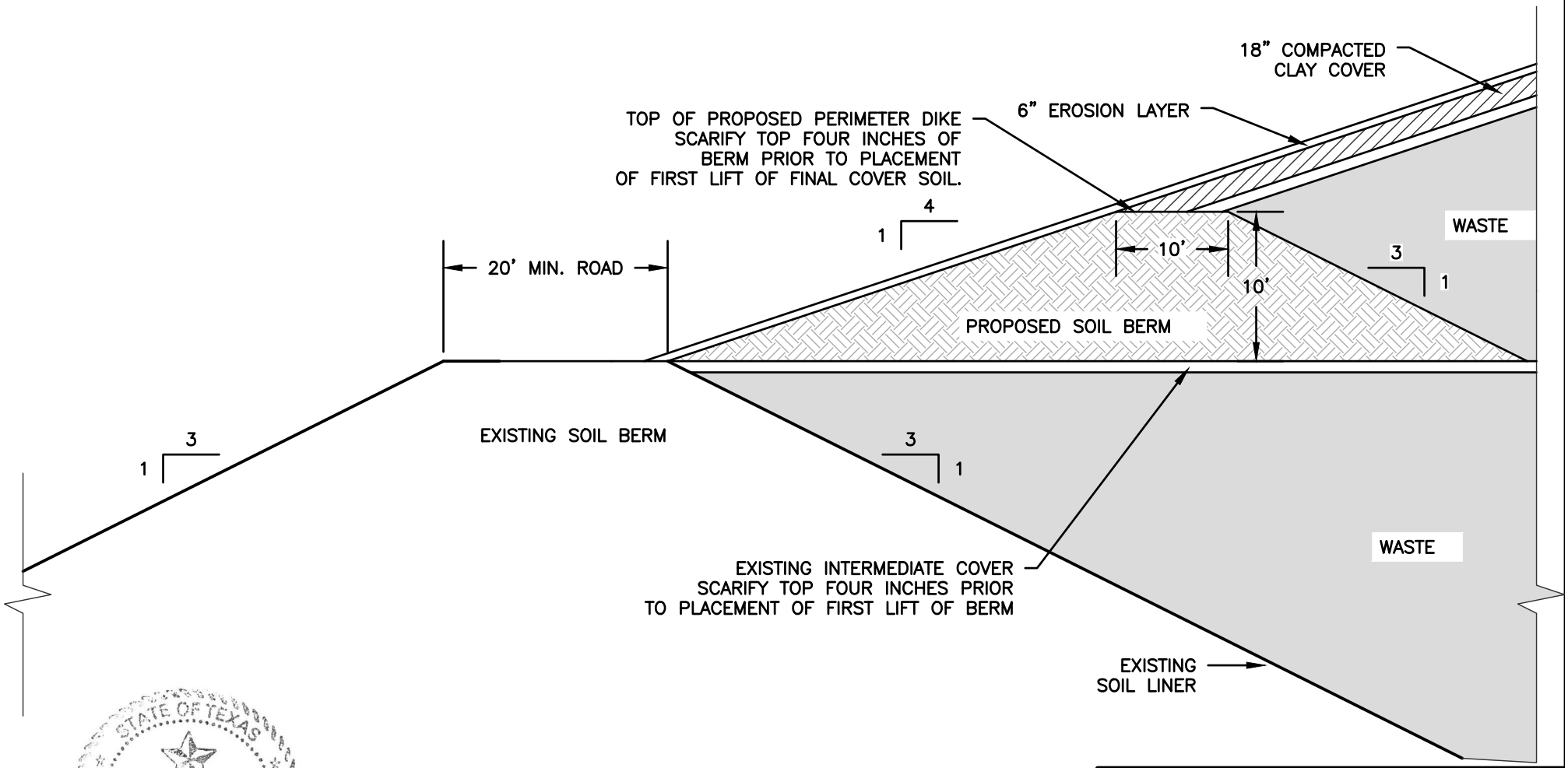
NO	DATE	DESCRIPTION
1	1/2/2023	TECHNICAL NOD 1
2	3/17/2023	TECHNICAL NOD 2

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

FINAL COVER AND LINER DETAILS

DRAWN BY:	BEO	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	D3.1
DATE:	08/2022	DWG SCALE:	AS NOTED	PROJECT NO:	311-653		



STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
3-17-2023

NOTE: SEE FIGURE D3.1 FOR FINAL COVER DETAILS.

REVISION RECORD		
NO	DATE	DESCRIPTION
2	3/17/2023	TECHNICAL NOD 2

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

FINAL COVER TIE-IN DETAIL

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	D3.2
DATE:	03/2023	DWG SCALE:	NTS	PROJECT NO:	311-653		

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D5
GEOTECHNICAL DESIGN

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: ~~September 2022~~Revised March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

Contents

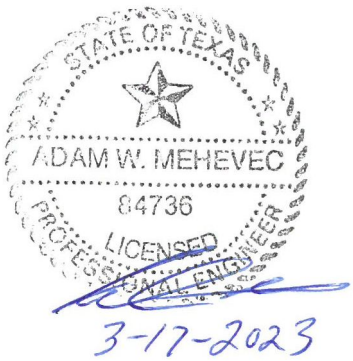
INTRODUCTION ..... i~~1~~
1 GEOTECHNICAL TESTING ..... 2~~2~~
2 SUBSURFACE MATERIALS ..... 2~~2~~
2.1 Material Properties ..... 4~~4~~
2.2 Material Requirements ..... 4~~4~~
3 EARTHWORK ..... 5~~5~~
3.1 Excavation ..... 5~~5~~
3.2 General Fill ..... 5~~5~~
4 CONSTRUCTION BELOW THE GROUNDWATER TABLE ..... 5~~5~~
5 SETTLEMENT ANALYSIS ..... 5~~5~~
5.1 Subgrade Heave ..... 5~~5~~
5.2 Subgrade Settlement ..... 6~~6~~
5.3 Solid Waste Settlement ..... 6~~6~~
6 SLOPE STABILITY ANALYSIS ..... 6~~6~~
7 LINER CONSTRUCTION ..... 8~~8~~
8 COVER CONSTRUCTION ..... 8~~8~~
8.1 Operational Cover ..... 8~~8~~
8.2 Final Cover ..... 9~~9~~
8.3 Final Cover Testing and Documentation ..... 9~~9~~

List of Appendices

Appendix D5-A
Settlement Analysis

Appendix D5-B
Slope Stability Analyses

Appendix D5-C - Previous Geotechnical Reports
Geotechnical Investigation (Attachment 11) prepared by Snowden , Inc. (1985)
Geotechnical Data Report prepared by Terracon Consultants, Inc. (2020)



Appendix D5-C

Previous Geotechnical Reports

Geotechnical Investigation (Attachment 11) prepared by Snowden , Inc. (1985)

Geotechnical Data Report prepared by Terracon Consultants, Inc. (2020)

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D6
CONTAMINATED WATER PLAN

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: Revised ~~January~~ March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

Contents

30 TAC §§330.65(c), 330.177, 330.207, 330.227, 330.331(a)(2), 330.333, 330.337(d)

1 INTRODUCTION ..... 1~~1~~
1.1 Purpose ..... 1~~1~~
1.2 Definitions ..... 1~~1~~
2 CONTAMINATED WATER MANAGEMENT 2
2.1 Contaminated Water Generation 2
2.2 Contaminated Water Collection, Containment, and Storage 2
2.3 Contaminated Water Disposal ..... 3~~3~~

List of Appendices

APPENDIX D6-A
Run-On/Run-Off Berm Design

1 INTRODUCTION

30 TAC§§330.65(c), 330.177, 330.207, 330.227, 330.331(a)(2), 330.333, 330.337(d)

1.1 Purpose

This Leachate and Contaminated Water Management Plan has been prepared for Beck Landfill consistent with 30 TAC §§330.65(c), 330.177, 330.207, 330.227, 330.331(a) (2), 330.333, and 330.337(d). Beck Landfill is a Type IV landfill and only accepts construction and demolition, and other inert wastes. The entire footprint of the landfill has been previously constructed and there is no requirement for a leachate collection system at this facility. This plan provides the details of the management of contaminated water that is generated during normal site operations.

1.2 Definitions

Contaminated water is defined in §330.3(36) as leachate, gas condensate, or water that has come into contact with waste.

2 CONTAMINATED WATER MANAGEMENT

30 TAC §330.207

2.1 Contaminated Water Generation

Surface water that comes into contact with waste, leachate, or gas condensate is considered to be contaminated water. Best management practices will be used to minimize contaminated water generation. Temporary diversion berms may be constructed around areas of exposed waste to minimize the amount of surface water that comes into contact with waste. Design calculations and typical details for temporary diversion berms are presented in Appendix D6-A -Containment/Diversion Berm Design. Daily cover and intermediate cover will be placed over filled areas to minimize the area of exposed waste. Procedures for verifying the adequacy of daily and intermediate cover placement 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.

2.2 Contaminated Water Collection, Containment, and Storage

Temporary containment 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 containment 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 provided in Appendix D6-A. All temporary containment berms shall be constructed of clay material and utilize the cross-section shown on Figure D6-A. Primary contaminated water storage will be provided by the containment berms, which will provide storage for the collected contaminated water, the 25-year, 24-hour storm event, and one additional foot of freeboard. Containment berms will be maintained until the contaminated water is removed.

Stormwater diversion and containment berms will also be placed around the processing and recovery areas to control run-on and run-off. The diversion and containment berms will be sized based off the calculations shown on Figure D6-A. The typical size for these areas is 150'x150' and this area is included in the berm sizing chart shown on the drawing.

Any spills that occur at the processing and recovery areas will be collected and managed as contaminated water. Any soil impacted by the spill will be excavated and analyzed to determine the proper waste classification and sent to an offsite permitted disposal facility.

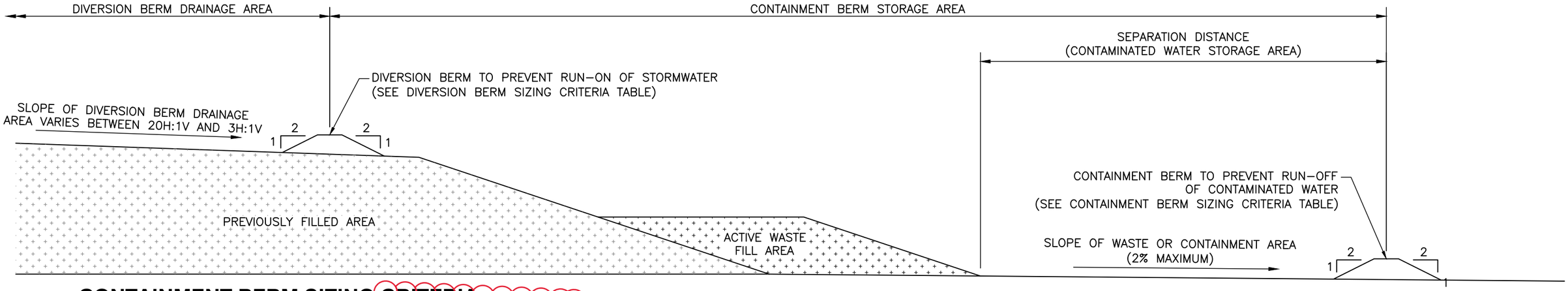
2.3 Contaminated Water Disposal

Contaminated water will not be allowed to discharge into waters of the United States. Contaminated water will be transported to an offsite POTW for treatment and disposal in accordance with §330.207. Sampling and analysis will meet the individual disposal facilities requirements.

BECK LANDFILL

APPENDIX D6-A
RUN-ON/RUN-OFF BERM DESIGN

Includes page D6-A-1



CONTAINMENT BERM SIZING CRITERIA

Active Area Length (ft.)	Active Area Width (ft.)	Separation Distance (ft.)	Runoff Volume ($ft^{3)}$	Depth (ft.)	Freeboard (ft.)	Design Berm Height (ft.)
100	100	45	10343	2.3	1.0	3.5
150	150	45	20865	3.1	1.0	4.5
200	200	45	34953	3.9	1.0	5.0
250	250	45	52608	4.7	1.0	6.0
300	300	45	73830	5.5	1.0	6.5
325	325	45	85778	5.9	1.0	7.0
100	100	50	10700	2.1	1.0	3.5
150	150	50	21400	2.9	1.0	4.0
200	200	50	35667	3.6	1.0	5.0
250	250	50	53500	4.3	1.0	5.5
300	300	50	74900	5.0	1.0	6.0
325	325	50	86938	5.4	1.0	6.5
100	100	55	11057	2.0	1.0	3.5
150	150	55	21935	2.7	1.0	4.0
200	200	55	36380	3.3	1.0	4.5
250	250	55	54392	4.0	1.0	5.0
300	300	55	75970	4.6	1.0	6.0
325	325	55	88097	4.9	1.0	6.0
100	100	60	11413	1.9	1.0	3.0
150	150	60	22470	2.5	1.0	3.5
200	200	60	37093	3.1	1.0	4.5
250	250	60	55283	3.7	1.0	5.0
300	300	60	77040	4.3	1.0	5.5
325	325	60	89256	4.6	1.0	6.0

25-Year, 24-Hour Depth= 8.56 in.
Percent Run-off of Rainfall= 100.0 %

Notes:
1. Separation distance refers to the length between the inside toe of the active area berm and the waste face.
2. Run-off is assumed to pond along the length of the active area, within the separation distance between waste and berm.
3. Percent Run-off conservatively assumed to be 100% of rainfall.
4. Using the same methodology, other options for the active area lengths, widths, and separation distances will yield acceptable design berm heights.

DIVERSION BERM SIZING CRITERIA

DIVERSION BERM DRAINAGE AREA (ACRES)	MINIMUM 5 %			MAXIMUM 33 %		
	FLOW RATE (CFS)	FLOW DEPTH (FEET)	REQ'D MIN. DIVERSION BERM HEIGHT (FEET)	FLOW RATE (CFS)	FLOW DEPTH (FEET)	REQ'D MIN. DIVERSION BERM HEIGHT (FEET)
0.5	3.2	0.3	1.5	3.2	0.6	1.5
1.0	6.4	0.4	1.5	6.4	0.7	2.0
1.5	9.5	0.5	1.5	9.5	0.8	2.0

NOTES:
1. FLOW RATE CALCULATED USING RATIONAL METHOD ASSUMING 10 MINUTE TIME OF CONCENTRATION, 0.7 RUN–OFF COEFFICIENT, AND INTENSITY CURVES FROM TxDOT HYDRAULIC MANUAL.
2. FLOW DEPTHS ALONG BERM CALCULATED USING FLOWMASTER SOFTWARE.
3. ONE FOOT MINIMUM FREEBOARD PROVIDED FOR BERMS.

SAMPLE CALCULATION FOR CONTAINMENT BERM HEIGHT

GIVEN: L=100', W=100', SEPARATION DISTANCE (SD)=45', RUNOFF DEPTH (RD)=8.56 INCHES
RUN–OFF VOLUME (FT^3) = (L+SD)*W*(RD/12)
RUN–OFF VOLUME = 10,343 FT^3

DEPTH= RUN–OFF VOLUME/L/SD
DEPTH= 10,343 FT^3/ 100 FT / 45 FEET
DEPTH=2.3 FT (ROUND UP TO 2.5 FEET)(ADD ONE FOOT FREEBOARD)
DEPTH=3.5 FT

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
3-17-2023

PERMIT DRAWINGS

REVISION RECORD

NO	DATE	DESCRIPTION
1	1/2/2022	TECHNICAL NOD 1
2	03/17/2023	TECH NOD 2

REV. NO.	DATE	DESCRIPTION	DR. BY	APP. BY
1	--	--		

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
3711 S Mopac Expy • Bld. 1-550 • Austin TX 78746
(512) 329-0006 • (877)-365-2324
www.cecinc.com

BECK COMPANIES
BECK LANDFILL
LANDFILL 1848–A
GUADALUPE COUNTY, TEXAS

CEC REFERENCE NO. 311–653
DATE: AUGUST 2022
FILE: D6–A BERM SIZING

CONTAMINATED WATER RUN–ON\ RUN–OFF BERMS

D6–A

P:\310–000\311–653\–CADD\Dwg\SW01\APPENDIX D6–A BERM SIZING.dwg[LAYOUT] LS:(12/23/2022 – amehevec) – LP: 3/7/2023 4:24 PM

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D7
LINER QUALITY CONTROL PLAN

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: Revised ~~January~~ March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway, Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

Contents

30 TAC §§330.63(d)(4)(G), 330.331, 330.337, 330.339, 330.341

1 INTRODUCTION 3
1.1 Purpose 3
1.2 Definitions 3
1.3 Sequence of Construction Activities 4
2 LINER SYSTEM 5
2.1 Soil Liner 5
2.2 Construction Monitoring 5
3 EARTHWORK 7
3.1 General 7
3.2 Materials 7
3.3 Construction Below Groundwater 8
3.4 Excavation 8
3.5 Expansion of Perimeter Dike 8
4 COMPACTED SOIL LINER 10
4.1 General 10
4.2 Materials 10
4.3 Subgrade Preparation 10
4.4 Placement and Processing 11
4.5 Compaction 11
4.6 Protection 12
4.7 Tie in to Existing Liners 12
4.8 Testing and Verification 12
4.8.1 Preconstruction Testing 12
4.8.2 Construction Testing 13
4.8.3 Thickness Verification 14
5 PROTECTIVE COVER 15
5.1 General 15
5.2 Materials 15
5.3 Preparation 15
5.4 Placement 15
5.5 Testing and Verification 15

6.1 Reports 17

6.2 Soils and Liner Evaluation Report 17

1 INTRODUCTION

1.1 Purpose

This Liner Quality Control Plan (LQCP) has been prepared in accordance with 30 TAC §330.339 to establish procedures for the design, construction, testing, and documentation of the liner system for the landfill. Beck Landfill is a Type IV landfill and only accepts construction and demolition, and other inert wastes. The entire footprint of the landfill has been previously constructed utilizing an in-situ clay liner, so no additional liner construction is anticipated. However, if any liner construction becomes necessary in the future, it will be constructed in accordance with the provision in this section.

1.2 Definitions

Specific terms and acronyms that are used in this LQCP are defined below.

- ASTM- American Society for Testing and Material
- Construction Quality Assurance (CQA) - CQA is a planned system of activities that provides the owner and permitting agency assurance that the facility was constructed as specified in the design. CQA includes the observations, evaluations, and testing necessary to assess and document the quality of the constructed facility. CQA includes measures taken by the CQA organization to assess whether the work is in compliance with the plans, specifications, and permit requirements for a project
- Geotechnical Professional (GP) - The GP is the authorized representative of the operator who is responsible for all CQA activities for the project. The GP must be registered as a Professional Engineer in Texas. Experience and education should include geotechnical engineering, engineering geology, soil mechanics, geotechnical laboratory testing, construction quality assurance and quality control testing, and hydrogeology. The GP must also have competency and experience in certifying similar projects. The GP may also be known in applicable regulations and guidelines as the CQA engineer, resident project representative, geotechnical quality control/quality assurance professional (GQCP), or professional of record (POR).

- CQA Monitors - CQA monitors are representatives of the GP who work under direct supervision of the GP. The CQA monitor is responsible for quality assurance monitoring and performing on-site tests and observations. The CQA monitor must be NICET- certified at Level 2 for soils and geosynthetics, an engineering technician with a minimum of four years of directly related experience, or a graduate engineer or geologist with one year of directly related experience.
- Quality Assurance- Quality assurance is a planned program that is designed to assure that the work meets the requirements of the plans, specifications, and permit for a project. Quality assurance includes procedures, quality control activities, and documentation that are performed by the GP and CQA monitor.
- Quality Control - Quality control includes the activities that implement the quality assurance program. The GP, CQA monitor, and contractor will perform quality control.
- Seasonal High Water Table - The seasonal high water table is the highest measured water level within the construction area.
- SLER- Soil Liner Evaluation Report (only used if liner repairs are required)

1.3 Sequence of Construction Activities

All of the planned liner system for Beck Landfill has been previously constructed, this section only applies to an unforeseen situation where a portion of the liner needs to be repaired or re-constructed. Generally, construction of any new lined areas at Beck Landfill will proceed in the following sequence of activities:

- The area will be excavated to the proposed subgrade elevations.
- The subgrade elevations will be verified.
- The compacted soil liner will be constructed, tested, and verified in accordance with Section 4.
- The Soils Liner Evaluation Report will be submitted to the TCEQ.

2 LINER SYSTEM

2.1 Soil Liner

As stated in Section 1.0, there is no anticipated construction of additional liner at the Beck landfill, because the entire footprint has previously been constructed with an in-situ soil liner. The in-situ liner has at least four feet of in-situ soil between the deposited waste and groundwater. The in-situ soil constitutes an in-situ liner and meets all the physical properties for a constructed liner as detailed in §330.339(c)(5). The In-situ liner was excavated to the depth necessary to ensure that it did not exhibit primary or secondary physical features such as jointing, fractures, bedding planes, solution cavities, root holes, desiccation shrinkage cracks etc., that have a coefficient of permeability greater than 1 x 10^{-7} cm/sec. Along the sidewalls a soil berm was constructed that has a slurry wall and/or clay core that penetrates a minimum of five feet into the unweathered shale layer. See Figures D-2 and D3.1 for details of the sidewall berm.

However, if an unforeseen condition requires the replacement of a portion of the liner system, the following provisions will be utilized. The optional soil liner, if required, will consist of 36 inches minimum of compacted clay with a maximum hydraulic conductivity of 1x10^{-7} cm/sec. The compacted clay liner will be overlain by a minimum of one foot of protective cover soil. A detail for the optional sidewall liner system is included on Figure D3.1.

An additional compacted soil berm is proposed to be constructed above the existing berm to provide protection and adequate freeboard from the 100-year floodplain. See Figure D-2 for the proposed dimensions of the soil berm.

2.2 Construction Monitoring

Continuous on-site monitoring is necessary to assure that the components of the liner system are constructed in accordance with this LQCP. In accordance with 30 TAC §330.339(a)(2), the CQA monitor shall provide on-site observation and field sampling and testing as required during the following construction activities:

- Subgrade preparation
- Compacted soil liner placement, processing, compaction, and testing
- Any work that could damage the installed components of the liner system

The GP will document and certify that the liner system was constructed in accordance with this LQCP. The GP shall make sufficient site visits to observe critical construction activities and to verify that the construction and quality assurance activities are performed in accordance with this LQCP.

All field sampling and testing, both during construction and after completion, shall be performed by a person acting in compliance with the provisions of the Texas Engineering Practice Act and other applicable state laws and regulations. The professional of record who signs the soil liner evaluation report or his representative will be on site during all liner construction. Quality control of construction and quality assurance of sampling and testing procedures will follow the latest technical guidelines of the executive director.

3 EARTHWORK

3.1 General

Earthwork activities and testing associated with liner construction will be documented in the SLER in accordance with Section 6.2.

3.2 Materials

The following material classifications will be encountered in excavations or will be required for landfill construction.

General Fill

General fill consists of soil that is free from debris, rubbish, solid waste, organic matter, and particles larger than four inches in diameter.

Compacted Soil Liner

Compacted soil liner materials consist of soil that is free from debris, rubbish, solid waste, organic matter, and meets the requirements of Section 4.2.

Operational and Intermediate Cover

Operational and intermediate cover materials consist of soil that has not been previously mixed with solid waste.

Topsoil

Topsoil consists of soil that is capable of sustaining vegetation and is free of debris, rubbish, and solid waste.

Unsuitable Materials

Unsuitable materials consist of any material that is determined by the GP to not be suitable for use as classified above.

3.3 Construction Below Groundwater

All cells have been excavated and no construction below the groundwater level was performed.

3.4 Excavation

A description of the materials that will be encountered in the excavations is provided in Attachment D5 -Geotechnical Design.

The slope stability analyses were performed for 3H:1V excavation and liner slopes, and 4H:1V final waste slopes. Any changes to the excavation plan, liner system, final cover system, or landfill completion plan will necessitate that the slope stability analyses be revised to reflect the changed conditions. Waste must be placed and properly compacted in horizontal lifts that are typically 20 feet thick. Temporary construction slopes should not be steeper than the final slopes and concentrated loadings such as heavy equipment and soil stockpiles will not be placed near the crest of slopes unless the permit is revised.

3.5 Expansion of Perimeter Dike

A compacted clay perimeter dike currently surrounds the entire landfill footprint. The top elevation of this dike is above the calculated 100 year floodplain and protects the landfill from wash-out of waste from the 100 year event. This landfill expansion application proposes to construct a second perimeter dike adjacent to the current one to provide a minimum of three feet of freeboard above the current 100 year flood event and to provide additional protection if the 100 year flood elevation were to rise in the future. The second perimeter dike will be 10 feet high and have 4:1 exterior slopes and 3:1 interior slopes. Figure D-2 in Attachment D shows the location and configuration of the proposed dike. The dike will be constructed of General Fill material.

The compacted soil subgrade below the dike and surface of each lift should be roughened prior to placement of the next lift of the dike. The dike material should be placed in maximum eight-inch loose lifts to produce compacted lift thickness of approximately six inches. The material should be processed to a maximum particle size of one inch or less before water is added.

If additional water is necessary to adjust the moisture content, it should be applied after initial processing, but prior to compaction. Water should be applied evenly across the lift and worked into the material. Water used for the dike compaction must not be contaminated by waste or any objectionable material.

The dike shall be compacted with a pad/tamping-foot or prong-foot roller. A footed roller is necessary to bond the lifts, to distribute the water, and to blend the soil matrix through kneading action. The compactor should make the required passes across the area being compacted to reach the required density. The material should be compacted to a minimum of 95 percent of the maximum dry density determined by standard Proctor (ASTM D 698) at a moisture content within 2% below or above optimum moisture. Areas with failing tests shall be reworked, re-compacted, and retested, and passing tests must be achieved before another lift is added.

4 COMPACTED SOIL LINER

4.1 General

The compacted soil liner component of the composite liner system consists of a 36-inch thick layer of compacted, relatively homogeneous, cohesive material. The CQA monitor shall provide continuous on-site observation during compacted soil liner placement, compaction, and testing in accordance with 30 TAC §330.339(a)(2). The GP shall make sufficient site visits during compacted soil liner construction to document the construction activities, testing, and thickness verification in the SLER, in accordance with Section 6.2.

4.2 Materials

Compacted soil liner material shall consist of soil that is free from debris, rubbish, frozen materials, foreign objects, and organic material. The required compacted soil liner material properties are summarized in Table D7-1.

Table D7-1
Beck Landfill
Compacted Soil Liner Material Properties

Test	Standard	Required Property
Plasticity Index	ASTM D 4318	15 or Greater
Liquid Limit	ASTM D 4318	30 or Greater
Percent Passing No. 200 Mesh Sieve	ASTM D 1140	30% or Greater
Percent Passing 1-inch Sieve	ASTM D 422	100%
Coefficient of Permeability	ASTM D 5084 or COE EM 1110-2-1906 Appendix VII	1×10^{-7} cm/sec or less

Preconstruction testing procedures and frequencies for compacted soil liner materials are listed in Section 4.8.1.

4.3 Subgrade Preparation

Prior to placing soil liner material, the subgrade should be proof-rolled with heavy, rubber-tired construction equipment to detect soft areas. The GP or CQA monitor must observe the proof-rolling operation. Soft areas should be undercut to firm material, then backfilled with compacted general fill.

The subgrade elevations shall be verified in accordance with the requirements of Section 4.8.3 prior to the placement of compacted soil liner.

4.4 Placement and Processing

The compacted soil subgrade and surface of each lift should be roughened prior to placement of the next lift of compacted soil liner. The soil liner material should be placed in maximum eight-inch loose lifts to produce compacted lift thickness of approximately six inches. The material should be processed to a maximum particle size of one inch or less before water is added. Rocks and clods less than one inch in diameter should not total more than 10 percent by weight. The surface of the top lift shall contain no material larger than 3/8 inch.

If additional water is necessary to adjust the moisture content, it should be applied after initial processing, but prior to compaction. Water should be applied evenly across the lift and worked into the material. Water used for the soil liner compaction must not be contaminated by waste or any objectionable material.

4.5 Compaction

The soil liner shall be compacted with a pad/tamping-foot or prong-foot roller. A footed roller is necessary to bond the lifts, to distribute the water, and to blend the soil matrix through kneading action. Soil liner shall not be compacted with a bulldozer, rubber-tired roller, flat-wheel roller, scraper, truck, or any track equipment unless it is used to pull a footed roller. The lift thickness shall be controlled to achieve penetration into the top of the previously compacted lift; therefore, the lift thickness should not be greater than the pad or prong length. Cleaning devices on the roller must be in place and maintained to prevent the prongs or pad feet from becoming clogged to the point that they cannot achieve full penetration. The minimum weight of the compactor shall be 1,500 lbs/ft of drum length.

The compactor should make the required passes across the area being compacted to reach the required density. A pass is defined as one pass of the compactor, front and rear drums. The material should be compacted to a minimum of 95 percent of the maximum dry density determined by standard Proctor (ASTM D 698) at a moisture content at or above optimum

moisture. Areas with failing tests shall be reworked, re-compacted, and retested, and passing tests must be achieved before another lift is added.

After a lift is compacted, it must be watered to prevent drying and excessive desiccation until the next lift can be placed. If desiccation occurs, the GP must determine if the lift can be rehydrated by surface application of water or if the lift must be scarified, watered, and re-compacted. Following compaction and fine grading of the final lift, the surface of the compacted soil liner shall be smooth drum rolled.

4.6 Protection

The completed compacted soil liner must be protected from drying, excessive desiccation, rutting, erosion, and ponded water until waste is placed. Areas that undergo excessive desiccation or damage shall be reworked, re-compacted, and retested as directed by the GP.

4.7 Tie in to Existing Liners

The edge of existing compacted soil liners shall be cut back on either a slope or steps to prevent the formation of a vertical joint. The slope will be a maximum of 3:1 and the steps will be three feet wide by one foot thick.

4.8 Testing and Verification

4.8.1 Preconstruction Testing

Table D7-2 lists the minimum testing required for material proposed for use as soil liner.

Table D7-2-Beck Landfill
Compacted Soil Liner Material Preconstruction Tests

Test	Standard	Frequency
Plasticity Index	ASTM D 4318	1 per material type
Liquid Limit	ASTM D 4318	1 per material type
Percent Passing No. 200 Mesh Sieve	ASTM D 1140	1 per material type
Percent Passing 1-inch Sieve	ASTM D 0422	1 per material type
Standard Proctor Test	ASTM D 698	1 per material type
Coefficient of Permeability	ASTM D 5084 or COE EM 1110-2-1906 Appendix VII	1 per moisture/density relationship
Unified Soil Classification	ASTM 2487	1 per material type

After the moisture density relationship has been determined for a material type, a soil sample should be remolded to about 95 percent of the maximum dry density at the optimum moisture content. This sample will be tested to determine if the soil can be compacted to achieve the required coefficient of permeability. Either falling head or constant head laboratory permeability tests may be performed to determine the coefficient of permeability. The permeant fluid for testing must be tap water or 0.005N calcium sulfate solution. Distilled or deionized water shall not be used as the permeant fluid.

4.8.2 Construction Testing

All quality control testing will be performed during construction of the liner, except for testing that is required after individual lifts are constructed. Table D7-3 lists the minimum testing required for material used as compacted soil liner.

Table D7-3
Beck Landfill
Compacted Soil Liner Material Construction Tests

Test	Standard	Frequency
Field Density	ASTM D 2922	1/8,000 ft^2 per 6" parallel lift; one per 100 lineal ft per 12" sidewall horizontal lift
Plasticity Index	ASTM D 4318	One per 100,000 ft^2 per 6" parallel lift; one per 2,000 lineal ft per 12" sidewall horizontal lift
Liquid Limit	ASTM D 4318	
Percent Passing No. 200 Mesh Sieve	ASTM D 1140 ASTM D 422	
Percent Passing 1-inch Sieve	ASTM D 0422	
Coefficient of Permeability	ASTM D 5084 or COE EM 1110-2-1906 Appendix VII	
Thickness	Surveyor	1/5,000 SF

The Atterberg limits of the in-place compacted soil liner must be compared to the Atterberg limits of the Proctor curve sample to assure that the Proctor curve represents the in-place material. Any variance of more than 10 points between the liquid limit or plasticity index of the in-place soil and those of the Proctor curve sample will require that a new Proctor curve be developed. Permeability testing will be performed as described in Section 4.8.1 and all test data will be reported. Areas with failing permeability tests shall be reworked, re-compacted, and retested, and passing tests must be achieved before another lift is added.

4.8.3 Thickness Verification

The as-built thickness of the compacted soil liner shall be determined by standard survey methods. Prior to the placement of liner material, the subgrade elevations will be determined at a minimum rate of one survey point per 5,000 sf of lined area. After the compacted soil liner is completed, the top of the liner elevations will be determined at the same locations as the subgrade elevations.

5 PROTECTIVE COVER

5.1 General

The protective cover component of the liner system will consist of a 12-inch- thick layer of soil placed over the compacted clay layer after completion of all required soil testing and verification. The clay liner construction shall be completed prior to initiation of protective cover placement. The CQA monitor shall provide continuous on-site observation during protective cover placement to assure that protective cover placement does not damage underlying soil liners. The GP shall make sufficient site visits during protective cover placement to document the construction activities, testing, and thickness verification.

5.2 Materials

Protective cover material shall consist of soil that is free from debris, rubbish, frozen materials, foreign objects, and organic material.

5.3 Preparation

Prior to placing the protective cover material, the top of compacted soil liner elevations shall be verified.

5.4 Placement

The protective cover shall be placed in a manner that minimizes the potential to damage the underlying soil liner. Hauling equipment shall be restricted to haul roads of sufficient thickness to protect the underlying liner. The protective cover shall be dumped from the haul road and spread by low ground pressure equipment. On sidewalls, protective cover shall be placed from the bottom to the top, not across or down.

5.5 Testing and Verification

The as-built thickness of the protective cover shall be determined by standard survey methods. Prior to the placement of protective cover, the top of compacted soil liner elevations will be determined at a minimum rate of 1 survey point per 5,000 sf of lined area. After the protective

cover is completed, the top of the protective cover elevations will be determined at the same locations as the top of compacted soil liner elevations.

6 DOCUMENTATION

6.1 Reports

Each report shall be submitted in triplicate to the Municipal Solid Waste Division and shall be prepared in accordance with the methods and procedures contained in this LQCP. The evaluated area should not be used for the receipt of solid waste until acceptance is received from the executive director. The executive director may respond to the permittee either verbally or in writing within 14 days from the date on which the Soils and Liner Evaluation Report is date-stamped by the Municipal Solid Waste Division. Verbal acceptance may be obtained from the executive director, which will be followed by written concurrence. If no response, either written or verbal, is received within 14 days, the SLER shall be considered accepted and the owner or operator may continue facility construction or operations. Each report must be signed and, where applicable, sealed by the individual performing the evaluation and countersigned by the site operator or his authorized representative.

Markers will be placed to identify all disposal areas for which a SLER has been submitted and accepted by the executive director. These markers shall be located so that they are not destroyed during operations.

The surface of a liner should be covered with a layer of solid waste within a period of six months to mitigate the effects of surface erosion and rutting due to traffic. Liner surfaces not covered with waste within six months shall be checked by the SLER evaluator, who shall then submit a letter report on his findings to the executive director. Any required repairs shall be performed properly. A new SLER shall be submitted on the new construction for all liners that need repair due to damage.

6.2 Soils and Liner Evaluation Report

After construction of the compacted soil liner, the GP will submit a SLER to the TCEQ on behalf of the owner. No area may be used for the receipt of solid waste until the TCEQ has accepted the SLER or 14 days from the date of receipt of the SLER by the TCEQ, if the executive director has not provided a verbal or written response.

Preparation and submission of the SLER shall be in accordance with TCEQ MSWR. The purpose of the SLER is to document that the construction methods and test procedures are consistent with this LQCP, the TCEQ MSWR, and the project specifications.

At a minimum, the SLER will contain the following:

- A summary of all construction activities
- A summary of all laboratory and field test results
- Sampling and testing location drawings
- A description of significant construction problems and the resolution of these problems
- Record drawings
- A statement of compliance with the LQCP
- The seal and signature of the GP and assistant GP, if applicable, in accordance with the Texas Engineering Practice Act

Formatted: Left

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT E
GEOLOGY REPORT

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022

Prepared by:

POWER ENGINEERS

PROJECT NUMBER: 150051.05.01

PROJECT CONTACT: Julie Morelli

EMAIL: Julie.Morelli@powereng.com

PHONE: 210-951-6424

REVISED ~~JANUARY 2, 2023~~MARCH 17, 2023

Formatted: Header, Justified

Formatted: Left

TABLE OF CONTENTS

3.1 GEOLOGY REPORT (§330.63(E)) 1
3.1.1 Regional Geology (§330.63(e)(1)) 1
3.1.2 Local Geological Processes (§330.63(e)(2)) 5
3.1.3 Regional Aquifers (§330.63(e)(3)) 6
3.1.4 Subsurface Conditions (§330.63(e)(4)) 12
3.1.5 Geotechnical Data (§330.63(e)(5)) 16
3.1.6 Groundwater Certification Process for Arid Exemption (§330.63(e)(6))
29~~28~~

Figures

Figure 3-1 Surface Geology
Figure 3-2 Stratigraphic Column
Figure 3-3 Regional Cross Section
Figure 3-4 Quaternary Fault Map
Figure 3-5 Regional Aquifers
Figure 3-6 Edwards Potentiometric Map
Figure 3-7 Water Wells
Figure 3-8 Seismic Impact

Appendix E-1 - Snowden, 1989, Attachment 11 and Supplements
Appendix E-2 – Snowden, 1989, Attachment 3C – Water Wells
Appendix E-3 - Approved Supplemental Boring Plan(s)
Appendix E-4 - Cross Sections

1.0 Geology Report (§330.63(e))

This portion of the application applies to owners or operators of MSW landfills, compost units, and if otherwise requested by the executive director. The geology report has been prepared and signed by a qualified groundwater scientist. The previously prepared permit documents relating to Geology, Aquifers, Groundwater, etc. are included as Appendices to this Report for continuity with prior permitting actions, as noted below. ~~The following prior documents are included by reference to this report:~~

- Appendix E-1 - Snowden, 1989, Attachment 11 and Supplements
- Appendix E-2 – Snowden, 1989, Attachment 3C – Water Wells
- Appendix E-3 – Supplemental Boring Plan
- Appendix E-4 – Cross Sections

1.1 Regional Geology (§330.63(e)(1))

The regional geology described herein includes from the ground surface to the base of the lowermost aquifer capable of providing usable groundwater within Guadalupe County, Texas. Those regional formations and structural features of significance to the Beck Landfill site are discussed below. **Figure 3-1** shows the surface geology of the subject area of Guadalupe County and adjoining counties and mapped fault lines of the Balcones Fault Zone. The Balcones Fault Zone has been inactive for nearly 15 million years and is considered a very low risk for earthquake hazard by the Federal Emergency Management Agency (FEMA).

Figure 3-2 is a generalized stratigraphic column of the region that indicates the geologic age, range of thickness, formation lithology and water supply usage.

Quaternary, Tertiary and Cretaceous System formations outcrop within the region of review. These formations are mainly comprised of sand, sandstone, gravel, clay, mudstone, shale, and marl. The stratigraphic sequence of formations that outcrop in the review region from the land surface to the base of the lowermost aquifer capable of providing usable groundwater is shown on the generalized stratigraphic column on **Figure 3-2**.

As indicated on the stratigraphic column, the youngest formation that outcrops in the area is the Holocene Series alluvium consisting of clay, silt, sand, and gravel deposited in the floodplain along major stream channels in the southern portion of the subject region. The Holocene Series alluvium is documented to be as much as 25 feet in thickness. The Holocene alluvium lies unconformably over the older Pleistocene Series Leona Formation, and Tertiary and Cretaceous series formations where Leona Formation beds have been eroded away.

Two Pleistocene Series formations outcrop within the mapped region. From youngest to oldest these are the fluviatile terrace deposits and Leona Formation. The fluviatile terrace deposits in the region of review are comprised of sand, silt, clay, and some gravel that were laid down as point bars, oxbows and abandoned channel fill. These fluviatile terrace deposits generally occupy a positioned above the Holocene floodplains of entrenched streams and may obtain a thickness of up to 30 feet based on a review of State Water Well Reports for wells drilled in Guadalupe County. The Pleistocene Series terrace unconformably overlie the older Pleistocene Series Leona Formation, where not eroded away, or Tertiary and Cretaceous system formations where the Leona was removed by erosion.

The Leona Formation of the review region consist of gravel, sand, silt, and caliche deposited as wide fluviatile terraces. The gravel and sand beds of the Leona are stratified and partly cross bedded with lenses of caliche and silt. The Leona is believed to obtain a maximum thickness of about 60 feet. The Leona Formation rests unconformably on top of Tertiary and Cretaceous system formations.

The youngest of the Tertiary System formations that outcrops within the review region is the Pliocene Series Uvalde Gravel; the deposition of which may have also occurred during the early Pleistocene. This formation is comprised of caliche-cemented gravel, cobbles, and some small boulders. Uvalde Gravel sediments were deposited as terraces and occupies topographically high areas that are not associated with present-day drainage. The thickness of this formation ranges from several feet to about 20 feet plus or minus. In the review region, the Uvalde Gravel unconformably overlies Tertiary and Cretaceous system formations.

Eocene and Paleocene series formations of the Tertiary System outcrop at the southeastern portion of the review region. These formations from youngest to oldest are:

- The Eocene Series Wilcox Group; and,
- The Paleocene Series Midway Group.

Both groups outcrop in the southeastern portion of the review region.

Within the review region, the Wilcox Group outcrops as a wide belt trending from the northeastward to the southwest. The Wilcox strata consists mostly of mudstone with some silt and very fine sand laminae. Variable amounts of sandstone and lignite also occur within the Wilcox Group. The sediments that comprise the Wilcox Group were deposited in palustrine and fluvial environments. The maximum thickness of this group is around 1,420 feet. The Wilcox Group grades vertically into the Midway Group resulting in a conformable contact.

The sediments that make up the Midway Group were deposited in coastal and marine environments. This group is predominately comprised of clay and silt with some lenses of sand and limestone. The Midway Group is about 500 feet thick and unconformably overlies the undivided Cretaceous System Navarro Group and Marlbrook Marl.

Gulf and Comanche series formations of the Cretaceous System outcrop throughout the majority of the review region. These formations from youngest to oldest are:

- Gulf Series
  - Navarro Group and Marlbrook Marl (upper Taylor Group) undivided
  - Pecan Gap Chalk (Lower Taylor Group)
  - Austin Chalk
  - Eagle Ford Group
  - Del Rio Clay
- Comanche Series
  - Buda Limestone

- Del Rio Clay
- Edwards Limestone undivided

The Navarro Group and Marlbrook Marl undivided outcrops through the middle of the review region. The lithology of this undivided assemblage of formations includes marl, clay, sandstone, and siltstone. The sandstone beds are discontinuous and of limited lateral extent. This undivided assemblage is thought to be deposited in a shallow water, marginal marine environment. The Navarro-Marlbrook Marl is up to 580 feet in thickness and may rest conformably upon the Pecan Gap Chalk. This undivided assemblage of formations is unconformably overlain by Holocene and Pleistocene series formations at the Beck Landfill site and is the formation into which the landfill excavation will terminate.

The Pecan Gap Chalk outcrops in the northwestern portion of the review region, ~~well~~ within the Balcones Fault Zone. This formation is composed of chalk and chalky marl deposited in shallow shelf, shoreface and transgressive marine environments. The Pecan Gap ranges from 100 feet to 400 feet in thickness and unconformably overlies the Austin Chalk.

The Austin Chalk further northwest of ~~b~~Beck Landfill site in a highly faulted area of the Balcones Fault Zone. The lithology of this formation includes chalk and marl with localized occurrences of bentonitic seams. The Austin carbonates accumulated in a low-energy shallow to open – shelf and shoal environment. The Austin Chalk thickness ranges from 350 feet to 580 feet and unconformably overlies the Eagle Ford Group.

The oldest formation of the Gulf Series is the Eagle Ford Group which is also referred to as the Eagle Ford Shale. Outcroppings of the Eagle Ford Group are limited to the highly faulted portion of the Balcones Fault Zone in the northwestern area of the review region. The Eagle Ford lithology includes shale, siltstone and flaggy limestone deposited as deltaic and marine sediment. The Eagle Ford Group contact with the underlying Buda Limestone is unconformable and is 30 feet to 75 feet thick.

The Buda Limestone is the upper formation of the Comanche Series. As with the Austin Chalk and Eagle Ford Group, outcroppings of Buda Limestone are mostly restricted to the highly faulted

portion of the Balcones Fault Zone within the northwestern limits of the review region. Sediments for this limestone formation were deposited in an open-shelf marine environment. The formation lithology is fine grained poorly bedded to nodular limestone that becomes argillaceous near its upper contact. The contact between the Buda Limestone and the Del Rio Clay is unconformable. The thickness of the Buda strata ranges from 60 feet to 100 feet within the review region.

Outcroppings of the Del Rio Clay, formally called the Grayson Formation, are restricted to the highly faulted area of the Balcones Fault Zone within the northwestern portion of the review region. The depositional environment for Del Rio sediments were lagoonal and nearshore shallow marine. Calcareous and gypsiferous clay with some thin lenticular beds of calcareous siltstone make up the Del Rio lithology. The thickness of this formation ranges from 60 feet to 120 feet. The Del Rio Clay conformably overlies the undivided Edwards Group.

The undivided Edwards Group outcrops in the far northwestern portion of the review region and is within the northwestern extent of the Balcones Fault Zone. The lithology of this undivided formation consists of fine to coarse grained massive limestone with abundant chert and solution zones deposited in a shallow water marine environment. The undivided Edwards Group ranges from 300 feet to 500 feet.

3.1.1 Local Geological Processes (§330.63(e)(2))

30 TAC 330.559 defines an unstable area as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all landfill structural components responsible for preventing releases from the landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movement, and karst terrains. The Beck Landfill was excavated through alluvial materials (sand and gravel) to the undivided Navarro Group and Marlbrook Marl, which consist of clay and shale material (impermeable). Evidence of active detrimental on-site geologic activity has not been documented within the landfill area. No on-site or local human-made features or events were observed to have created unstable conditions.

The Beck Landfill is located within the Balcones Fault Zone as show on **Figure 3-21.** The Balcones Fault Zone is a system of normal faults that traverses the review region from the northeast to the southwest. This fault zone is associated with the Paleozoic-age Ouachita Fold Belt, a remnant of an ancient highly eroded mountain range which is buried beneath the Balcones Fault Zone. Movement along the Balcones faults took place mainly during the Miocene Epoch. Data contained within the USGS Quaternary Fault and Fold Database indicates that no Holocene displacement of faults within the Balcones Fault Zone has occurred.

The Ouachita Fold Belt caused regional tilting and uplifting of Paleozoic rocks that underlie the review region. Pre-Cretaceous erosion of the uplifted Paleozoic rocks created a southeast dipping regional erosional surface or unconformity upon which Cretaceous System sediments were deposited. This regional unconformity and extensive faulting are the most significant structural features affecting the Cretaceous System and Paleocene Series formations within the review region. The Ouachita Fold Belt regional unconformity affected the deposition of both Cretaceous and Tertiary system sediments bringing about the creation of wedge-shaped formation bodies that thicken southeastward towards the Gulf Coast. **Figure 3-3** is a simplified down-the-coast oriented regional stratigraphic cross-section through central Guadalupe County which illustrates the geometry and dip of the review region formations.

The Beck Landfill and adjacent areas is documented to be devoid of Holocene displacement along those faults of the Balcones Fault Zone or active land surface subsidence and does not appear to meet the definition of an "unstable area". **Figure 3-4** shows the landfill location in relation to areas of known Holocene fault displacement. **Figure 3-8** shows the landfill location relative to the seismic risk, which is "very low" according to the Federal Emergency Management Agency (FEMA) National Risk Index for earthquakes.

Formatted: Font: Bold

3.1.2 Regional Aquifers (§330.63(e)(3))

Four aquifers are utilized for water supplies within the review region. The four aquifers that outcrop and/or subcrop the review region are: the Carrizo – Wilcox, Edwards, Austin, and the

Leona aquifers. The Carrizo – Wilcox and Edwards aquifers are classified by the Texas Water Development Board (TWDB) as major aquifers, with the Leona and Austin being classified as "other" by the TWDB. No aquifers classified as minor outcrop or subcrop the review region. A map depicting the location of the Beck Landfill relative to the Carrizo – Wilcox, zones of the Edwards, Austin and Leona aquifers is provided as **Figure 3-5**. Those geologic formations and groups associated with the above referred aquifers and the rock/sediment makeup of each aquifer are listed from youngest to oldest in geologic age in Table 3-1 below.

Table 3-1 Regional Aquifers

Aquifer Name	Associated Geologic Formation or Group	Rock/Sediment Makeup
Leona	Leona Formation	Gravel and sand with lenses of caliche and silt
Carrizo – Wilcox	Wilcox Group within the Review Region	Mostly mudstone with some silt and very fine sand laminae and variable amounts of sandstone and lignite
Austin	Austin Chalk	Chalk and marl
Edwards	Edwards and Associated Limestones	Fine to coarse grained massive limestone with abundant chert and solution zones

Of these four aquifers, the Leona, Austin, and Edwards either outcrop near the Beck Landfill site boundary or underlie it. The Carrizo – Wilcox outcrops approximately 7.75 miles southeast of the landfill site and it highly unlikely to be affected by landfill activities. Therefore, no further discussion regarding the Carrizo – Wilcox follows this text. **Figure 3-5** shows the outcrop areas of the above referenced aquifers in relation to the landfill location.

As shown in table above, the Leona Aquifer is comprised of gravel and sand with lenses of caliche and silt. Hydraulic properties data for the Leona Aquifer within the review region and Guadalupe County appears to be nonexistent in readily available State groundwater reports. However, data

pertaining to the range of the average hydraulic conductivity for the Leona Aquifer in neighboring Caldwell County was obtained. According to the source, the average Leona hydraulic conductivity ranged from 37 feet/day to 397 feet/day. Yields for water well producing from the Leona range from 1 gallon/minute (gpm) to 500 gpm are reported on State Water Well Reports obtained from the TWDB for wells producing for the Leona Aquifer and State groundwater reports.

The Leona Aquifer is under water table conditions. Recharge to this aquifer occurs where precipitation infiltrates Leona strata that outcrops within the review region. Additional recharge may also be received from streams entrenched in the Leona outcrop area during flood events. The Leona may provide some recharge to the Carrizo Willcox where Leona strata directly rest upon the Wilcox Group outcrop area in the southeastern corner of the review region. Recharge from the Leona to the Austin Aquifer is impeded by two aquitards that separate the Leona and Austin. These two aquicludes are the Cretaceous Series Pecan Gap Chalk and undivided Navarro Group and Marlbrook Marl, which underlie the Leona at the Beck Landfill site.

Maps showing the regional Leona water table surface were not identified during a review of readily available regional hydrogeologic literature. Being unconfined and assuming the absence of pumping well interference, the Leona water table surface most likely mimics the land surface topography flowing in the direction of lower topographical elevations and entrenched stream channels. Historical water table elevation measurements taken at the Beck Landfill site during groundwater monitoring events indicate groundwater flow in the Leona is towards Cibolo Creek supporting the regional flow direction conclusion. Regional rates of groundwater flow through the Leona Aquifer were not found in the reviewed readily available regional hydrogeologic literature. Using the range of average Leona hydraulic conductivities presented earlier, an estimated effective porosity of 0.25 for sand and gravel and an assumed hydraulic gradient of 0.003feet/foot (based on Beck Landfill historical water table elevation measurements), the estimated groundwater flow rate would range from 0.44 feet/day to 4.8 feet/day.

A review of State Water Well Reports for those water wells producing from the Leona Aquifer within the review region showed total dissolved solids (TDS) concentrations to be less than 500 mg/L. Historical groundwater monitoring data for the Beck Landfill shows TDS concentrations

ranged from 502 mg/L to 3460 mg/L (see Part III, Attachment F, Appendix F-1). These TDS concentrations indicate that groundwater in the Leona Aquifer can be categorized as fresh to moderately saline. Groundwater withdrawn from the Leona Aquifer is utilized for public supply, domestic, irrigation and livestock purposes.

The Austin Aquifer is comprised of chalk and marl, which outcrop west and northwest of the Beck Landfill site within the Balcones Fault zone. These outcrop areas are highly faulted and of limited extent in the review region. Recharge to the Austin Aquifer occurs by direct infiltration of precipitation on its outcrop area and by limited seepage from streams that cross the outcrop areas. The Austin is most likely under water table conditions in its outcrop area but goes to a confined (artesian) condition southeast (downdip) of its outcrop areas where it is overlain by the Pecan Gap Chalk and undivided Navarro Group and Marlbrook Marl strata that form aquitards hydraulically separating it from the overlying Leona Aquifer. The Austin is underlain by strata belonging to the Eagle Ford Group, Buda Limestone and Del Rio Clay which form aquitards that separate it from the deeper Edwards Aquifer.

Maps showing the Austin Chalk regional water table surface and potentiometric surface, where confined, were not included in the reviewed, readily available regional hydrogeologic literature. However, the regional hydrogeologic literature reviewed did state that the predominate direction of groundwater flow within the Austin Aquifer is southeastward toward the Gulf Coast. The regional hydrogeologic literature also pointed out that localized variations in flow direction occur due to fault barriers or withdrawals of groundwater by pumping water wells. Where groundwater movement comes under the influence of pumping water wells, groundwater flow is towards the wells from all directions.

Hydraulic properties data for the Austin Aquifer within the review region was not found in readily available State groundwater reports or other hydrogeologic literature. However, data regarding well yield for water well producing from the Austin Aquifer were obtained from State Water Well Reports and one TWDB groundwater report. According to these sources, well yields range from 2 gpm to 60 gpm.

Data pertaining to TDS concentrations in groundwater withdrawn from the Austin Aquifer were obtained from State Water Well Reports for water wells producing from the Austin within the review region and reviewed TWDB groundwater reports. According to this data, TDS concentrations in Austin Aquifer groundwater range from 385 mg/L to 1,528 mg/L. These TDS concentrations indicate that groundwater in the Austin Aquifer mostly fresh but can be moderately saline at some locations. Groundwater withdrawn from the Austin is used for public supply, domestic and livestock purposes.

As pervious stated, the Edwards Aquifer is classified by the TWDB as a major aquifer and located northwest of the ~~underlies the~~ Beck Landfill site. This major aquifer is comprised of fine to coarse grained massive limestone with abundant chert and solution zones. The Edwards outcrops northwest of the Beck Landfill site within the Balcones Fault zone. Recharge to the Edwards Aquifer occurs by direct infiltration of precipitation on its outcrop area and some seepage from streams that cross its outcrop area. The Edwards is under water table conditions in its outcrop area but becomes confined southeast of it outcrop area being overlain by strata of the Eagle Ford Group, Buda Limestone and Del Rio Clay which form aquitards that hydraulically separate it from the overlying Austin Aquifer.

The Leona Aquifer and associated Leona Formation consists of several isolated alluvial deposits at the edge of the Edwards Plateau. It is mapped as existing beneath the Beck Landfill (see **Figure 3-5**). This alluvium aquifer is recharged by infiltration of precipitation and is discharged by numerous springs and seeps. The saturated thickness is rarely greater than ten feet. The saturated zone varies seasonally. Groundwater flow and hydraulic conductivity is influenced by the heterogeneous nature of the alluvium deposit. The arithmetic mean of hydraulic conductivity in vertical profiles ranges from 0.013 cm/sec to 0.14 cm/sec[1]. Elevated nitrate levels are common ranging from 4 parts per million to 70 parts per million. Due to activity at the landfill, the Leona Aquifer has been removed within the embankment of the Beck Landfill. No information on the potentiometric surface or specific hydraulic dynamics in Guadalupe County was identified. The

Formatted: Font: Bold

[1] Hydrogeology of heterogeneous alluvium in the Leona aquifer, Caldwell County, Texas. Sharp, John Malcolm. May 2005.

Guadalupe County Groundwater Conservation District (GCGCD) studies, conserves, preserves, and protects the Carrizo and Wilcox Aquifers, but makes no mention of the Leona.

To demonstrate regional groundwater trends, **Figure 3-6** shows the regional water table surface and potentiometric surfaces of the Edwards Aquifer in July 1974, republished in 1986. No changes in regional groundwater flows since this time are known at the time of this application. As shown on this figure, the direction of groundwater flow within the unconfined portion of the Edwards is southeastward toward the Gulf Coast, then turning to the northeast upon transitioning to confined conditions. Where groundwater movement locally comes under the influence of pumping water wells, groundwater flow is towards the wells from all directions.

Formatted: Font: Not Bold

The hydraulic conductivity of the Edwards Aquifer is documented as ranging from 2 feet/day to 31 feet/day, with transmissivities ranging from "negligible" to 2 million feet^2/day. Well yield for water well producing from the Edwards Aquifer within the review region range from 15 gpm to 160 gpm. The estimated rates of groundwater flow through the Edwards range from 2 feet/day to 31 feet/day.

TDS concentrations data for groundwater withdrawn from the Edwards Aquifer were taken from State Water Well Reports for water wells producing from the Edwards within the review region and reviewed TWDB groundwater reports. This data shows that TDS concentrations in Edwards Aquifer groundwater range from 247 mg/L to 8,249 mg/L. The distribution of these TDS concentrations across the review region show that Edwards groundwater at the northwestern half of the review region can be categorized as be fresh to slightly saline and moderately saline in the southern half of the review region. Groundwater withdrawn from the Edwards is used for public supply, domestic and livestock purposes.

A list of all water wells located within one mile of the Beck Landfill from which groundwater is withdrawn of use is provided in Table 3-2 below. The locations of these water wells are shown of **Figure 3-7**.

Table 3-2 Water Wells within One Mile of the Beck Landfill Boundaries

TWDB Well Report Number	Location	Bore Depth (ft.)	Use	Aquifer Name
297428	29.531667°, -98.259445°	35	Domestic	Leona
297432	29.532222°, -98.257778°	34	Domestic	Leona
288275	29.53334°, -98.265834°	41	Domestic	Leona
268534	29.565556° -98.256111°	380	Domestic	Austin Chalk
6830603	29.558612°, -98.260001°	550	Irrigation	Edwards
6830605	29.567778°, -98.261667°	116	Domestic	Austin Chalk
6830606	29.565834°, -98.266944°	295	Domestic	Austin Chalk
6831702	29.535° -98.245278°	35	Public Supply	Leona
68306A	29.550161° -98.273573°	35	Domestic	Leona
68306C	29.550643° -98.268175°	390	Domestic	Edwards
68306D	29.550645° -98.268163°	75	Domestic	Leona
68314	29.555336° -98.264186°	55	Domestic	Leona
68317	29.536302° -98.247536°	33	Domestic	Leona

Sources: Texas Water Development Board (TWDB) Groundwater Data Viewer and Texas Commission on Environmental Quality (TCEQ) Water Well Report Viewer, Accessed on April 19, 2021

3.1.3 Subsurface Conditions (§330.63(e)(4))

The original geotechnical analysis and supplemental borings drilled in 2020 are presented under Part III, ~~Attachment~~ Appendix D-5-C. Additional geotechnical information is provided in that attachment in support of this application. The information provided below synthesizes information

submitted with the original application (Snowden, 1989) as relevant to this rule requirement, as supplemented by borings advanced in 2020.

Per Snowden (Subsurface Conditions, 1989), a series of borings, along a 400 foot grid layout within the confines of the project area was proposed to the Texas Department of Health (TDH). The TDH approved the investigative proposal with the understanding that some individual boring locations were subject to equipment accessibility and thus may be delated. Omission of boring could not however compromise the development of an adequate subsurface stratigraphic relationship.

A total of fifty-four (54) borings were advanced. Each of the proposed boring locations is indicated on the original boring plan, but only those designated by grid numbers were actually drilled. A continuous flight auger system, either of a solid or hollow stem type, was employed in the advancement of the borings. An updated cross-sectional analysis of this boring plan and boring lot set is provided as **Appendix E-4** of this Report. The locations and elevations are approximated based on best available information today. A Table is provided for references.

Representative samples of the subsurface sediments were obtained from selected borings. Undisturbed or Shelby tube samples were recovered to represent much of the clay-shale penetration as recorded on the accompanying logs. Auger samples were generally recovered to represent the stream deposited stratum. All samples were immediately sealed to preserve in-situ states and moisture conditions as near as possible.

The analysis of the soil samples was performed in a soils laboratory. Testing generally conformed to an appropriate A.S.T.M specification as per the soil property being determined. The values of permeability, each expressed as centimeters per second, were derived by a constant head method utilizing flexible wall permeameters. The recompacted samples were also tested by the same method. Permeability was determined for selected clay samples from six (6) widely spaced borings. The samples were chosen as to be representative of the entirety of the clay formation underlying the proposed site and/or to confirm the impermeable nature of the natural clay. Atterberg Limits were determined from un-tested portions of the permeability samples, in order to

formulate a basis of comparison, with the plasticity indexes, as determined from other sampled borings. A comparison of this nature should support the suitability of the particular natural clay, as relevant to the proposed site usage. Sieve and Hydrometer analysis were not performed, as the majority of the laboratory investigation was concentrated on materials predominantly of clay minerals. Such clay materials would generally pass the #200 sieve.

The conclusions of the laboratory testing are given on the tables included in Part III, Appendix D5-C~~Attachment D-5~~. The findings of the exploratory borings as depicted by the boring logs, along with the other aspects of the field accumulated datum, allowed an analysis of the subsurface conditions existing at the proposed site.

Formatted: Not Highlight

A supplemental geotechnical investigation was conducted by Terracon in the southeast portion of the landfill in September 2020 to revisit the findings of the original investigation. The investigation was conducted in accordance with 30 TAC §330.63(e)(4) and §330.63(e)(5). A total of eight borings were advanced in the approximately 12-acre area, consistent with the guidance of 6-10 borings in 30 TAC §330.63(e)(4)(B) for a study area of 10-20 acres. A boring plan detailing the proposed investigation was submitted by POWER Engineers, Inc. to the TCEQ Municipal Solid Waste Permits section on August 17, 2020. No changes to the proposed number and depth of the borings were requested due to site conditions in the proposed boring plan. No geophysical methods, such as electrical resistivity, were proposed for use as part of this study to reduce the number of required borings. The TCEQ received the boring plan for review on August 31, 2020, and issued an approval letter dated September 3, 2020. A copy of the approved boring plan and TCEQ approval letter are included with this submittal as Appendix E-3.

The Terracon Geotechnical Data Report indicates that borings were advanced with a truck-mounted drill rig utilizing continuous flight augers. Samples were obtained by Terracon continuously in the upper 10 ft. if each soil boring and at intervals of 5 ft. thereafter. A thin-wall tube or split-barrel tube was utilized. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed soil sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was utilized by Terracon and driven into the ground by a

140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration was recorded by Terracon as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the Terracon boring logs at the test depths. Terracon observed and recorded groundwater levels during drilling and sampling. Terracon backfilled all borings with bentonite chips after their completion.

Table 3-3 below summarizes the subsurface findings at each boring location. The Terracon Geotechnical Data Report with detailed information presented for each boring, including Unified Soil Classification System findings is included in Part III Attachment D-5. A discussion of the laboratory soil tests and findings by Terracon following boring activities is presented below. Cross-sections prepared from the findings are attached as **Appendix E-4** to this Report.

Table 3-3 Summary of Subsurface Soil Findings

Boring No.	**Generalized Soil Findings and Depths Below Ground Surface**					
FB-1 (Terminated at 45 ft.)	0-4 ft. Fill -Fat Clay (CH)	4-13 ft. Fill- Fat Clay (Reworked Clay-Shale)	13-23 ft. Fill- Clayey Sand (SC)	23-33 ft. Clayey Gravel (GC)	33.0-38 ft. Lean Clay (CL)	38-45 ft. Clay-Shale
FB-2 (Terminated at 45 ft.)	0-3 ft. Fill-Fat Clay (CH)	3.0-13.0 ft. Fill- Fat Clay (Reworked Clay-Shale) (CH)	13.0-38.0 ft. Fat Clay (CH)	38.0-45.0 ft. Clay-Shale	N/A	N/A
FB-3 (Terminated at 50 ft.; Groundwater encountered at 38 ft.)	0-6 ft. Fill-Lean Clay (CL)	6-18 ft. Fill-Fat Clay (Reworked Clay-Shale) (CH)	18-20 ft. Lean Clay (CL)	20-35 ft. Clayey Gravel (GC)	35-43 ft. Fat Clay (CH)	43-50 ft. Clay-Shale
FB-4 (Terminated at 35 ft.)	0-35 ft. Clay-Shale	N/A	N/A	N/A	N/A	N/A

Boring No.	Generalized Soil Findings and Depths Below Ground Surface					
FB-5 (Terminated at 35 ft.)	0-35 ft. Clay-Shale	N/A	N/A	N/A	N/A	N/A
FB-6 (Terminated at 35 ft.)	0-35 ft. Clay-Shale	N/A	N/A	N/A	N/A	N/A
FB-7 (Terminated at 50 ft.; Groundwater Encountered at 9ft. and stabilized at 12 ft.)	0-4. ft. Fill - Lean Clay (CL)	4.0-14.0 ft. Fill – Clayey Gravel (GC)	14-50 ft. Clay-Shale	N/A	N/A	N/A
FB-8 (Terminated at 50 ft.)	0-18 ft. Fat Clay (CH)	18-50 ft. Clay-Shale	N/A	N/A	N/A	N/A

3.1.4 Geotechnical Data (§330.63(e)(5))

The original geotechnical analysis and supplemental borings are presented under Part III, Attachment D-5. Additional geotechnical information is provided in that attachment in support of this application. The information provided below synthesizes information submitted with the original application (Snowden, 1989) as relevant to this rule requirement, as supplemented by borings advanced in 2020.

The various soil layers identified in the soil borings were tested and evaluated to determine their index properties and their in situ undisturbed permeabilities. Clause 325.74 (b) (5) (I) (iii) of the TDH Municipal Solid Waste Regulations was used as a guide for these evaluations. This clause states as follows:

A laboratory report of soil characteristics shall be submitted consisting of a minimum of one sample from each soil layer that will form the bottom and sides of the proposed excavation. The

design engineer should have as many additional tests performed as necessary to provide a typical profile of the soil stratifications within the site. No laboratory work need be performed on highly permeable soil layers which obviously will require lining. The soil samples shall be tested by a competent soils laboratory. The soil tests shall consist of the following:

1. *Permeability tests, to be performed according to one of the following standards on undisturbed soil samples. Where excavations already exist on the site that are to be used for waste disposal, undisturbed samples shall be taken from the sidewalls of those excavations and said permeability tests made on the horizontal axis. All test results shall indicate the type of test used and the orientation of each sample.*

   Constant Head—ABTM D 2434; or

   Falling Head—Appendix VII of the Corps of Engineers Manual EM 1110-2-1906, 30 Nov. 70, Laboratory Soils Testing.

2. *Sieve analysis and hydrometer analysis: No.4, No.10, No.40, No.200, —200, and hydrometer analysis on —200 fraction—ASTM D422.*

3. *Atterberg Limits—ASTM D 423 and D 424.*

4. *Moisture - Density Relations—ASTM D 69B.*

5. *Moisture Content—ASTM D 2216.*

All soils bounded within the following range of values shall be tested in a soils laboratory for the coefficient of permeability. Normally all soils below the range of values stated in this subclause are very sandy and will require lining, unless additional test data support a deviation. Those soils which exceed the range of values are high in clay and do not require additional testing to prove their adequacy for sanitary landfill purposes. The physical parameters stated are to be considered as guidelines for soil sample testing. Engineering judgement must be used on those samples which exhibit some but not all of the boundary limits stated.

Plasticity Index 15 to 25, Liquid Limit 30 to 50, Percent Passing 30 to 50, No.200 Mesh Sieve (-200)

The sandy clays exhibit Liquid Limits (LL) of 26 to 46 and Plasticity Indices (PI) of 11 to 30. This soil layer requires testing to determine the coefficient of permeability. Samples from the silty clays were tested for permeability and were found to be well within required characteristic qualities when mixed with clays and bentonite as proposed as for use in the dike.

The clay and shale deposits exhibit Liquid Limits of 53 to 72 and Plasticity Indices of 37 to 52. This soil layer does not require additional permeability testing and is considered suitable for use as a natural liner.

The permeability test results from this project are presented in the Geotechnical Investigation Attachment 11 (Snowden, 1989 presented in Part III, Attachment D-5). It should be noted that soils with a high Plasticity Index may also exhibit substructures of seams or joints which may have an effect upon permeability. The gray shale beneath this project was not however observed to have significant permeable substructure. Based on our observations and the permeability test results, the Navarro & Taylor Deposits are expected to be suitable as natural liners provided that the slurry trench key is extended a minimum of five (5) feet into this shale.

The design as proposed for this project then will require the establishment of the soil bentonite slurry trench keyway to be excavated a minimum of 5 feet into the underlying shale, to insure against any substructure permeability and afford the greatest degree of integrity.

A supplemental Geotechnical Investigation was conducted by Terracon at the southeast portion of the Beck Landfill in September 2020. A general overview of the geotechnical data associated with the investigation is presented below. The full Terracon Geotechnical Data Report is attached as **Appendix E-2**.

330.63(e)(5)(A) – Overview of Laboratory Investigation and Findings

Samples collected by Terracon during the field exploration were taken to the laboratory for further

observation by the Terracon project geotechnical engineer and were classified in accordance with the United Soil Classification System (USCS). The following laboratory test methods were conducted by Terracon on selected soil samples from this investigation:

- Moisture Content (ASTM D2216);
- Atterberg Limits (ASTM D4318);
- Gradation of Soils using Sieve Analysis (ASTM D422);
- Percent Passing No. 4 and No. 200 Mesh Sieves (ASTM D1140); and
- Permeability Tests (ASTM D5084).

A grain size analysis through the use of ASTM D422 and ASTM D1140 was conducted for each boring location, including that represent the side and bottom of the landfill. A summary of grain size analysis findings is presented in Tables 3-4 to 3-12 below. Terracon runs all the sieves on the first portion of sample and then for the other two, they run the #4 and #200 screens, only. Any unreported percentages are larger than the #4 screen but are not listed as a size because they are not "graded". Further information on the grain size analysis is available in the Terracon Geotechnical Data Report. Cross sections are provided in **Appendix E-4**.

Table 3-4 – Summary of Boring FB-1 Grain Size Analysis (Side of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
4-5	N/A	N/A	4.4	N/A	95.4	N/A	99.74	95.37
6-7	N/A	N/A	7.1	N/A	91.7	N/A	98.88	91.73
13.5-15	N/A	N/A	34.8	N/A	46.5	N/A	81.3	46.51
23.5-25	0.0	44.7	37.4	N/A	17.9	N/A	55.33	17.93

Table 3-5 – Summary of Boring FB-2 Grain Size Analysis (Side of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
0-1.5	N/A	N/A	18.4	N/A	50.2	N/A	68.61	50.22
5-6	N/A	N/A	4.5	N/A	92.0	N/A	96.52	92.02
13-15	N/A	N/A	13.7	N/A	57.8	N/A	71.55	57.84
23.5-25	N/A	N/A	28.2	N/A	66.7	N/A	94.83	66.67
38-40	N/A	N/A	N/A	N/A	99.7	N/A	N/A	99.69

Table 3-7 – Summary of Boring FB-3 Grain Size Analysis (Side of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
2-3	N/A	N/A	17.5	N/A	69.9	N/A	87.4	69.94
9-10	N/A	N/A	7.1	N/A	91.4	N/A	98.57	91.43
23.5-25	0.0	36.4	36.6	N/A	27.0	N/A	63.56	26.97

Table 3-8 – Summary of Boring FB-4 Grain Size Analysis (Bottom of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
1-2	N/A	N/A	N/A	N/A	99.0	N/A	N/A	99.02
5-6	0.0	0.0	1.1	N/A	98.9	N/A	100.0	98.93
18.5-19.7	0.0	0.0	3.9	N/A	96.1	N/A	100.0	96.12

Table 3-9 – Summary of Boring FB-5 Grain Size Analysis (Bottom of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
0-1.4	0.0	0.0	3.2	N/A	96.8	N/A	100.0	96.84
6.5-7	0.0	0.0	2.7	N/A	97.3	N/A	100.0	97.35
23.5-24.8	0.0	0.0	1.2	N/A	98.8	N/A	100.0	98.84

Table 3-10 – Summary of Boring FB-6 Grain Size Analysis (Bottom of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
2-4	0.0	0.0	1.5	N/A	98.5	N/A	100.0	98.54
6-8	N/A	N/A	N/A	N/A	98.0	N/A	N/A	98.01
18.5-19.5	N/A	N/A	1.1	N/A	98.2	N/A	99.31	98.23

Table 3-11 – Summary of Boring FB-7 Grain Size Analysis (Bottom of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
4.5-6	N/A	N/A	28.6	N/A	17.8	N/A	46.47	17.82
8.5-10	N/A	N/A	20.1	N/A	38.9	N/A	58.97	38.89
18-20	N/A	N/A	N/A	N/A	95.7	N/A	N/A	95.74
38.5-39.8	0.0	0.0	2.0	N/A	98.0	N/A	100.0	97.97

Table 3-12 – Summary of Boring FB-8 Grain Size Analysis (Bottom of Landfill)

Boring Depth (ft. below ground surface)	% Cobbles	% Gravel	% Sand	% Silt	% Fines	% Clay	% No. 4 Sieve	% No. 200 Sieve
6.5-8	N/A	N/A	17.2	N/A	68.9	N/A	86.11	68.86
33.5-34	0.0	N/A	3.6	N/A	68.9	N/A	100.0	96.43
49-50	0.0	0.0	1.6	N/A	98.4	N/A	100.0	98.43

330.63(e)(5)(B) – Overview of Permeability, Atterberg Limits and Moisture Content Test Results

An analysis for soil moisture content (ASTM D2216), Atterberg Limits (ASTM D4318) and permeability tests (ASTM D5084) was conducted on samples obtained by Terracon during this investigation. Borings from the landfill side wall were tested on the horizontal axis and those from the bottom were tested on the vertical axis. A summary of findings for each test is presented in the tables below. Further information detailing these findings is available in the Terracon Geotechnical Data Report in **Appendix E-2**.

Table 3-13 - Summary of Boring FB-1 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)[2]	Coefficient of Permeability (cm/sec)
0-1.5	16.4	50-19-31	
2.5-4	12.6	N/A	
4-5	17.1	N/A	
5-6	17.7	N/A	N/A
6-7	17.8	52-20-32	N/A
7-8	19.5	N/A	N/A
8-9	20.6	N/A	N/A
9-10	23.2	N/A	N/A
13.5-15	11.6	N/A	N/A
18.5-20	19.5	N/A	N/A
23.5-25	6.0	N/A	N/A
28.5-30	3.6	N/A	N/A
33.5-34.5	3.9	N/A	N/A
38.5-40	19.6	N/A	N/A
43.5-45	16.1	N/A	N/A

Table 3-14 - Summary of Boring FB-2 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	13.8	N/A	N/A
2-3	14.4	54-21-33	N/A
3-4	12.8	N/A	N/A
4-5	14.7	N/A	N/A
5-6	19.0	N/A	N/A
6-7	18.4	N/A	N/A
7-8	18.7	61-23-38	N/A
8.5-10	18.9	N/A	N/A
13-15	17.5	N/A	N/A
18.5-20	25.3	54-22-32	N/A
23.5-25	17.5	N/A	N/A
28.5-30	16.3	N/A	N/A
33.5-35	15.4	N/A	N/A
38-40	18.6	62-17-45	$1.8E^{-09}$
43.5-45	18.0	N/A	N/A

[2] LL- Liquid Limit; PL – Plastic Limit; PI – Plasticity Index

Table 3-15 - Summary of Boring FB-3 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	14.6	N/A	N/A
2-3	11.8	N/A	N/A
3-4	12.5	40-18-22	N/A
4-5	13.4	N/A	N/A
5-6	12.5	46-18-28	N/A
6-7	16.2	N/A	N/A
7-8	16.2	N/A	N/A
8-9	15.1	N/A	N/A
9-10	14.0	N/A	N/A
13-15	10.1	N/A	N/A
18-20	7.4	33-16-17	N/A
23.5-25	10.2	N/A	N/A
28.5-30	9.5	N/A	N/A
33.5-34	3.9	N/A	N/A
37-39.5	34.4	54-19-35	N/A
43.5-45	18.6	N/A	N/A
49.5-50	14.9	N/A	N/A

Table 3-16 - Summary of Boring FB-4 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1	18.4	N/A	N/A
1-2	19.0	59-17-42	$2.5E^{-09}$
2-3	19.8	N/A	N/A
3-4	20.2	N/A	N/A
4-5	19.8	N/A	N/A
5-6	18.7	61-24-37	N/A
6.5-8	18.3	N/A	N/A
8.5-10	17.6	N/A	N/A
13.5-14	14.6	N/A	N/A
18.5-19.5	14.8	47-21-26	N/A
23.5-24.5	10.1	N/A	N/A
28.5-29.5	9.4	N/A	N/A
35-36	7.7	N/A	N/A

Table 3-17 - Summary of Boring FB-5 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	14.3	52-18-34	N/A
2.5-3.5	12.3	N/A	N/A
6.5-7.5	11.3	64-15-49	N/A
8.5-10	13.5	N/A	N/A
13.5-15	11.3	N/A	N/A
18.5-20	14.2	N/A	N/A
23.5-25	14.9	N/A	N/A
28.5-30	14.3	N/A	N/A
34-35	15.8	63-21-42	N/A

Table 3-18 - Summary of Boring FB-6 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	15.6	N/A	N/A
2-4	14.9	55-17-38	N/A
4-6	14.7	N/A	N/A
6-8	14.4	48-16-32	$4.3E^{-09}$
8.5-10	15.6	N/A	N/A
13.5-14.5	13.2	N/A	N/A
18.5-19.5	12.4	N/A	N/A
23.5-24.5	15.1	53-19-34	N/A
28.5-29.5	15.9	N/A	N/A
34.5-35	14.7	N/A	N/A

Table 3-19 - Summary of Boring FB-7 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	9.5	N/A	N/A
2.5-3.5	7.5	35-15-20	N/A
4.5-6	2.8	N/A	N/A
6.5-8	3.7	N/A	N/A
8.5-10	19.0	N/A	N/A
13.5-15	23.2	N/A	N/A

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
18-20	18.1	56-17-39	$3.0E^{-09}$
23.5-25	17.4	N/A	N/A
28.5-29.5	22.4	N/A	N/A
33.5-34.5	18.4	N/A	N/A
38.5-40	21.8	57-20-37	N/A
43.5-44.5	20.1	N/A	N/A
49.5-50	20.9	N/A	N/A

Table 3-20 - Summary of Boring FB-8 Soil Moisture Content, Atterberg Limits, and Permeability

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
0-1.5	8.4	N/A	N/A
2.5-4	8.6	N/A	N/A
4.5-6	15.4	49-19-30	N/A
6.5-8	13.2	N/A	N/A
8-9	21.8	62-23-39	N/A
9-10	16.6	N/A	N/A
13-15	21.4	58-22-36	N/A
18-20	15.3	N/A	N/A
23.5-25	17.7	N/A	N/A
28-30	17.3	N/A	N/A
33.5-34.5	14.0	43-17-26	N/A
43.5-44.5	12.3	N/A	N/A
49-50	13.9	N/A	N/A

330.63(e)(5)(C) – Overview of Encountered Groundwater

~~As noted in the Snowden, 1989 application~~During initial geotechnical investigations, groundwater was encountered by the exploratory borings in the alluvium terrace deposits. Water levels proved to be the equivalent of the static water level. An exception would be the few borings in which clay cuttings sealed off the water bearing zone. Generally, the static water level stabilized in the open bore holes within minutes of completion. As exploratory borings are small diameter excavations, and the thickness of the water bearing stratum was typically just a few feet, only low yield bailers could be used. In those borings in which bailing was attempted, the

Formatted: Not Highlight

removal of water, equivalent to a bore volume, reflected no change in the static water elevation. The elevation of the ground water shortly after completion, was thus established as the static water elevation.

In 1989, recorded water well datum, as available at the Texas Water Commission, indicated two domestic wells to have been completed within an Alluvial aquifer in the proximity of the project area. The two wells (see **Appendix E-2**) are not within 500 feet of the project area. It is probable that these wells could be completed in a Pleistocene deposit rather than the predominate Holocene deposits as encountered beneath this project. The geologic structure of the two deposits would normally indicate an interconnection of any saturated zones. The potential for recharge and/or discharge along Cibolo Creek, which generally separates the two age deposits, would make it difficult to verify the interconnection of saturated zones.

The perched ground water table, or Alluvial aquifer, though of significance to this proposed development, is not considered the primary use aquifer of the immediate area. The majority of the recorded water wells within a five mile radius of the project are producing from the Edwards aquifer. The Edwards aquifer should be in excess of approximately 500 feet beneath the site of this investigation. Seventy (70) feet of Navarro shale and an underlying 110 feet of Taylor shale is indicated by the log of well Kx 68-30-603. Equivalent shales should extend beneath this project and thus preclude any connection between the Edwards aquifer and the development of this project. The Navarro Shale was shown by the laboratory portion of this investigation to be relatively impermeable.

Groundwater was encountered during the supplemental field investigation in 2020 at borings FB-3 and FB-7 as noted in the Terracon Geotechnical Data Report in **Appendix E-3**. Groundwater level information is presented in the below table. A cross-section of the investigation area, including groundwater information is included with this report as **Appendix E-4**.

Table 3-21 – Groundwater Levels at Borings FB-3 and FB-7

Boring Number	Groundwater Level	Comment
FB-3	38 ft. below ground surface	Groundwater level remained static from initial detection to completion of drilling
FB-7	9 ft. below ground surface (initial) 12 ft. below ground surface (completion)	N/A

330.63(e)(5)(D) – Records of Groundwater Level Measurements in Wells

Five monitoring wells (MW) were installed outside the slurry wall, coupled with twin piezometer wells on the inside of the slurry wall on May 20, 1998. Due to the drought conditions at the time of installation, the wells were dry and could not be developed. Flooding in October of 1998 delayed monitoring further and badly damaged prior records at the landfill, as documented to the Texas Natural Resource Conservation Commission (TNRCC) on January 27, 1999.~~Five monitoring wells are in use at the Beck Landfill and are tested annually.~~ The well on Line D (MW-D) was replaced on February 29, 2000. The Groundwater Sampling and Analysis Plan (GWSAP) was approved by the TNRCC on July 12, 2000 as a Class I Permit Modification to the Site Operation Plan (SOP).

The initial sampling event was conducted on August 4, 2000. Subsequent monitoring occurred annually through 2022, though some historic records appear to be lost or destroyed. Available information is provided in Table 3-22 below which presents historic water-level measurements from past annual groundwater monitoring events.

Table 3-22 - Historic Groundwater Monitoring Data at the Beck Landfill

Year	MW-A Water Elevation (ft. above msl)	MW-C Water Elevation (ft. above msl)	MW-D Water Elevation (ft. above msl)	MW-F Water Elevation (ft. above msl)	MW-G Water Elevation (ft. above msl)
2020	680.71	675.55	671.90	667.22	672.19
2019	682.73	676.89	673.46	667.69	671.68

Year	MW-A Water Elevation (ft. above msl)	MW-C Water Elevation (ft. above msl)	MW-D Water Elevation (ft. above msl)	MW-F Water Elevation (ft. above msl)	MW-G Water Elevation (ft. above msl)
2018 (resample)	680.47	678.14	Not sampled	Not sampled	671.22
2018	679.36	675.17	671.12	667.37	670.74
2017	679.79	676.34	672.23	667.22	670.53
2016	681.32	680.03	677.10	672.68	670.15
2015	681.05	680.34	678.17	672.75	670.39
2014	679.94	675.96	672.72	668.62	338.95
2013	678.43	675.4	674.99	666.71	670.06
2012	679.22	678.11	674.99	668.04	670.06
2011	673.80	673.65	669.33	670.23	669.66
2010	Not Available	-	-	-	-
2009	Not Available	-	-	-	-
2008	Not Available	-	-	-	-
2007	Not Available	-	-	-	-
2006	Not Available	-	-	-	-
2005	Not Available	-	-	-	-
2004	Not Available	-	-	-	-
2003	Not Available	-	-	-	-
2002	Not Available	-	-	-	-
2001	680.61	676.65	674.05	670.52	673.59
2000	687.61	679.65	673.22	676.19	675.09

330.63(e)(5)(E) – Records of Groundwater Monitoring Data

Available ~~H~~historical annual groundwater monitoring data from 2005 to 2022 for the Beck Landfill at each monitoring well is presented in the table in Part III, Attachment F (Groundwater Characterization Report), Appendix F-1 (Historical Groundwater Data). ~~.~~

330.63(e)(5)(F) – Identification of Uppermost Aquifer

The uppermost aquifer at the Beck Landfill site may have been the Leona Aquifer which is comprised of gravel and sand with lenses of caliche and silt of the Pleistocene Series Leona Formation. The identification of the Leona as the uppermost aquifer at the site is based on review of region groundwater reports published by the Texas Water Development Board (TWDB), surface geology maps and monitoring well logs. However, due to the similarity between the Holocene alluvial terrace deposits and the Leona Formation and the intervening Cibolo Creek, it is likely

that the Holocene alluvial deposits contained perched water from infiltrated rainwater and early communication with the Cibolo Creek. The Beck Landfill as constructed has an impermeable slurry trench to prevent hydraulic connection with the Cibolo Creek and the Holocene alluvial deposits are removed.

The Leona Aquifer is not hydraulically connected to the deeper ~~Austin~~ Edwards Aquifer due to the presence of two aquitards creating hydraulic separation. ~~separating these two aquifers.~~ These aquitards consist of undivided Navarro Group and Marlbrook Marl and Pecan Gap Chalk strata. The Edwards Aquifer would likely be considered the uppermost aquifer beneath Beck Landfill in the absence of the Leona Aquifer.

A review of historical groundwater elevation measurements taken from the landfill monitoring wells show that groundwater in the uppermost aquifer typically flows from the northwest to the southeast toward Cibolo Creek. The site-specific hydraulic conductivity of the uppermost aquifer has not been measured; therefore, the rate of groundwater flow cannot be calculated at this time.

3.1.5 Groundwater Certification Process for Arid Exemption (§330.63(e)(6))

Not applicable - Beck is not seeking an arid exemption for the landfill, therefore this section does not apply.

FIGURES

APPENDIX E-1
ATTACHMENT 11 AND GEOLOGY (SNOWDEN, 1989)

APPROVED SUPPLEMENTAL BORING PLAN

APPENDIX E-2
ATTACHMENT 3-C WATER WELLS (SNOWDEN, 1989)

APPENDIX E-3
SUPPLEMENTAL BORING PLAN

APPENDIX E-4
CROSS-SECTIONS

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

Style Definition: TOC 3

PART III-ATTACHMENT F
GROUNDWATER CHARACTERIZATION REPORT

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022

Prepared by:

PROJECT NUMBER: 150051.05.01
PROJECT CONTACT: Julie Morelli
EMAIL: Julie.Morelli@powereng.com
PHONE: 210-951-6424

Revised January 2, 2023

TABLE OF CONTENTS

1. GROUNDWATER CERTIFICATION PROCESS FOR ARID EXEMPTION (§330.63(E)(6)) 1
2. GROUNDWATER SAMPLING AND ANALYSIS PLAN (§330.63(F)) 1
a. Applicability Statement (§330.401(f)) 1
b. Groundwater Monitoring System (§330.403) 2
c. Groundwater Monitoring at Type IV Landfills (§330.417) 3
d. Monitor Well Construction Specifications (30 TAC §330.421) 5

Commented [MJ1]: Please list tables and figures in the Table of Contents

Commented [MJ2]: Match Header and Footer format to the other sections in this NOD response (see Parts I and II)

Commented [MJ3]: Revise table numbers and section references throughout Attachment F to be consistent with document structure.

LIST OF APPENDICES

Appendix F-1 Monitor Well Installation Information and Historic Groundwater Data

Appendix F-2 Groundwater Sampling and Analysis Plan

1. Groundwater Certification Process for Arid Exemption (§330.63(e)(6))

Not applicable - Beck is not seeking an arid exemption for the landfill, therefore this section does not apply.

2. Groundwater Sampling and Analysis Plan (§330.63(f))

(f) Groundwater sampling and analysis plan. The groundwater sampling and analysis plan for landfills and if otherwise requested by the executive director for other MSW units must be prepared in accordance with Subchapter J of this chapter (relating to Groundwater Monitoring and Corrective Action).

Beck Landfill is a Type IV Landfill subject to the groundwater monitoring requirements promulgated in 30 TAC 330, Subchapter J, and more specifically those outlined in 30 TAC 330.417. The Facility has an approved Groundwater Sampling and Analysis Plan (GWSAP) (TCEQ Minor Modification approved 2013) in compliance with the monitoring requirements for Type IV Landfills in 30 TAC §330 Subchapter J. The full GWSAP is attached herein, for consistency with the application format.

a. Applicability Statement (§330.401(f))

(f) Once established at a solid waste management unit, groundwater monitoring must be conducted throughout the active life and any required post-closure care period of that solid waste management unit as specified in §330.463 of this title (relating to Post-Closure Care Requirements).

Beck Landfill has an existing groundwater monitoring system, installed in 1998 and 2000. Background monitoring was performed from August 2000 to August 2001. Annual detection monitoring has been performed each year since then. Beck Landfill will conduct groundwater monitoring throughout the active life and any required post-closure care period, as required by MSW Permit No. 1848A.

b. Groundwater Monitoring System (§330.403)

(a) A groundwater monitoring system must be installed that consists of a sufficient number of monitoring wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer as defined in §330.3 of this title (relating to Definitions)

An existing, TCEQ-approved groundwater monitoring system in in place and in use at the Facility (TCEQ Class I Permit Modification dated July 12, 2000). The System is comprised of five (5) monitoring wells installed on the outside of the flood control dike (impermeable barrier to prevent migration of contaminants from with the landfill) and installed at a depth to intersect the confining layer (the Navarro Formation) of the perched alluvial water table. The monitor wells are screened to intercept the saturated zone of the alluvium. Wells are provided with a protective, steel collar and stick up approximately 36" from the concrete pad. Each well is protected with a lockable, water-tight cap and enclosed within a lockable steel collar.

In addition, Beck Landfill installed five (5) piezometer wells in correlation with the five (5) monitor wells. The piezometer wells are installed between the landfill and the flood control dike (inside the landfill), at a depth to intersect the confining layer (the Navarro Formation), identical to its corresponding monitor well. These wells are similarly screened. No concrete pad was installed with the piezometer wells. Each well is flush-mounted and is protected with a lockable, water-tight cap. The well is protected by a flush mount iron collar with a bolted on lid.

All parts of the monitoring system shall be operated and maintained so they perform as designed. Table 3-1 below documents the relevant information regarding the monitor and piezometer wells approved for use at Beck Landfill.

Beck proposes to plug and abandon MW-D and install a replacement well along Line E (MW-E) in accordance with the design criteria established above. The current MW-D well location is situated in proximity to the proposed stormwater collection pond and may not be as representative of groundwater conditions due to potential influence from the proposed pond.

Table 3-1

Well ID No.	Installation Date	Well Pad Elevation (ft. above msl)	Well Depth Elevation (ft. above msl)	Total Depth (feet)	Monitoring Performed
MW-A	May 20, 1998	712.61	673.93	38.68	Annual Detection Monitoring; Background in 2000
712.61PZ-A	May 20, 1998	712.59	673.13	39.46	Informational only
MW-C	May 20, 1998	712.65	666.56	46.09	Annual Detection Monitoring
PZ-C	May 20, 1998	712.85	671.46	41.39	Informational only
MW-D (to be replaced by MW-E)	February 29, 2000	708.05	665.67	42.39	Annual Detection Monitoring
PZ-D (to be replaced by PZ-E)	~~February 29, 2000~~May 20, 1998	N/A		38.15	Informational only
MW-E	Proposed	TBD	TBD	TBD	To replace MW-D
PZ-E	Proposed	TBD	TBD	TBD	To replace PZ-D
MW-F	May 20, 1998	702.52	666.00	36.52	Annual Detection Monitoring
PZ-F	May 20, 1998	702.51	669.2	33.31	Informational only
MW-G	May 20, 1998	700.59	663.61	36.98	Annual Detection Monitoring
PZ-G	May 20, 1998	700.54	668.09	32.45	Informational only

Formatted: Highlight

Commented [MJ4]: Need the well install log for this replacement well.

c. Groundwater Monitoring at Type IV Landfills (§330.417)

(b) At the discretion of the executive director, the owner or operator of a Type IV landfill may be required to installed groundwater monitoring systems and to monitor on a regular basis the quality of groundwater at the point of compliance.

See Section 3.1.2 above.

(3) Groundwater sampling and analysis requirements shall be in accordance with §330.405(a)-(d) of this title (relating to Groundwater Sampling and Analysis Requirements).

The approved GWSAP conforms to the requirements set forth in 30 TAC 330.405(a)-(d).

(4) Each monitoring well or other sampling point shall be sampled and analyzed annually, or on some other schedule but not less frequently than annually as determined by the executive director, for the following constituents: chloride, iron, manganese, cadmium, zinc, total dissolved solids, specific conductance (field and laboratory measurements), pH (field and laboratory measurements), and non-purgeable organic commands.

The approved GWSAP identifies annual detection monitoring and includes required parameters as outlined in this rule.

(5) Not later than 60 days after each sampling event, the owner or operator shall determine whether the landfill has released contaminants to the uppermost aquifer. The owner or operator shall provide an annual detection monitoring report within 60 days after the facility's annual groundwater monitoring event that includes the following information determined since the previously submitted report:

(A) the results of all monitoring, testing, and analytical work obtained or prepared in accordance with the requirements of this permit, including a summary of background groundwater quality values, groundwater monitoring analyses, any statistical calculations, graphs, and drawings;

(B) the groundwater flow rate and direction in the uppermost aquifer. The groundwater flow rate and direction of groundwater flow shall be established using the data collected during the preceding calendar year's sampling events from the monitoring wells of the Detection Monitoring Program. The owner or operator shall also include in the report all documentation used to determine the groundwater flow rate and direction of groundwater flow;

(C) a contour map of piezometric water levels in the uppermost aquifer based at a minimum upon concurrent measurement in all monitoring wells. All data or documentation used to establish the contour map should be included in the report;
(D) recommendation for any changes; and
(E) any other items requested by the executive director.

Beck Landfill submits an Annual Groundwater Monitoring Event Report that conforms with the required elements above.

(6) The executive director may require additional sampling, analyses of additional constituents, installation of additional monitoring wells or other sampling points, and/or other hydrogeological investigations if the facility appears to be contaminating the uppermost aquifer.

No additional constituents are included in MSW Permit No. 1848.

d. Monitor Well Construction Specifications (30 TAC §330.421)

As noted in the original application (Snowden, 1989), monitor wells were installed for the purpose of sampling and testing groundwater adjacent to the landfill as a provision of quality assurance. The protection of the groundwater quality in the area of the landfill is a major concern of the landfill operator, the TDH, and the public. Monitor wells on this site were installed only by Jedi Drilling, a licensed Texas Water Well Driller. The wells were completed in accordance with Texas Water Commission regulations in place at the time of installation. The wells are used to monitor the quality of water found in the shallow, perched Alluvial system. Water associated with the Edwards Aquifer, some 500 feet beneath the site, is not to be monitored, as interconnection is not anticipated.

The gradient of the groundwater beneath the landfill site currently exists as depicted in Part III-E, Figure 3-5. The installation of the slurry wall creates a hydraulic barrier between the Landfill and the Cibolo Creek, effectively stopping the hydraulic connection inside the Landfill. The basic northeasterly flow pattern as currently indicated will be diverted by the slurry wall as said wall, serves to preclude infiltration of groundwater as well as exfiltration of any landfill leachate.

Groundwater will thus be directed around the slurry wall rather than beneath the site. The path or flow pattern of groundwater post slurry wall installation will predominately parallel Cibolo Creek.

Monitor well MW-A as depicted on Part II, Figure 2-4 is the primary upgradient well. Wells MW-C and MW-G are predominately upgradient but are situated so as to detect and aid in isolating any leachate, should such ever become apparent. Wells MW-D and MW-F are downgradient.

The monitor wells will be somewhat variable in depth corresponding to the existing strata variations depicted by the original "Geotechnical Investigation" (Snowden, 1989, See Part III, Attachment E-1) An approximate 20-foot depth plus the height of the dike, was considered as an average for the proposed wells, or an average of 40 feet. The static water table, or the first potable aquifer being the Alluvial aquifer comprised of the sand and gravel deposits overlying the shales beneath the site, is the zone to be monitored. No dynamic head characteristics are expected to prevail though static level variations will occur corresponding to the rather rapid recharge and/or discharge directly related to the adjacent Cibolo Creek. The rate of groundwater flow will likewise relate to the flow of Cibolo Creek and be corresponding variable.

Details of monitor well construction were provided by Snowden. These well construction details have been updated to more closely represent the wells installed at the Landfill, based on surface observations. The top of the wells were to be completed a minimum of 24 inches above the finish grade of the dike, which as specified, will require the dike to be above the (then) 100-year flood plain. A 4-ft square by 4-inch minimum thickness sloped concrete sealing block was cast around the monitor wells at the top of the dike. Other construction parameters were as per the Water Well Drillers Act, Chapter 319-Standards for Completion with the most stringent of these standards being applicable. Permanent well identification plates are installed on each stick-up on each well.

The monitor wells were located upon an extended section of the dike. Such location does not comply with the specifications of the Water Well Drillers Act in terms of horizontal separation. The location is however the only method by which the monitor wells could be maintained above the 100-year flood plain and allow accessibility for sample extraction. The required horizontal separation is further inappropriate and otherwise differed as said separation would require location in Cibolo Creek and/or beyond the boundaries of the landfill property.

The monitor wells have an extended screened or blank section of schedule 40-ft PVC extending below the saturated zone to a depth equivalent to that of the slurry wall key. Said extended screen-blank section of pipe is a minimal provision of storage, as it is possible that during certain periods of any given year a low yield characteristic could occur in the vicinity of some monitor wells. Provisions to assure sample freshness, with regards to the blank section, are addressed within Groundwater Sampling and Analysis Plan (GWSAP) (Attachment F-2 of this Report).

A background well, in excess of the five minimum monitor wells, and as within the upgradient vicinity from the proposed landfill, was evaluated through samples obtained with owners permission. Existing wells, as similarly completed within the Alluvial aquifer or as to be constructed on property other than the landfill property, within a reasonable distance from the landfill, are envisioned for these purposes. Background data was additionally generated through the use of samples recovered directly from Cibolo Creek, or in lieu of a background well if an appropriate well location cannot be obtained.

i. Monitoring Well and Piezometer Data Sheets

On May 20th, 1998, Jedi (TNRCC Driller License No. 50205-M) installed a series of five monitoring wells and five piezometers at the Beck Landfill under the supervision of Harley Weld. The TNRCC MSW-SE67 monitor well data sheets for each monitoring well and piezometer are attached as **Appendix F-1**. Included in the TNRCC data sheets is relevant information pertaining to the construction of monitoring well and piezometer on-site including elevations, depths, cross sections, and dimensions. Each monitoring well and piezometer was reported to have been dry following installation.

The locations of all existing and abandoned wells at the Beck Landfill are depicted in **Table 3-2** below. The on-site wells are utilized for groundwater quality monitoring in accordance with the existing MSW permit. No other active or historical wells within the Beck Landfill facility are depicted on the Texas Water Development Board (TWDB) Groundwater Data Viewer (TWDB, accessed September 6, 2022). Beck will replace MW-D and Piezometer D with a similar well installed along Line E to accommodate the installation of the proposed stormwater drainage pond.

Table 3-2 – Water Wells at the Beck Landfill

Well	Use	Latitude and Longitude
MW-A	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.548880°, -98.268411°
MW-C	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.544524°, -98.265643°
MW-D	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.543768°, -98.258393°
MW-F	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.547263°, -98.260227°
MW-G	Groundwater monitoring of perched aquifer outside of landfill dike-line.	29.551674°, -98.262166°
Piezometer A	Groundwater monitoring of leachate inside of the landfill dike-line	29.548868°, -98.268394°
Piezometer C	Groundwater monitoring of leachate inside of the landfill dike-line	29.544557°, -98.265645°
Piezometer D	Groundwater monitoring of leachate inside of the landfill dike-line	29.543796°, -98.258427°
Piezometer F	Groundwater monitoring of leachate inside of the landfill dike-line	29.547273°, -98.260264°
Piezometer G	Groundwater monitoring of leachate inside of the landfill dike-line	29.551662°, -98.262213°

APPENDIX F-1
MONITOR WELL INSTALLATION INFORMATION AND HISTORIC GROUNDWATER DATA

APPENDIX F-2
GROUNDWATER SAMPLING AND ANALYSIS PLAN

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

Commented [MJ1]: Match header and footers with Parts I and II documents; Check sections, add tables and figures to TOC

Groundwater Sampling and Analysis Plan

(TAC Title 30 Rule §330.63(f))

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022

Prepared by:

PROJECT NUMBER: 150051.05.01
PROJECT CONTACT: Julie Morelli
EMAIL: Julie.Morelli@powereng.com
PHONE: 210-951-6424

Formatted: Space After: 0 pt

Groundwater Sampling and Analysis Plan

OVERVIEW

The following Groundwater Sampling and Analysis Plan (GWSAP) is prepared for the Beck Landfill, Nido, LTD. Type IV Landfill (Beck Landfill), MSW Permit No. 1848A, located in Schertz,, Guadalupe County, Texas in accordance with the regulations in 30 TAC §330.417 (relating to Groundwater Monitoring at Type IV Landfills).

This GWSAP is included as Attachment F, Appendix F-2 of Part III of the Beck Landfill permit application submitted in September 2022. It is intended to provide a consistent sampling and analysis procedure and is designed to ensure that ground-water data accurately represents actual groundwater quality and can be used to reliably evaluate the groundwater conditions at this site.

Table of Contents

PROCEDURES: 4
I Timing and Order of Purging or Sampling 4
II Well Inspection 4
III Water-Level Measurements 5
IV Well Purging 5
V Sample Collection and Preservation 6
V.1 Sample Collection and Preparation 6
V.2 Field Measurements 7
V.3 Sample Containers 7
V.4 Sample Containers, Preservation and Holding Times 8
V.5 QC Samples (Trip Blanks, Field Blanks, Replicates) 9
V.6 Sample Storage and Transport 9
V.7 Chain-of-Custody Documentation 9
V.8 Documentation of Sampling 10
VI Sample Filtration 10
VII Analytical Parameters 11
VIII Analytical Methods 11
IX Background Samples – Not Revised during January 2008 Updates 12
X Detection Monitoring 13
XI Corrective Action 14
XII Quality Assurance and Quality Control (QA/QC) 14
XIII Reporting and Submittals 15
XIV Safety Plan 16
Attachment 1 – Field Log Data Sheets for Purging and for Sampling
Attachment 2 – Chain of Custody Form for San Antonio Testing Lab
Attachment 3 – San Antonio Testing LabLaboratories, Ltd.
Quality Assurance Plan (QAP) Standard
Operating Procedures (SOPs)

Beck Landfill, Nido, LTD.
Type IV Landfill
Schertz, Guadalupe County, Texas
MSW Permit No. 1848
Groundwater Sampling and Analysis Plan (GWSAP)

Beck Landfill, Nido, LTD. has developed the following Groundwater Sampling and Analysis Plan (GWSAP) for the Guadalupe County Landfill in Schertz, MSW Permit No. 1848, in accordance with the regulations in 30 TAC §330.417 (relating to Groundwater Monitoring at Type IV Landfills). This GWSAP is submitted as a modification to the Site Operating Plan and is intended to provide a consistent sampling and analysis procedure. It is designed to ensure that ground-water data accurately represents actual groundwater quality and can be used to reliably evaluate the groundwater conditions at this site.

PROCEDURES:

I Timing and Order of Purging or Sampling

The elapsed time between well purging and sample collection should be as short as possible to avoid temporal variations in water levels and water chemistry. Sampling should be done preferably within 24 hours of purging. If a well is very slow to recharge, it should be sampled as soon as practicable; a maximum of seven days may be acceptable with prior TCEQ approval.

The wells will be sampled from the up-gradient well to the down-gradient well, sequentially beginning with the well on Line A and proceeding as follows: Line A to Line C to Line D to Line F to Line G. See gradient map attached directly behind this page.

If contamination is known to be present, sampling should proceed from the monitoring well least or not contaminated to the well with the most contamination.

II Well Inspection

Inspect the integrity of the monitoring well prior to commencement of purging and/or sampling the well. The inspection of the well should be documented on a Field Log Data Sheet.

- Check the casing and concrete pad for cracks or fissures. Be sure that vandalism, animals, heavy equipment, etc have not damaged the well.
- Check that the cap is locked.
- Check that the well plug cap is tightened to prevent surface runoff infiltration into the well.
- Note the proximity of the well to potential sources of contamination on a Field Log Data Sheet.
- If insects are found in or on the well casing, do NOT use organic sprays or other potential contaminants to remove them.
- Similarly, organic lubricants should not be used on well components such as locks.

III *Water-Level Measurements*

Prior to purging or sampling of a well, measure the depth to water to determine water level and to be sure that enough water is present for sampling. Follow these steps for proper measurements.

- Decontaminate the measurement probe prior to use in each well by washing with a phosphate-free soap and rinsing with reagent grade water, obtained from the laboratory, or commercially distilled water.
- Calibrate measurement probes regularly to determine the stretch of suspended measuring tapes, wires, or cables.
- Measure from the top of the well casing, identified on the Monitor Well Data Sheets, for each well. Record the depth to water to the nearest hundredth of a foot.
- Calculate the elevation of the water level with respect to mean sea level (msl) and record it to the nearest hundredth of a foot.

IV *Well Purging*

- Wells should be purged of stagnant water with a bailer (or a pump) 24 hours prior to sampling to obtain a chemically representative ground water sample from each well.
- To assure comparability of the ground-water samples collected from the site, the same type of purging equipment should generally be used in each of the site wells.
- Each well will be purged with a disposable bailer or using a submersible pump and disposable tubing, so that the well does not become contaminated during sampling.
- Bailers should be bottom-emptying devices, so that the bailer can be emptied slowly, with minimum aeration.
- Care should be taken during purging to avoid introducing contaminants to the water in the well. Use disposable, plastic or vinyl gloves, changed between each well, to avoid cross-contamination. Latex gloves can cause contamination.
- Purging should be performed in such a way as to minimize the stirring of sediments with the waters in the well. Lower the bailer (or pump) gently. Do NOT drop the bailer (or pump) to the bottom of the screen in the well. Pull the bailer (or pump) to the surface slowly. (If a pump is used, pump intakes should not be set too close to the bottom of the well.)
- If possible, purge at least three times the total volume of water determined to be in the well casing from the measurements made in Section II.

Example: Volume = pi * r2 * h

Where -
pi = 3.14159265
r = radius of the casing
h = height of the water column in the well

V = pi * (.17')2 * (4') = .36 cu. ft.

Conversion to gallons (7.48052 gallons per cubic foot)
0.36 cu. ft * 7.48052 = 2.7 gallons Volume *
3 = 8.1 gallons

Note: The casing volume is the amount of water in the casing itself prior to purging and does not include the volume of water in the filter pack.

These wells recharge very slowly. If insufficient water is available to be removed from the well, purging to dryness is sufficient to remove stagnant water.

Allow the well to recover enough to allow collection of samples. Where possible, the water level should be allowed to recover to within 90% of the water level established prior to purging.

Record the following data collected on a Field Log Data Sheet (See Attachment 1):

- The initial depth to water (DTW),
- measured well depth (total depth (TD)),
- height of the water column,
- well purging time,
- volume of water purged from the well,
- purging discharge rate, and
- information from the well inspection.

Purged water should be containerized and ~~may be returned to the landfill or~~ disposed of through the local POTW, with written permission. ~~Purged water should be placed inside the landfill perimeter, such that it will not commingle with or discharge via surface runoff.~~

V Sample Collection and Preservation

Sample collection, preservation and shipment to the laboratory are important steps in the sampling process. Physical or chemical changes occur in ground-water samples no matter how carefully sampling is done. Inappropriate sampling devices, collection procedures, preservatives and temperature controls, or inadequate shipment can damage sample quality, giving inaccurate results.

V.1 Sample Collection and Preparation

The need to minimize turbulence and aeration of the sample can not be overemphasized.

- Fill sample containers directly from the bailer (or pump tubing) when possible. Transfer containers are not recommended for sample collection because of the likelihood of cross-contamination.

- Do not reuse soiled sample containers, bailers and bailer rope, disposable tubing, or plastic (or vinyl) gloves.
- Where possible, keep clean equipment off the ground to prevent contamination once the equipment is cleaned.
- Handle water removed during sampling and not saved in the same way as purged water.
- Do not allow the sampling device to touch the sampling container, but hold the two as close as possible to reduce aeration.
- Check the area around the sampling point for possible sources of air contamination.

V.2 Field Measurements

- The equipment used for field measurements should be calibrated at least daily during sampling.
- Slowly pour an unfiltered portion into a clean container for field measurement of temperature, specific conductance, and pH.
- Measure and record the temperature immediately.
- Measure and record the specific conductance of the sample to avoid any effect on the sample from salts from the pH probe.
- Measure and record the pH.
- Record the color, odor, foaming, presence of more than one phase of liquid, and turbidity of the sample.

V.3 Sample Containers

The volume of samples and types of sample containers needed are described in Table 1 below. Volumes and containers have been selected in accordance with methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (United States Environmental Protection Agency (EPA) Publication Number SW-846). To avoid confusion, the number of containers collected from each well will be minimized.

Label all sample containers with indelible ink for identification purposes. Alternatively, cover the sample label with clear packing tape and place the sample container inside a ziplock bag before placing on ice. The label information should include:

- sample number,
- well number,
- site identification,
- analysis to be performed,
- preservatives used,
- date and time of sample collection, and
- name of sampler.

Fill the sample containers in the following order:

1) Non-Purgeable Organics (NPOC)
2) Metals
3) Other Inorganic Parameters

Fill replicate sample containers for NPOC from a single bailer to improve homogeneity in the samples.

V.4 Sample Containers, Preservation and Holding Times

Holding times and sample volumes required for each analysis have been reviewed with the laboratory. Sample preservation is intended to 1) retard biological action, 2) retard hydrolysis, and 3) reduce sorption effects. Preservation methods are generally limited to pH control, chemical addition, refrigeration, and protection from light. Specific preservation methods presented in Table 1, below, are in accordance with the EPA requirements of SW-846, "Test Methods for Evaluating Solid Waste", 3rd Edition as revised and updated or Standard Methods for the Examination of Water and Wastewater, 21st Edition as revised and updated.

Table 1

Parameter	Sample Container	Preservative	Replicates	Holding Time
pH	1 Liter Glass Bottle	Ice	No	Analyze Immediately
Specific Conductance	1 Liter Plastic Bottle	Ice	No	28 days
Non-Purgeable Organics (TOC)	100 mL Amber VOA	Ice, HCL or H2SO4	Three	2 hours (28 days if acidified)
Total Dissolved Solids	1 Liter Plastic Bottle	Ice	No	7 days
Chloride	1 Liter Plastic Bottle	Ice	No	28 Days
Iron (dissolved)	1 Liter Plastic Bottle	Ice, (HNO3 if filtered)	No	6 Months
Manganese (dissolved)	1 Liter Plastic Bottle	Ice, (HNO3 if filtered)	No	6 Months
Cadmium (dissolved)	1 Liter Plastic Bottle	Ice, (HNO3 if filtered)	No	6 Months
Zinc (dissolved)	1 Liter Plastic Bottle	Ice, (HNO3 if filtered)	No	6 Months

Note: See Table 4 at the end of this report for Background Parameters

V.5 QC Samples (Trip Blanks, Field Blanks, Replicates)

- One field blank will be used during each sampling event to identify possible sources of air pollutant contamination originating at the onsite ready mix plant.
- Three Replicate samples will be collected during each sampling event for analysis of Non-Purgeable Organic Compounds.
- One sample duplicate will be collected for analysis of Volatile Organic Compounds during Background Sampling.

V.6 Sample Storage and Transport

- All samples should be kept cold, ideally at 4°C, and transported to the laboratory within 2 days of sampling.
- Samples should be kept in re-sealable bags, then in an ice chest and packed with sufficient ice or re-freezeable materials to keep then as near 4°C as possible. DON'T USE DRY ICE TO CHILL THE SAMPLES BECAUSE THE SAMPLES WILL FREEZE AND THE CONTAINERS
- WILL BREAK.
- If the samples are shipped, they and the insulated container should first be chilled with ice. Pour off the ice and water, and keep cold during shipment with frozen packages of re-freezeable materials such as "blue ice."
- The insulated container needs to be packed inside with foam, newspaper, or an absorbent material such as vermiculite to prevent or minimize the likelihood of container breakage, then thoroughly sealed with cloth tape or reinforced shipping tape.
- Inexpensive foam chests are NOT suitable for shipping.
- Under NO circumstances, should water, ice, or dry ice be used for samples shipped via public transportation (i.e. the bus).

V.7 Chain-of-Custody Documentation

- A suitable chain-of-custody (COC) document must accompany the samples at every step from field to laboratory and must be signed by each party handling the samples, from sampler through transporter to the laboratory, to document the possession of the samples at all times. Proper COC procedures are essential to ensure sample integrity and to provide legally and technically defensible data.
- The person collecting the sample starts the COC procedure.
- Individuals relinquishing and receiving the samples sign, date, and note the time of the transfer on the COC form (see attachment 2).
- Packages sent by mail should be certified with return receipt requested to document shipment.
- For packages sent by common carrier, a copy of the bill of lading will suffice.

- Copies of the return receipt or bill of lading should be attached to the COC document.
- The COC document must accompany the sample during transport and shipping, and should be protected from moisture using sealable plastic bags.

V.8 Documentation of Sampling

- Information related to a sampling event should be recorded in a bound, permanent field log book or on Field Log Data Sheets.
- All entries should be legible and made in indelible ink.
- Entry errors should be crossed out with a single line, dated, and initialed by the person making corrections.
- Record sufficient information so that the sampling situation can be reconstructed without relying on the sampler's memory.
- Location, date, time, weather conditions, name and identity of sampling personnel, all field measurements, including numerical values and units, comments about the integrity of the well, etc., should be recorded.
- These records may be the only acceptable record for legal purposes. Protect it and keep it in a safe place.

VI Sample Filtration

As stated in §330.405(c), samples shall not be field filtered prior to laboratory analysis. Laboratory filtering of samples for metals analysis is permitted if necessary to protect analytical equipment. Because of chemical or physical changes that may occur during shipping or transport, the interpretation of "total" metals is questionable if the samples are filtered in the laboratory. ~~It is the Commission's opinion that d~~Dissolved metals are better indicators than "total" metals, and owners and operators are encouraged to analyze samples for both "total" and dissolved metals, especially for sites that have large amounts of suspended sediments in the samples. If dissolved metals are to be analyzed, the samples should be properly filtered in the field. If field filtering is not practical, the samples should be filtered in the lab as soon as possible. Samples to be analyzed for inorganic parameters other than metals may also be filtered for the sake of consistency. A note indicating whether or not the samples were filtered and the place where they were filtered must accompany the results of the ground-water analyses.

- The ~~dissolved~~ metals (Fe, Mn, Cd, and Zn) to be analyzed at this site will be filtered in the laboratory.
- When samples are to be filtered, acid preservatives should be added after filtration to avoid breaking down clay molecules or placing adsorbed ions into solution, which could result in the generation of artificially high concentrations of metals.
- Neither field nor lab filtering is permitted for samples that are to be analyzed for NPOC. Many organic compounds are attached to solid particles, and filtering would remove them, yielding false, negative results.

- A note indicating whether or not the samples were filtered and the place where they were filtered must accompany the results of ground-water analyses.

VII *Analytical Parameters*

Ground-water sampling and analysis requirements shall be in accordance with §330.417 of this title (relating to Ground-Water Monitoring at Type IV Landfills).

The following constituents will be tested for: chloride, iron (~~dissolved~~total), manganese (~~dissolved~~total), cadmium (~~dissolved~~total), zinc (~~dissolved~~total), total dissolved solids, specific conductance (field and laboratory measurements), pH (field and laboratory measurements), and non-purgeable organic compounds (analysis of three replicate samples).

Not later than 60 days after each sampling event, the owner or operator shall submit to the Executive Director for review and approval a report containing the results of the analyses. If the facility is found to have contaminated or be contaminating the shallow water-bearing zones, the Executive Director may order corrective action appropriate to protect human health and the environment up to and including that in §§330.411, 330.412, and 333.415 of this title (relating to Assessment of Corrective Measures; Selection of Remedy; and Implementation of Corrective Action Program). See Section XI of this report for a discussion of Corrective Action.

VIII *Analytical Methods*

This ground-water monitoring program will incorporate appropriate analytical methods that accurately measure monitoring parameters in ground-water samples.
Among acceptable analytical methods are those in Standard Methods for the Examination of Water and Wastewater, 21st Edition, or those listed in SW-846.

- EPA Method 8270 may be used to analyze samples for Non-Purgeable Organic Compounds
- Most heavy metals can be analyzed by inductively coupled plasma-atomic emission spectrometry (ICP).
- Other metals will be analyzed using anion chromatography.
- Attachment 3 contains the Laboratory Standard Operating Procedures for methods employed.

See Table 2 for the methods and reporting limits (RL).

Parameter	Method	RL (mg/L)
Chloride	Method E300	1
iron (total~~dissolved~~)	Method E200.7	0.03
manganese (~~dissolved~~total)	Method E200.7	0.005
Cadmium (~~dissolved~~total)	Method E200.7	0.0023~~3~~
Zinc (~~dissolved~~total)	Method E200.7	0.0012~~2~~
total dissolved solids	Method E160.1	10
specific conductance	Method E120.1	1 umhos/cm
pH	Method E150.1	1
non-purgeable organic compounds	Method E415.1	0.5

IX *Background Samples – Not Revised during January 2008 Updates*

Formatted: Highlight

A minimum of four background samples, one per calendar quarter will be taken, for one year. If possible, 45 days shall exist between sampling events. The following table lists the background parameters that will be analyzed for during this first year.

Table 3: Background Sampling Parameters

Parameter	Total or Dissolved	Method	MDL mg/L	RL mg/L
Cobalt	Total	219.1	0.04	0.10
Arsenic	Total	206.2	0.01	0.02
Mercury	Total	245.1	*	0.0005
Barium	Total	208.1	*	1.0
Silver	Total	272.1	0.02	0.10
Chromium	Total	218.1	0.05	0.10
Zinc	Total	289.1	0.05	0.10
Lead	Total	239.2	0.004	0.015
Cadmium	Total	213.2	0.001	0.005
Selenium	Total	270.2	0.01	0.02
Copper	Total	220.1	*	0.10
Manganese	Total~~Dissolved~~	243.1	0.02	0.05
Iron	Total~~Dissolved~~	236.1	0.14	0.3
Alkalinity	N/A	310.1	NA	5
Carbonate	N/A	310.1	NA	5
Hardness	N/A	Calculation	NA	10
Potassium	N/A	258.1	*	1.0
Phenophthalein alkalinity	N/A	310.1	NA	5
Bicarbonate	N/A	310.1	NA	5

Table 3: Background Sampling Parameters				
Parameter	**Total or Dissolved**	**Method**	**MDL mg/L**	**RL mg/L**
anion-cation ration	N/A	Calc.	NA	NA
Calcium	N/A	215.1	*	1.0
Magnesium	N/A	242.1	0.24	1.0
Sulfate	N/A	375.4	0.84	5.0
total dissolved solids	N/A	160.1	NA	10
Chloride	N/A	4500-Cl- B	5.4	15
Sodium	N/A	273.1	2.3	5.0
Fluoride	N/A	340.2	0.02	0.10
pH (field & lab)	N/A	Meter	NA	1.0 S.U.
Specific Conductance (field & lab)	N/A	Meter	NA	10umhos /cm
nitrate as nitrogen or ammonia as nitrogen	N/A	353.3	0.02	0.10
total organic carbon (3 replicates)	N/A	5310 C	See LSOP	See LSOP
VOCs	N/A	Best Available	**	**

*Current MDL not available.
**See Table 5: VOC Breakdown and Reporting Limits

X *Detection Monitoring*

Twelve months after the completion of the last quarterly background sampling event, annual monitoring will begin. Analysis will be in accordance with the requirements of 30 TAC §330.417. The monitoring parameters are discussed in Section VII.

The goal of detection monitoring is finding specific constituents that may be leaking from the site. If a breach is suspected, leachate may be analyzed for the detection monitoring parameters. Leachate analysis data can be helpful in supporting a reduction of the number of parameters monitored from the monitoring wells and may be crucial in showing that an anomalous reading was probably not from the landfill.

XI *Corrective Action*

The Executive Director may require additional sampling, analyses of additional constituents, installation of additional monitoring wells or other sampling points, and/or other hydro-geological investigations if the facility appears to be contaminating the shallow water-bearing zone(s).

If the facility is found to have contaminated or be contaminating the shallow water-bearing zone(s), the Executive Director may order corrective action appropriate to protect human health and the environment up to and including that in §§§§330.411, 330.412, and 333.415 of this title (relating to Assessment of Corrective Measures; Selection of Remedy; and Implementation of Corrective Action Program).

XII *Quality Assurance and Quality Control (QA/QC)*

All analytical data submitted under the requirements of this permit will be examined by the owner and/or operator to ensure that the data quality objectives are considered and met prior to submittal for the commission to review. The owner or operator will determine if the results representing the sample are accurate and complete. The quality control results, supporting data, and data review by the laboratory must be included when the owner/operator reviews the data. Any potential impacts will be reported such as the bias on the quality of the data, footnotes in the report, and anything of concern that was identified in the laboratory case narrative.

The owner or operator will ensure that the laboratory documents and reports all problems observed anomalies associated with the analysis. If analysis of the data indicates that the data fails to meet the quality control goals for the laboratory's analytical data analysis program, the owner or operator will determine if the data is usable. If the owner and/or operator determines the analytical data may be utilized, any and 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) report for all problems and anomalies observed must be submitted by the owner and/or operator. The LCN will report the following information:

1. The exact number of samples, testing parameters and sample matrix.
2. The name of the laboratory involved in the analysis. If more than one laboratory is used, all laboratories shall be identified in the case narrative.
3. The test objectives regarding samples.
4. Explanation of each failed precision and accuracy measurement determined to be outside of the laboratory and/or method control limits.
5. Explanation if the effect of the failed precision and accuracy measurements on the results induces a positive or negative bias.

6. Identification and explanation of problems associated with the sample results, along with the limitations these problems have on data usability.
7. A statement on the estimated uncertainty of analytical results of the samples when appropriate and/or when requested.
8. A statement of compliance and/or non-compliance with the requirements and specifications. Exceedance of holding times and identification of matrix interferences must be identified. Dilutions shall 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.
9. Identification of any and all applicable quality assurance and quality control samples that will require special attention by the reviewer.
10. A statement on the quality control of the analytical method of the permit and the analytical recoveries information shall be provided when appropriate and/or when requested.

The San Antonio Testing LabLaboratory Quality Assurance Plan (QAP) and Standard Operating Procedures (SOPs) are included as Attachment 3 to this GWSAP.

XIII *Reporting and Submittals*

The results of the analyses of ground-water samples collected during detection monitoring will be submitted to the Commission that includes all information required by §330.417(b)(5)(A)-(E). Not later than 60 days after each sampling event, Beck Landfill shall determine whether the landfill has released contaminants to the uppermost aquifer. . Triplicate copies of the results are to be submitted.

In addition to the LCN, the following information must be submitted for all analytical data:

1. A table identifying the field sample name with the sample identification in the laboratory report.
2. Chain of custody.
3. An analytical report that documents the results and methods for each sample and analyte to be included for every analytical testing event. These test reports must document the reporting limit/method detection limit the laboratory used.
4. A release statement must be submitted from the laboratory. This statement must state, "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, 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."
5. A laboratory checklist. For every response of "No, NA, or NR" that is reported on the checklist, the permittee will ensure the laboratory provides a detailed description of the "exception report" in the summary of the LCN. The permittee will

require that the laboratory use the checklist and do an equivalent of an EPA level 3 review regarding quality control analysis.

The submittal, including a cover letter, will be in triplicate (one original and two copies). The original is to be filed in TCEQ Central Records in Austin, one copy is sent to the appropriate Regional office, and one copy is used as a work copy by the Commission staff.

XIV *Safety Plan*

Beck Readymix Concrete Company, Inc. and/or all of its subcontractors performing functions specific to activities associated with and identified in the GWSAP will establish, implement, and maintain appropriate health and safety plans.

- When sampling at the site, avoid the introduction of contaminants into the body by ingestion, absorption, or respiration.
- Smoking, chewing, drinking, and eating are all prohibited at a waste site.
- Monitor-well water should not be allowed to come in contact with the eyes, mouth, or skin.
- Special care is necessary when handling sample containers, some cleaning solutions, and sample preservatives.
- Combination of reagents may result in a violent reaction.
- Read all warning labels carefully.
- Walk carefully and be aware of steep slopes, unstable ground, poison ivy, fire ant mounds, debris piles, poisonous snakes and spiders, stinging insects, ticks, and mosquitoes.
- Wear proper garments such as boots, hats, gloves, and safety glasses, to protect from exposure.
- Watch out for heavy equipment moving around the site.
- Bring a partner who can help with sampling and transport and will be ready to render aid to the second person or go for help if it becomes necessary.

Table 4: Background Sampling				
Parameter	Sample Container	Preservative	Replicates	Holding Time
Cobalt	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Arsenic	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Mercury	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	28 Days
Barium	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Silver	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Chromium	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Zinc	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Lead	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Cadmium	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Selenium	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Copper	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Manganese	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Iron	1 Liter Plastic Bottle	Ice (HNO3 if filtered)	No	6 Months
Alkalinity	1 Liter Plastic Bottle	Ice	No	200 mL
Carbonate	1 Liter Plastic Bottle	Ice	No	6 Months
Hardness	1 Liter Plastic Bottle	Ice	No	28 Days
Potassium	1 Liter Plastic Bottle	Ice	No	28 Days
Phenophthtalein alkalinity	1 Liter Plastic Bottle	Ice	No	28 Days
Bicarbonate	1 Liter Plastic Bottle	Ice	No	28 Days

Table 4: Background Sampling

Parameter	Sample Container	Preservative	Replicates	Holding Time
anion-cation ration	1 Liter Plastic Bottle	Ice	No	28 Days
Calcium	1 Liter Plastic Bottle	Ice	No	28 Days
Magnesium	1 Liter Plastic Bottle	Ice	No	28 Days
Sulfate	1 Liter Plastic Bottle	Ice	No	28 Days
total dissolved solids	1 Liter Plastic Bottle	Ice	No	7 Days
Chloride	1 Liter Plastic Bottle	Ice	No	28 Days
Sodium	1 Liter Plastic Bottle	Ice	No	28 Days
Fluoride	1 Liter Plastic Bottle	Ice	No	28 Days
pH (field & lab)	25 mL Plastic Bottle	None	No	Immediately
Specific Conductance (field & lab)	100 mL Plastic Bottle	None	No	Immediately
nitrate as nitrogen or ammonia as nitrogen	100 mL Plastic Bottle	Ice	No	48 Hours
total organic carbon (3 replicates)	100 mL Amber Glass	Ice, (HCl, if filtered)	One	48 Hours (28 Days if acidified)
VOCs	40 mL glass, Teflon lined septa	Ice, (HCl, if filtered)	Two	48 Hours (28 Days if acidified)

Formatted Table

Table 5: VOCs and Reporting L imits

Analysis:	Reporting Limit ug/L
1,1,1,2 Tetrachloroethane	5
1,1 ,1-Trichloroethane	5
1,1 ,2,2-Tetrachloroethane	5
1,1 ,2-Trichloroethane	5
1 ,1-Dichloroethane	5
1 ,1-Dichloroethene	5
1,2 Dichloropropane	5
1 ,2,3-Trichloropropane	5
1 ,2-Dibromo-3-Chloropropane	2*
1 ,2-Dibromoethane	2*
1 ,2-Dichlorobenzene	5
1 ,2-Dichloroethane	5
1 ,4-Dichlorobenzene	5
2-Butanone (MEK)	10
2-hexanone	10
4-Methyl-2pentanone	10
Acetone	10
Acrylonitrile	30
Benzene	5
Bromochloromethane	5
Bromodichloromethane	5
Bromoform	5
Bromomethane	10
Carbon Disulfide	5
Carbon tetrachloride	5
Chlorobenzene	5
Chlorodibromomethane	5
Chloroethane (Ethyl Chloride)	10
Chloroform	5
Chloromethane	10
cis-1 ,2-Dichloroethene	5
cis-1 ,3-Dichloropropene	5
Dibromomethane	5
Dichloromethane	5
Ethylbenzene	5
Iodomethane	5
Styrene	5

Formatted: Indent: Left: 0"

Table 5: VOCs and Reporting Limits

Analysis:	Reporting Limit ug/L
Tetrachloroethene	5
Toluene	5
trans-1 ,2-Dichloroethene	5
trans-1 ,3-Dichloropropene	5
trans-1 ,4-Dichloro-2-Butene	10
Trichloroethene	5
Trichlorofluoromethane	5
Vinyl Acetate	5
Vinyl Chloride	2*
Xylene	10*

* Lower reporting limits are available using a purge volume of 25mL (Cost of analysis will increase) J-Flags (Data Flag) are also possible to indicate the compound is present but below reporting limit.

Beck Landfill, Nido, LTD.
Type IV Landfill
Schertz, Guadalupe County, Texas
MSW Permit No. 1848
Groundwater Sampling and Analysis Plan (GWSAP)

Attachment 1 – Purging and Sampling Worksheets

Attachment 2 – Chain of Custody Form

Attachment 3 – QAPP and SOP

Beck Landfill, Nido, LTD.
Type IV Landfill
Schertz, Guadalupe County, Texas
MSW Permit No. 1848
Groundwater Sampling and Analysis Plan (GWSAP)

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT G
LANDFILL GAS MANAGEMENT PLAN

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848A

OWNER: Nido, LTD (CN603075011)

OPERATOR: Beck Landfill (RN102310968)

CITY, COUNTY: Schertz, Guadalupe County

Major Amendment: September 2022
Revision2-January 2023
Revision 2-March 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
3711 S MoPac Expressway
Building 1 Suite 550,
Austin, Texas 78746
(512) 329-0006

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER

3-17-2023

Contents

30 TAC§§330.159, 330.125, 330.371

1.0 Introduction 1
2.0 Landfill Gas Management Plan 3
Introduction 3
Facility Boundary Monitoring Network 3
Gas Monitoring Probe Installation 3
3.0 Landfill Gas Monitoring Procedures 8
4.0 Landfill Gas Monitoring Exceedance Record Keeping and Reporting 9

List of Figures

Figure G-1 - Landfill Aerial and Grid
Figure G-2 - Proposed Landfill Gas Well Design
Figure G-3 – Gas Vent Plan

List of Appendices

APPENDIX G-A
Gas Probe Installation Report

APPENDIX G-B
Typical Gas Monitoring Data Form

1.0 Introduction

30 TAC§§330.159, 330.125, 330.371

The site manager is responsible for executing the Landfill Gas Management Plan in order to ensure that the concentration of methane gas generated by the facility does not exceed 1.25% by volume in facility structures (excluding gas control or recovery system components, if any), and the concentration of methane gas does not exceed 5% by volume in monitoring points, probes, subsurface soils, or other matrices at the facility boundary defined by the legal description in the permit.

Type and Frequency of Monitoring

Beck LF determined the type and frequency of monitoring based upon the factors described herein.

Soil Conditions: Within the LF perimeter flood control dike and along Lines D, E, F, G, and the northeastern side of A, the dominant soil type is mapped as Sunev loam, 0 to 1 percent slopes. This well drained soil may be up to 72 inches deep, comprised of up to 70% calcium carbonate, and is defined as Hydrologic Soil Group B. Along the northwestern side of Line A, the dominant soils type is the Barbarosa silty clay (0 to 1 percent slopes). This well drained soil may be up to 72 inches deep, comprised of clayey alluvium, and is defined as Hydrologic Soil Group C. Along Lines B and C, the dominant soil type is the Bosque and Seguin soils, frequently flooded. This well drained soil is typical of floodplains and may be up to 62 inches deep, comprised of up to 20% calcium carbonate, and defined as Hydrologic Soil Group B. These soils are not hydric.

Hydraulic and Hydrologic Conditions: The Landfill is constructed within an oxbow of the Cibolo Creek. The floor of the landfill is keyed into the Taylor-Navarro Shale, a clay formation that acts as a natural, impermeable liner. The landfill is enclosed by a slurry trench within a compacted clay embankment. The embankment and slurry trench were designed to isolate the landfill from communication with shallow, perched groundwater associated with the surrounding Cibolo Creek.

Location of Facility Structures and Property Boundaries: There are only three, permanent, enclosed structures within the facility boundary: the readymix plant office located approximately

885 feet from the toe of the embankment; the scalehouse located approximately 610 feet from the toe of the embankment, and an uninhabited house located approximately 1,030 feet from the perimeter embankment. These structures are shown on Figure D1-1 in Attachment D. All other structures at the facility are temporary. Monitoring of these enclosed structures is not proposed at this time. If the concentration of methane in the landfill gas monitoring probes approaches the LEL monitoring of these enclosed structures will be considered.

Utility Lines and Pipelines: The City of Schertz GIS information shows~~There are~~ two utility lines that approximately parallel the northwest side of the landfill (along Lines B and C). One is an old wastewater line, constructed of clay pipe, the other is a cast-iron water line. However, Beck Landfill requested that the City of Schertz utility department mark any utilities crossing the site and only the wastewater line is present. The clay pipe wastewater line is approximately 150 to 200 feet~~75 feet~~ northwest of the toe of the flood-control dike along which the landfill gas monitoring probes ~~will be~~are installed. ~~The water line is about 150 to 200 feet northwest of the toe of the flood control dike. The exact locations of these utility lines are unknown, even to the City of Schertz. Neither landfill gas monitoring probes nor vents along the utility lines are proposed at this time. These will be considered only if the concentration of methane in the landfill gas monitoring probes approaches the LEL.~~ Utility trench gas vents will be installed where this line crosses the permit boundary. Gas vent TV-1 will be installed at the eastern end of the utility line and TV-2 will be installed at the western end. Figure G-3 shows the location of the sanitary sewer line and the proposed locations of TV-1 and TV-2. A typical detail for the utility trench gas vents is also included on this figure. The vents will be equipped with monitoring ports for routine monitoring. Vents will also be placed where any future utilities cross the permit boundary.

2.0 Landfill Gas Management Plan

Introduction

This Landfill Gas Management Plan ("Plan") has been developed for the Beck Landfill, a Type IV landfill in Schertz, Texas, as required by 30 Tex. Admin. Code (TAC) §330.63(g). This Plan addresses the requirements set forth in 30 TAC §330.371. The Plan describes the proposed system, including installation procedures, monitoring procedures, and procedures to assess the need for maintenance, repair, or replacement; and backup plans to be used if the monitoring system becomes ineffective or must be expanded. This Plan also outlines notification procedures and possible remediation activities, if required.

The requirements of this landfill gas management plan will be in effect through the remainder of the operating life of the landfill, landfill closure, and will continue for a period of 5 years after certification of final closure of the facility, unless altered by TCEQ. Any revisions to this plan will be submitted to TCEQ for review and approval. Information may be submitted to the Executive Director, to reduce gas monitoring and control. The information must demonstrate no potential for gas migration beyond the property boundary or into on-site structures. Gas monitoring shall be revised & maintained as needed; post-closure land use shall not interfere with the gas monitoring system and all utility trenches crossing the facility shall be vented & monitored.

Facility Boundary Monitoring Network

Six landfill gas monitoring probes are to be installed along the northwest exterior toe of the flood control dike surrounding the landfill opposite grid markers 5, 10, 15, 20, 25 and 30 (Fig. 8). The nominal spacing between the landfill gas monitoring probes is 500 feet as measured along the top of the flood control dike. The probes will be labeled as MM-1 through MM-6 in the order presented above. A single probe is specified at each location to accommodate the heterogeneity of the alluvial deposits through which landfill gas might migrate,

Gas Monitoring Probe Installation

The landfill gas monitoring probes will be drilled and installed by driller registered in the state of Texas under the supervision of a licensed professional geoscientist or engineer. The borings will be advanced using hollow-stem augers with samples visually classified and logged in accordance

with the Unified Soil Classification System (ASTM No. D-2487). If in the opinion of the supervising geologist or engineer, the materials encountered are too impermeable to allow migration of landfill gas emissions, the borings may be moved left or right along the toe of the flood control dike to find more suitable subsurface conditions for potential gas migration through the vadose zone.

The probes (Fig. 9) will be screened with factory fabricated 1/2-inch diameter 0.010 inch Schedule 80 PVC screen from the total depth of the probe, less an end cap, to no less than 4 or 5 feet below the ground surface (Fig 8). A solid Schedule 80 PVC riser will extend upward from the screen to approximately 3 feet above the ground surface capped with a quick-connect device to allow purging and monitoring with the gas monitoring meter. All joints will either be threaded or use compression fittings; no glue or solvent-based welding is permitted.

A 20-40 mix of silica sand or concrete sand (ASTM C-33), as available, will be tremied around the probe screen to a minimum of 6 inches above the top of the screen. Followed by hydrated bentonite pellets to 6 inches below the ground surface. A lockable steel well-head protector will be installed over the riser and a 4-foot by 4-foot by 6-inch thick reinforced concrete pad poured around the steel well-head protector to stabilize and protect the well head. Pea gravel, or the equivalent, will be placed around the riser within the steel well-head protector to stabilize the monitoring probe, and one or more weep holes will be drilled into the bottom of the steel well-head protector to allow drainage of excess moisture. Concrete filled steel bollards will be installed around the surface pad as deemed necessary to provide additional protection to the well-head.

Boring/completion logs for the landfill gas monitoring robes will be prepared, submitted to TCEQ and to the Texas Department of Licensing and Regulation (DLR), and retained in the site operating record.

Installation of landfill gas monitoring probes around the remainder of the landfill is unnecessary. Should any landfill gas penetrate the slurry wall and flood control dike, it would either be discharged to the atmosphere or enter the vadose zone, which terminates at Cibolo Creek. The creek, then, is a barrier to landfill gas migration. Other than on the northwest side of the landfill, there are no structures in which landfill gas could accumulate between the landfill and the creek.

BECK LANDFILL MSW Permit #1848
Methane Monitoring Well Locations

Notes

STATE OF TEXAS
Juliana C. Morelli
Geology
10570
LICENSED
PROFESSIONAL GEOSCIENTIST

9-10-2019

N

0 250 500
Scale in Feet

Vertical Datum: Local
Horizontal Datum: NAD83

This drawing is for illustration only and not for permitting, bidding or construction

Prepared For:
Beck Companies
550 FM 78
Schertz, TX 78154

Landfill Aerial and Grid
Beck Companies - Schertz Landfill
Flight Date: December 5, 2018

FIRMATEK
3D MAPPING SOLUTIONS
www.Firmatek.com 210.651.4990

Figure G-1

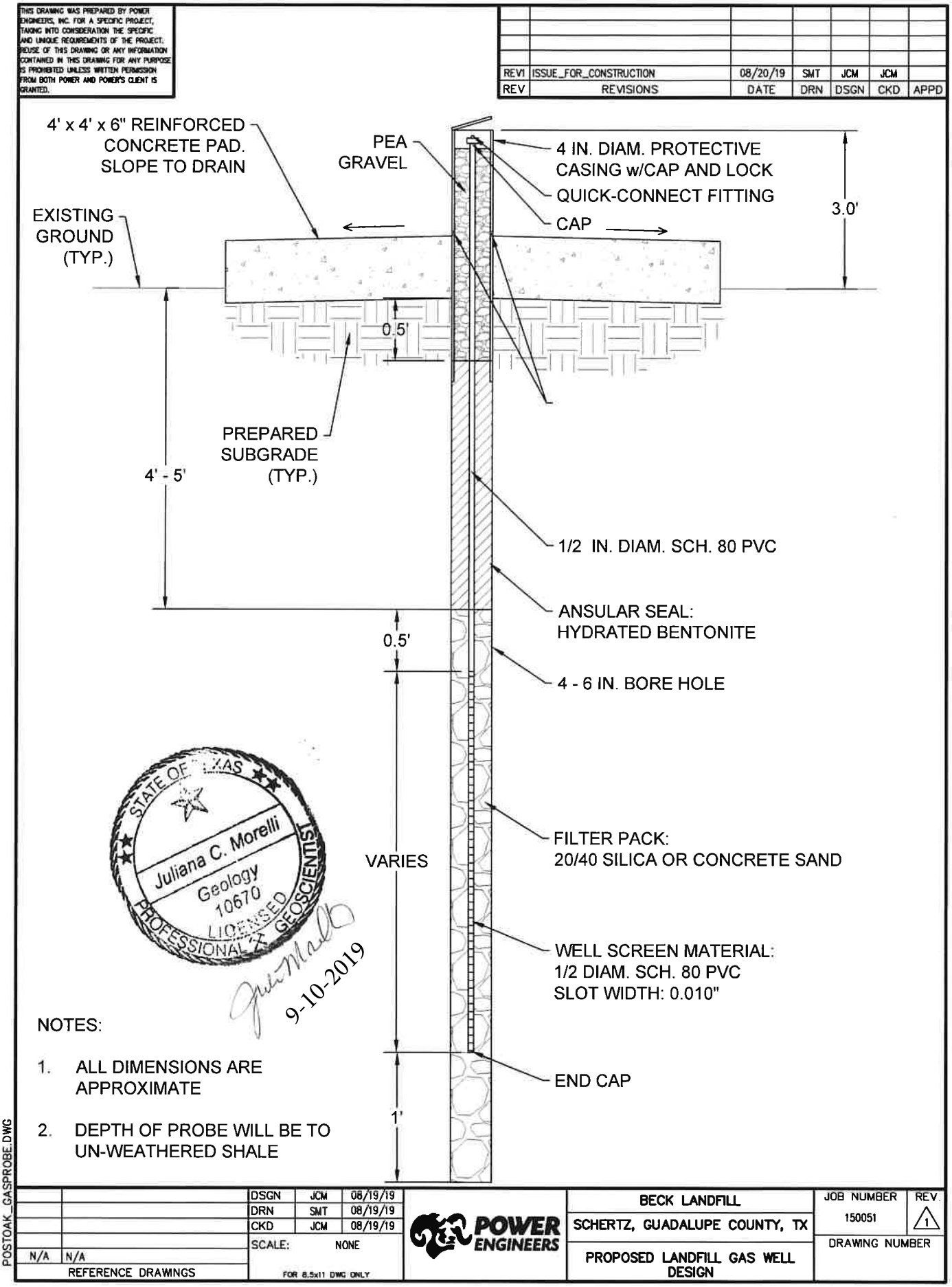

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.
REV1 ISSUE_FOR_CONSTRUCTION 08/20/19 SMT JCM JCM
REV REVISIONS DATE DRN DSGN CKD APPD
4' x 4' x 6" REINFORCED CONCRETE PAD. SLOPE TO DRAIN
PEA GRAVEL
4 IN. DIAM. PROTECTIVE CASING w/CAP AND LOCK
QUICK-CONNECT FITTING
CAP
3.0'
EXISTING GROUND (TYP.)
0.5'
PREPARED SUBGRADE (TYP.)
4' - 5'
1/2 IN. DIAM. SCH. 80 PVC
ANSULAR SEAL: HYDRATED BENTONITE
0.5'
4 - 6 IN. BORE HOLE
FILTER PACK: 20/40 SILICA OR CONCRETE SAND
VARIES
WELL SCREEN MATERIAL: 1/2 DIAM. SCH. 80 PVC SLOT WIDTH: 0.010"
END CAP
1'
STATE OF TEXAS
Juliana C. Morelli
Geology
10670
LICENSED
PROFESSIONAL GEOSCIENTIST
9-10-2019
NOTES:
1. ALL DIMENSIONS ARE APPROXIMATE
2. DEPTH OF PROBE WILL BE TO UN-WEATHERED SHALE
POSTOAK_GASPROBE.DWG
DSGN JCM 08/19/19
DRN SMT 08/19/19
CKD JCM 08/19/19
SCALE: NONE
FOR 8.5x11 DWG ONLY
N/A N/A
REFERENCE DRAWINGS
POWER ENGINEERS
BECK LANDFILL
SCHERTZ, GUADALUPE COUNTY, TX
PROPOSED LANDFILL GAS WELL DESIGN
JOB NUMBER 150051
REV. 1
DRAWING NUMBER

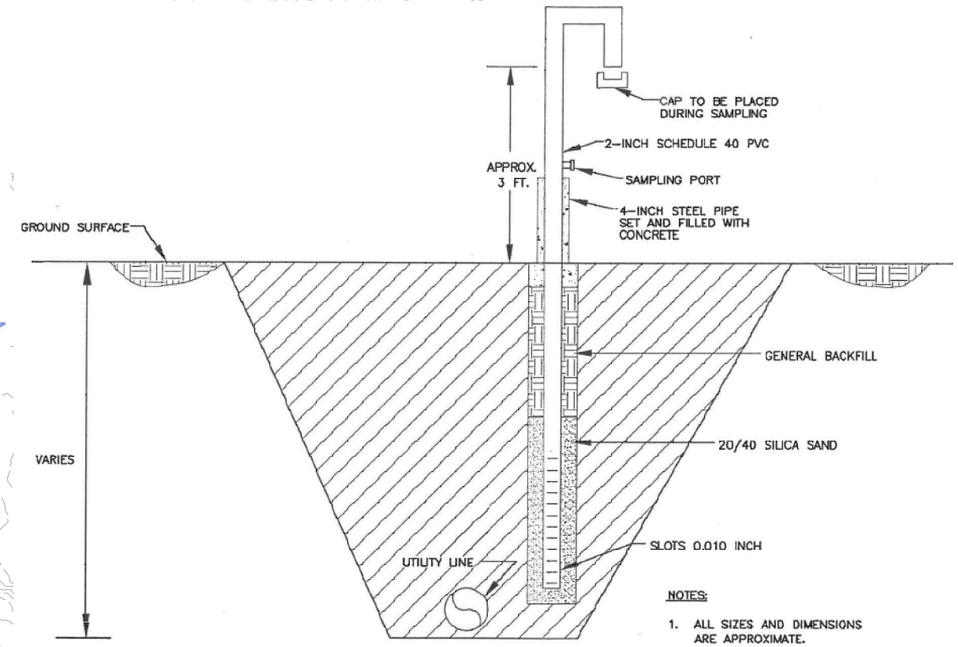
Figure G-2

NORTH

REVISION RECORD		
NO	DATE	DESCRIPTION
1	3/17/2023	TECHNICAL NOD 2
2		
3		
4		
5		

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
3-17-2023

FM 78
SITE ENTRANCE
SCALE HOUSE/OFFICE
EXISTING READY-MIX OPERATION
EXISTING POND
EXISTING POND
UTILITY TRENCH VENT TV-1
UTILITY TRENCH VENT TV-2
SAN
SAN
TV-1
TV-2
MW 1
MW 2
MW 3
MW 4
MW 5
MW 6
MW A
MW B
MW C
MW D
MW E
MW F
MW G
725
750
775
800
825
850
875
MAXIMUM FINAL COVER HEIGHT: 890 FEET MSL
CIBOLO CREEK
CIBOLO CREEK
CIBOLO CREEK
CIBOLO CREEK
PERIMETER ROAD
PERIMETER ROAD
DETENTION POND



UTILITY TRENCH VENT DETAIL

NOTES

1.

REFERENCE

TOPOGRAPHIC INFORMATION FROM AERIAL SURVEY BY FIRMATEK: (SEPTEMBER 15, 2021) AUGMENTED WITH A PORTION OF THE EXISTING GROUND SURFACE PREPARED BY CEC.

SCALE IN FEET
0 400 800

LEGEND

- TV-1 — PROPOSED UTILITY TRENCH VENT
- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- SAN — EXISTING SANITARY SEWER LINE
- LANDFILL CONTOURS ARE TOP OF FINAL COVER.
- FENCE (BARBED-WIRE OR CHAIN LINK)

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com
Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

GAS VENT PLAN

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	03/2023	DWG SCALE:	1" = 400'	PROJECT NO:	311-653

FIGURE NO.: G-3

3.0 Landfill Gas Monitoring Procedures

The concentration of methane in the landfill gas monitoring probes and vents will be measured on a quarterly basis per calendar year, with two of those monitoring times, to the extent possible, corresponding with sampling of the ground water monitoring wells at the landfill. More frequent monitoring may be used at locations where gas migration is occurring or accumulating. The integrity and labelling of the monitoring probes and vents, including the integrity of the steel, well-head protectors, locks, and concrete pads, will be inspected during or before each monitoring event and repairs or replacement made as needed. Repair or replacement of any landfill gas monitoring probes or vents will be documented and retained in the site operating record. Sampling for specified trace gases, may be required by the executive director when there is a possibility of acute or chronic exposure due to carcinogenic or toxic compounds. For the utility trench vents, the cap on the vent shall be closed for a minimum of thirty minutes before the concentration of methane is measured from the sampling port. Once the measurement has been taken, the cap on the vent will be removed and left open.

Beck Landfill uses a four-gas monitoring instrument, -- carbon monoxide, hydrogen sulfide, and oxygen in addition to methane and the LEL. This instrument is suitable for surface monitoring and for sampling the landfill gas monitoring probes and vents. Operation of the device should be in accordance with the instrument manual. If at any time the instrument fails, it will be repaired or replaced, TCEQ will be informed in writing, and the repair or replacement noted in the site operating record. Results of all methane monitoring events, including purge volumes, will be retained in the site operating record. Gas monitoring probes will also be monitored for water level with a water-level meter. The meter will be used to measure the depth to water within the monitoring probes. Results will be recorded on an appropriate data sheet, such as the Typical Gas Monitoring Data Form provided in Appendix G-B.

4.0 Landfill Gas Monitoring Exceedance Record Keeping and Reporting

If methane gas is detected in excess of the following limits, the danger of explosion should be considered imminent. The contingency plan will be implemented if methane gas readings at any location exceed:

Location		Maximum Allowable Methane Concentration
On-Site Structures		1.25 percent
Permitted Boundary		5.00 percent

If the facility is performing quarterly landfill gas monitoring in accordance with Title 30 TAC §330.371 and methane is detected at a concentration above either of the limits specified in §330.371(a), then you must submit monitoring reports and take the following actions in accordance with §330.371(c):

1. Immediately take all necessary steps to ensure protection of human health and notify the Executive Director, local and county officials, emergency officials, and the public;
2. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
3. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, provide a copy to the executive director, and notify the executive director that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy. After review, the executive director may require additional remedial measures.

Procedures for notification and implementing a remediation plan are outlined below:

- Notification to the Executive Director shall be made in writing to the TCEQ region office, and to the TCEQ MSW Permits Section at the following address:

MC124
Municipal Solid Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality
P.O. BOX 13087
Austin, Texas 78711-3087

- Notification to the local and county officials (mayors, council persons, and commissions), emergency officials (such as local volunteer and city/county fire departments and emergency medical personnel), adjacent property owners, and the public should include both verbal and follow up written communication. The notice should inform them about the developing situation at the facility, including which monitoring points are involved and the actions being taken. Records of those contacts must be maintained in the facility's site operating record as required by Title 30 TAC §330.125.

- If contingencies and plans for landfill gas remediation are not already part of the facility permit, a remediation plan should be submitted to the TCEQ as a permit modification pursuant to Title 30 TAC §305. 70. The modification may propose a variety of changes to the site operations, and depending on the nature of the remedial action, different provisions of the §305.70 modification rule may apply. The permit modification should be submitted to the TCEQ at the address listed above within 60 days of detecting methane above the limits in Title 30 TAC §330.371(c). Note that §330.371(c) requires that the remediation plan also be implemented within 60 days of methane detection above limits; therefore owners and operators should not wait until the permit modification is issued to implement the remediation plan.

If Methane is detected above the limits in §330.371(a), more frequent monitoring (for example, monthly or weekly) may be necessary. During the period of more frequent monitoring, reports should still be submitted quarterly.

4.1 Immediate Actions to Protect Human Health

The following actions will be taken immediately per Title 30 TAC §330.371(c)(1):

1. Inform the landfill manager and/or site engineer of the reading. If limits are exceeded in a building, the building will be evacuated in an orderly fashion as described in Section 4.3.4. A

representative of the owner or operator will contact (in writing and verbally):

a) The MSW Permits Section, MC-124
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087
(512) 239-6784

The following county offices:

b) TCEQ Region 13 – San Antonio Waste Section
14250 Judson Road
San Antonio, TX 78233-4480
210-490-3096 (O); 210-545-4329 (Fax)

c) Guadalupe County EMS at 911

d) Schertz EMS
1400 Schertz Parkway, Building 7
Schertz, TX
830-619-1400

e) The neighboring residents within approximately 1,000 feet of the reading location; and

f) The owners of the underground utilities which cross the facility property line within approximately 1,000 feet of the location of the readings.

2. Daily follow-up readings will be taken for one week.

3. If the follow-up readings suggest that there are methane gas levels greater than five percent methane by volume at the property line, then efforts will be made to determine the extent of the gas migration both along the property line and away from the property line.

a) Typical efforts to determine the extent of the gas migration may include borehole sampling. Borehole sampling will only be performed when the locations of underground utilities and other potential hazards have been determined.

b) Typical sampling along the property line may continue in either direction from the initial reading until the methane gas is not detected.

c) The location and results of the readings performed to determine the nature and extent of the gas migration will be reported to the landfill manager.

4. The landfill manager will be kept informed of the progress and results of the follow-up sampling.

5. A laboratory analysis of the gas (Method TO-14) will be performed within 30 days, if there are structures within 1,000 feet of the probe.

4.2 Action Within Seven Days To Update The Operating Record

The following actions will be taken within seven days of the date of the initial readings exceeding maximum allowable methane gas concentrations:

1. Inform the landfill manager of the progress and results of the follow-up sampling.

2. The landfill manager will prepare a brief report, to be submitted the Executive Director and placed in the operating record, which describes the following:

a) The date, location, and magnitude of the initial readings which exceed the allowable maximum percent methane by volume);

b) The actions taken following the initial reading to protect human health; and

c) Information regarding the required notification of the Executive Director, local and county officials and residents within 1,000 feet of the reading.

4.3 Action Within 60 Days To Implement A Remediation Plan

The following actions will be taken within sixty days of the date of the initial readings exceeding

maximum allowable methane gas concentrations.

1. The nature and extent of the gas migration problem will be determined. A remediation plan will be prepared to describe the nature and extent of any problem and proposed remedy.

2. The plan will be submitted to the Commission as a Class I permit modification. Implementation of the plan may begin prior to receiving approval from the Commission.

3. The remediation plan will be implemented. This will consist of starting a course of action to effect the proposed remedy. Reasonable efforts will be made to complete the course of action in a timely manner.

4. A copy of the remediation plan will be placed in the operating record.

5. The Executive Director will be provided with a copy of the remediation plan and notified that the plan has been implemented.

~~Results of landfill gas monitoring will be kept in the site operating record; however, if during any monitoring event, the volumetric methane concentration in any landfill gas monitoring probe or structure exceeds the levels stated in 30TAC§330.371(a) (1.25% in a facility structure or 5% at the facility boundary)., the probe will be resampled within 24 hours, and again within 7 days to confirm the exceedance. Reporting will be in accordance with 30 TAC §330.371(c). Notifications will be as follows:~~

~~MSW Permits Section, MC-124~~
~~Texas Commission on Environmental Quality~~
~~PO Box 13087~~
~~Austin, TX 78711-3087~~
~~512-239-6784 (O); 512-239-6000 (Fax)~~

~~The records of the concentrations detected and description of steps to be taken to protect human health will be placed in the operating record within 7 days of detection. A plan to address the exceedance will be formulated and implemented, with TCEQ approval, if possible within 60 days. The remediation plan will describe the nature, extent of the problem, and the proposed remedy, the Executive Director may require additional remedial measures. The precise nature of the plan~~

~~will depend on which probes show exceedances; those opposite near-by residences or those opposite of commercial businesses. The potential remedial actions may include precisely locating the utility trenches to install monitoring probes and/or vents, sampling the nearest residences, and installation of additional gas monitoring probes or vents. An alternative schedule may be implemented by the Executive Director in accordance with 30 TAC §330.371(d).~~

APPENDIX G-A
Gas Probe Installation Report

APPENDIX G-B
Typical Gas Monitoring Data Form

Beck Landfill
Explosive Gas Monitoring Data Form

NAME:	COMMENTS:	WEATHER:
DATE:		AMBIENT TEMPERATURE: (degree Fahrenheit)
MONITORING DEVICE(S):		BAROMETERIC PRESSURE: (Inches of Mercury)
DATE CALIBRATED:		

GAS MONITORING PROBE NUMBER:	GP -	GP -	GP -	GP -	GP -	GP -	GP -	GP -
Probe Condition:	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Probe Labeling Correct?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Casing Intact?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Concrete Pad Intact?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Lock And Cover In Place?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Quick Connect Fitting Serviceable?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Valve Closed Prior To Inspection?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Repair Or Maintenance Required?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
If yes, specify above in comments								
Probe Static Pressure (inches of water column):								
Probe Temperature (degree Fahrenheit):								
Percent by Volume Methane (ppmv)/LEL:								
Percent By Volume Carbon Dioxide:								
Percent By Volume Oxygen/Air:								
Top Of Probe Casing Elevation (feet-MSL):								
Water Level (feet-MSL):								
Probe Screened Interval (feet-MSL):								
Time Of Measurement:	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM