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:

PROJECT NUMBER: 150051.05.01

PROJECT CONTACT: Julie Morelli

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PHONE: 210-951-6424

REVISED JANUARY 3, 2023

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

1.1 Core Data Form

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

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;
- 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.

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

4.0 MAPS (330.59(c))

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.

5.0 PROPERTY OWNER INFORMATION (330.59(d))

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.

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:

PROJECT NUMBER: 150051.05.01

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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 2-6 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 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 I, 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.

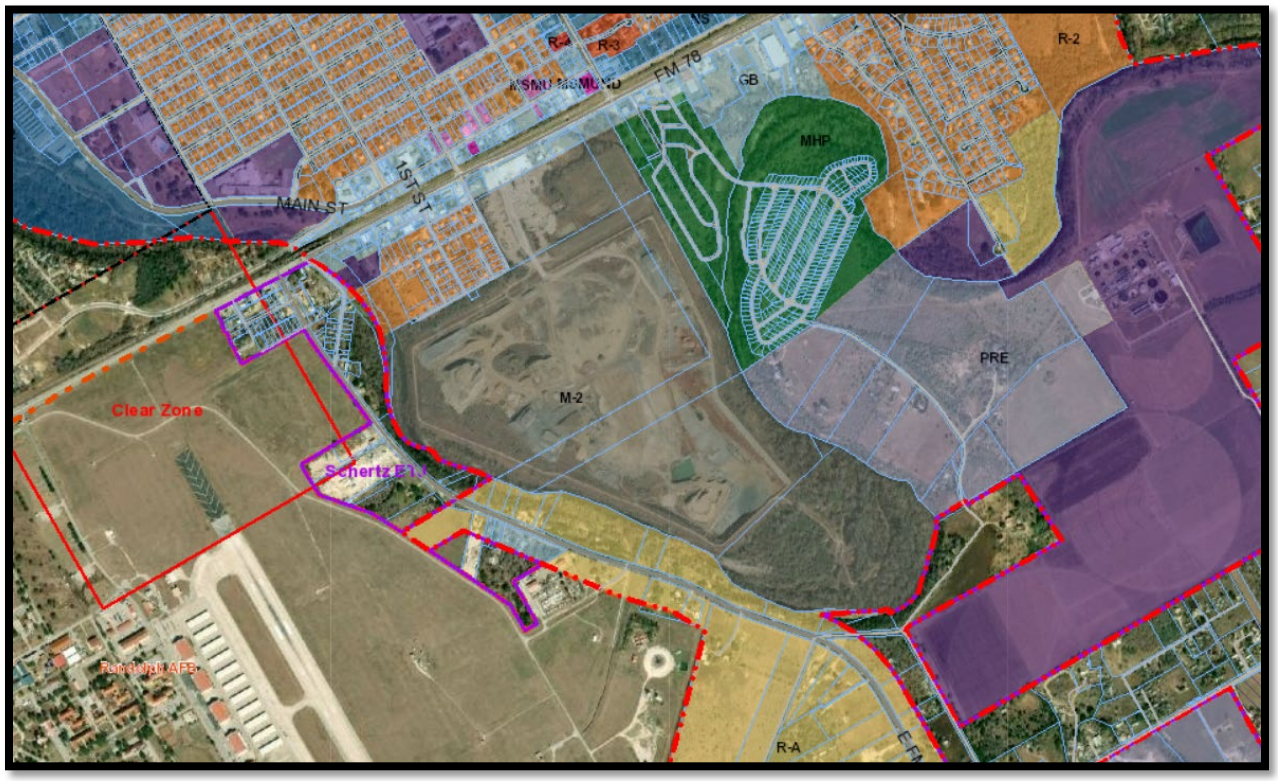
The site was originally authorized by the Texas Department of Health in 1989. At that time, the Landfill was totally within Guadalupe County and the service area of the Cibolo Creek Municipal Authority. The site was only partially within the City of Schertz, Texas. The additional political boundaries 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.

City of Schertz Zoning Map (2022)



[1] City of Schertz Zoning Map

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(i)(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(i)(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:

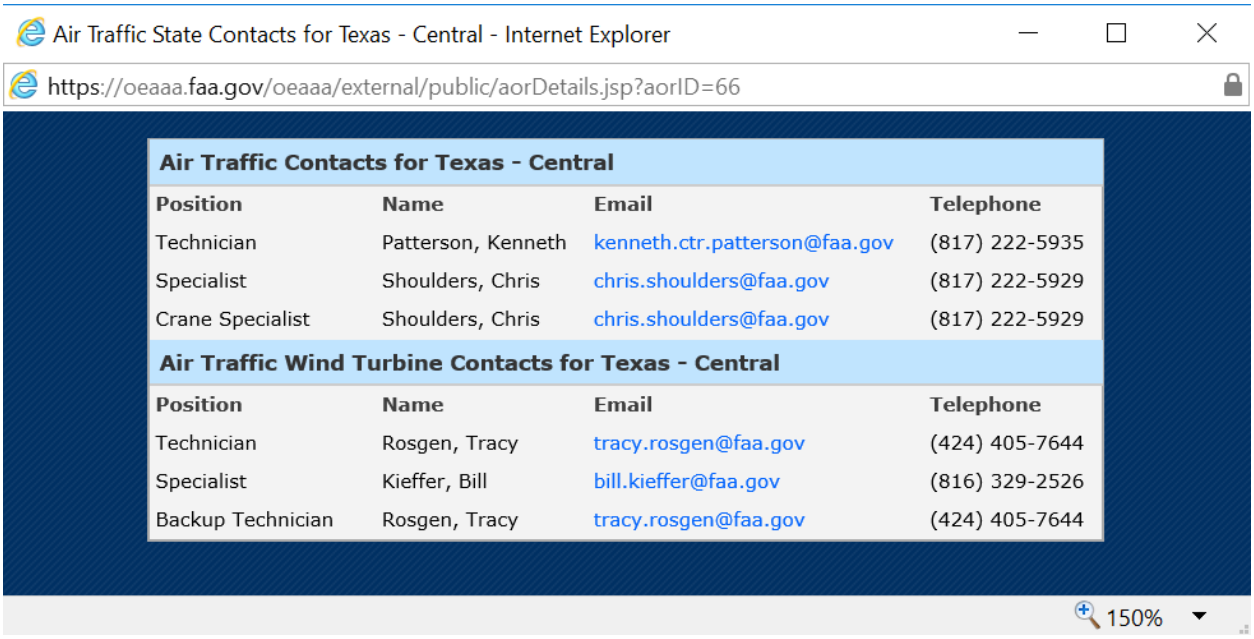
Your proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception. The FAA, in accordance with 77.9, requests that you file.

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.

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.

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

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
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 2-7** 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). A

[3] Below ground surface

review of the USGS Quaternary Fault and Fold Database[5] 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.

[5] 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.

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. 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 rotate around the Landfill from MW-A to MW-G and then in a counterclockwise rotation. 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[8].

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).

[8] (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.

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

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

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

8.0 APPOINTMENTS (330.59(g))

9.0 APPLICATION FEE (330.59(h))

10.0 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).

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT A
SITE DEVELOPMENT 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 October 2022~~Revised January 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
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Austin, Texas 78746
(512) 329-0006

TABLE OF CONTENTS

1.0 INTRODUCTION

Consistent with 30 TAC §330.63(a), this site development plan narrative is included as Attachment A - Site Development Plan. Attachment A provides an outline of the criteria used in the design of this facility for safeguarding the health, welfare, and physical property of the public and environment. The site development plan narrative also includes references to discussion of the geology, soil conditions, drainage, land use, zoning, adequacy of access roads and highways, and other considerations specific to this facility. At the time of the submittal of the application, there were no delinquent fees shown for the regulated entity or the customer associated with this facility.

1.1 SITE LOCATION AND HISTORY

The Beck Landfill, located at 550 FM 78 in Schertz, Texas Guadalupe County, is an existing Type IV Solid Waste Disposal Facility which accepts brush, construction, or demolition waste, and/or rubbish in accordance with applicable State and Federal regulations. The Beck Landfill may not accept putrescible wastes, conditionally exempt small-quantity generator waste, or household wastes. The facility is currently owned by Cibolo Industries, Ltd. and operated by Nido, Ltd. The initial facility was given provisional authorization in 1985 by the Texas Department of Health (TDH) (See letters from TDH in Appendix A). The provisional authorization required that the facility file a MSW landfill permit application to obtain permanent authorization by November 8, 1985. MSW Permit 1848 was issued by the TDH in 1989. At the time of the 1989 application to the TDH, the applicant documented that waste disposal was taking place “in the south west end of the site, and in the north west 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.

In addition, the application documented that gravel was “being removed from this area around the old Randolph Air Force Base fill. In general, the old fill is not being disturbed. When edges of the fill are encountered, excavation is halted, and the exposed face is investigated. If the characteristics of the fill are proper, the fill is covered immediately. Scattered and random surficial fill materials, usually 4 feet or less in depth, as well as improperly installed fills, as encountered in areas from

which gravel is to be removed, are relocated to the current fill placement area, and placed in accordance with current TDH regulations."

1.2 FACILITY DESCRIPTION

General activities which occur daily, include; but are not limited to, acceptance of construction and demolition waste; earth moving activities for periodic below-grade cell construction; excavation and application of daily, intermediate and final cover material to waste; stormwater management; minimization of leachate through currently permitted operational methods; construction quality assurance; maintenance of facility equipment, roads and structures; monitoring of groundwater; and monitoring for subsurface gas migration. The facility consists of a perimeter fence, scalehouse, maintenance shop, all-weather roads, soil stockpiles, groundwater monitoring wells, gas monitoring wells, and solid waste disposal area. Facilities for the control of stormwater runoff/run-on include benches, ditches and detention ponds and associated drainage structures.

This amendment application seeks to increase the permit boundary of the facility from 212 acres to 256.9 acres and increase the maximum permitted height of the disposal unit as depicted on the drawings included in Part III-Appendix D. No change in the permitted landfill footprint is proposed. The entire footprint of the disposal area has been previously excavated and partially filled, so no changes to the bottom excavation grades are proposed. The maximum permitted top of final cover elevation is proposed to be increased from 771 feet MSL to 890 feet MSL. No significant operational changes are being proposed as part of this amendment request.

The following table summarizes the proposed changes to the Facility Site Development and Site Operating Plans:

	Existing - Permit No. 1848	Expansion - Permit No. 1848A
Permitted Area (acres)	212~~48.6~~	25~~76~~.9
Waste Disposal Area (acres)	155~~212~~	155
Total Capacity (cy)	12,383,486	26,417,117
Total Remaining Capacity	2,225,966	16,259,957
Remaining Site Life (years)	3	23
Maximum Elevation of Final Cover (msl)	771	890
Minimum Elevation of Landfill Excavation (ft-msl)	Varies based on encountered subsurface conditions	No change
Operating Hours	7:00 am to 7:00 pm	24 hours/day

Operational Procedures	Accepts brush, construction, or demolition waste, and/or rubbish	No Change
Stormwater Management System	Interim stormwater ponds only	Adding new permanent stormwater detention pond on southeast side of the landfill
Liner System Design	In-situ clay liner	No change
Groundwater Monitoring	5 monitor wells	No change
Gas Monitoring Probes	6 monitoring probes	No change

* Remaining capacity as of June 16, 2021.

1.3 LAND USE AND ZONING

An analysis of land use and potential impact on the area surrounding the facility was prepared and included in Appendix IIB. The proposed Beck Landfill is located within the city limits of Schertz, Texas. The site is currently zoned M-2 (Heavy Manufacturing), which allows for landfilling with the approval of a specific use permit. The landfill pre-dates the establishment of zoning in this area and therefore the current use is allowed to continue as long as there is no lateral expansion of the landfill.

1.4 ADEQUACY OF ACCESS ROADS AND HIGHWAYS

A transportation study providing information related to access roads and vehicular traffic with respect to the facility expansion is included in Part II. There are no existing or planned restrictions on the main access roadways within one mile of the site that would preclude safe and efficient operations for landfill vehicles and other traffic in the area.

Access to the facility from the nearest State Highway (Loop 1604) is approximately 3 miles via the intersection of Loop 1604 and Farm-to-Market Road 78 (FM 78) and approximately 4 miles south of the intersection of FM 1518 and Interstate Highway 35. There are no known weight restrictions on the local or regional roads in the proximity of the facility other than the maximum legal weight limit of 80,000 pounds. Refer to Part II, Attachment 8, for full traffic analysis and Attachment 9 for the TxDOT coordination letter.

2.0 GENERAL FACILITY DESIGN

Consistent with §330.63(b), the general facility design information for the expansion is included in Attachment B- General Facility Design. Attachment B includes narrative and drawings that

provide the required general facility design information including a discussion on facility access control as required by §330.63(b)(1), a generalized process design and working plan of the facility that describes waste movement as required by §330.63(b)(2), a description of how solid waste processing facilities will be designed to facilitate proper cleaning as required by §330.63(b)(3), a description of how all liquids resulting from the operation of solid waste processing facilities will be disposed of in a manner that will not cause surface water or groundwater pollution as well as the treatment of wastewaters resulting from the process or from cleaning and washing as required by §330.63(b)(4), and a general discussion of how the facility is designed to protect endangered and threatened species as required by §330.63(b)(5).

3.0 FACILITY SURFACE WATER DRAINAGE DESIGN

Consistent with §330.63(c), the facility surface water drainage design information for the expansion is included in Attachment C - Facility Surface Water Drainage Report. Attachment C includes a narrative discussion, drawings, and calculations that demonstrate how the facility is designed to meet the drainage and flood control requirements of §330.63(c) and §§330.303, 330.305, and 330.307. The surface water drainage design report includes analyses of the existing conditions, post-development conditions, and design of the surface water management system including final cover drainage facilities, perimeter drainage channels, and detention and sedimentation ponds; and also includes an erosion and sediment control plan for all phases of landfill development. The facility surface water drainage design report demonstrates that existing drainage patterns will not be adversely altered. In addition, a demonstration that the proposed landfill footprint and proposed processing facilities are not located within the 100-year floodway is included.

4.0 WASTE MANAGEMENT UNIT DESIGN

Consistent with §330.63(d), the waste management unit design information for the expansion is included in Attachment D - Waste Management Unit Design. Attachment D includes a narrative, drawings, and calculations that demonstrate how the facility is designed to meet §330.63(d)(1) for storage and transfer units and §330.63(d)(4) for landfill units.

The storage and transfer units located within the facility boundary will include a wood waste processing area. Attachment B - General Facility Design provides details on these storage and

transfer units. Attachment B also includes a narrative and drawings that demonstrate how the facility is designed to meet §330.63(b) and §330.63(d)(1) for general facility design and waste management unit design.

The landfill unit has been designed to meet the requirements of §330.63(d)(4), and §330.331(d)(1) for an in-situ liner. All liquids resulting from the operation of the solid waste facilities shall be disposed of in a manner that will not cause surface water or groundwater pollution. Any wastewaters resulting from waste management activities and from cleaning and washing will be treated either onsite or at an offsite treatment facility in compliance with TCEQ regulations. Beck Landfill shall ensure that stormwater and wastewater is managed in compliance with the regulations.

The landfill unit design includes provisions for all-weather operations, proposed landfill method, elevation of deepest excavation, maximum elevation of waste and final cover, waste disposal rate and operating life of the landfill, landfill unit cross sections, and construction and design details of the landfill unit. In addition, Attachment D includes the geotechnical design report for the facility, the liner quality control plan, the contaminated water management plan, and the final cover quality control plan.

5.0 GEOLOGY REPORT

Consistent with §330.63(e), the geology and soil information for the expansion is included in Attachment E - Geology Report. Attachment E includes a narrative discussion, evaluations, and figures that provide the information required by §330.63(e). The geology report includes descriptions of the regional geology and hydrogeology, geologic process, regional aquifers, subsurface investigations, geotechnical properties of subsurface soils, and fault and seismic conditions. The geology report includes the evaluation and demonstrations which confirm that the geology and soil conditions are suitable for operations as a municipal solid waste disposal facility.

6.0 GROUNDWATER SAMPLING AND ANALYSIS PLAN

Consistent with §330.63(f), the groundwater sampling and analysis plan is included as Attachment F – Groundwater Monitoring Plan. Attachment F includes a narrative discussion, evaluations, and figures that provide the information required by §330.63(f) and

§§330.401 through 330.421. The groundwater monitoring plan includes, among other things, the point of compliance, contaminant pathway analysis, groundwater monitoring program, detection monitoring program, and groundwater sampling and analysis plan.

7.0 LANDFILL GAS MANAGEMENT PLAN

The site is not required to install a gas collection and control system, however, landfill gas probes have been installed along the perimeter of the landfill to monitor for any gas traveling in the sub-surface. The landfill gas management plan is included in Attachment G. The construction and operation of the waste management facility shall comply with Subchapter U of 30 TAC Chapter 330 (relating to Standard Air Permits for Municipal Solid Waste Landfill Facilities and Transfer Stations) or other approved air authorizations. Owners or operators of these types of facilities should consult with the Air Permits Division on or before the date that the municipal solid waste application is filed with the executive director

8.0 CLOSURE PLAN

Consistent with §330.63(h), the closure plan is included as Attachment H - Closure Plan. Attachment H includes narrative, evaluations, and maps and drawings that provide the information required by §330.63(h), §330.457, §330.459 and §330.461. The closure plan includes the procedures to be taken for ongoing closure of the facility and following final acceptance of waste and certification of final closure. The closure plan describes the final cover system, closure procedures, and a closure schedule.

9.0 POSTCLOSURE PLAN

Consistent with §330.63(i), the post closure plan is included as Attachment I - Postclosure Plan. Attachment I includes a narrative discussion that provides the information required by §330.63(i), §330.463 and §330.465. The postclosure plan includes the procedures to be taken for postclosure care maintenance of the facility following closure including postclosure care certification. The postclosure plan describes the postclosure care activities, persons responsible for conducting postclosure care activities, and postclosure land use.

10.0 COST ESTIMATES FOR CLOSURE AND POSTCLOSURE CARE

Consistent with §330.630), the cost estimates for closure and postclosure care are included as Attachment J - Cost Estimates for Closure and Postclosure Care. Attachment J includes a narrative discussion, evaluations, calculations, and drawings that provide the information required by §330.630). The detailed cost estimate for closure meets the requirements of §330.503. The detailed cost estimate for postclosure care meets the requirements of §330.507. This plan also provides procedures to adjust the cost estimates during the life of the facility and describes the evidence of financial assurance, as required.

Appendix A

Original Texas Department of Health Approval Letter

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT B
GENERAL FACILITY 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 January 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
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Austin, Texas 78746
(512) 329-0006

TABLE OF CONTENTS

1.0 FACILITY ACCESS

Access to Beck Landfill is controlled by a perimeter fence located along portions of the facility boundary, Cibolo Creek, which acts as a natural barrier, and a locking gate at the site entrance. The fence, creek, and gate will prevent the entry of livestock, protect the public from exposure to potential health and safety hazards, discourage unauthorized public access to the disposal operations, and discourage unauthorized entry or uncontrolled disposal of solid waste or prohibited materials. Perimeter fencing consisting of barbed wire, woven wire, or other suitable material will be provided. See Figure D1.1 for locations of the fencing.

An entrance gate is located on the entrance road. The gate is locked when the landfill personnel leave for the day. The perimeter fence and gate will be inspected periodically as specified in the Site Operating Plan. Maintenance will be performed as necessary. Should a breach be detected during inspection or at any other time, every reasonable effort will be made to make repairs within 24 hours of detection. Should repairs require more than 24 hours, temporary repairs will be performed within the time specified to the TCEQ region office following notification. The TCEQ region office will be notified of the breach within 24 hours of detection unless permanent repairs are made within eight hours of detection.

Entry to the active portion of the site will be restricted to designated personnel, approved waste haulers, properly identified persons whose entry is authorized by site management, and regulatory personnel. Visitors may be allowed on the active area only when accompanied by a site representative. Signs will be located along the entrance road directing traffic to the gatehouse. The gate attendant will restrict site access to authorized vehicles and direct these vehicles appropriately.

Waste hauling vehicles will be directed to appropriate fill areas by signs located along the landfill haul road and access road. These vehicles will deposit their loads and depart the site. Private, commercial, or public solid waste vehicles will not be allowed access to any areas other than the active portion of the landfill. Site personnel will provide traffic directions as necessary to facilitate safe movement of vehicles. Within the site, signs will be placed along the landfill haul road and access road at a frequency adequate for users to be able to determine the disposal area locations and which roads are to be used. Roads not being used for access to disposal areas will be blocked or otherwise marked for no entry.

2.0 WASTE MOVEMENT

The major classifications of solid waste to be accepted at Beck Landfill include brush, construction, or demolition waste, and/or rubbish (C&D waste). Waste disposal facilities include the C&D solid waste disposal area. Waste processing and/or storage facilities include the brush and wood grinding area. Drawing B.1 is a flow diagram that provides the storage, processing, and disposal sequences for the various wastes accepted. Waste enters the facility via the site entrance road. The gate attendant observes the incoming waste at the gatehouse, conducts waste screening and weighing, and documents the incoming waste. The gate attendant is familiar with the rules and regulations governing the various types of waste that can or cannot be accepted into this facility and will direct the waste hauler to the appropriate waste disposal, storage, or processing area. These gatehouse personnel will also have the authority to reject prohibited wastes and have the rejected waste removed by the waste haul vehicle or transporter immediately upon discovery.

Trained personnel will observe waste unloading at the active working face and will have the authority and responsibility to reject loads that contain prohibited wastes. These working face personnel will also have the authority to have prohibited waste removed by the waste haul vehicle or transporter immediately upon discovery.

2.1 WASTE DISPOSAL

The proposed landfill liner and final cover systems will meet all applicable Subtitle D requirements and TCEQ rules and guidelines for Type IV landfills. Provisions addressing design and construction are addressed in the liner quality control plan, the contaminated water management plan, and the final cover quality control plan.

The waste disposal area will be excavated with side slopes no steeper than 3H:1V. The in-situ liner system will be evaluated following excavation of a new waste disposal area. Information regarding materials and construction quality assurance are included in Attachment D7 - Liner Quality Control Plan. Liner system details are also included in Attachment D7.

The proposed landfill development method for the site is a combination of the below-grade area excavation fill followed by aerial fill to the proposed landfill completion height. Landfill

development will generally follow the sequence of development as shown on Drawing D1.2, which will generally be in the order the cells are numbered.

Waste accepted for disposal will be directed to the active working face. Waste will be unloaded within the active working face, spread in layers and thoroughly compacted. Weekly operational cover of waste will be applied to control disease vectors, windblown waste, odors, fires, scavenging, and to promote runoff from the fill area. Operational cover consisting of a minimum of six inches of soil will be placed over wastes at the end of each week.

The aerial fill side slopes will not be steeper than 4H:1V, and the aerial fill top slope will be approximately six percent. A final cover will be constructed over the entire landfill as detailed in Attachment D8-Final Cover Quality Control Plan
Final cover placement will generally follow the sequence of development as shown on Drawing D1.3 through D1.6 and may be ongoing as the site is developed. Sectors will be closed according to the closure plan provided in Part III, Attachment H- Closure Plan.

3.0 STORAGE AND PROCESSING UNITS

The Beck Landfill facility contains the following storage and processing units:

1. Wood waste processing area, and
2. Recyclable material recovery area.

The wastes stored or processed in these areas emanate from residential, municipal, and commercial sources, and include brush, wood scraps, saw dust, pallets, other wood wastes, metal, concrete, plastic, and other recyclable materials. These facilities may not receive, process, or store regulated hazardous waste. There are no known waste constituents or characteristics that could be a limiting parameter that would impact or influence the design and operation of the facilities.

The types and an estimate of the amount of each waste to be received daily will vary based on market conditions and availability of storage or processing capacity. The maximum amount of waste to be stored at any point is based on the storage capacity of each unit. Material will be stored for a maximum of 180 days. The intended destination of material stored and/or processed at the

wood waste processing area is for offsite use as a bio-fuel or onsite use for erosion controls and site roads.

All waste shall be stored in such a manner that it does not constitute a fire, safety, or health hazard or provide food or harborage for animals and vectors, and shall be contained or bundled so as not to result in litter. The brush storage and grinding area will be separated from any onsite structures or other facilities. Brush piles will be maintained at a maximum size of one acre to limit fire potential. See Section 7 of Part IV SOP for specific fire-fighting procedures for the proposed processing and storage areas. Pressurized water is available near all onsite buildings, but it is not planned to be used for firefighting purposes. The site water truck may be used for extinguishing fires as detailed in Part IV-Section 7. All employees working at or near the storage and processing areas shall be trained on the requirements of the Fire Protection Plan included in Part IV-Section 7.

Vehicle parking for equipment, employees, and visitors will be provided. Employees will park near the landfill maintenance facility and visitors will park at the scalehouse. Equipment can be parked adjacent to the storage or processing unit. See Part IV-Section 4<u>8</u>.1 for access control provisions for the facility.

No processing or storage areas are susceptible to significant leaks or spills.

There is not significant noise pollution anticipated to be generated at the storage and processing areas. The loudest anticipated noise will be the back-up alarms from equipment operating at these facilities. The storage and processing areas will be set back as far as practicable from the permit boundary to mitigate noise pollution and will only be operated during the approved operating hours for the facility.

There are no sumps or floor drains required for any of the storage or processing facilities.

3.1 WOOD WASTE PROCESSING AREA

The wood waste processing area will be located within the landfill footprint and will process incoming yard trimmings, clean wood materials and vegetative materials, including trees and brush, into wood chips and mulch. The wood chips and mulch will be used on-site or sent offsite for further processing or use as a bio-fuel. The wood chips and mulch will be stored in small piles and will be managed to prevent fire, safety, or health hazards in accordance with 30 TAC§330.209(a). The active wood waste processing area will not be larger than approximately 150 feet by 150 feet. The wood processing area will be located outside of the 100-year floodplain boundary.

3.2 RECYCLABLE MATERIAL RECOVERY AREA

The recyclable material recovery area will be located within the landfill footprint and will process incoming metal, concrete, plastic, and other recyclable materials. The recycled materials will be sent offsite for processing. The materials will be stored in roll-offs or small piles and will be managed to prevent fire, safety, or health hazards in accordance with 30 TAC§330.209(a). The recyclable material area will not be larger than approximately 150 feet by 150 feet. The recyclable material area will be located outside of the 100-year floodplain boundary.

4.0 SANITATION

The solid waste processing and/or storage facilities include the wood waste processing area and recyclable materials area, which have been designed to facilitate proper cleaning. Refer to Section 2 - Waste Movement And Section 3 – Storage and Processing Units for a discussion of each of the solid waste processing facilities. Operational requirements for each facility are described in Part IV- Site Operating Plan, including a discussion of surface water controls, cleaning facilities, and contaminated water.

4.1 WOOD WASTE PROCESSING AREA

Wood wastes received will be chipped and stockpiled only to be used for site operations or sent offsite for further processing. The area will consist of small piles managed to prevent litter and control fire, health hazards and safety in accordance with §330.209(a). There are no water runon and runoff control, or additional sanitation controls required.

4.2 RECYCLABLE MATERIAL RECOVERY AREA

The recyclable material recovery area will be located within the landfill footprint and will process incoming metal, concrete, plastic, and other recyclable materials. The recycled materials will be sent offsite for further processing. The materials will be stored in roll-offs or small piles and managed to prevent litter and control fire, health hazards and safety in accordance with §330.209(a). There are no water runon and runoff control, or additional sanitation controls required.

5.0 WATER POLLUTION CONTROL

The processing and/or storage facilities will be maintained and operated to manage runon and runoff during the peak discharge from the 25-year, 24-hour storm event to prevent the off-site discharge of waste and feedstock material, including, but not limited to, processed or stored materials. Surface water in and around each processing and/or storage facility will be controlled to minimize surface water running onto, into, and off the processing and/or storage area. Since all contaminated water will be managed in a controlled manner, as discussed above, groundwater will be protected. Should the discharge of contaminated water become necessary, the facility will obtain specific written authorization from the TCEQ prior to discharge. The landfill and its processing and/or storage facilities will be operated consistent with §330.15(h)(1)-(4) regarding discharge of solid wastes or pollutants into waters of the United States or waters of the state.

The design of the landfill itself and the surface water management system for the facility will prevent the discharge of solid waste, pollutants, dredged or fill material and nonpoint source pollution that would violate any of the provisions referenced in 30 TAC§330.15(h). The facility has been designed to keep contaminated surface water (water that may have come into contact with waste at the landfill) separated from uncontaminated stormwater runoff. The contaminated water will not be discharged to the surface water management system at the site.

Refer to Section 2 - Waste Movement and Section 3 – Storage and Processing Units for a discussion of the solid waste processing and/or storage facilities and Part IV- Site Operating Plan

for a discussion of operational requirements. Refer to Part III, Attachment D6 - Contaminated Water Plan for a discussion of contaminated water management.

6.0 ENDANGERED SPECIES PROTECTION

A detailed threatened and endangered species survey and assessment for the landfill expansion area was conducted by a qualified biologist. The surveys and assessments along with coordination with the United States Fish and Wildlife Service (USFWS) and the Texas Parks and Wildlife Department (TPWD) regarding endangered and threatened species is provided in Part II, Appendix II-H Endangered or Threatened Species Documentation.

Development of the facility shall be conducted to minimize potential impacts to endangered or threatened species. The facility and the operation of the facility will not result in the destruction or adverse modification of the critical habitat of endangered or threatened species, or cause or contribute to the taking of any endangered or threatened species.

7.0 BENCHMARK

The location and elevation of the permanent benchmark for the site is indicated on the Site Layout Plan (Figure D1.1). The benchmark is conveniently located near the scalehouse.

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT C-1
FACILITY SURFACE WATER DRAINAGE 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: Revised January 2023~~September 2022~~

Prepared by:

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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

1 INTRODUCTION

30 TAC §330.63(c) and 330.301-330.307

1.1 Purpose

This drainage analysis and design is prepared as part of a permit application for the expansion of the Beck Landfill and includes the demonstrations consistent with the requirements of 30 TAC Chapter §§330.63(c) and §§330.301-307. The drainage analysis and design is organized to include a narrative description of the existing and post-development conditions, the proposed drainage system design, effective erosional stability of top dome surfaces and external embankment side slopes during all phases of landfill operation, and a discussion of the existing/post-development comparison at the facility and property boundaries. Drainage calculations are included in the appendices to this section. Drainage design plans and details are included in Attachment C3. The following is a brief description of each of the appendices.

Appendix C1-A- Drainage Maps and Existing/Post-Development Comparison

Appendix C1-A includes drainage area maps that delineate the drainage areas that contribute surface water run-on and runoff at the facility and property boundaries and provide a summary of the peak flow rates, runoff volumes, and runoff velocities at locations along the facility boundary for the existing and post-development conditions. Appendix C1-A also includes a table summarizing the existing/post-development drainage analysis comparison.

Appendix C1-B- Existing Hydrologic Calculations

The existing hydrologic and hydraulic condition is the final permitted condition depicted in TCEQ MSW Permit 1848. The existing hydrologic and hydraulic evaluation is included in Appendix C1-B. The existing analysis includes delineations of drainage areas that contribute surface water run-on and runoff at comparison locations along the facility boundary.

The results of the existing hydrologic evaluation are provided on the existing conditions drainage analysis summary, which shows the 25- and 100-year peak flow rates, runoff volumes, and runoff velocities at comparison locations along the proposed facility boundary.

Appendix C1-C- Post-Development Hydrologic Calculations

The post-development hydrologic and hydraulic evaluation included in Appendix C1-C represents the proposed final closure landfill configuration. The post-development analysis includes delineations of drainage areas that contribute surface water run-on and runoff at comparison points along the proposed facility boundary.

The results of the post-development hydrologic evaluation are provided on the post-development boundary analysis summary, which shows the 25- and 100-year peak flow rates, runoff volumes, and runoff velocities at the comparison locations along the proposed permit boundary.

Appendix C1-D- Perimeter Drainage System Design

Appendix C1-D presents the hydraulic design of the perimeter drainage system. The perimeter drainage plan shows the locations of the perimeter drainage ~~channels~~ berms and detention ponds. The detention ponds are designed to provide the necessary storage and outlet control to mitigate impacts to the receiving channels downstream of the Beck Landfill. The perimeter ~~channels~~ berms are designed to convey the 25-year and 100-year, 24-hour storm event.

Appendix C1-E- Final Cover Drainage Structure Design

Appendix C1-E is limited to the design of the permanent final cover drainage structures (i.e., chute and bench system). The calculations demonstrate that the structures are designed to convey runoff produced from a 25-year storm event, to provide erosion protection, and to minimize sediment loss from the final cover condition.

Appendix C1-F - Intermediate Cover Erosion and Sedimentation Control Plan

Appendix C1-F provides a detailed erosion and sediment control plan during the intermediate cover phase of the landfill development.

Appendix C1-G- Intermediate Cover Erosion Control Structure Design

Appendix C1-G provides the supporting documentation to evaluate and design temporary erosion and sediment control structures for the intermediate cover phase of the landfill development.

6 EROSION AND SEDIMENTATION CONTROL

30 TAC §330.305(f) and §330.307

6.1 Final Cover Stormwater System Control Plan

Perimeter drainage channels and the detention pond will be constructed as the subsequent phased development of the landfill progresses. Erosion will be minimized in these structures by establishment of vegetation or with rock riprap, gabions, or other materials as provided for in the drainage design calculations for these permanent structures as found in Appendix C1-E Final Cover Drainage Structure Design.

Berms, benches, and chutes will be constructed upon placement of the final cover. The final cover includes an erosion layer that is a minimum of ~~12~~6 inches of earthen material ~~with the top 6 inches~~ capable of sustaining native plant life and will be seeded with native and introduced grasses immediately following the application of final cover in order to minimize erosion. A soil loss demonstration for the erosion layer is included in Appendix C1-E of this attachment. The benches and chutes include establishment of vegetation, Maccaferri gabion mattress, and other materials as provided in the drainage calculations for these permanent structures.

6.2 Final Cover Stormwater System Maintenance Plan

Beck Landfill will inspect, restore, and repair constructed permanent stormwater systems such as channels, drainage benches, chutes, and flood control structures in the event of washout or failure from extreme storm events. Excessive sediment will be removed, as needed, so that the drainage structures, such as the perimeter channels and detention pond, function as designed. Site inspections by landfill personnel will be performed weekly or within 48 hours of a rainfall event of 0.5 inches or more. The time frame for correction of damaged or deficient items under normal conditions will be within five working days after the inspection identifying these items. Normal conditions are weather, ground and other site-specific conditions that do not impede access to the item, result in additional damage to the site attempting to access or repair the item, or risk equipment or personnel safety. Documentation of the inspection will be included in the site operating record.

The following items will be evaluated during the inspections:

- Erosion of final cover areas, perimeter ditches, chutes, benches, detention pond, berms, and other drainage features
- Settlement of final cover areas, perimeter ditches, chutes, benches, and other drainage features
- Silt and sediment build-up in perimeter ditches, chutes, benches, and the detention pond
- Obstructions in drainage features

BECK LANDFILL
APPENDIX C1-D
FACILITY SURFACE WATER DRAINAGE REPORT
PERIMETER DRAINAGE ~~SWALE~~ BERM DESIGN

Includes pages C1-D-1 through C1-D-5

Revised January 2023

NARRATIVE

30 TAC §330.305

This appendix presents the design of Beck Landfill perimeter drainage channels and detention pond in accordance with §330.305(a)-(d).

PERIMETER DRAINAGE PLAN

Drawing C1-2 depicts the perimeter drainage system and detention pond location for Beck Landfill. The typical section for the perimeter drainage bermschannels is shown on Figure C3-3C1-2A and the detention pond details are shown on Figure C3-1. The perimeter channel berm hydraulic analysis is included for the 25-year rainfall event. Profiles for the perimeter berms are shown on Figures C1-2A through C1-2F.

PERIMETER CHANNEL BERM DESIGN SUMMARY

The perimeter channels berms are designed for the peak discharge resulting from the 25-year storm event and will pass the 100-year storm event while maintaining velocities between 2 fps and 6 fps. The typical perimeter channel berm has 23:1 sideslopes, five two feet bottom top width, and is two feet deephigh. The channel berm slope is assumed as 12%. The largest area contributing to a perimeter channel berm occurs for Berm 8 (See Figure C1-2)in the southern portion of DA-P08 and is 5.16.5 acres. The Rational Method and methods and parameters included in the TxDOT Hydraulic *Design Manual,* September 2019 will be used to calculate the peak flow anticipated in this worst-case perimeter channelberm.

The rational formula estimates the peak rate of runoff at a specific location in a watershed as a function of the drainage area, runoff coefficient, and mean rainfall intensity for a duration equal to the time of concentration. The rational formula is:

Q=CIA

Where:

Q = maximum rate of runoff (cfs)

C = runoff coefficient

I = average rainfall intensity (in./hr.)

A = drainage area (ac)

Runoff Coefficient (C)

The following table from the TxDOT manual lists appropriate run-off coefficients for various uses and surface conditions. Steep grassed slopes was chosen as the most appropriate for the landfill final cover, which corresponds to a coefficient of 0.70.

Chapter 4 — Hydrology *Section 12 — Rational Method*

Table 4-10: Runoff Coefficients for Urban Watersheds

Type of drainage area	Runoff coefficient
Business:	
Downtown areas	0.70-0.95
Neighborhood areas	0.30-0.70
Residential:	
Single-family areas	0.30-0.50
Multi-units, detached	0.40-0.60
Multi-units, attached	0.60-0.75
Suburban	0.35-0.40
Apartment dwelling areas	0.30-0.70
Industrial:	
Light areas	0.30-0.80
Heavy areas	0.60-0.90
Parks, cemeteries	0.10-0.25
Playgrounds	0.30-0.40
Railroad yards	0.30-0.40
Unimproved areas:	
Sand or sandy loam soil, 0-3%	0.15-0.20
Sand or sandy loam soil, 3-5%	0.20-0.25
Black or loessial soil, 0-3%	0.18-0.25
Black or loessial soil, 3-5%	0.25-0.30
Black or loessial soil, > 5%	0.70-0.80
Deep sand area	0.05-0.15
Steep grassed slopes	0.70
Lawns:	
Sandy soil, flat 2%	0.05-0.10
Sandy soil, average 2-7%	0.10-0.15
Sandy soil, steep 7%	0.15-0.20
Heavy soil, flat 2%	0.13-0.17
Heavy soil, average 2-7%	0.18-0.22

Hydraulic Design Manual *4-53* *TxDOT 09/2019*

Rainfall Intensity (I)

The rainfall intensity (I) is the average rainfall rate in in./hr. for a specific rainfall duration and a selected frequency. The duration is assumed to be equal to the time of concentration. The intensity was taken from the following table from 2018 NOAA Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 11, Version 2.0: Texas, assuming a time of concentration and storm duration of ten minutes. From the table the 25-year intensity is 8.8 in/hr and the 100-year intensity is 11.1 in/hr.

NOAA Atlas 14, Volume 11, Version 2
Location name: Schertz, Texas, USA*
Latitude: 29.5483°, Longitude: -98.2639°
Elevation: 706.71 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	5.32 (4.03-7.02)	6.29 (4.80-8.21)	7.86 (5.99-10.3)	9.18 (6.89-12.2)	11.0 (8.00-15.1)	12.4 (8.80-17.5)	13.9 (9.58-20.1)	15.4 (10.4-22.9)	17.5 (11.4-27.0)	19.2 (12.1-30.3)
10-min	4.23 (3.20-5.59)	5.01 (3.82-6.54)	6.28 (4.78-8.24)	7.34 (5.51-9.77)	8.81 (6.42-12.1)	9.97 (7.07-14.1)	11.1 (7.68-16.1)	12.3 (8.27-18.3)	13.8 (8.99-21.3)	15.0 (9.50-23.7)
15-min	3.61 (2.73-4.77)	4.24 (3.23-5.53)	5.26 (4.00-6.90)	6.12 (4.59-8.15)	7.30 (5.31-10.0)	8.22 (5.82-11.6)	9.17 (6.32-13.3)	10.2 (6.84-15.1)	11.5 (7.49-17.8)	12.6 (7.98-19.9)
30-min	2.54 (1.92-3.36)	2.98 (2.27-3.89)	3.68 (2.80-4.84)	4.27 (3.21-5.69)	5.08 (3.69-6.96)	5.70 (4.03-8.04)	6.35 (4.38-9.20)	7.05 (4.74-10.5)	8.05 (5.23-12.4)	8.86 (5.61-14.0)
60-min	1.64 (1.24-2.16)	1.93 (1.48-2.52)	2.42 (1.84-3.17)	2.82 (2.12-3.76)	3.39 (2.45-4.63)	3.81 (2.69-5.37)	4.27 (2.94-6.19)	4.78 (3.22-7.12)	5.53 (3.59-8.53)	6.14 (3.89-9.70)
2-hr	0.974 (0.740-1.28)	1.19 (0.902-1.52)	1.52 (1.16-1.98)	1.81 (1.37-2.40)	2.23 (1.63-3.04)	2.57 (1.83-3.61)	2.94 (2.04-4.24)	3.37 (2.27-4.98)	3.99 (2.60-6.13)	4.52 (2.87-7.10)
3-hr	0.703 (0.536-0.920)	0.877 (0.663-1.11)	1.14 (0.869-1.47)	1.37 (1.04-1.81)	1.72 (1.26-2.35)	2.01 (1.44-2.82)	2.34 (1.62-3.36)	2.71 (1.83-4.00)	3.26 (2.13-4.99)	3.73 (2.37-5.84)
6-hr	0.401 (0.307-0.522)	0.514 (0.387-0.639)	0.678 (0.520-0.870)	0.832 (0.632-1.09)	1.07 (0.786-1.44)	1.26 (0.907-1.76)	1.49 (1.04-2.13)	1.75 (1.19-2.57)	2.15 (1.41-3.27)	2.48 (1.58-3.86)
12-hr	0.225 (0.173-0.290)	0.292 (0.220-0.358)	0.387 (0.299-0.494)	0.479 (0.366-0.625)	0.619 (0.459-0.835)	0.739 (0.533-1.03)	0.879 (0.616-1.25)	1.04 (0.710-1.52)	1.29 (0.849-1.96)	1.51 (0.965-2.33)
24-hr	0.127 (0.098-0.163)	0.166 (0.126-0.202)	0.221 (0.171-0.280)	0.275 (0.211-0.356)	0.357 (0.266-0.478)	0.428 (0.310-0.591)	0.510 (0.359-0.721)	0.608 (0.415-0.880)	0.757 (0.500-1.14)	0.885 (0.570-1.36)
2-day	0.072 (0.056-0.092)	0.095 (0.072-0.115)	0.126 (0.098-0.159)	0.157 (0.121-0.202)	0.204 (0.152-0.272)	0.244 (0.178-0.335)	0.291 (0.206-0.409)	0.346 (0.238-0.499)	0.430 (0.285-0.644)	0.502 (0.324-0.770)
3-day	0.052 (0.041-0.067)	0.068 (0.052-0.083)	0.091 (0.071-0.115)	0.113 (0.088-0.145)	0.146 (0.110-0.195)	0.175 (0.128-0.239)	0.208 (0.147-0.291)	0.246 (0.170-0.354)	0.305 (0.202-0.454)	0.354 (0.229-0.541)
4-day	0.042 (0.033-0.053)	0.054 (0.042-0.066)	0.073 (0.057-0.091)	0.090 (0.069-0.115)	0.115 (0.087-0.153)	0.138 (0.101-0.188)	0.163 (0.116-0.227)	0.192 (0.132-0.275)	0.236 (0.157-0.352)	0.274 (0.177-0.417)
7-day	0.027 (0.022-0.035)	0.035 (0.027-0.043)	0.046 (0.037-0.058)	0.057 (0.044-0.073)	0.073 (0.055-0.096)	0.086 (0.063-0.116)	0.101 (0.072-0.140)	0.117 (0.081-0.168)	0.143 (0.095-0.211)	0.164 (0.106-0.248)
10-day	0.021 (0.017-0.027)	0.027 (0.021-0.033)	0.035 (0.028-0.044)	0.043 (0.034-0.055)	0.054 (0.041-0.071)	0.064 (0.047-0.086)	0.074 (0.053-0.103)	0.086 (0.060-0.123)	0.104 (0.069-0.153)	0.118 (0.077-0.179)
20-day	0.014 (0.011-0.017)	0.017 (0.013-0.021)	0.022 (0.017-0.027)	0.026 (0.020-0.033)	0.032 (0.024-0.042)	0.037 (0.027-0.050)	0.042 (0.030-0.058)	0.048 (0.034-0.068)	0.057 (0.038-0.083)	0.063 (0.041-0.095)
30-day	0.011 (0.009-0.013)	0.013 (0.010-0.016)	0.017 (0.013-0.021)	0.020 (0.016-0.025)	0.024 (0.018-0.031)	0.028 (0.020-0.037)	0.031 (0.022-0.043)	0.035 (0.024-0.049)	0.040 (0.027-0.059)	0.045 (0.029-0.067)
45-day	0.009 (0.007-0.011)	0.010 (0.008-0.013)	0.013 (0.011-0.016)	0.015 (0.012-0.019)	0.019 (0.014-0.024)	0.021 (0.016-0.028)	0.024 (0.017-0.032)	0.026 (0.018-0.037)	0.030 (0.020-0.043)	0.033 (0.021-0.049)
60-day	0.008 (0.006-0.009)	0.009 (0.007-0.011)	0.011 (0.009-0.014)	0.013 (0.010-0.016)	0.016 (0.012-0.020)	0.018 (0.013-0.023)	0.020 (0.014-0.027)	0.022 (0.015-0.030)	0.024 (0.016-0.035)	0.026 (0.017-0.039)

For the worst-case perimeter ~~channel~~berm:

Q_{25} = CIA
= (0.7)(8.8 in/hr)(~~5.1~~6.52 Acres)
= ~~31.4~~40.16 cfs

Q_{100} = CIA
= (0.7)(11.1 in/hr)(~~5.1~~6.52 Acres)
= ~~39.6~~50.7 cfs

The Flowmaster software package was utilized to determine ~~the maximum flow capacity of the proposed perimeter channel. The full-flow capacity of the channel is 84.0 cfs as shown in the print out from the Flowmaster software. The selected channel configuration is much greater than necessary to convey the predicted stormwater flow rates; however, the oversized channel cross-section helps prevent excessive velocity and erosion.~~flow depth for each of the perimeter berms and the table below lists each berm, the contributing area, and the calculated 25-year flow depth.

Beck Landfill Perimter Berm Design Calculations

C= 0.7 Steep grassed slopes
i= 8.8 (in/hr) (25 yr return period)

BERM	CONTRIBUTING AREA (SF)	CONTRIBUTING AREA (AC)	PEAK FLOW (CFS)	FLOW DEPTH (FT)
1	137,456	3.16	19.44	1.1
2	129,787	2.98	18.35	1.1
3	99,459	2.28	14.06	1.0
4	206,752	4.75	29.24	1.3
5	102,102	2.34	14.44	1.0
6A	94,439	2.17	13.36	1.0
6B	110,462	2.54	15.62	1.0
7A	39,377	0.90	5.57	0.7
7B	51,131	1.17	7.23	0.8
7C	27,391	0.63	3.87	0.6
8	283,991	6.52	40.16	1.4
9	38,656	0.89	5.47	0.7
10A	122,091	2.80	17.27	1.0
10B	93,610	2.15	13.24	0.9

Notes: 1) Flow depths calculated using FlowMaster Hydraulic Calculator
2) Peak flow calculated using Rational Method with factors shown in the tab

Worst-Case Perimeter Berm

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.025
Channel Slope	0.020 ft/ft
Left Side Slope	2.000 H:V
Right Side Slope	4.000 H:V
Discharge	40.16 cfs
Results	
Normal Depth	1.4 ft
Flow Area	6.2 ft²
Wetted Perimeter	9.1 ft
Hydraulic Radius	0.7 ft
Top Width	8.62 ft
Critical Depth	1.6 ft
Critical Slope	0.011 ft/ft
Velocity	6.49 ft/s
Velocity Head	0.65 ft
Specific Energy	2.09 ft
Froude Number	1.349
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	1.4 ft
Critical Depth	1.6 ft
Channel Slope	0.020 ft/ft
Critical Slope	0.011 ft/ft

DETENTION POND ANALYSIS

The rainfall depth, duration, and frequency relationships for the storm event for the facility was taken from the 2018 NOAA Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 11, Version 2.0: Texas. Return periods of 25 and 100 years and a duration of 24 hours was used for the design storm. The synthetic rainfall distribution is the NRCS 24-hour Type Ill storm. The rainfall data for the facility located in Guadalupe County, Texas is shown on page C1-B-7. The details for the detention pond are shown on Figure C3-1 and the pond outlet design and elevation-stage-storage tables are shown on Page C1-B-9.

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: ~~September 2022~~Revised January 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

The current FEMA map panels for the area around the landfill property are numbers 48187C0210F & 48029C0295F, which were revised in 2007 and 2010, respectively. At the time the model for these panels was created, the Beck Landfill was permitted to be filled to its final grades, but not yet constructed to an extent where the entire footprint was above the calculated 100-year water surface. FEMA modeled this permitted future condition by placing blocked obstructions on the cross-sections that traverse the landfill footprint, so that the model accounted for the authorized final condition of the landfill. FEMA then extended the floodplain across the portions of the landfill that had not yet been constructed above the 100-year water surface elevations.

To prevent the wash-out of waste by a flood event, the entire landfill footprint is encompassed by a compacted clay berm, which extends above the current 100-year flood elevation. As part of the amendment application, Beck Landfill is proposing to extend the berm 10 feet vertically to provide additional freeboard above the 100-year event. The entire footprint of the landfill and perimeter berm is currently constructed above the 100-year water surface and Beck Landfill has submitted a LOMR application to the City of Schertz and FEMA to revise the affected panels to accurately reflect the lateral extents of the floodplain. The LOMR application has updated cross-sections affected by the landfill with current topography and re-delineated the extents of the floodplain. The floodway shown on these panels was not revised since the new topography did not affect the areas shown as floodway. The LOMR application maintains the hydrologic flow values included in the effective FEMA model.

The City of Schertz has approved the LOMR application and a copy of their concurrence is included in this section. The LOMR has been submitted to FEMA and has been assigned Case No. 22-06-2567P. A complete copy of the LOMR application is included in Appendix C2-A.

Stormwater Detention and Sedimentation Pond

The proposed stormwater pond for the landfill is within the 100-year floodplain. The pond will be excavated below grade and include above grade compacted soil berms to provide additional volume. The purpose of the pond is to provide detention and sedimentation capacity for the landfill. The pond will be constructed at the same location as the existing stormwater pond and the proposed soil berms will be tied into the existing landfill perimeter berm to minimize the encroachment on the floodplain. In order to offset the loss of flow area in the floodplain from the pond berm, the area south of the new pond is proposed to be excavated to enhance flow through Cibolo Creek. A no-rise certification for the proposed pond was submitted to the City of Schertz for review and a copy of the submittal is included in Appendix C2-B. Based on the modeling in the no-rise certification, there is no increase in the calculated

water surface elevation of the floodplain from the pond construction, since the areas along the creek will be excavated to completely offset any effects of the new pond.

The City of Schertz approved the no-rise certification for the pond construction on October 20, 2022.

NORTH

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0220F

FIRM

FLOOD INSURANCE RATE MAP

GUADALUPE COUNTY, TEXAS

AND INCORPORATED AREAS

PANEL 220 OF 480

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

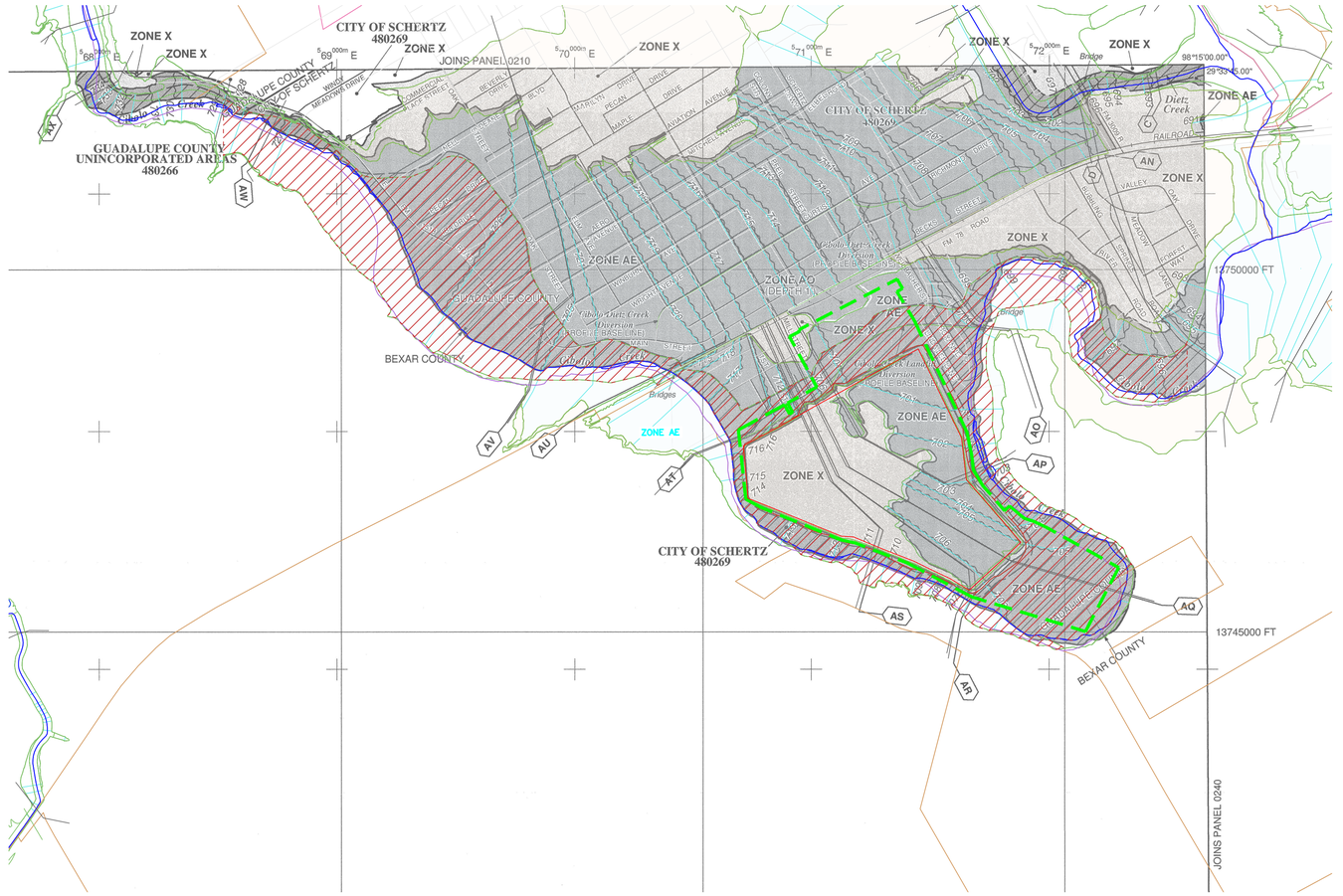
COMMUNITY	NUMBER	PANEL	SUFFIX
GUADALUPE COUNTY	480266	0220	F
SCHERTZ, CITY OF	480269	0220	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
48187C0220F

EFFECTIVE DATE
NOVEMBER 2, 2007

Federal Emergency Management Agency



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referred to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- ^{4275000m}N — 1000-meter Universal Transverse Mercator grid ticks, zone 14
- 6000000 FT — 5000-foot grid values: Texas State Plane coordinate system, south central zone (FIPSZONE 4204), Lambert Conformal Conic
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 2, 2007
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

LEGEND

- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY

REFERENCE

AERIAL IMAGERY PROVIDER: GOOGLE EARTH; DATE OF PHOTOGRAPHY: 11/22/2019.

ELEVATION CONTOURS: STRATEGIC MAPPING PROGRAM (STRATMAP) CENTRAL TEXAS LIDAR, 2017-01-01 (DATA COLLECTION PERIOD: 01/28/201/ THROUGH 03/22/201/).

SCALE IN FEET

0 1000 2000

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
1-2-2023

REVISION RECORD		
NO	DATE	DESCRIPTION
1	12-20-2022	TECHNICAL ADJ 1

CEC
Texas Registered Engineering Firm F-98
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

BECK LANDFILL EXPANSION
600 FM 78, SCHERTZ, TEXAS 78154
GUADALUPE COUNTY, TEXAS

FLOOD INSURANCE RATE MAP (FIRM)
48187C0220F

DATE:	12/21/2022
DRAWN BY:	AGT
DWG SCALE:	1" = 1000'
CHECKED BY:	JCM
PROJECT NO:	311-653.SITE
APPROVED BY:	AWM

DRAWING NO.: **C2-1**

SHEET C2-1 OF C2-1

P:\310-000\311-653\1-CAD\[dwg]\CVR\131653-CVR1-C2-1 Effective FIRMette.dwg[3] LS(12/22/2022 - amehevec) - LP: 12/23/2022 12:15 AM

NORTH

REFERENCE

DATUM: TX83-SCF: NAD83 Texas State Planes, South Central Zone, US Foot

ELEVATION CONTOURS: STRATEGIC MAPPING PROGRAM (STRATMAP) CENTRAL TEXAS LIDAR, 2017-01-01 (DATA COLLECTION PERIOD: 01/28/201/ THROUGH 03/22/201/).

FLOODPLAIN DATA: FEMA NATIONAL FLOOD HAZARD LAYER (NFHL), 2021-08-18, PUBLICLY AVAILABLE GIS.

THE PORTION OF THE STUDY AREA WITHIN THE UNINCORPORATED PORTION OF BEXAR COUNTY USES NOAA ATLAS-14 RAINFALL DATA. THE PORTION WITHIN THE CITY OF SCHERTZ USES THE EFFECTIVE FEMA MODEL RAINFALL DATA.

LEGEND

- EXISTING CREEK CENTERLINE
- EFFECTIVE 1% ANNUAL CHANCE FLOODPLAIN (ZONE AE)
- EFFECTIVE 1% ANNUAL CHANCE FLOODWAY
- EFFECTIVE ZONE X
- 1% ANNUAL CHANCE FLOODPLAIN BOUNDARY
- 0.2% ANNUAL CHANCE FLOODPLAIN BOUNDARY
- 1% ANNUAL CHANCE FLOODWAY
- CROSS-SECTION LINE FROM CURRENT STUDY
- CROSS-SECTION LINE FROM EFFECTIVE STUDY

SCALE IN FEET
0 300 600
ONE INCH EQUALS 300 FEET

LIMITS OF STUDY
TIE-IN LOCATION

BRIDGE AT PECAN GROVE DRIVE

RAILROAD BRIDGE
FM 78 BRIDGE

LIMITS OF STUDY
TIE-IN LOCATION

433181 WSE: 700.20
433408 WSE: 700.34
433939 WSE: 700.59
433740 WSE: 700.47
434453 WSE: 701.08
435043 WSE: 702.40
435810 WSE: 703.05
436536 WSE: 704.27
437265 WSE: 705.03
437996 WSE: 705.21 (SCHERTZ) WSE: 708.08 (BEXAR COUNTY)
438740 WSE: 705.30 (SCHERTZ) WSE: 708.17 (BEXAR COUNTY)
439471 WSE: 705.51
440762 WSE: 705.81
441476 WSE: 708.12
442214 WSE: 709.72
442891 WSE: 711.58
443555 WSE: 712.24
444240 WSE: 712.59
444777 WSE: 714.34
445233 WSE: 715.46
445537 WSE: 716.47
446037 WSE: 716.14
446236 WSE: 716.12

BEXAR COUNTY

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED PROFESSIONAL ENGINEER
12-21-2022

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-98
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

BECK LANDFILL EXPANSION
600 FM 78, SCHERTZ, TEXAS 78154
GUADALUPE COUNTY, TEXAS

TOPOGRAPHIC WORK MAP

DATE:	12/22/2022
DWG SCALE:	1" = 300'
PROJECT NO:	311-653.SITE
DRAWN BY:	AGT
CHECKED BY:	JCM
APPROVED BY:	AWM

DRAWING NO.: C2-2

SHEET 2 OF 4

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

City of Schertz

Floodplain Permit

Permit PRGR202202064

Date Issued: October 20, 2022 **Expires:** April 18, 2023

Project Address: 550 FM 78;

Subdivision:

Lot # **Block #**

Owner Information:

Contractor:

Proposed Use: **Not Applicable**

Description of Work:

- Floodplain:
- Clearing and Grading: Disturbing Soil (Greater than 1/10th of an Acre)

Note: Permit is for construction of new detention basin for landfill.

Conditions:

Issued By:
Engineering Department

Kathy Woodlee
City Engineer
(210) 619-1823

Permits are non-transferable and shall be displayed on site at all times.

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D
WASTE MANAGEMENT UNIT 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 January 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

1-2-2023

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TABLES AND FIGURES

1 WASTE MANAGEMENT UNIT DESIGN

30 TAC §330.63(d)

The Beck Landfill, located at 550 FM 78 in Schertz, Texas Guadalupe County, is an existing Type IV Solid Waste Disposal Facility which accepts brush, construction, or demolition waste, and/or rubbish in accordance with applicable State and Federal regulations. The proposed Beck Landfill facility boundary encompasses about 258 acres. The landfill facility is accessed from FM 78 through an entrance road. A gatehouse and scales are located within the facility boundary along with a wood waste processing area and recyclables collection area.

The landfill footprint will cover approximately 154.6 acres and have a disposal capacity of approximately~~-~~ 26.4 million cubic yards which will provide about 23 years of site life. The landfill method will be below-grade fill with 3H:1V liner sidewall slopes and aerial fill with 4H:1V final cover side slopes, with a maximum six percent final cover top slope. The drainage system will be designed to meet or exceed TCEQ ~~and EPA~~ requirements for runon and runoff. The landfill liner, final cover, gas monitoring, and groundwater monitoring systems will be designed to meet the ~~Subtitle D and/or~~ TCEQ requirements~~, whichever are more stringent~~.

The following table provides a summary of the proposed permit conditions:

Table D-1	
	Proposed Permit No. 1848A
Permitted Area (acres)	25~~7~~6.9
Waste Disposal Area (acres)	154.6
Total Capacity (cy)	26,417,117
Total Remaining Capacity (cy)	16,259,957*
Remaining Site Life (years)	23
Maximum Elevation of Final Cover (msl)	889
Minimum Elevation of Landfill Excavation (ft-msl)	~~Varies (Approx.~~ 640 MSL~~)~~

* Remaining capacity as of June 16, 2021.

2 STORAGE AND TRANSFER UNITS

30 TAC §330.63(d)(1)(A)~~ and (8)~~

The storage and transfer units will be designed for the rapid processing and minimum detention of solid waste at the facility and will be managed to prevent nuisances and fire hazards. The design of the storage and transfer units will be sufficient to control and contain a worst-case spill or release from the units and the unenclosed areas associated with the units, and will account for precipitation from the 25-year, 24-hour rainfall event. The storage and transfer units will include the wood waste processing area and recyclable material recovery area. All storage and processing areas will be located outside of the 100-year floodplain. Material will only be held in these areas for a maximum of 180 days.

2.1 Wood Waste Processing Area

The wood waste processing area will be located within the landfill footprint and will process incoming yard trimmings, clean wood materials and vegetative materials, including trees and brush, into wood chips and mulch. The wood chips and mulch will only be used on-site or taken offsite for further processing or use. The wood chips and mulch will be stored in small piles and will be managed to prevent fire, safety, or health hazards in accordance with 30 TAC§330.209(a). The wood waste processing area will not be larger than approximately 150 feet by 150 feet.

2.2 Recyclable Material Recovery Area

The recyclable material recovery area will be located within the landfill footprint and will process incoming metal, concrete, plastic, and other recyclable materials. The recycled materials will be sent offsite for processing. The materials will be stored in roll-offs or small piles and will be managed to prevent fire, safety, or health hazards in accordance with 30 TAC§330.209(a). The recyclable material area will not be larger than approximately 150 feet by 150 feet. The recyclable material area will be located outside of the 100-year floodplain boundary.

3 LANDFILL UNITS

30 TAC §330.63(d)(4)

The landfill unit design includes all weather operation, landfilling methods, landfill design parameters, site life projection, landfill cross sections, and the liner and final cover quality control plans.

3.1 All Weather Operation (30 TAC §330.63(d)(4)(A))

The landfill access roads will be constructed of crushed stone, gravel, concrete rubble, masonry rubble, wood chips, or other similar materials to provide access to the disposal area during all weather conditions. To enhance operating efficiency during wet weather, a disposal area close to the all weather roads may be reserved for wet weather operations. The wet weather area will move as operations progress.

Site personnel will maintain the access roads for all weather access. Stockpiles of crushed stone, gravel, concrete rubble, masonry rubble, wood chips or other similar material will be available for use in maintaining passable access roads. Grading equipment or other appropriate equipment will be used as necessary to control or remove mud from the access roads and the entrance road.

Tracking of mud onto public roads will be minimized by the all weather surfaces of the access roads and the entrance road. A minimum of 900 feet of paved entrance and access road will be maintained between the entrance and the closest waste disposal area to provide mud control for waste hauling vehicles prior to exiting the site and returning to public roads. Additional mud control will be provided by speed bumps along the access route. A street sweeper will also be used, as necessary, to clean internal paved roads. The street sweeper will not normally be used on public roads. In the event the sweeper is required to clean the public road, a traffic control plan approved by TxDOT will be developed and the approved traffic controls will be maintained during the entire period when the sweeper is active on the roadway.

3.2 Landfilling Methods (30 TAC §330.63(d)(4)(B))

The development method for the landfill will be a combination of area-excavation fill followed by aerial fill to the proposed landfill completion height. Final cover placement will occur after areas have been taken to final grade and no further waste placement is planned for that area. Completed areas will be closed according to the closure plan provided in Part III, Attachment H - Closure Plan.

3.3 Landfill Design Parameters (30 TAC §330.63{d)(4)(C))

The 25~~7~~6.9 permitted acres will include 154.6 acres for waste disposal and 110.5 acres of buffer and other non-fill areas. The elevation of deepest excavation will be approximately 640 feet msl and the maximum elevation of final cover will be 889 feet msl. The maximum elevation of disposed waste will be 887 feet msl

Excavation sideslopes will not exceed 3H:1V and waste sideslopes will not exceed 4H:1V. Final cover top slopes will have a six percent slope, Excavation and final completion plans are presented in Attachment D1.

3.4 Site Life Projection (30 TAC §330.63(d)(4)(D))

The total volume available for waste disposal calculations and assumptions for the waste volume and site life estimate are included in Attachment D4 - Site Life.

3.5 Landfill Cross Sections (30 TAC §330.63(d)(4)(E) and (F))

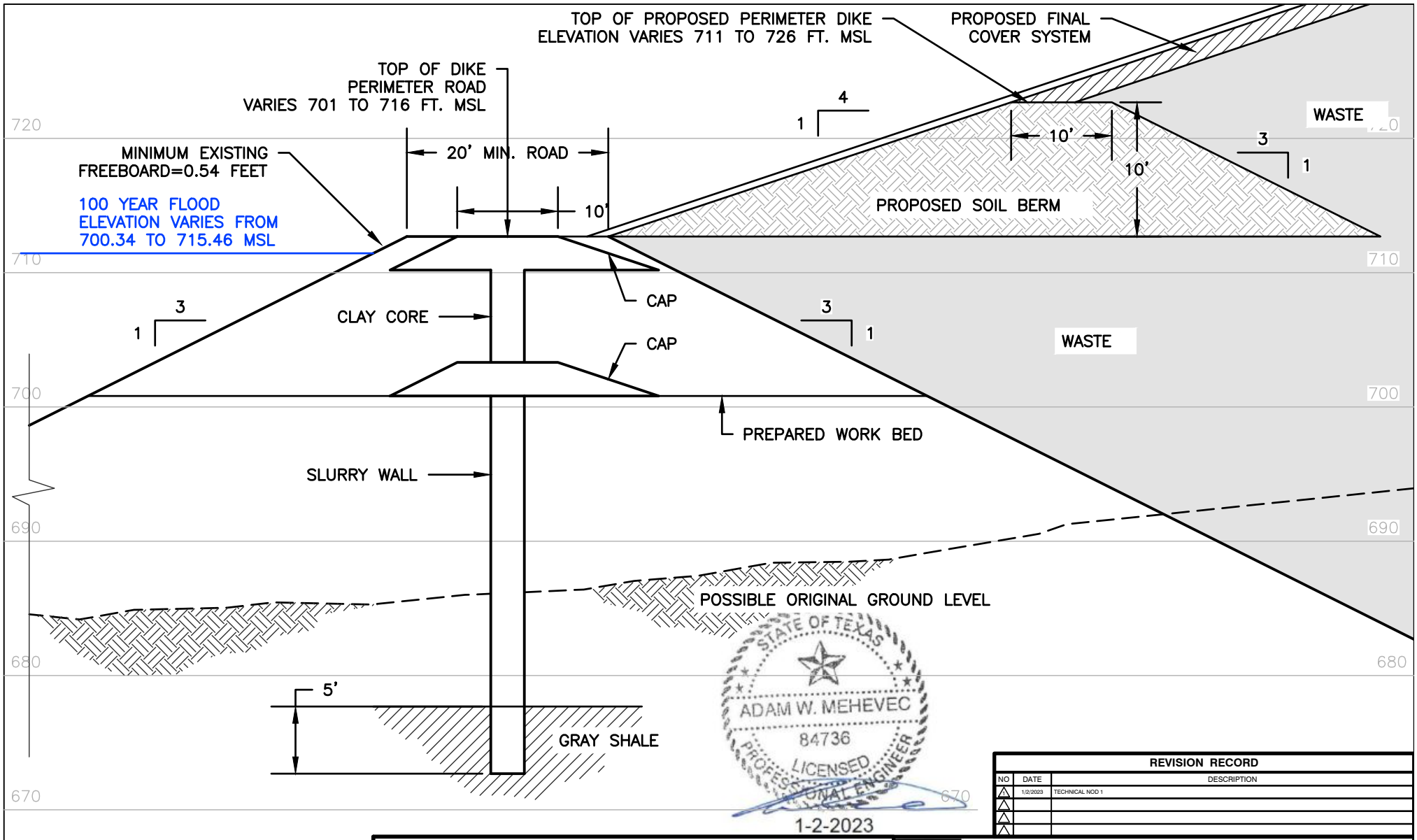
Cross sections of the landfill unit are provided in Attachment D2 - Cross Sections. The section locations were selected to represent the conditions across the entire site. These sections show the top of the levee, top of the proposed fill (top of the final cover), maximum elevation of the proposed fill, top of waste, existing ground, bottom of the excavation, side slopes of excavations, gas probes, groundwater monitoring wells, and the initial and static levels of any water encountered, Soil borings, monitoring wells, and gas monitoring probes near the sections have been projected onto the sections.

3.6 Liner Quality Control Plan (30 TAC §330.63(d)(4)(G))

The quality control plan for the liner system is provided in Attachment D7 - Liner Quality Control Plan. The Beck landfill utilizes an in-situ clay liner, but can construct a compacted clay liner system if the encountered native soils are not satisfactory. Details of the liner system are provided in Attachment D7 – Liner Quality Control Plan.

3.7 Final Cover Quality Control Plan (30 TAC §330.457)

The quality control plan for the final cover system is provided in Attachment D8 - Final Cover Quality Control Plan. Details of the final cover system are provided in Attachment D3.



NOTE: MONITOR WELLS ARE INSTALLED OUTSIDE OF THE SLURRY WALL AT THE SHOWN LOCATIONS AND A PIEZOMETER IS INSTALLED INSIDE THE SLURRY WALL AT THESE SAME LOCATIONS.

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
1-2-2023

REVISION RECORD		
NO	DATE	DESCRIPTION
1	1/2/2023	TECHNICAL NOD 1

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BECK COMPANIES

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

TYPICAL EXISTING PERIMETER DIKE DETAIL

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	D-2
DATE:	08/2022	DWG SCALE:	1" = 500'	PROJECT NO:	311-653		

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D1
SITE LAYOUT

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 January 2023

Prepared by:

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ADAM W. MEHEVEC
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PROFESSIONAL ENGINEER
1-2-2023

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NORTH

REVISION RECORD		
NO	DATE	DESCRIPTION
1	1/2/2023	TECHNICAL NOD 1

SCALE IN FEET

0 400 800

STATE OF TEXAS
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PROFESSIONAL ENGINEER
1-2-2023

FM 78

SITE ENTRANCE

GATE

EXISTING READY-MIX OPERATION

EXISTING POND

EXISTING POND

SCALE HOUSE/OFFICE

PARKING AND ROLL-OFF STORAGE

WHEELWASH

GATE

BENCHMARK
N 13,748,565.11
E 2,202,086.12
EL. 693.68

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

CIBOLO CREEK

725 750 775 800 825 850 875

MAXIMUM FINAL COVER HEIGHT: 890 FEET MSL

PERIMETER ROAD

PERFORM FLOODPLAIN EXCAVATION

DETENTION POND

D2 | D2 | D1

TYPICAL PERIMETER BERM-SEE FIGURE D-2

PERIMETER BERM

STORMWATER BENCH @ 2% RUNNING SLOPE, TYP

4:1 TYP

TOP OF FINAL COVER

6%

STORMWATER DOWN CHUTE, TYP

PERIMETER BERM

STORMWATER BENCH @ 2% RUNNING SLOPE, TYP

GRADING DETAIL

NOTES

1. ALL AREAS WITHIN THE LANDFILL FOOTPRINT THAT DO NOT HAVE FINAL COVER MAY BE USED FOR SOIL STOCKPILES, BRUSH STORAGE AND GRINDING, OR VEHICLE PARKING AND MAINTENANCE.
2. ALL MONITOR WELLS AND GAS PROBES HAVE BEEN PREVIOUSLY INSTALLED. MONITOR WELL D IS BEING RELOCATED AND WILL BECOME MONITOR WELL E.
3. INTERIOR ACCESS AND PERIMETER ROADS SHALL BE SURFACED WITH CRUSHED STONE, GRAVEL, RECYCLED CONCRETE, OR EQUIVALENT ALL-WEATHER SURFACE.
4. SITE PERIMETER FENCING OR NATURAL BARRIERS WILL BE USED ALONG THE ENTIRE PERMIT BOUNDARY.
5. SOLID WASTE STORAGE AND PROCESSING AREAS WILL BE PLACED OUTSIDE OF THE 100-YEAR FLOODPLAIN OR WILL BE PROTECTED WITH A LEVEE THAT EXTENDS A MINIMUM OF ONE FOOT ABOVE THE FLOODPLAIN ELEVATION.
6. THERE ARE NO NATURAL WINDBREAKS, SUCH AS GREENBELTS, OR SCREENING PROPOSED FOR THE FACILITY.

REFERENCE

TOPOGRAPHIC INFORMATION FROM AERIAL SURVEY BY FIRMATEK: (SEPTEMBER 15, 2021) AUGMENTED WITH A PORTION OF THE EXISTING GROUND SURFACE PREPARED BY CEC.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- 100 YEAR FLOODPLAIN BASED ON LOMR APPLICATION
- LANDFILL CONTOURS ARE TOP OF FINAL COVER.
- FENCE (BARBED-WIRE OR CHAIN LINK)

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BECK LANDFILL
BEXAR COUNTY, TEXAS

SITE LAYOUT PLAN

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	08/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653

FIGURE NO.: **D1.1**

NORTH

SCALE IN FEET
0 400 800

REVISION RECORD		
NO	DATE	DESCRIPTION
1	1/2/23	TECHNICAL NOD 1
2		
3		
4		
5		

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1-2-2022

SITE ENTRANCE
SCALE HOUSE/OFFICE
EXISTING POND
EXISTING POND
EXISTING POND
BENCHMARK
N 13,748,565.11
E 2,202,086.12
EL. 693.68

LIMITS OF EXCAVATION: EXCAVATION GRADES VARY BASED ON THE ENCOUNTERED SOIL CONDITIONS. APPROXIMATE AVERAGE BOTTOM ELEVATION IS 650' MSL.

PERIMETER ROAD
PERIMETER ROAD

REFERENCE

TOPOGRAPHIC INFORMATION FROM AERIAL SURVEY BY FIRMATEK: (SEPTEMBER 15, 2021) AUGMENTED WITH A PORTION OF THE EXISTING GROUND SURFACE PREPARED BY CEC.

NOTES

1. EXCAVATION EMBANKMENTS ARE GRADED AT A 3:1 SLOPE.
2. ALL CELLS HAVE BEEN PREVIOUSLY EXCAVATED AND PARTIALLY FILLED WITH WASTE.
3. CELL DESIGNATIONS SHOWN ARE FROM CURRENT PERMIT AND REPRESENT THE GENERAL SEQUENCE IN WHICH THE CELLS WERE DEVELOPED.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL—TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY

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EXCAVATION PLAN

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	08/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653

FIGURE NO.: **D1.2**

NORTH

SITE ENTRANCE

EXISTING READY-MIX OPERATION

SCALE HOUSE/OFFICE

PARKING AND ROLL-OFF STORAGE

WHEELWASH

GATE

EXISTING POND

EXISTING POND BENCHMARK
N 13,748,565.11
E 2,202,086.12
EL. 693.68

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

EXISTING SOIL STOCKPILES

PERIMETER ROAD

825
800
775
750
725

PERFORM FLOODPLAIN EXCAVATION

EXISTING POND

PERIMETER ROAD

SCALE IN FEET
0 400 800

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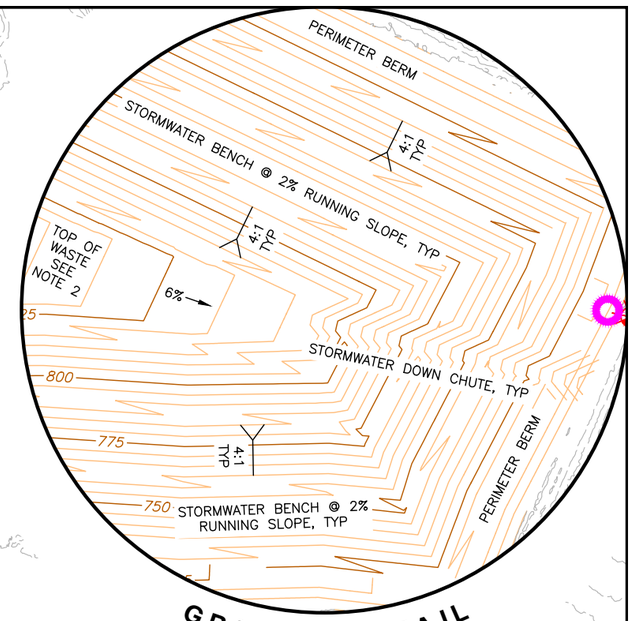
1-2-2022



GRADING DETAIL

NOTES

1. ALL AREAS WITHIN THE LANDFILL FOOTPRINT THAT DO NOT HAVE FINAL COVER MAY BE USED FOR SOIL STOCKPILES, BRUSH STORAGE AND GRINDING, OR VEHICLE PARKING AND MAINTENANCE.
2. FILL SOUTHERN AREAS TO 1848A GRADES AND INSTALL INTERMEDIATE COVER.
3. INTERIM SLOPE FACE SHALL BE GRADED AT 3:1 MAXIMUM SLOPE.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL-TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- BRUSH/ROLL-OFF STORAGE AREA
- MAINTENANCE AREA

REFERENCE

TOPOGRAPHIC INFORMATION FROM AERIAL SURVEY BY FIRMATEK: (SEPTEMBER 15, 2021) AUGMENTED WITH A PORTION OF THE EXISTING GROUND SURFACE PREPARED BY CEC.

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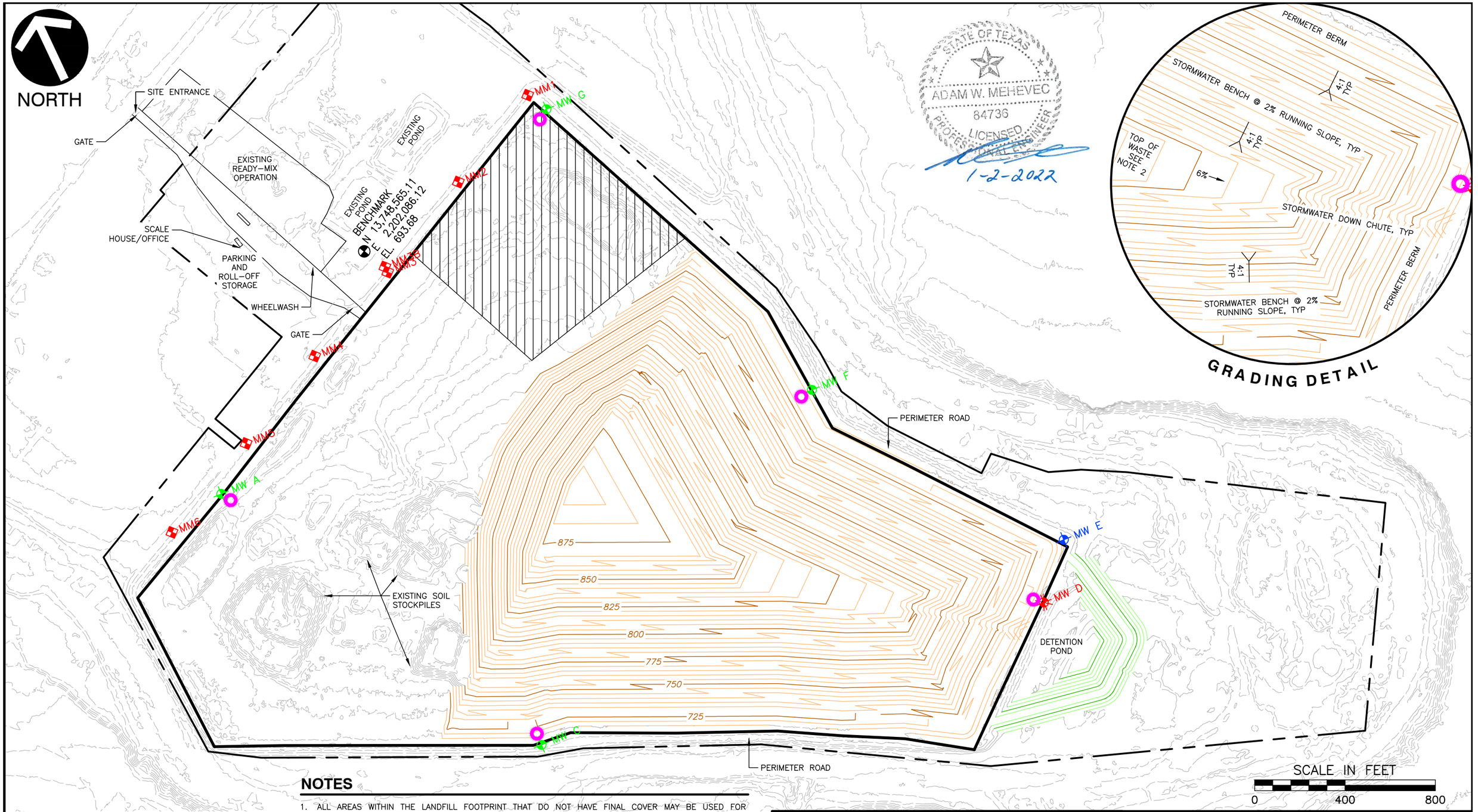
BEXAR COUNTY, TEXAS

SEQUENCE PLAN (SEQUENCE 1)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	08/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653

FIGURE NO.: **D1.3**



GRADING DETAIL

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
1-2-2022

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NOTES

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2. CONTINUE TO FILL AREAS TO 1848A GRADES AND INSTALL INTERMEDIATE COVER.
3. INTERIM SLOPE FACE SHALL BE GRADED AT 3:1 MAXIMUM SLOPE.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL–TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- BRUSH/ROLL–OFF STORAGE AREA
- MAINTENANCE AREA

REVISION RECORD		
NO	DATE	DESCRIPTION
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2		
3		
4		

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SEQUENCE PLAN (SEQUENCE 2)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM
DATE:	08/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653

FIGURE NO.: **D1.4**

NORTH

SITE ENTRANCE

EXISTING READY-MIX OPERATION

SCALE HOUSE/OFFICE

PARKING AND ROLL-OFF STORAGE

WHEELWASH

GATE

EXISTING POND

EXISTING POND BENCHMARK
N 13,748,565.11
E 2,202,086.12
EL. 693.68

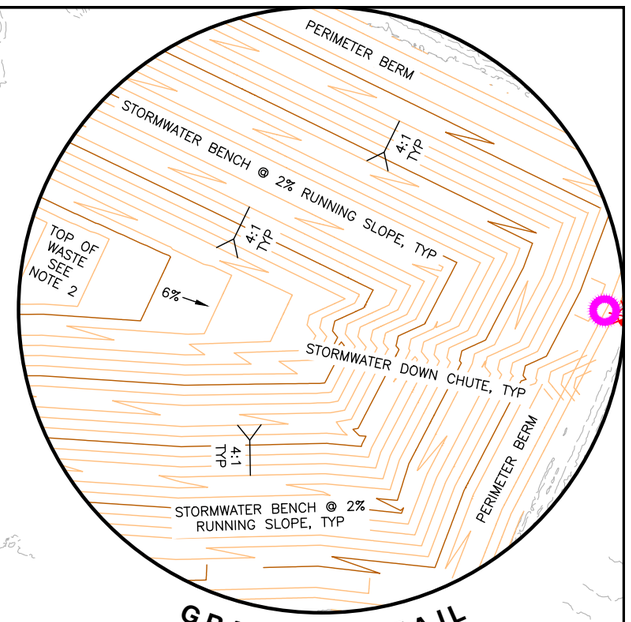
MW-1 MW-G MW-2 MW-3 MW-4 MW-5 MW-6 MW-A MW-F MW-E MW-D MW-C

725 750 775 800 825 850 875

PERIMETER ROAD

DETENTION POND

PERIMETER ROAD



GRADING DETAIL

STATE OF TEXAS
ADAM W. MEHEVEC
84736
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PROFESSIONAL ENGINEER
1-2-2022

SCALE IN FEET
0 400 800

REFERENCE

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REVISION RECORD		
NO	DATE	DESCRIPTION
1	1/2/23	TECHNICAL NOD 1
2		
3		
4		

NOTES

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2. CONTINUE TO FILL AREAS TO 1848A GRADES AND INSTALL INTERMEDIATE COVER.
3. INTERIM SLOPE FACE SHALL BE GRADED AT 3:1 MAXIMUM SLOPE.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL-TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- BRUSH/ROLL-OFF STORAGE AREA AND MAINTENANCE AREA

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Texas Registered Engineering Firm F-38

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BECK LANDFILL
BEXAR COUNTY, TEXAS

SEQUENCE PLAN (SEQUENCE 3)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	D1.5
DATE:	08/2022	DWG SCALE:	1" = 400'	PROJECT NO:	311-653		

NORTH

SITE ENTRANCE

EXISTING READY-MIX OPERATION

EXISTING POND

EXISTING POND BENCHMARK
N 13,748,565.11
E 2,202,086.12
EL. 693.68

SCALE HOUSE/OFFICE

PARKING AND ROLL-OFF STORAGE

WHEELWASH

GATE

MM1 MM2 MM3 MM4 MM5 MM6

MW G MW F MW E MW D MW C MW A

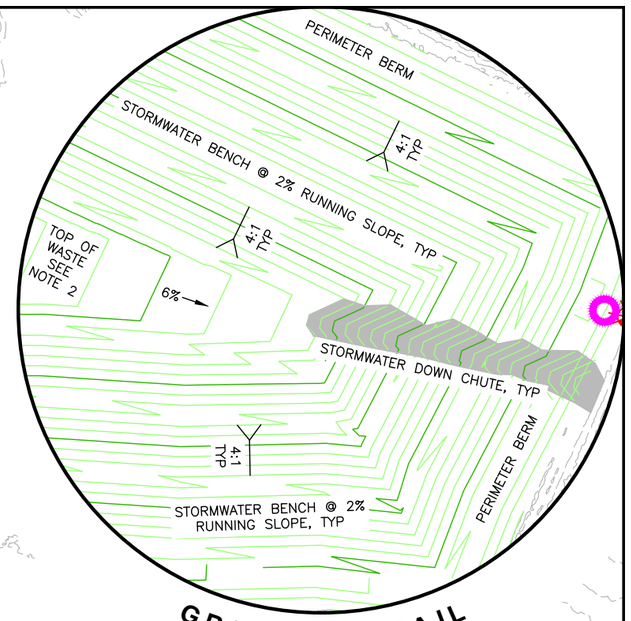
725 750 775 800 825 850 875

MAXIMUM FINAL COVER HEIGHT: 890 FEET MSL

PERIMETER ROAD

DETENTION POND

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
1-2-2022



GRADING DETAIL

SCALE IN FEET
0 400 800

NOTES

1. ALL AREAS WITHIN THE LANDFILL FOOTPRINT THAT DO NOT HAVE FINAL COVER MAY BE USED FOR SOIL STOCKPILES, BRUSH STORAGE AND GRINDING, OR VEHICLE PARKING AND MAINTENANCE.
2. CONTINUE TO FILL AREAS TO 1848 A GRADES AND INSTALL INTERMEDIATE COVER.
3. INTERIM SLOPE FACE SHALL BE GRADED AT 3:1 MAXIMUM SLOPE.

LEGEND

- EXISTING MONITOR WELL
- EXISTING GAS PROBE
- EXISTING PIEZOMETER
- MONITOR WELL-TO BE REMOVED
- PROPOSED MONITOR WELL
- LANDFILL PERMIT BOUNDARY
- LANDFILL FOOTPRINT BOUNDARY
- CONSTRUCT FINAL LAND FILL COVER: ±155 ACRES

REFERENCE

TOPOGRAPHIC INFORMATION FROM AERIAL SURVEY BY FIRMATEK: (SEPTEMBER 15, 2021) AUGMENTED WITH A PORTION OF THE EXISTING GROUND SURFACE PREPARED BY CEC.

REVISION RECORD

NO	DATE	DESCRIPTION
1	1/2/23	TECHNICAL NOD 1

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Texas Registered Engineering Firm F-38

NIDO, LTD
BECK LANDFILL
BEXAR COUNTY, TEXAS

SEQUENCE PLAN (SEQUENCE 4)

DRAWN BY:	MFV	CHECKED BY:	AWM	APPROVED BY:	AWM	FIGURE NO.:	D1.6
DATE:	08/2022	DWG SCALE:	1" = 400'	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
Revision 1 ~~December~~January 2023~~2~~

Prepared by:

Civil & Environmental Consultants, Inc.

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Austin, Texas 78746
(512) 329-0006

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Appendix D5-C

INTRODUCTION

This Geotechnical Design Report present the results of the geotechnical engineering analysis performed in connection with the Permit Amendment Application for vertical expansion for the Beck Landfill located in Guadalupe County, Texas. The entire footprint of the landfill has been excavated and is currently partially filled with waste. The Beck Landfill is a Type IV landfill that accepts construction and demolition debris and is owned and operated by NIDO, Ltd. and is regulated by Texas Commission on Environmental Quality (TCEQ) under MSW Permit No. 1848.

The geotechnical characteristics of the site are summarized herein and are based on the information from previous geotechnical investigations of the site performed by Snowden, Inc. (Last Revised 1985) and Terracon (October, 2020).

Engineering analyses performed as part of this Geotechnical Design Report include the following:

- an analysis for settlement;
- stability of final filled landfill.

These calculations, along with the geotechnical properties of the subsurface described in Section 2 of this report, demonstrate that the soils at the site location are suitable for the intended landfill construction purposes. Descriptions of the engineering properties of the subsurface and the analyses performed are presented in the following sections. Calculations performed as part of the engineering evaluation are included in the attached appendices of this report and are summarized in the following sections.

This report supplements other reports and analyses included in the Permit Amendment Application. The analyses in this report are intended to address specific requirements of the Texas Commission on Environmental Quality (TCEQ) as they relate to municipal solid waste landfills. This report is intended to be considered as an integral part of the Permit Amendment Application.

1. GEOTECHNICAL TESTING

This Geotechnical Design Report is based on the field explorations described in Attachment E — Geology Report. All laboratory testing procedures followed the commonly accepted ASTM testing standards, as follows:

- Tests to determine Atterberg limits were performed in accordance with ASTM D 4318,
- Gradation testing and percent passing the number 200 sieve tests were performed in accordance with ASTM C 136 and ASTM D1140, respectively.
- Tests to determine moisture content were performed in accordance with ASTM D 2216.
- Permeability tests using tap water as the permeant were performed in accordance with ASTM D 5084.

These test results were used to classify the soils according to the Unified Soil Classification System (USCS) and to evaluate the engineering properties of the soils.

2. SUBSURFACE MATERIALS

The stratigraphy beneath the proposed Beck Landfill was characterized using information from the site exploration for the site and is presented in Attachment E — Geology Report.

Two strata have been identified by the current and previous subsurface explorations of the site and are described as follows:

- Unit I is composed primarily of alluvial silty clays, sands, and gravels deposited by Cibolo Creek encountered from the surface to a depth of up to 25 feet below ground surface (bgs).

- Unit II is composed primarily of low permeability clays and shales. Unit II is part of the Navarro Formation.

Table D5-1

Beck Landfill

Generalized Site Stratigraphy

Geologic Unit	Lithology	Average Depth to Top of Unit (ft)
Unit I	Silty Clay, Sand, and Gravel	Surface
Unit II	Clay and Shale	10-25

The Beck Landfill is wholly situated within the fluviatile terrace deposits (Qt) of the Pleistocene. This rock unit is comprised of gravel, sand, silt, and clay; adjacent to the Edwards Plateau, predominantly gravel, limestone, and chert; southeastward in vicinity of Tertiary rocks, increasing in amounts of sand, silt, and clay; contiguous terraces are separated by a solid line. The clay and shale of the Navarro and Taylor formations underlie the alluvial materials. The stratigraphy is variable within the Alluvial Deposit and somewhat variable in the Navarro and Taylor Deposits due to historic erosion of Cibolo Creek.

The Navarro Shale was shown by the laboratory portion of the previous investigations to be relatively impermeable. The Navarro Group, consisting of the upper Kemp Formation and the lower Corsicana Formation, represent the youngest of the Cretaceous age deposits in the central Texas vicinity. Generally, the Navarro deposit could be described as a gray calcareous clay shale. At least two beds of the Navarro, are indicated by geologic sources, to contain limey sandstones and concretionary siltstones. Neither of these beds were encountered by the exploratory borings. The uppermost portion of the deposit has weathered to produce an expansive tan-gray clay. The depth of weathering, as indicated by the borings, was somewhat variable beneath this site. This variation is primarily due to the natural joint structure and development of gypsum type deposits within such joints. Areas for greater and/or lesser potential moisture migration are thus expressed

within the upper deposits. The determined values of permeability, however indicate all of the Navarro deposit, regardless of the state of weathering, to likely retain low permeabilities. The total thickness and position of the Navarro Group deposits could not be accurately determined by the exploratory borings performed.

2.1 Material Properties

The laboratory test results are included in Attachment E, - Geology Report. These test results were reviewed along with the boring logs to develop generalized soil properties for use in the analyses. The landfill excavation completely removed the Unit I material and was extended into the unweathered portion of Unit II.

2.2 Material Requirements

On-site soils are intended to be used for the construction of the infiltration layer and erosion layer components of the final cover system. Additionally, on-site soils will be required for operational cover. The bottom liner system utilized in-situ clay soils of Unit II and the entire liner system has been previously constructed.

The compacted final cover infiltration layer must be constructed from soils that can be compacted to form a low hydraulic conductivity barrier. The classification and hydraulic conductivity test results indicate that the clays excavated from the site will be satisfactory for use as compacted soil infiltration layer material. Classification and hydraulic conductivity test results for the compacted final cover infiltration layer will be verified prior to construction in accordance with Attachment D8 — Final Cover Quality Control Plan.

Erosion layer soils will not contain large rocks. Operational cover soils will not have been previously mixed with waste materials and erosion layer material will be capable of sustaining vegetation. The test results and boring logs indicate that any of the soil material excavated from

the site will be suitable for use as operational cover and that the surficial soils will be suitable for use as the upper layer of the final cover system erosion layer. Classification results for erosion layer soils will be verified prior to construction in accordance with Attachment D8 — Final Cover Quality Control Plan.

3 EARTHWORK

3.1 Excavation

All excavation has been completed at the site and all of the landfill cells are partially filled with waste.

3.2 General Fill

General fill will be required to construct access roads and perimeter berms for landfill operations. General fill material shall be placed in accordance with the Liner Quality Control Plan contained in Attachment D7.

4 CONSTRUCTION BELOW THE GROUNDWATER TABLE

All landfill disposal cells have been previously constructed and none of them were excavated below the groundwater table.

5 SETTLEMENT ANALYSIS

5.1 Subgrade Heave

Heave or rebound can occur in cohesive soils after the removal of overburden. Heave occurs relatively soon after excavating the overburden and is directly related to the depth of the excavation. The potential heave in the subgrade beneath the floor of the landfill is expected to be

minimal and should be uniform over the landfill floor. As such, any heave that may occur during and soon after excavation should not adversely affect the performance of the in-situ liner system.

5.2 Subgrade Settlement

Settlement may occur due to consolidation of cohesive soils from the weight of the landfill components (i.e., solid waste and operational cover, and final cover systems). However, since the landfill has ben previously excavated and does not have a leachate collection system, the expected minor degree of subgrade settlement will not affect the landfill's performance.

5.3 Solid Waste Settlement

Consolidation and decomposition can produce settlement within the solid waste. Primary consolidation results from stress increase and occurs soon after load application and secondary consolidation results from the decomposition of solid waste. Due to the length of time that it will take to construct and fill the landfill, most of the consolidation in the waste will have occurred prior to construction of the final cover system. Minor settlement that occurs after the construction of the final cover system will be corrected by the addition of erosion layer material in accordance with Attachment I — Post Closure Plan.

6 SLOPE STABILITY ANALYSIS

Slope stability analyses were performed on representative cross-sections of the landfill to evaluate the stability of the final waste slope and final cover slope, stability of excavated interior 3 Horizontal to 1 Vertical (3H:1V) side slopes prior to waste disposal, and stability of the perimeter berm under rapid drawdown conditions following a 100-year flood event. Table D5-2 summarizes the unit weights and strength parameters that were used for the stability analyses. The analyses use effective stress parameters. The unit weights and strength parameters for the in-situ soils were selected based on a review of the boring logs and historical laboratory and field test results, as well as prior CEC experience where applicable field data was not present. The unit weights and strength

parameters for the liner/cover material and solid waste were selected based on prior CEC experience and laboratory test values. Site specific strength parameters for the liner and cover geosynthetic materials will be verified prior to construction in accordance with Attachment D7 — Liner Quality Control Plan and Attachment D8 — Final Cover Quality Control Plan.

Table D5-2
Beck Landfill
Summary of Material Weight and Strength Properties

Material	Dry Unit Weight (pcf)	Effective Angle of Internal Friction φ' (deg.)	Effective Cohesion, c' (psf)
C&D Waste	60	35	0
Clay Subgrade	108	0	1,400
Shale Subgrade	118	27	0
Compacted Perimeter Berm	123	28	270
In-situ Clay Liner	123	28	270

Slide, a computer program developed to model the slope stability, was used to analyze the stability of the final waste slopes and final cover slopes, stability of excavated 3H:1V interior side slopes, and stability of the perimeter berm following rapid drawdown. The results of the stability analyses indicate that the proposed slopes are stable under the conditions analyzed. Table D5-3 summarizes the results of the static stability analyses and compares the calculated factor of safety to the recommended minimum factor of safety. Table D5-4 summarizes the results of the excavated 3H:1V interior side slope analyses, and Table D5-5 summarizes the results of the rapid drawdown analyses. The recommended minimum factors of safety were selected from the Corps of Engineers "Design and construction of Levees" manual (EM 1110-2-1913) or CEC's experience. The slope stability analyses are provided in Appendix D5-B.

The ~~interim, global, and~~ final waste slope stability, excavated 3H:1V slope stability and rapid

drawdown slope stability ~~was~~ were analyzed for two failure modes~~. The~~ to include circular arc failure surfaces and non-circular failure surfaces. ~~a~~Analysis were performed using properties of the solid waste, in-situ clay liner and supporting soils.

Table D5-3
Beck Landfill
Summary of Static Slope Stability Analyses

Cross Section	Failure Type	Minimum Factor of Safety	Allowable Factor of Safety
A	Circular	2.476	1.5
A	Non-Circular	2.34	1.5
B	Circular	2.43	1.5
B	Non-Circular	2.34	1.5
C	Circular	2.30	1.5
C	Non-Circular	2.232	1.5
D	Circular	2.464	1.5
D	Non-Circular	2.367	1.5

Table D5-4
Beck Landfill
Summary of 3H:1V Excavated Slope Stability Analyses

Cross Section	Failure Type	Minimum Factor of Safety	Allowable Factor of Safety
A	Circular	1.90	1.3
A	Non-Circular	1.82	1.3
B	Circular	1.88	1.3
B	Non-Circular	1.82	1.3
C	Circular	1.85	1.3
C	Non-Circular	1.76	1.3
D	Circular	1.78	1.3
D	Non-Circular	1.66	1.3

Table D5-5
Beck Landfill
Summary of Rapid Drawdown Slope Stability Analyses

Cross Section	Failure Type	Minimum Factor of Safety	Allowable Factor of Safety
A	Not Performed (1)	Not Applicable	1.5
B	Circular	1.59	1.5
B	Non-Circular	1.58	1.5
C	Circular	1.87	1.5
C	Non-Circular	1.86	1.5
D	Circular	2.61	1.5
D	Non-Circular	2.54	1.5

Notes
1. At Cross Section A the 100-year flood elevation is essentially the same elevation as the bottom of the perimeter berm. Therefore, at this location the perimeter berm would not be saturated, and a rapid drawdown analysis was not performed for Cross Section A

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

7 LINER CONSTRUCTION

The entire landfill footprint has been excavated and an in-situ liner from the unweathered portion of Unit II was used in all cells.

8 COVER CONSTRUCTION

8.1 Operational Cover

The operational cover should be constructed of soils that are free of waste and debris. Suitable cover soils should be available from on-site sources such as the proposed landfill excavations or on-site borrows. Requirements for the placement of operational cover are provided in Part IV — Site Operating Plan.

8.2 Final Cover

The final cover for the Beck Landfill has been designed in accordance with 30TAC§330.457(a)(2), since the landfill does not have a synthetic bottom liner system. The final cover consists of a minimum 18-inch re-compacted cohesive soil cover, exhibiting a minimum hydraulic conductivity of 1.0×10^{-5} cm/sec, overlain by a minimum 6-inch erosion layer consisting of earthen material that is capable of sustaining native plant growth.

The final cover plan and details are included in Attachment D3 - Construction Design Details.

The infiltration layer material must consist of relatively homogeneous cohesive materials that are free of debris, rocks greater than 1 inch in diameter, plant materials, frozen materials, foreign objects, and organic material. The infiltration layer should be constructed directly over the intermediate cover once the waste has reached final grades.

The erosion layer should consist of: (1) topsoil stockpiled during the excavation process, (2) on-site soil that has been modified to be capable of sustaining vegetation, or (3) an imported material suitable to sustain vegetation growth. This layer may be spread and placed in one lift over the compacter soil layer. After spreading, the layer may be rolled lightly to reduce future erosion, although not to the extent that compaction would inhibit plant growth.

8.3 Final Cover Testing and Documentation

CQA testing of the final cover system must be performed during construction. Final cover system requirements are outlined in Attachment D8 — Final Cover Quality Control Plan.

Appendix D5-A

Settlement Analysis

Appendix D5-B

Slope Stability Analyses

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: ~~September 2022~~Revised January 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)

List of Appendices

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. Primary contaminated water storage will be provided by the containment berms, which will provide storage for the 25-year, 24-hour storm event. Containment berms will be maintained until the contaminated water is removed.

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.

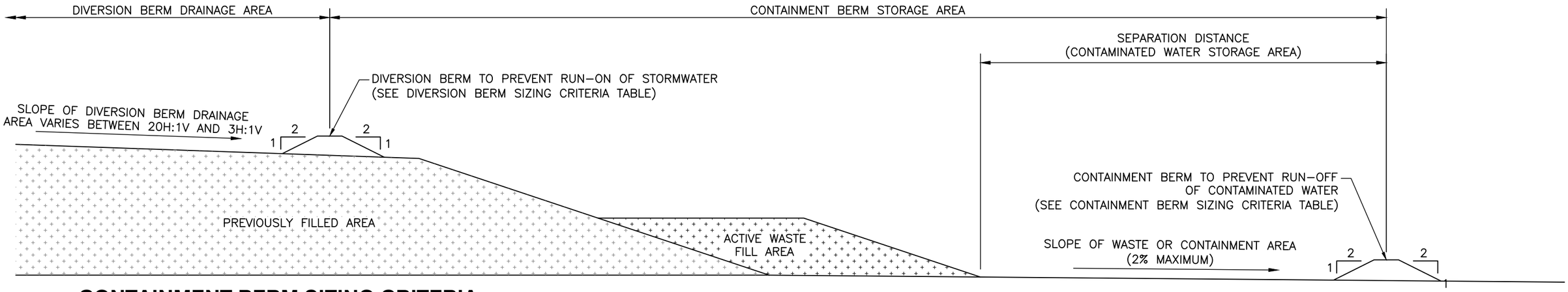
2.3 Contaminated Water Disposal

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.)	Design Berm Height (ft.)
100	100	45	10343	2.3	2.5
150	150	45	20865	3.1	3.5
200	200	45	34953	3.9	4.0
250	250	45	52608	4.7	5.0
300	300	45	73830	5.5	5.5
325	325	45	85778	5.9	6.0
100	100	50	10700	2.1	2.5
150	150	50	21400	2.9	3.0
200	200	50	35667	3.6	4.0
250	250	50	53500	4.3	4.5
300	300	50	74900	5.0	5.0
325	325	50	86938	5.4	5.5
100	100	55	11057	2.0	2.5
150	150	55	21935	2.7	3.0
200	200	55	36380	3.3	3.5
250	250	55	54392	4.0	4.0
300	300	55	75970	4.6	5.0
325	325	55	88097	4.9	5.0
100	100	60	11413	1.9	2.0
150	150	60	22470	2.5	2.5
200	200	60	37093	3.1	3.5
250	250	60	55283	3.7	4.0
300	300	60	77040	4.3	4.5
325	325	60	89256	4.6	5.0

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 % FLOW RATE (CFS)	MINIMUM 5 % FLOW DEPTH (FEET)	MINIMUM 5 % REQ'D MIN. DIVERSION BERM HEIGHT (FEET)	MAXIMUM 33 % FLOW RATE (CFS)	MAXIMUM 33 % FLOW DEPTH (FEET)	MAXIMUM 33 % 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)

STATE OF TEXAS
ADAM W. MEHEVEC
84736
LICENSED
PROFESSIONAL ENGINEER
1-2-2023

PERMIT DRAWINGS

REVISION RECORD

NO	DATE	DESCRIPTION
1	1/2/2022	TECHNICAL NOD 1

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

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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

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: ~~September 2022~~Revised January 2023

Prepared by:

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LICENSED
PROFESSIONAL ENGINEER
1-2-2023

Contents

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

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

1.3 Sequence of Construction Activities

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.

~~h~~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~~24~~ 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~~should~~ be on site during all liner construction. Quality control of construction and quality assurance of sampling and testing procedures ~~should~~ will follow the latest technical guidelines of the executive director.

3 EARTHWORK

3.1 General

Earthwork activities and testing will be documented in the SLER in accordance with Section 6~~5~~.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 ~~interim waste and~~ 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 ~~or interim~~ slopes and concentrated loadings such as heavy equipment and soil stockpiles will~~should~~ not be placed near the crest of slopes unless ~~additional slope stability analyses are performed~~the permit is revised.

4 COMPACTED SOIL LINER

4.1 General

The compacted soil liner component of the composite liner system consists of a 36~~24~~-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 ~~5~~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. ~~Details of the existing liner tie-in are shown in Attachment D3-Construction Design Details.~~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 compacted 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.

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 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.

~~5~~6 DOCUMENTATION

~~5.1~~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.

~~5.2~~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

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT D8
FINAL COVER 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: ~~September 2022~~Revised January 2023

Prepared by:

Civil & Environmental Consultants, Inc.

Texas Registration Number F-38
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4 INFILTRATION

4.1 General

The infiltration layer consists of compacted, relatively homogeneous, cohesive material. The CQA monitor shall provide continuous on-site observation during infiltration layer placement, processing, compaction, and testing. The GP shall make sufficient site visits during infiltration layer construction to document the construction activities, testing, and thickness verification in the Final Cover System Report, in accordance with Section 8.

4.2 Materials

Infiltration layer material shall consist of soil that is free from debris, rubbish, frozen materials, foreign objects, and organic material. The required infiltration layer material properties are summarized in Table D8-1.

Table D8-1
Beck Landfill
Infiltration 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	$\leq 1 \times 10^{-5}$ cm/sec

Preconstruction testing procedures and frequencies for infiltration layer materials are listed in Section 4.8.1.

4.3 Subgrade Preparation

Prior to placing infiltration layer 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 compacted and then be proof rolled again.

The subgrade elevations shall be verified in accordance with the requirements of Section 4.8.3

prior to the placement of infiltration layer.

4.4 Placement and Processing

The infiltration layer subgrade and surface of each lift should be scarified to a minimum depth of six inches prior to placement of the next lift of the infiltration layer. The infiltration layer material should be placed in maximum eight-inch loose lifts to produce a 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 about 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. Waste or any objectionable material must not contaminate compaction water.

4.5 Compaction

The infiltration layer shall be compacted with a pad/tamping-foot or prong-foot roller. A footed roller is necessary to bond the lifts, distribute the water, and blend the soil matrix through kneading action. The infiltration layer shall not be compacted with a bulldozer, rubber-tired roller, flat-wheel roller, scrapers, or any track equipment unless it is used to pull a footed roller. The lift thickness shall be controlled to achieve total penetration into the top of the previously compacted lift; therefore, the lift thickness must 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 compactor shall make at least two passes across the area being compacted. A pass is defined as one pass of the compactor, front and rear drums. The material should be compacted to a minimum of 9~~8~~5 percent of the maximum dry density determined by standard Proctor (ASTM D 698) at a moisture content at or above optimum moisture in order to achieve the required permeability. Areas with failing tests shall be reworked and recompacted, and then retested with passing tests before another lift is added.

After a lift is compacted, it must be watered to prevent drying and 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 then recompacted. Following compaction and fine grading of the final lift, the surface of the infiltration layer shall be smooth drum rolled.

4.6 Protection

The completed infiltration layer must be protected from drying, desiccation, rutting, erosion and ponded water until the FMC is installed. Areas that undergo excessive desiccation or damage shall be reworked, recompacted, and retested as directed by the GP.

4.7 Tie In to Existing Covers

The edge of existing infiltration layers shall be cut back on either a slope or step 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 D8-2 lists the minimum testing required for material proposed for use as the infiltration layer.

Table D8-2
Beck Landfill
Infiltration Layer 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 material type

After the moisture density relationship has been determined for a material type, a soil sample should be remolded to about 85 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 a suitable 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

Table D8-3 lists the minimum testing required for material used as the infiltration layer.

Table D8-3
Beck Landfill
Infiltration Layer Material Construction Tests

Test	Standard	Frequency
Field Density	ASTM D 2922	1/8,000 sf per 6-inch lift
Plasticity Index	ASTM D 4318	1 per acre
Liquid Limit	ASTM D 4318	1 per acre
Percent Passing No. 200 Mesh Sieve	ASTM D 1140	1 per acre
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 acre

The Atterberg limits of the in-place infiltration layer must be continually compared to the Atterberg limits of the Proctor curve sample to assure that the Proctor curve accurately 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. Areas with failing permeability tests shall be reworked and recompacted, and then retested with passing tests before another lift is added.

4.8.3 Thickness Verification

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

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

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Revised January 2, 2023

TABLE OF CONTENTS

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. 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. **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 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 3-2.** 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.

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. 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 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.

Figure 3-6 shows the regional water table surface and potentiometric surfaces of the Edwards Aquifer in July 1974. 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.

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°	33	Domestic	Leona

TWDB Well Report Number	Location	Bore Depth (ft.)	Use	Aquifer Name
	-98.247536°			

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 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.

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, 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.

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

Boring No.	Generalized Soil Findings and Depths Below Ground Surface					
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
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)[1]	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

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

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

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

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
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
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

Boring Depth (ft. below ground surface)	Water Content %	Atterberg Limits (LL-PL-PI)	Coefficient of Permeability (cm/sec)
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, 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 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 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 are in use at the Beck Landfill and are tested annually. Table 3-22 below 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
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

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

Historical annual groundwater monitoring data from 2005 to 2022 for the Beck Landfill at each monitoring well is presented in the table in Attachment F.

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 Aquifer due to the presence of two aquitards separating these two aquifers. These aquitards consist of undivided Navarro Group and Marlbrook Marl and Pecan Gap Chalk strata.

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

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:

POWER ENGINEERS

PROJECT NUMBER: 150051.05.01

PROJECT CONTACT: Julie Morelli

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~~BECK LANDFILL, Nido, LTD~~

~~Schertz, Guadalupe County, Texas~~

~~TCEQ Permit # 1848~~

~~Groundwater Sampling and Analysis Plan~~

~~Revised March 22, 2013~~

~~**Prepared for**~~

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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 ~~a part of~~ Beck Landfill~~'s permit application submitted in September 2022. Site Operating Plan (SOP).~~ 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.

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Table of Contents

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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 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), manganese (dissolved), cadmium (dissolved), zinc (dissolved), 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 (dissolved)	Method E200.7	0.03
manganese (dissolved)	Method E200.7	0.005
Cadmium (dissolved)	Method E200.7	0.003
Zinc (dissolved)	Method E200.7	0.02
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*

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	Dissolved	243.1	0.02	0.05
Iron	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
	N/A	4500-Cl- B		
chloride			5.4	15
sodium	N/A	273.1	2.3	5.0
fluoride	N/A	340.2	0.02	0.10
pH (field & lab)				1.0 S.U.
	N/A	Meter	NA	
Specific Conductance (field &				10umhos
lab)	N/A	Meter	NA	/cm
nitrate as nitrogen or ammonia as	N/A			
nitrogen		353.3	0.02	0.10
total organic carbon (3			See	See LSOP
replicates)	N/A	5310 C	LSOP	
VOCs	N/A	Best Available	**	**

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

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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 Alamo Analytical Laboratory 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

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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)

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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

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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.

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MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

PART III-ATTACHMENT G
LANDFILL GAS ~~MONITORING~~ 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
Revision 21 ~~October 2022~~ January 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

1-2-2023

Contents

30 TAC§§330.159, 330.125, 330.371

List of Appendices

APPENDIX G-A
Gas Probe Installation Report

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: 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. The clay pipe wastewater line is approximately 75 feet northwest of the toe of the flood-control dike along which the landfill gas monitoring probes will be 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.

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.

Fig. 8 Proposed locations of landfill gas monitoring probes shown on aerial photo;

BECK LANDFILL MSW Permit #1848
Methane Monitoring Well Locations

Notes

STATE OF TEXAS
Juliana C. Morelli
Geology
10570
LICENSED
PROFESSIONAL GEOSCIENTIST

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

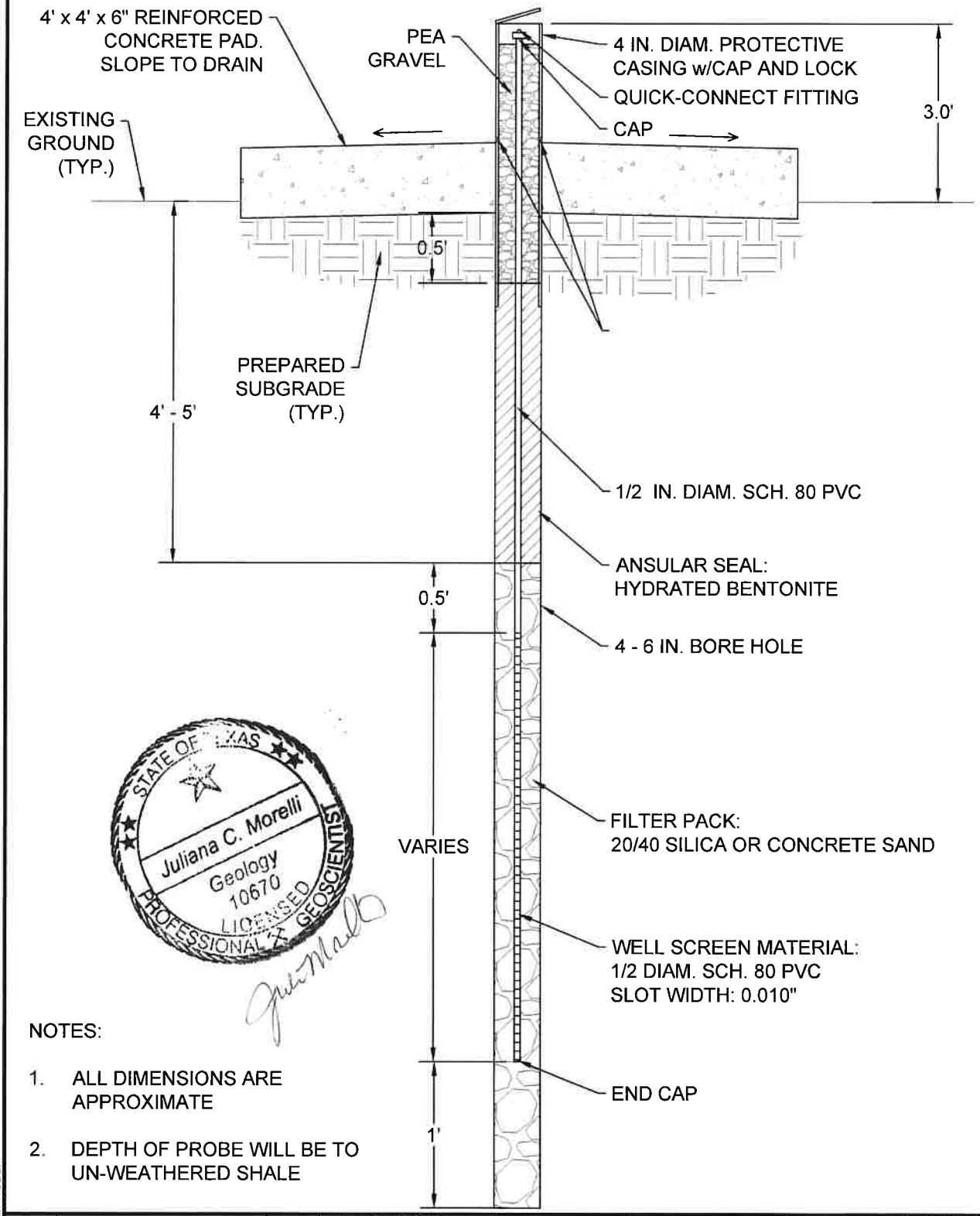
Prepared For:
Beck Companies
550 FM 78
Schertz, TX 78154

Landfill Aerial and Grid
Beck Companies - Schertz Landfill
Flight Date: December 5, 2018

FIRMATEK
3D MAPPING SOLUTIONS
www.Firmatek.com 210.651.4990

Fig. 9 [Schematic drawing of landfill gas monitoring probe]

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
REV1	ISSUE_FOR_CONSTRUCTION	08/20/19	SMT	JCM	JCM	



STATE OF TEXAS
Juliana C. Morelli
Geology
10670
LICENSED
PROFESSIONAL GEOSCIENTIST

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

3.0 Landfill Gas Monitoring Procedures

The concentration of methane in the landfill gas monitoring probes 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 at locations where gas migration is occurring or accumulating. The integrity and labelling of the monitoring probes, 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 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.

Beck Landfill uses a ~~QRAE 3 wireless~~ 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. 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.

Landfill Gas Monitoring Exceedance Record Keeping and Reporting

Results of landfill gas monitoring will be kept in the site operating record; however, i~~I~~f 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).~~LEL~~, 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)

TCEQ Region 13 – San Antonio Waste Section
14250 Judson Road
San Antonio, TX 78233-4480
210-490-3096 (O); 210-545-4329 (Fax)

Guadalupe County EMS at 911

Schertz EMS
1400 Schertz Parkway, Building 7
Schertz, TX
830-619-1400

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).

MUNICIPAL SOLID WASTE PERMIT
MAJOR AMENDMENT

Part IV Application for Permit Amendment

(TAC Title 30 Rule §330.65))

NAME OF PROJECT: Beck Landfill

MSW PERMIT APPLICATION NO.: 1848AA

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

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1.0 INTRODUCTION

1.1 Introduction (§330.127)

The Beck Landfill Site Operating Plan (SOP), in accordance with 30 TAC §330.127, includes provisions for site management and site operating personnel to meet the general and site- specific requirements of for the day-to-day operation of the Beck Landfill. This SOP will be retained onsite throughout the active life of the Beck Landfill and throughout the post-closure care maintenance period. This SOP also includes provisions for site management and site operating personnel to meet the general and site-specific requirements for the waste acceptance rate established in the SOP.

The operational requirements for Beck Landfill, including the existing Site Development Plan (SDP), Site Operating Plan (SOP), Final Closure Plan, Post-Closure Maintenance Plan (PCMP) and all other documents and plans required by this chapter are defined in the previously approved TCEQ Permit No. 1848A. Additional TCEQ approved revisions and/or required documents shall be incorporated into the operational requirements and shall be considered a part of the operating record of the Beck Landfill.

1.2 General Information

Beck Landfill is an existing Type IV landfill (TCEQ Permit No. MSW-1848A) operated by Beck Landfill, Nido, LTD. (Beck Landfill or BLF). Beck Landfill is a privately owned and operated Type IV landfill that provides Type IV acceptable waste disposal capacity primarily for Guadalupe and Bexar Counties, and surrounding areas. Beck Landfill is located in southwestern Guadalupe County, Texas. The facility is located at 550 FM 78, Schertz, TX 78154, primarily within the south part of the City of Schertz, 1,400 feet southeast of the junction of FM 1518 and FM 78.

1.3 Wastes Authorized for Disposal

Beck Landfill is a Type IV landfill unit and may only accept brush, construction and/or demolition waste (C&D waste), and/or rubbish, as described in 30 TAC §330.5(a)(2).

In accordance with 30 TAC §330.171 (Disposal of Special Wastes) and §330.173 (Disposal of Industrial Wastes) Beck Landfill may also accept special wastes consistent with the limitations of 30 TAC §330.5(a)(2) and the Waste Acceptance Plan required by §330.61(b). Special wastes must be handled in accordance with waste-specific provisions, as described in the Waste Acceptance Plan. Special wastes may include, but are not limited to:

- Non-regulated asbestos-containing materials (non-RACM)
- Soils contaminated by petroleum products ,crude oils, or chemicals in concentrations of greater than 1,500 milligrams per kilogram (mg/kg) total petroleum hydrocarbons; or contaminated by constituents of concern that exceed the concentrations listed in Table 1, §335.521(a)(1) (subject to provisions of 30 TAC §330.171(b)(4))
- Class 2 industrial solid waste
- Class 3 industrial solid waste

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1.4 Pre-Operation Notice (§330.123)

Beck Landfill will provide ongoing cell construction notification to the TCEQ MSW Permits Section, in the form of a "30-DAY NOTICE OF CELL COMPLETION" letter. This notification will include a site layout map identifying the area(s) being excavated, along with acknowledgement that the cell has been excavated into the gray shale formation. The notification submittal will be in triplicate (one original and two copies), one copy being sent to the appropriate TCEQ Regional Office. The executive director has 14 days to provide a verbal or written response. If no response has been received by the end of the fourteenth day following the executive director's receipt of the report, the operator may begin placing waste in the new cell areas.

2.0 RECORDKEEPING REQUIREMENTS (30 TAC §330.125)

During the operating life of the landfill, Beck Landfill will maintain a written site operating record (SOR). This record will be retained for the life of the facility including the post-closure care period. The SOR is a complete collection of facility permit documents, designs, operating procedures, monitoring data and waste receipt information as required by 30 TAC §330.125.

2.1 Documents (§330.125(a))

Beck Landfill will maintain the SOR on site. Consistent with §330.125(a), copies of documents that are part of the approved permitting process that are considered part of the SOR are listed in **Table 2-1**.

2.2 Analytical Data (§330.125(b))

Beck Landfill, in accordance with §330.125(b), within seven working days following completion or receipt of analytical data, will record and retain in the SOR those items as listed in **Table 2-1**.

2.3 Notification (§330.125(c))

Beck Landfill, in accordance with §330.125(c), will place the items included in **Table 2-1** into the SOR within the specified time period. Beck Landfill will maintain the SOR in an organized format, where information is easily locatable and retrievable. The SOR will be furnished to the executive director upon request, and will be made available on site for inspection by the authorized TCEQ representatives.

2.4 Record Retention (§330.125(d))

Beck Landfill, in accordance with §330.125(d), will retain all information contained within the SOR and all plans required for the life of the site, including the post-closure care period.

2.5 Personnel Training Records and Licenses (§330.125(e)(f))

In accordance with §330.125(e), Beck Landfill will maintain personnel training records in accordance with §335.586(d) and (e). Personnel training requirements will be consistent with Section 3.1 of this SOP, "Personnel and Training". Personnel training records for current Beck Landfill personnel will be maintained until closure of the site. Records of former employees will be maintained for three years from the date the employee last worked at the Beck Landfill. Records for each personnel will include name, job title, job description, introductory training, continuing training, and documentation of training. In accordance with §330.125(f), the Beck Landfill will maintain personnel operator licenses issued in

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accordance with Chapter 30,

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Subchapter F, relating to Municipal Solid Waste Facility Supervisors. Personnel training records and operator licenses will be maintained in the SOR.

2.6 Annual Waste Acceptance Rate (§330.125(h))

Beck Landfill will maintain, as part of the SOR, documentation of the annual waste acceptance rate for Beck Landfill in accordance with §330.125(h). Records will include maintaining the quarterly solid waste summary reports and the annual solid waste summary report as required by §330.675. The annual waste acceptance rate, as established by the sum of the previous four quarterly summary reports, will be evaluated by Beck Landfill to determine if the waste acceptance rate exceeds the rate estimated in the approved permit and SDP. Should an increase in waste acceptance be established, the Beck Landfill will determine if the increase is due to a temporary occurrence. Should the waste acceptance rate exceed that established in the approved permit, a permit modification will be prepared in accordance with the current applicable TCEQ regulations to propose changes, if required, to manage the increased waste acceptance rate.

Beck Landfill anticipates that the site's waste acceptance rate will increase during the life of the site. Based on the volumes submitted for inclusion in the Beck Landfill TCEQ "FY 2011 MSW Annual Report", Beck Landfill accepted 182,267 tons for FY 2011.

This SOP includes variable provisions to manage the increased waste acceptance rate to protect public health and the environment.

3.0 PERSONNEL AND TRAINING (30 TAC §330.127)

Beck Landfill will provide on-site management of the landfill operations. The level of employment at the landfill will be determined by the waste acceptance volume, and shall be sufficient to comply with the requirements of the site-operating plan and with the provisions of the site permit.

3.1 Personnel (§330.127(1))

Beck Landfill will be staffed with qualified individuals experienced with municipal solid waste disposal operations and/or earthmoving construction projects. See Table 3.1,which outlines landfill staffing levels.

3.1.1 Landfill Facility Manager (LFM)

The LFM is the individual having managerial oversight of the landfill and is responsible for management of the entire site. The LFM is responsible for assuring that adequate personnel and equipment are available to provide for site operations in accordance with SDP, SOP, and TCEQ regulations. The LFM will, at a minimum, have a high school diploma or equivalent, experience in municipal solid waste disposal operations.

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3.1.2 Landfill Supervisor (LS)

Under the general direction of the LFM, the Landfill Supervisor (LS), is responsible for daily operations, site personnel, administration of the SOP, and will also serve as the emergency coordinator. The LS may designate other personnel to assist with the daily site operating requirements. The LS will designate an individual to fulfill his duties in the event that they are unavailable during waste acceptance hours. When the LS is unavailable during waste acceptance hours, the LS's designee will have the same basic on-site training as required for the LS. The LS and his alternate, at a minimum, will have experience in earthmoving operations, and experience in municipal solid waste disposal operations. The LS and his alternate will obtain and maintain a license consistent with the requirements of §§30.201, 30.207, 30.210, and 30.212.

3.1.3 Equipment Operators

Equipment operators are responsible for the safe operation of their equipment, and depending on their job responsibility, may be trained to recognize unauthorized waste. Equipment operators, when necessary, will monitor and direct the unloading of vehicles, and they may also perform random load inspections, general site maintenance, construction, litter abatement, and general site cleanup. Equipment operators will participate as necessary to prevent accidents and report unsafe conditions to the LS.

At a minimum, all applicable equipment operators shall be qualified to safely and effectively operate equipment normally operated at Type IV landfills, have the ability to be trained to operate other heavy equipment on-site, and have the ability to receive and comprehend on the job training in landfill operations, health and safety, and waste identification.

3.1.4 Gate Attendants

Gate attendant(s) stationed at the gatehouse, under the direction of the LS, are primarily responsible for maintaining records of vehicles and solid waste entering the landfill. Gate attendants will be trained in site safety procedures, to visually check for unauthorized wastes, to determine waste volumes, and to collect disposal fees. A gate attendant will be present during hours that the landfill is open to the public. Gate attendants will report to the Landfill Supervisor, and at a minimum, will have a basic understanding of landfill related accounting principles, and communication skills.

3.1.5 Landfill Spotters

Landfill Spotters may be employed at the landfill working face. These personnel shall responsible for the directing of trucks backing up for unloading. The spotters will also be responsible for visually screening each load as it is unloaded. In the event that unauthorized or prohibited waste is observed, procedures outlined in section 5.0 of this SOP will be followed by applicable site personnel.

3.1.6 Other Personnel

Other site personnel and/or laborer(s) may be employed from time to time in other categories such as maintenance, construction, litter abatement, and general site cleanup. These personnel must have appropriate training for the tasks to which they are assigned. Site personnel may be permanent, part-time or temporary employees.

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3.2 Training (§330.127(4))

Beck Landfill personnel will be trained consistent with the applicable training requirements as defined in §335.586(a) and (c). Personnel will receive training through a combination of on-the- job training, company-provided training and classroom instruction as necessary. The training program will be directed by a person trained in waste management procedures and will include instruction that teaches facility personnel waste management procedures, including contingency plan implementation, relevant to the position(s) in which they are employed.

At a minimum, the training program will be designed to ensure that personnel are able to respond effectively to emergencies by familiarizing site personnel with emergency procedures, emergency equipment, and emergency systems.

Facility personnel must successfully complete the program required within six months after the date of their employment or assignment to a new position at the facility, whichever is later. Employees must not work in unsupervised positions until they have completed the training requirements.

Beck Landfill will ensure that facility personnel take part in an annual review of the initial training as required.

4.0 EQUIPMENT (§330.127)(2)

Sufficient equipment will be provided to conduct site operations in accordance with the site design and permit conditions. Equipment requirements may vary in accordance with landfill operations and/or the waste acceptance rate at any given time. Other equivalent types of equipment may be substituted on an as-needed basis. A description, including the minimum number, size, type, and function, of the equipment to be utilized at the facility based on the estimated waste acceptance rate and other operational requirement is listed in Table 4.1. Provisions for back-up equipment during periods of breakdown or maintenance of equipment listed in Table 4.1 include the onsite availability of a comparable or alternately acceptable piece of equipment to ensure the continuation of site operations in accordance with permit conditions. As a back-up provision, in the case that such equipment is not readily available, appropriate equipment will be rented until such a time that company owned or leased equipment is available.

5.0 DETECTION AND PREVENTION OF DISPOSAL OF PROHIBITED WASTES (30 TAC §330.127(5))

5.1 General Procedures

Beck Landfill, in accordance with 30 TAC §330.127(5), has established procedures for the detection and prevention of the disposal of unauthorized or prohibited wastes, including regulated hazardous waste, and polychlorinated biphenyls (PCB) wastes. The detection and prevention program will include training of site personnel to recognize and reject prohibited wastes, how to perform a random inspection, how to control site access, what training will be provided for site personnel, and what procedures are required in the event of identification of prohibited wastes.

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The detection and prevention program includes the following steps:

- Observation of each load that is disposed of at the active face.
- Random inspections of incoming loads.
- Records of inspections.
- Training for appropriate landfill personnel to recognize unauthorized, prohibited waste, regulated hazardous waste, and PCB waste.
- Notification to the TCEQ Executive Director of any incident involving the receipt or disposal of regulated hazardous waste or PCB waste.
- Provisions for remediation of the incident in accordance with applicable regulations.
- Signs prohibiting the receipt of unauthorized and prohibited wastes including hazardous waste and PCB waste will be posted on-site.
- Informing waste haulers of wastes unauthorized and/or prohibited for acceptance and disposal at the site.

5.2 Load Inspection at the Active Face (§330.127(5)(A))

Loads at the active working face of the landfill will be directed by a trained landfill spotter or equipment operator. These personnel will visually inspect waste as it is unloaded from vehicles. Should any indication of unauthorized and/or prohibited waste be detected, appropriate landfill personnel will stop the unloading of the vehicle to allow for a thorough inspection of the load. The driver will be directed to a load inspection area located near the working face, where the load will be discharged from the vehicle. The load inspector will break up the waste pile and inspect the material for any unauthorized, prohibited and/or regulated hazardous waste.

5.3 Random Inspections (§330.127(5)(A))

Beck Landfill will perform documented random inspections as required by §330.127(5)(A) on a minimum of 1% of incoming loads. Loads selected for random inspections will be directed to a specified area close to but separate from the active waste disposal area. The load will be inspected by the Landfill Supervisor and/or qualified landfill personnel. The random load inspector(s) will manually and visually inspect the load and take appropriate action(s) based on the inspection findings. Conforming loads that have been randomly inspected will be sent for final disposal at the landfill active face. In the event that non-conforming materials are discovered during the random inspection, those materials will be properly and safely segregated and handled appropriately as detailed in section 5.7 of the SOP. The random inspection will be documented on a Random Inspection Form as specified in Figure 5-1.

5.4 Recordkeeping (§330.127(5)(B))

The LS is required to maintain and include in the SOR the following:

- Load inspection reports
- Records of regulated hazardous or PCB waste notifications
- Personnel training records

Load inspection reports will be completed for each inspected load. The reports will include at a minimum, the date and time of inspection, the name and address of the hauling company, driver name, the type of vehicle, the size and source of the load, contents of the load, indicators of unauthorized and/or prohibited waste, and results of the inspection.

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5.5 Training (§330.127(5)(C))

The LFM, LS, equipment operators, and gate attendants will maintain a thorough understanding of waste screening procedures and will be trained as necessary in the following areas:

- Load inspection procedures
- Identification of unauthorized, prohibited and regulated hazardous and/or PCB wastes
- Waste handling procedures
- Health and safety procedures
- Recordkeeping

Documentation of this training will be placed in the SOR.

5.6 Notification (§330.127(5)(D))

TCEQ notification is required if regulated hazardous waste or PCB waste is received or disposed of in the landfill. When notification is required, records of the notifications will be kept in the SOR and will include the date and time of notification, the individual contacted, and the information reported.

5.7 Managing Prohibited Wastes (§330.127(5)(E))

Unauthorized and/or prohibited waste detected during inspections will be returned immediately to the waste hauler. If the waste hauler is not available, the prohibited waste will be stored in such a manner to protect human health and the environment until provisions for proper removal can be arranged.

In the event that regulated hazardous or PCB wastes are detected, the TCEQ will be notified and as soon as is practical, the hauler will be required to properly contain and remove the hazardous or PCB waste from the site.

In the case of putrescible waste being detected, the putrescible waste may either be returned to the waste hauler at time of unloading or if hauler is unavailable, the putrescible waste may be temporarily managed in an appropriate Type I waste container onsite Putrescible waste will not be disposed of onsite and will be removed from the facility and disposed of at a facility authorized to accept such waste within 24 hours.

5.8 Special Procedures for Waste in Enclosed Containers or Enclosed Vehicles

As indicated in 30 TAC §330.169, stationary compactors permitted in accordance with 30 TAC §330.7 and municipal transporter routes permitted in accordance with 30 TAC §330.103 are exempt from the requirements identified in 30 TAC §330.169(1)-(3) and transporters will be allowed to discharge waste from these stationary compactors at the Beck Landfill. However, the landfill will obtain, from the transporter, load documentation for a municipal transporter route or a stationary compactor, as appropriate, prior to allowing discharge of the waste at the landfill. The load documentation will be maintained as a part of the SOR.

Other waste received in enclosed containers or enclosed vehicles will only be accepted per provisions identified in 30 TAC §330.169(1)-(3).

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6.0 SITE SAFETY (30 TAC §330.127(6))

6.1 General Site Safety

Site safety will be promoted by properly trained personnel using well-maintained equipment to perform standard work procedures. Site safety will be enhanced by limiting access to the active areas only to authorized personnel. In the event of an emergency, planned emergency response procedures will be followed.

All site personnel will receive site-specific training consisting, but not limited to, the following:

- Safe work practices
- Nature of anticipated hazards
- Equipment and vehicle safety
- Site access controls
- Hazardous material identification and communication
- Fire safety
- Emergency response
- Employee rights and responsibilities

A record of training will be maintained in each employee's personnel file to confirm that each employee has received the proper training.

In the event of an emergency, site personnel will assess the situation, notify the LS or designated supervisor, and take appropriate actions. Emergency numbers will be posted in the landfill gatehouse as indicated below.

Emergency Numbers

Office	**Phone**
Ambulance	911or 210-619-1400
Schertz Fire Department	911 or 210-619-1300
Schertz Police Department	911 or 210-619-1200
Guadalupe County Sheriff's Office	911 or 830-379-1224

6.2 Preparedness and Prevention Measures

Preparedness and prevention measures have been developed to minimize both frequency and severity of accidents and emergency situations. These measures depend on the attentiveness and state of readiness of site personnel. Preparedness and prevention measures have been developed for one general category and two specific areas of the site: the gatehouse and the onsite access routes. These preparedness and prevention measures are detailed in the following sections.

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6.2.1 General

General preparedness and prevention measures that will be followed shall include:

- Employee breaks or rest periods will be provided to minimize fatigue, improve alertness, and thereby reduce accident potential.
- Access controls will provide for the safety of non-landfill personnel.
- Routine preventive maintenance of equipment will be provided.
- Daily and weekly site inspections of the working areas will be performed by the Landfill Supervisor or designated employee.
- Appropriate personal protection equipment (PPE) will be kept onsite and maintained in good repair.
- Adequate turning area for hauling vehicles will be provided.
- Scavenging and unauthorized salvaging will not be allowed.
- Waste unloading will be restricted to designated areas only.
- Site personnel will be alert for possible hazardous or other unauthorized wastes.
- Unauthorized and/or prohibited wastes will be controlled or contained and removed as necessary.

6.2.2 Gatehouse

Preventative measures that will be followed in the gatehouse include the following:

- Verbally and/or visually screen all incoming waste loads for unauthorized wastes.
- Monitor to see that all incoming wastes loads are adequately covered, or otherwise protected or contained.
- Visually observe incoming vehicles for evidence of improper operation, faulty equipment, or other conditions that could be hazardous to personnel or other persons onsite.
- Maintain access to appropriate emergency equipment and first-aid materials.
- Display signs warning transporters that wastes including regulated hazardous wastes and other non-allowable wastes are prohibited.

6.2.3 Landfill Entrance Road, Haul Road, and Access Road

Landfill haul road and access road preventative measures include the following:

- Display speed limit, directional, and other precautionary signs.

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- Provide road passable for two-way traffic.
- Maintain roadway free from obstructions.

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7.0 FIRE PROTECTION PLAN (30 TAC §330.129)

A Fire Protection Plan (FPP) shall be established and followed as shown in the following subsections.

7.1 Fire Prevention Procedures

The following steps will be taken regularly by designated landfill personnel to prevent fires:

- Open burning of waste is prohibited at all times.
- Burning waste from incoming waste loads will be prevented from being dumped in the active area of the landfill. The gate attendant and equipment operators will be alert for signs of burning waste such as smoke, steam, or heat being released from incoming waste loads.
- Fuel spills will be contained and cleaned up immediately.
- Landfill equipment will not remain directly on the active working face of the site overnight.
- Dead trees, brush, or vegetation adjacent to the active waste disposal area will be removed, and grass and weeds managed so that forest, grass, or brush fires cannot easily spread to the landfill.
- Smoking is not allowed on the active areas of the landfill.
- Waste material will be properly compacted and covered with compacted earthen material.

The site will be equipped with fire extinguishers of a type, size, location, and number as recommended by the local fire department. Each fire extinguisher will be fully-charged and ready for use at all times. Each extinguisher will be inspected on an annual basis and recharged as necessary. These inspections will be performed by a qualified service company, and all extinguishers will display a current inspection tag. Inspection and recharging will be performed following each use. At a minimum, the gatehouse, equipment and maintenance area, and all landfill equipment and vehicles will be equipped with fire extinguishers.

A soil stockpile and site equipment (e.g., front-end loaders, haul trucks, excavators) will be maintained at all times to extinguish an onsite fire. A soil stockpile will be provided within 1,000 feet of the active working face and any other areas actively receiving materials for disposal, processing, temporary storage or recycling. Loaders and haul trucks will be used together to deliver sufficient soil to extinguish the file. The stockpile(s) of earthen material available will be sized to cover the working face with a minimum six-inch layer of earthen material within one hour as shown in table 7-1.

The Fire Suppression Calculations below are based upon the use of: Two (2)

five cubic yard loaders = 10 cubic yards transfer capacity
15 cubic yard haul truck and 25 cubic yard haul truck = 35 cubic yards haul capacity

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Table 7-1 – Fire Suppression Soil Requirements

Length (feet)	Height (feet)	Depth (feet)	Volume of Soil (cubic yards (CY))
100	50	0.5	93
150	100	0.5	278
200	150	0.5	556

Response Time Calculation Scenarios Assumptions: Front End Loader Capacity is 10 CY Haul Truck Capacity is 35 CY
Haul Truck Speed is 10 MPH
Distance to soil stockpile is 1,000 feet (0.19 miles) Load time for trucks is 2 minutes

Therefore:
Travel time = 0.19 miles / 10 miles per hour = 1.14 minutes per load (one way)
= 1.14 minutes round trip + 2 minute load time = 3.14 minutes per load
93 CY / 35 CY/Load = 2.7 Loads x 3.14 minutes = 8.3 minutes
278 CY/35 CY/Load = 7.9 Loads x 3.14 minutes = 24.7 minutes
556 CY/35 CY/Load = 15.9 Loads x 3.14 minutes =49.9 minutes

7.2 Specific Fire-Fighting Procedures

The following procedures will be followed in the event of a fire:

If a fire occurs on a vehicle or piece of equipment, the equipment operator should bring the vehicle or equipment to a safe stop. If safety of personnel will allow, the vehicle must be parked away from fuel supplies, uncovered solid wastes, and other vehicles. The engine should be shut off and the brake engaged to prevent movement of the vehicle or piece of equipment. Fire extinguishers should be used to extinguish fire, if possible, without undue risk to the equipment operator.

If a fire is in the working face, the working face should immediately be covered with earthen material from the stockpile to smother the fire.

Firefighting methods include smothering with soil, separating burning material from other waste, and spraying with water from the water truck or water pumped from nearby water sources. If detected soon enough, a small fire may be fought with a hand-held fire extinguisher. A fire extinguisher will be located at the gatehouse and on each piece of equipment.

7.3 General Rules for Fires

The following rules will be implemented in the event of a fire at Beck Landfill:

- Contact the City of Schertz Fire Department by calling 911.
- Immediately contact the gatehouse and LS.
- Equipment operators will be equipped with two-way radios or cell phones.
- Alert other site personnel.
- Assess extent of fire, possibilities for the fire to spread, and alternatives for extinguishing the fire.
- If it appears that the fire can be safely fought with available fire fighting devices until arrival of the Fire Department, attempt to contain or extinguish the fire.

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- Upon arrival of Fire Department personnel, direct them to the fire and provide assistance as appropriate.
- Do not attempt to fight the fire alone.
- Do not attempt to fight the fire without adequate personal protective equipment.
- Be familiar with the use and limitations of firefighting equipment available onsite.

7.4 Fire Protection Training

Landfill personnel will be trained in the contents of the FPP. The following topics will be addressed:

- Fire prevention
- Fire safety
- Fire fighting procedures

7.5 TCEQ Notification

Beck Landfill will make every reasonable effort to contact the TCEQ regional office immediately upon detection of a fire, if the fire is not extinguished within ten minutes of detection. At a minimum, the TCEQ regional office will be contacted no later than four hours by phone, and in writing within 14 days of the fire. The notification will include a description of the fire and resulting response.

8.0 OPERATIONAL PROCEDURES (30 TAC §330.127(3))

8.1 Access Control (§330.131)

Various measures are in place to control access to the Beck Landfill and other operations located within the facility boundary. Access controls are designed to prevent unauthorized access to operational areas in an effort to protect human health and safety and the environment. Additionally, site security measures are in place in an effort to reduce vandalism or disruption of Beck Landfill operations caused by unauthorized site entry.

Public access to the landfill is permitted via a gated entrance from Farm to Market Road (FM) 78. This gate will remain closed and locked when the facility is closed for business. Chain link fencing is installed parallel to FM 78. The Beck Landfill direct entrance is located approximately 630 feet southeast of FM 78, south of the co-located ready mix concrete facility. A scale and office are positioned such that all traffic entering and exiting the Beck Landfill can be monitored by site personnel.

No other public roadway intersects the Beck Landfill facility boundary. The operational areas of the landfill are located approximately 1,230 feet south of FM78. The site is surrounded by Cibolo Creek to the southwest and south. Zuehl Road parallels Line A of the landfill perimeter. Barbed wire fencing, expanded metal fencing and debris screens provide limited access controls from Zuehl Road to the northwest of the operational area. Barbed wire fencing is also currently installed around the entire perimeter of the active areas of the Beck Landfill.

8.1.1 Site Security

Unauthorized entry into the site is minimized by controlling access to the landfill site with perimeter fencing and a lockable steel security gate at the entrance.

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Entrance to the landfill is monitored by a gatehouse attendant during site operating hours. Outside of normal operating hours, the site access gate will be locked and/or monitored by onsite personnel. Security cameras are installed to record vehicle traffic at the scalehouse.

Entry to the active disposal area of the site is restricted to designated personnel, approved waste haulers, and properly identified persons whose entry is authorized by appropriate site personnel. Visitors may be allowed in active areas only when accompanied by a site representative.

8.1.2 Traffic Control

Public access to the landfill site is provided via the main public entrance road from FM 78. Signs are located along the entrance road, directing traffic to the gatehouse. The gate attendant will restrict site access to authorized vehicles and direct vehicles appropriately. To minimize incoming landfill traffic from queuing on FM 78, landfill personnel may direct traffic to form multiple lines upon entering the main access gate, prior to ticket processing at the gatehouse.

Authorized waste haulers will be directed to the appropriate waste disposal area by signs located along the designated landfill haul road and/or access road. Authorized waste transporters will deposit their loads as directed and depart the site via the main site entrance/exit road. Site personnel will provide traffic directions as necessary to facilitate safe movement of vehicles.

Roads not being used for access to disposal areas will be blocked or otherwise marked for no entry.

8.1.3 Inspection and Maintenance Schedule

The LFM and the LS conduct daily perimeter inspections along the perimeter of the operational areas of the Beck Landfill. Maintenance is conducted, as necessary, to ensure the effectiveness of perimeter controls.

8.1.4 Access Breach

Breaches to perimeter fencing or road barricades will be repaired as soon as practicable. Temporary repairs will be installed within 24 hours of detection. If a permanent repair can not be completed within 8 hours, the TCEQ Region 13 office (and any local pollution agency with jurisdiction that has requested notification) will be notified and a timeline for corrective action proposed. Permanent repairs that can be completed within 8 hours of detection do not need to be reported to the TCEQ Region 13 office.

8.2 Unloading of Waste (§330.133)

Trained personnel will monitor the incoming waste on the trucks at the gatehouse, prior to unloading. A trained staff person shall also be on duty during operating hours at each area where waste is being unloaded to direct and observe the unloading of solid waste. These personnel will be familiar with the rules and regulations governing the various types of waste that can or cannot be accepted for disposal.

The unloading of waste in unauthorized areas is prohibited. Waste unloading will be controlled to prevent disposal in locations other than those specified by site management. Any otherwise

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acceptable waste deposited in an unauthorized area will be promptly removed and properly disposed of at the working face. Signs with directional arrows and portable traffic barricades will help to restrict traffic to designated disposal locations.

Written procedures for the unloading of waste, in accordance with 30 TAC §330.133(f), will be retained onsite and made available for review by the executive director.

Refer to Section 5.0 of this SOP, "Detection and Prevention of Disposal of Prohibited Wastes" for additional waste handling procedures. The owner or operator is not required to accept any solid waste that the owner or operator determines will cause or may cause problems in maintaining full and continuous compliance with these sections.

8.2.1 Landfill Working Face (§330.133)

The unloading of solid waste shall be confined to as small an area as practical. The active landfill working face will be confined to an area consistent with the rate of incoming waste, while allowing for safe and efficient operation. The active landfill working face will be maintained not to exceed a maximum size of 150 feet by 150 feet.

8.2.2 Other Possible Unloading Areas

Designated Wet Weather Area
Designated Public Drop Off Area
Designated Asphalt Shingle Recycling Area
Designated C&D Recycling Area Designated
Wood Recycling Area

8.2.3 Transporter Requirements (§330.133(h))

As a requirement, it is the responsibility of all transporters to secure all incoming loads to prevent to occurrence of windblown wastes and to provide properly executed documentation, as necessary, for all incoming loads. This documentation includes, but is not limited to the following;

- Manifests for authorized Special Wastes
- Manifests for Non-Regulated Asbestos Containing Materials.
- Permits for enclosed containers

Penalties may, at the discretion of the operator, be imposed in the event transporters do not meet these requirements.

8.3 Hours of Operation (§330.135)

The waste acceptance hours for Beck Landfill will be from 7:00 a.m. to 7:00 p.m., Monday through Friday and 7:00am to 12:00pm on Saturday. The site is closed to the public on Sunday. Beck Landfill will post the authorized waste acceptance hours on the site sign as specified in §330.137.

There is no individual hourly limitation on conducting waste acceptance, filling, construction, earthmoving, or other activities that take place within the landfill waste acceptance hours. Operations separate from actual waste acceptance activity may be conducted as necessary except for between the

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hours of 9:00pm and 5:00am, seven days a week.

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As allowed in 30 TAC §330.135(c), temporary waste acceptance hours may be established for emergencies at the executive directors discretion. In the event of temporary waste acceptance hours are established, adequate records will be maintained per the requirements of 30 TAC §330.135(d)

Alternate operating hours for special occasions, special purpose events, holidays, or other special occurrences may be designated (up to five days per year).

8.4 Site Sign (§330.137)

A sign will be displayed at the gated entrance to the site. This sign will measure at least 4 feet by 4 feet, and have lettering of at least 3 inches in height. The sign will state the name of the site, type of site, hours and days of operation, and the TCEQ permit number. An emergency 24-hour contact phone number and the local emergency fire department phone number will also be included. The emergency contact phone number will reach an individual with the authority to obligate the Beck Landfill at all times the landfill is closed. The site sign will be readable from the site's main entrance.

Signs prohibiting receipt of prohibited wastes including putrescible waste, hazardous waste and PCB waste, closed drums, smoking, and un-tarped loads will be posted at the gatehouse.

8.5 Control of Windblown Solid Waste and Litter (§330.139)

The site will be operated in such a way as to minimize windblown material. The working face will be maintained and operated in a manner to control windblown solid waste. Windblown material and litter will be collected and properly managed to control unhealthy, unsafe, or unsightly conditions by the following methods:

- Waste transportation vehicles using this Beck Landfill will be required to use adequate covers or other means of covering and securing loads. The adequacy of covers or securing of incoming wastes will be checked at the gatehouse. A sign will be prominently displayed at the gatehouse stating that all loads shall be properly covered and secured.

- The active working face will be limited to as small an area as practical for the safe operation of the incoming waste hauling vehicles, and operation of compaction equipment, and delivery and placement of weekly cover soil.

- Excess working face area will be covered as frequently as needed, to assist with the control of windblown waste.

- The Beck Landfill will provide litter control fences, as necessary, at appropriate locations near the working face and elsewhere. The litter control fences will be constructed of wire or plastic mesh screens attached to portable or permanent frames or temporary fences. The litter control fence will be of sufficient height and will be located as close as practical to the active area to control windblown waste and litter.

- Windblown waste and litter along the entrance road, the gatehouse area, within the permit boundary, and that has accumulated along the permit boundary will be collected once a day and

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returned to the active working face. Should windblown waste cross the

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permit boundary onto adjacent property, landfill personnel, with landowner permission, will access the property and conduct litter pickup. Some adjacent properties around the landfill permit boundary is owned by Beck Landfill related companies, therefore permission is not required for personnel to enter those adjacent properties for litter pick- up,

- Adjacent filled areas and the landfill flood control dike system will provide protection from the prevailing winds. If additionally necessary, earthen berms will be used to assist in control of windblown wastes by providing a windbreak against prevailing winds.

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8.6 Easements and Buffer Zones (§330.141)

8.6.1 Easements (§330.141(a))

Solid waste unloading, storage, disposal, or landfill operations will not occur within any easement, buffer zone, or right-of-way that crosses the site. No solid waste disposal will occur within 25 feet of the centerline of any utility line or pipeline easement, unless otherwise authorized by TCEQ. All easements will be clearly marked as specified in Section 8.7 of this SOP. Pipelines and utility easements will be marked with posts extending a minimum of six feet above ground surface at intervals that do not exceed 300 feet. There are currently no easements or right-of-ways located within the permit boundary.

8.6.2 Buffer Zones (§330.141(b))

The buffer zone is defined as the area between the permit boundary and the limit of waste disposal. The limit of waste is located along the inside edge of the perimeter road. No solid waste unloading, storage, disposal, or processing operations will occur within any buffer zone. The buffer zones will provide for safe passage for fire-fighting and other emergency vehicles. The buffer zones vary around the perimeter of the site, but in no case are they less than 50 feet. All buffer zones will be clearly marked as specified in Section 8.7 of this SOP.

8.7 Landfill Markers and Benchmark (§330.143)

Landfill markers will be installed to clearly identify significant features. The markers will be steel, wooden, or other durable material posts, and will extend at least 6-ft above the ground surface. The markers will not be obscured by vegetation and will be placed in sufficient numbers to clearly show the required boundaries. Markers will be inspected on a monthly basis and markers that are removed or destroyed will be replaced within 15 calendar days of discovering a marker does not meet regulatory requirements. A permanent concrete set benchmark monument, as required by 30 TAC §330.143(8) and indicated in Figure 8.3 will be installed and maintained within the landfill permit boundary. Records of all marker and benchmark inspections will be maintained at the facility. Markers will also be repainted as needed to retain visibility. Guidelines for type, placement, and color-coding of markers are outlined below.

1. **Site Boundary:** Site boundary markers will be installed and will be painted black. The markers are placed at each corner of the site and along the permit boundary at intervals no greater than 300 ft.

2. **Buffer Zone:** Buffer zone markers will be painted yellow. Markers identifying the buffer zone will be placed a minimum of 50 ft from the permit boundary and at the buffer zone corners and along the buffer zone boundary at intervals of no greater than 300 ft.

3. **Easement and Right-of-Way:** If and where applicable, easement and right-of-way markers will be painted green. The markers will be placed along the boundary of easement and right-of-way. Markers will be placed at each corner within the site and at the intersection of the site boundary.

4. **Landfill Grid System:** Landfill grid system markers will be painted white. The grid system will consist of black lettered markers along two opposite sides and numbered

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markers along the other two sides. The markers will be spaced no greater than 100 ft apart measured along perpendicular lines. Intermediate markers will be installed in the case where markers cannot be seen from opposite boundaries.

5. **Flood Protection Markers:** If and where applicable, flood protection markers will be painted blue. The markers identifying the flood protection zone will be placed at each corner of the site and along the limits of the zone, at intervals of no greater than 300 ft.

6. **Point of Compliance for Groundwater Monitoring System (§330.403(a)(2)**: The Beck Landfill consists of individual waste cells situated within an elevated bermed perimeter. Impermeable slurry-walls constructed within the elevated bermed perimeter, creating a continuous barrier between the contents of the landfill and the surrounding environment. In order to determine whether the landfill has released contaminants to the uppermost aquifer, five (5) monitoring wells are installed along the exterior of the dike line perimeter and associated piezometer wells are installed along the interior of the dike line perimeter. Annual water quality testing is conducted in each of the monitoring wells and the results are compared to historical data collected at these points. If an anomaly is detected from historical results, monitor wells are re-tested and additional testing may be performed at each of the associated piezometer wells to determine whether constituents of concern are detectable within the dike line. Additional sampling may be conducted in the Cibolo Creek, which surrounds the landfill on three sides to determine if constituents of concern are detectable in surrounding surface water.

8.8 Material along the Route to the Site (§330.145)

Beck Landfill will take steps to ensure that vehicles hauling waste to the site are covered with a tarp, net, or other means to properly secure the load. These steps are necessary to prevent the escape of any part of the load. Signs are posted at the landfill entrance gate and gatehouse notifying haulers of this requirement. Enforcement of this rule may include 1) reporting offenders to proper law enforcement officers, 2) adding surcharges, or 3) prohibiting haulers access to the landfill.

Beck Landfill will provide for the cleanup of Type IV compatible waste materials spilled along and within the right-of-way of FM 78 (or any future entrance to the landfill from a public access road) for a distance of 2 miles in either direction from the entrance road connection to FM 78. Cleanup for the spilled materials will be performed once per day. The LFM or LS will consult with TxDOT officials concerning cleanup of state highways and right-of-ways consistent with §330.145.

8.9 Disposal of Large Items (§330.147)

Most non-recyclable large items can be placed and compacted during normal site disposal operations. Large items that cannot be recycled may require crushing with a landfill compactor or bulldozer to reduce the potential for voids within the waste cell. If the handling and crushing of large items interferes with normal operations, the items shall be temporarily stored near the working face until scheduling allows for their proper disposal. Such items will be removed often enough to prevent the items from becoming a nuisance and to avoid an excessive accumulation of the items. All such temporarily stored items shall also be stored in an area so as to minimize interference with the working face operations.

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Refrigerators, freezers, air conditioning units, or other items that may contain chlorinated fluorocarbon (CFC) refrigerant will be handled in accordance with 40 CFR §82.156(f).. Refrigerators, freezers, air conditioning units, or other items containing CFC will not be accepted unless the CFC contained in the item has been captured and sent to an approved CFC disposal or recycling facility and the generator or transporter provides written certification that the CFC has been evacuated from the unit. Items such as electrical equipment, which may contain PCBs, will not be knowingly accepted for disposal or recycling.

8.10 Odor Management Plan (§330.149)

The Beck Landfill will implement an odor management plan (OMP) to control odors resulting from site operations. This OMP addresses the identification of potential sources of odors and includes methods to minimize odors or sources of odors.

Sources of Odor

Sources of odor that emanate from a landfill can vary considerably and may include the wastes being delivered to the landfill, the open working face, ponded water, or contaminated water. Since putrescible waste is not accepted at site, the potential generation of odors is limited.

8.10.1 Odor Minimization

The primary objective of this Odor Management Plan is to minimize odor generation and odor emissions. Methods used to achieve this objective include waste handling procedures, the placement of cover materials, contaminated water handling procedures, and the elimination of ponded water.

8.10.2 Waste Handling Procedures

Wastes are to be deposited at the working face, spread into layers that can be readily compacted and covered. While weekly cover is required at the site, wastes with odors may be placed at the working face in a manner that allows for immediate cover.

8.10.3 Cover

Weekly cover will limit odor generation by preventing air and water from further impacting the wastes. If odors persist, soil covers may be placed more frequently than weekly. If odors persist after placement of 6 inches of soil cover, additional cover soils may be placed.

8.10.4 Contaminated Water Handling Procedures

Contaminated water may become a source of odors and will be segregated from clean storm water. See section 8.23 of this SOP for details regarding the management of contaminated water.

8.10.5 Ponded Water

Water ponded over waste disposal areas may become a source of odors and should be eliminated prior to the occurrence of odors. Ponded water areas will be filled in and re- graded within 7 days of the detection, weather permitting.

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8.11 Disease Vector Control (§330.151)

Type IV landfills, with proper compaction and adequate intermediate and monthly cover, will typically require minimal vector control under normal circumstances. Landfill personnel will be constantly appraising site conditions as they perform their regular duties and should report unusual circumstances or areas requiring maintenance to the landfill operator. The regular basis in order to appraise all circumstances ranging from windblown litter and the condition of drainage features to quality of buffers and fences.

Pest populations primarily including rodents, and mosquitoes, shall be an additional vector item. Currently such species exist at the site but are held within reasonable balance by natural conditions.

Landfill personnel will monitor ongoing operations and be prepared to take additional action should it be required.

These actions may include:

- Temporarily applying cover more frequently than weekly;
- Temporarily applying a thicker layer of weekly cover;
- Use of non-lethal bird control measures such as pyrotechnics, baiting, decoys, etc. to discourage birds at the site and scare them away if they become a nuisance; and
- Contracting with professional exterminators, if necessary, to control rodents or other pests that may appear at the site.

8.12 Site Access Roads (§330.153)

The main public landfill entrance road from FM 78 will consist of approximately 1200 feet of concrete surfaced road, from the entrance to the gatehouse, continuing to the main landfill dike- line entrance point. The main internal access roads beyond the end of the concrete surfaced road will be surfaced with crushed rock and secondary internal access roads will be constructed of and maintained with sand and gravel. Disposal operations may be suspended during periods of heavy rain at the discretion of the LFM and/or LS depending on the safe and efficient accessibility of the active disposal area.

Equipment utilized within the site will also be utilized to maintain roadways allowing proper grading and drainage as well as to minimize rutting. The landfill operator shall also be responsible for inspecting Highway78 on a daily basis and during periods of inclement weather and will promptly clear any mud which has been tracked onto FM 78.

Dust control will similarly be the responsibility of the landfill operator. During periods of dry weather, the LS shall direct personnel to utilize a water truck as necessary to wet site roads.
Landfill haul roads, and access roads will be maintained in a reasonably dust-free condition by periodic spraying from a water truck. Grading equipment will be used as needed to control or remove mud accumulations on internal roads including the entrance road. Stockpiles of crushed stone, concrete rubble, used asphalt, masonry demolition debris, or other similar material may be utilized in maintaining passable internal access roads including re-grading to minimize depressions, ruts, and potholes. The site entrance road, landfill haul road, and access roads will be maintained in a clean and safe condition. Litter and debris along site access roads will be picked up daily and returned to the active working face.

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8.13 Salvaging and Scavenging (§330.155)

Salvaging may be performed by landfill personnel under the direction of landfill management, and shall not be allowed to interfere with prompt sanitary disposal of solid waste or to create public health nuisances. Salvaged materials will be considered as potentially recyclable materials and will be stored in a safe and secure manner. All salvaged material shall be removed from the site as necessary to prevent an excessive accumulation to the material at the site. Salvaged material will be removed often enough to preclude the discharge of any pollutants from the area in accordance with 30 TAC §330.155.

Scavenging will be prohibited at all times.

8.14 Endangered Species Protection (§330.157)

No known endangered or threatened species were present at the site during the permitting process. Workers will be instructed to report the sighting of possible endangered species to the Landfill Supervisor, who shall contact the U.S. Fish and Wildlife Service to help identify any potentially endangered species.

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8.15 Landfill Gas Control and Management (§330.159 and §330.371)

The LS 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. 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: 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. The clay pipe wastewater line is approximately 75 feet northwest of the toe of the flood-control dike along which the landfill gas monitoring probes will be 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.

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8.16 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.

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

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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.

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Fig. 8 Proposed locations of landfill gas monitoring probes shown on aerial photo;

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Fig. 9 [Schematic drawing of landfill gas monitoring probe]

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Landfill Gas Monitoring Procedures

The concentration of methane in the landfill gas monitoring probes will be measured on a quarterly basis per calendar year, with two of those monitoring times, to the extent possible, correspondingwith sampling of the ground water monitoring wells at the landfill. The integrity and labelling of the monitoring probes, 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 will be documented and retained in the site operating record.

Beck Landfill uses a QRAE 3 wireless 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. 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.

Landfill Gas Monitoring Exceedance Record Keeping and Reporting

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 exceeds the LEL, 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)

TCEQ Region 13 – San Antonio Waste Section
14250 Judson Road
San Antonio, TX 78233-4480
210-490-3096 (O); 210-545-4329 (Fax)

Guadalupe County EMS at 911

Schertz EMS
1400 Schertz Parkway, Building 7
Schertz, TX
830-619-1400

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A plan to address the exceedance will be formulated and implemented, with TCEQ approval, if possible within 60 days. 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 in accordance with 30 TAC §330.371(d).

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8.17 Oil, Gas, and Water Wells (§330.161)

8.17.1 Water Wells (§330.161(a))

There are no known water wells located within the landfill permit boundary. In the event that a water well is discovered within the landfill permit boundary, Beck Landfill shall provide written notification to the executive director of the location of any and all existing or abandoned water wells situated within the facility upon discovery during the course of facility development. The facility operator shall, within 30 days of such a discovery, provide the executive director with such notification and written certification that such wells have been capped, plugged, and closed in accordance with all applicable rules and regulations of the commission or other state agency. Any water or other type of wells under the jurisdiction of the commission must be plugged in accordance with all applicable state requirements or additional requirements imposed by the executive director. A copy of the well plugging report required to be submitted to the appropriate state agency must also be submitted to the executive director within 30 days after the well has been plugged.

8.17.2 Oil and Gas Wells (§330.161(b))

There are no known crude oil or natural gas wells or other wells associated with mineral recovery within the landfill permit boundary. If crude oil or natural gas wells, or other wells associated with mineral recovery are located, the landfill will provide written notification to the TCEQ executive director of their location within 30 days of their discovery. For crude oil or natural gas wells, or other wells associated with mineral recovery, the Landfill Supervisor will provide the executive director of the TCEQ with written certification that all such wells have been properly capped, plugged, and closed in accordance with all applicable rules and regulations of the Railroad Commission of Texas. A copy of the well plugging report to be submitted to the appropriate state agency will also be submitted to the executive director of the TCEQ within 30 days after the well has been plugged. A permit modification will be submitted to the executive director if revisions to the liner installation plan are required as the result of well abandonment.

8.18 Compaction (§330.163)

Compaction of waste material will be accomplished by a landfill compactor, dozer or similar equipment. The site dozer will be used to compact waste should the primary landfill compactor be temporarily out of service. Adequate compaction will be accomplished to minimize future consolidation and settlement and provide for the proper application of intermediate and final cover. Incoming waste will be spread in layers and thoroughly compacted.

8.19 Landfill Cover (§330.165)

8.19.1 Soil Management

Management of soil for use in and around the landfill area will be an ongoing process. In general, soil for use as weekly cover, intermediate cover, final cover, and other uses will be available onsite. This onsite soil will be obtained from excavation that is ongoing as part of the excavation and development of landfill cells.

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In addition to this available material located on the landfill property, a stockpile of material will be kept available on site. The stockpile will consist of soil that has not previously come in contact with waste, and will be of sufficient volume to provide at least one day's application of 6 inches of weekly cover over the working face. As this stockpile is used, it will be replenished as soon as practical. The soil may also be used in emergency situations for fire control.

8.19.2 Weekly Cover (§330.165(b))

Weekly cover of waste is necessary to control disease vectors, windblown waste, odors, fires, scavenging, and to promote runoff from the fill area. At least 6 inches of well- compacted soil cover material that has not been previously mixed with garbage, rubbish, or other solid waste will be placed over all solid waste received during that same day.

To ensure that the weekly cover soil will be adequate (i.e., minimize vectors, contaminated storm-water runoff, odors, etc.) the following procedures will be followed:

- Cover will be sloped to drain.
- Cover will be compacted with a minimum of two passes with the dozer tracks to minimize infiltration of storm water.

The LS will document weekly cover location and visually inspect during placement that a minimum of 6 inches of cover soil has been placed and that no waste is exposed. The LS shall document, as cover is necessary, on at least a weekly basis, the daily cover placement area and indicate that he has visually verified the thickness and condition in the Cover Inspection Record, After each rainfall event, the Landfill Supervisor will inspect cover areas for erosion, exposed waste or other damage, and repair as necessary.

8.19.3 Intermediate Cover (§330.165(c))

Areas that receive waste and subsequently become inactive for longer than 180 days will receive intermediate cover. Intermediate cover must include an additional 6 inches of suitable earthen material, for a total cover thickness of at least 12 inches, capable of sustaining native plant growth. This additional earthen material will be seeded or sodded following application in accordance with 30 TAC §330.165(c). The intermediate cover will be graded to prevent erosion and ponding of water. Storm water runoff from areas that have received intermediate cover are considered to have not come into contact with waste material and are to be managed as necessary as uncontaminated storm water runoff.

8.18.4 Final Cover (§330.165(f))

Final cover placement will occur as areas of the site are filled to the maximum waste fill grades. Final cover placement over individual areas will be in accordance with Beck Landfill's existing Final Closure Plan. Surface water will be managed throughout the active life of the site to minimize infiltration into the filled areas and to minimize contact with solid waste. Erosion of final or intermediate cover will be repaired promptly by restoring the cover material, grading, compacting, and seeding it as necessary. Such periodic inspections and restorations are required during the entire operational life and for the post closure maintenance period.

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In general, final cover placement over completed portions of the site will consist of the following steps:

- Survey controls will be implemented to control the filling of solid waste to the bottom level of the intermediate cover layer elevation.
- The final cover system layers will be constructed. Testing of the various components of the final cover system will be performed in accordance with the site's existing Final Closure Plan.
- A final cover certification report complete with an as-built survey will be prepared by an independent registered professional engineer and submitted to the TCEQ for approval.
- The TCEQ-approved final cover certification report will be maintained in the SOR. The cover inspection record will be updated to reflect areas where final cover has been placed.

8.18.5 Erosion of Cover (§330.165(g))

The LS will inspect intermediate cover at the site on a weekly basis. The final cover system, including erosion control structures will be maintained during and after construction. During the active life of the site, the LS will inspect the final cover system on a weekly basis. During post- closure care, the final cover system will be visually inspected on a monthly basis. In accordance with 30 TAC §330.165(g), eroded or washed-out areas of intermediate or final cover which are deep enough to jeopardize the intermediate or final cover, defined as exceeding four inches in depth as measured from the vertical plane from the erosion feature and the 90 degree intersection of this plane with the horizontal slope face or surface, will be repaired within 5 days of detection. Repair of final cover includes restoring cover, grading, compacting, and seeding as required by 30 TAC §330.165(g) In addition, all cover areas will be visually inspected following significant rainfall events. Documentation of weather delays for the repairs will be included in the cover inspection record. Weekly inspections and restorations are required for the active life of the landfill.

8.18.6 Cover Inspection Record (§330.165(h))

A cover inspection record will be maintained and be readily available for inspection in accordance with §330.165(h). For weekly and intermediate cover, the record will specify the date cover was accomplished (no exposed waste), area covered (by use of the grid system), how it was placed, and when it was completed. When applicable, dates of erosion detection and dates of completion of repair will be identified in the cover inspection record. For final cover, the record will show the final cover area completed, date cover was applied and thickness of final cover. The final cover certification report for each area will be referenced in the record. Each entry in the record will be certified by the signature of the Landfill Supervisor that the work was accomplished as stated in the record.

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8.19 Ponded Water (§330.167)

Beck Landfill will prevent ponding of water over areas that have received waste through site operation practices such as grading and maintenance. The Ponded Water Plan (PWP) provides direction to the landfill operations for the prevention and elimination of ponded water.

The Ponded Water Plan is as follows:

- The landfill will place daily cover, intermediate cover, and final cover in accordance with requirements established in Section 8.18 – Landfill Cover.
- The landfill will inspect the surface of areas that have received waste and landfill cover consistent with Section 8.18 – Landfill Cover and Section 8.24 –Site Inspection and Maintenance Schedule.
- Site grading and maintenance as required by Section 8.18 will minimize the ponding of water over areas containing waste.
- Should ponding of water occur, the ponded water will be removed and the depressions filled within 7 days, weather permitting. Landfill cover will be repaired consistent with procedures specified in Section 8.18.
- If the ponded water has come into contact with waste, or waste-contaminated soils, it will be treated as leachate and handled accordingly

8.20 Disposal of Special Wastes (§330.171)

Beck Landfill may accept Special Wastes, as defined in §330.3, assuming their physical nature meets the definition of wastes acceptable for disposal at a Type IV landfill as defined in §330.5(a)(2). Special Wastes may require TCEQ authorization for disposal on a case by case basis. Requests for approval to accept special waste shall include those items specified in §330.171(b)(2)(A), (C) and (D). Requests must be submitted and certified by the generator to the TCEQ executive director or to Beck Landfill for submittal to the TCEQ executive director.

The request must include the following:

A complete description of the chemical and physical characteristics of each waste and the quantity and rate at which each waste is produced and/or the expected frequency of disposal, including a statement that the waste is not a Class I industrial waste as defined in §330.3.

The approval for acceptance and disposal of Type IV landfill compatible special wastes at Beck Landfill will be waste-specific consistent with §330.171(b)(1). The executive director may authorize the receipt of special waste with a written concurrence from Beck Landfill. The landfill is not required to accept the waste.

In addition to authorized special wastes, Beck Landfill may accept non-regulated asbestos- containing materials (NRACM) as follows:

> *Non-regulated asbestos-containing materials may be accepted for disposal provided the wastes are placed on the active working face and covered in accordance with §330.171(c)(4) and Section 8.18 of this SOP. Under no circumstances shall any material containing non-RACM be placed on any surface or roadway which is subject to vehicular traffic or disposed of by any other means by which the material could be crumbled into a*

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8.21 Disposal of Industrial Wastes (§330.173)

Industrial waste (nonhazardous) is defined by §330.3 as solid waste resulting from or incidental to any process of industry or manufacturing, or mining or agricultural operations. Class I wastes will not be accepted at the Beck Landfill. Class II and Class III industrial solid wastes may be accepted at the Beck Landfill, consistent with the limitations of §330.5(a)(2) and provided that disposal of these wastes does not interfere with proper operation of the Beck Landfill.

8.22 Visual Screening of Deposited Wastes (§330.175)

The nature of land use immediately adjacent to the site, and the flood control dike will screen disposal areas from any reasonable site line. The south and west sides of the site border on Cibolo Creek and undeveloped land. The east side and the north side of the site are bordered by the Beck Readymix concrete plant. The site partially borders Zuehl Street on the northeast border of the site. Sufficient separating distance and natural vegetation will be adequately maintained to screen ongoing disposal operations from residences along Zuehl Street. Additional visual screening will be provided if the executive director determines a need for such.

8.23 Contaminated Water Discharge

Run-off, which has come into contact with the working face, will be collected in a bermed area near the base of the working face and used for improved compaction of waste and/or for dust control within the permit boundary of the landfill.

If the volume of contaminated water is greater than can be used for improved waste compaction and or dust control as described above, a retention pond located outside the active disposal area, but within the permitted landfill has been designated to receive water for storage. The retention pond will be sized to handle water volume received during the three wettest consecutive months of the year. Any berms around the active working face and/or around the retention pond will be a minimum height of 3 feet with a crest width of 2 feet.

Beck Landfill will take all steps necessary to control and prevent the discharge of contaminated water from the site. Should the discharge of contaminated water become necessary, the LFM will obtain specific written authorization from the TCEQ prior to discharge. All water coming in direct contact with waste will be treated as leachate. The landfill will be operated consistent with §330.15(h)(1)-(4) regarding discharge of solid wastes or pollutants into waters of the United States.

8.24 Site Inspection and Maintenance Schedule

Beck Landfill will periodically perform inspections of the site, including landfill operations. Inspections will be performed as indicated in Table 8.2. The LS or designee is responsible for performing the inspections. Records of site inspections will be maintained as part of the SOP.

9.0 SEQUENCE OF DEVELOPMENT (30 TAC §330.127(2))

Beck Landfill is divided into 41 individual cell areas as shown in Figure 9.1, located in the Attachments section of this SOP. Per Section 1.4 of this SOP, Beck Landfill, as an attachment to the "30-DAY NOTICE OF CELL COMPLETION" letter sent to the TCEQ MSW Permits Section, includes a continually updated site layout map identifying the cell area(s) being excavated and utilized per site

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operating requirements. This procedure serves as the mechanism for informing the TCEQ of the landfill's sequence of development.

10.0 Recycling Activities

Beck Landfill includes this Addendum to the Site Operating Plan (SOP) to address management practices to be followed when diverting specific recyclable materials from the solid waste stream received at the facility. These management practices are written in conformance with the Waste Minimization and Recycling rules (30 TAC 328), Composting rules (30 TAC 332), and the Operational Standards for Permitted Solid Waste Landfill Facilities (30 TAC 330).

In accordance with 30 TAC 330.155, scavenging is not allowed and the salvaging of material from the solid waste stream will not be allowed to interfere with the prompt sanitary disposal of solid waste or to create a public health nuisance. Salvaged items will be removed from active areas often enough to prevent the items from becoming a nuisance, to preclude the discharge of any pollutants from the area, and to prevent an excessive accumulation of the material at the facility.

10.1 Purpose

Beck Landfill will divert certain recyclable materials from the solid waste stream to promote the economic recovery and reuse of materials, and to support the development of markets for recycled, remanufactured, or environmentally sensitive products or services in a sustainable manner that protects the environment, public health, and safety. This Addendum provides management practices for the temporary storage and processing of recyclable materials.

10.2 Scrap Tires

Per 30 TAC 328.53 (relating to Management of Used or Scrap Tires), Beck Landfill (MSW Permit No. 1848) may store or process whole tires or tire pieces in an unused portion of the property within its permit boundary dedicated to tires only. Scrap tires may not be disposed of within the Beck Landfill unless the tire has been quartered, shredded or split (the sidewalls removed from the tires).

Authorization for this storage and/or processing activities is conferred through the approval of the Site Development Plan, including this Addendum of the Site Operating Plan. The tire storage and/or processing activity shall not be conducted in a manner that will adversely affect operations of the municipal solid waste disposal site, or otherwise endanger human health or the environment.

Beck Landfill may store up to 500 tires for processing, reuse or sale at any given time.. Processing may include splitting, quartering or shredding of the tires.

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The following management practices will be followed:

10.2.1 Tire Storage Criteria

1. Scrap tire storage areas are designed so that the health, welfare, and safety of operators, transporters, and others who may utilize the site are maintained.
2. No more than three (3) piles of whole or scrap tires will be stored on the ground (stockpiles).
3. A fire lane (40-feet buffer) must encircle the tire piles and be usable as an all-weather road.
4. The roadway must provide a minimum 25-foot turning radii.
5. The Site Layout Plan shall include this area with appropriate design notes.
6. Indoor storage piles or bins shall not exceed 12,000 cubic feet with a 10-foot aisle space between piles or bins.
7. Outdoor piles and entire buildings used to store scrap tires or tire pieces shall not be within 40 feet of the property line or easements. This setback will be maintained free of rubbish, equipment, tires, or other materials.
8. Outdoor storage of used or scrap tires or tire pieces at the processing location will be monitored for vector control, and appropriate vector control measures shall be applied when needed, but in no event less than once every two weeks.
9. Scrap tires or tire pieces may be stored in trailers provided the trailer is totally enclosed and lockable.

10.2.2 Fire Prevention and Suppression

Dry chemical fire extinguishers are located on the LS and the LFM trucks, as well as on mobile equipment working on or near the tire storage area.

Firewater may also be accessed from on-site ponds through the use of pumps and water trucks.

10.2.3 Access Controls

The scrap tire storage area(s) is within the fully-fence perimeter of Beck Landfill. The gate is locked when the facility is closed.

10.2.4 Water Quality Protection

Drainage away from the scrap tire storage location will flow into Beck Landfill and be retained in ponds, allowed to infiltrate, or will evaporate. No discharge of water is anticipated from the storage site.

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10.3Asphalt Shingles

Asphalt shingles may be received at Beck Landfill for the purpose of disposal or processing for reuse. Only residential roof tear-off asphalt shingles or sized asphalt shingles may be received for processing and end-use in the production of hot mix asphalt. The feed stocks will be managed for processing. Non-conforming shingles and associated debris will be disposed in Beck Landfill.

At least 50% of shingles accumulated within a six-month period will be recycled or transferred to a different site for recycling. Recycled materials, including processed shingles, are not subject to this time limitation, but should be covered or otherwise protected to prevent degradation, contamination, or loss of value as recyclable material.

The following management practices will be followed:

10.3.1 Recordkeeping and Reporting

10. Shingles must not contain asbestos or asbestos containing materials (ACM). Analysis or other documentation demonstrating that no asbestos or ACM may be found in shingles proposed for recycling or disposal at Beck Landfill must be maintained.
11. Proof of financial assurance sufficient to cover closure costs.
12. Records indicating the volume of shingles processed for reuse versus volume of shingles land disposed at Beck Landfill. (Note: Follow Air Permit)

10.3.2 Shingle Storage Criteria

13. Shingle storage areas are designed so that the health, welfare, and safety of operators, transporters, and others who may utilize the site are maintained.
14. Incoming loads will be inspected by a person trained to identify asbestos containing shingles. Any material suspected of containing asbestos will be rejected.
15. All visible materials which are not part of the shingle will be removed before grinding, including excess wood, paper, metal, and plastics.
16. A fire lane (40-feet buffer) must encircle the shingle piles and be usable as an all-weather road.
17. The roadway must provide a minimum 25-foot turning radius.
18. Shingle storage piles shall not be within 50 feet of the property line or easements. This setback will be maintained free of rubbish, equipment, tires, or other materials.
19. Shingle piles will be maintained with a pile height no greater than 25 feet.

10.3.3 Fire Prevention and Suppression

Dry chemical fire extinguishers are located on the LS and the LFM trucks, as well as on mobile equipment working on or near the tire storage area.

Firewater may also be accessed from on-site ponds through the use of pumps and water trucks.

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10.3.4 Access Controls

Shingle storage areas will be wholly located within the fully-fenced perimeter of Beck Landfill. The gate is locked when the facility is closed.

10.3.5 Water Quality Protection

Drainage away from shingle storage area(s) will flow within the Beck Landfill permitted area and be directed to and retained in detention ponds, allowed to infiltrate, or will evaporate. No off-site discharge of water is anticipated from the shingle storage area(s)..

10.4 Wood Materials

Wood, brush and other vegetative debris may be received at Beck Landfill for the purpose of disposal or processing for reuse. Beck Landfill will compost or mulch materials considered to be exempt in 30 TAC §332.3.

The following management practices will be followed:

10.4.1 Recordkeeping and Reporting

20. Only untreated lumber and woody debris will be utilized for the manufacture of mulch or compost material. Treated lumber may be disposed in Beck Landfill.
21. Proof of financial assurance sufficient to cover closure costs.

10.4.2 Woody Debris Storage Criteria

22. Composting, mulching, and land application of material shall be conducted in a sanitary manner that shall prevent the creation of nuisance conditions as defined in §330.2 of this title (relating to Definitions) and as prohibited by the Texas Health and Safety Code, Chapters 341 and 382 (relating to Minimum Standards of Sanitation and Health Protection Measures; and Clean Air Act), the Texas Water Code, Chapter 26 (relating to Water Quality Control), §101.4 of this title (relating to Nuisance), and any other applicable regulations or statutes.
23. Operations shall be conducted in such a manner to ensure that no unauthorized or prohibited materials are processed at the facility. All unauthorized or prohibited materials received by the facility shall be disposed of at an authorized facility in a timely manner.
24. The setback distance from all property boundaries to the edge of the area receiving, processing, or storing feedstock or finished product must be at least 50 feet.
25. All permanent in-plant roads and vehicle work areas shall be watered, treated with dust-suppressant chemicals, or paved and cleaned as necessary to achieve maximum control of dust emissions.
26. Vehicular speeds on non-paved roads shall not exceed ten miles per hour.
27. A fire lane (40-feet buffer) must encircle the woody debris piles and be usable as an all-weather road.
28. The roadway must provide a minimum 25-foot turning radii.

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10.4.3 Fire Prevention and Suppression

Dry chemical fire extinguishers are located on the LS and the LFM trucks, as well as on mobile equipment working on or near the tire storage area.

Firewater may also be accessed from on-site ponds through the use of pumps and water trucks.

10.4.4 Access Controls

Compost, mulch, and woody debris storage areas will be wholly located within the fenced perimeter of Beck Landfill. The main facility gate is locked when the facility is closed.

10.4.5 Water Quality Protection

Drainage away from the woody debris/compost/mulch storage areas will flow within the Beck Landfill permitted area and be directed to and retained in detention ponds, allowed to infiltrate, or will evaporate. No off-site discharge of water is anticipated from the wood storage or operation area(s).

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