August 1, 2013

Mr. Henry Freedenberg
Solid Waste Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399

RE: Response to Request for Additional Information No.1
Operation Permit Renewal
Southeast County Landfill, Hillsborough County, Florida
FDEP Permit No. 35435-014-SO/01
FDEP ID No. SWD/29/41193

Dear Mr. Freedenberg:

On behalf of Hillsborough County Public Utilities Department, Solid Waste Management Group (SWMG), HDR Engineering, Inc. (HDR) is pleased to provide the following information in response to the Florida Department of Environmental Protection's (FDEP) July 11, 2013 Request for Additional Information (RAI#1) regarding the Operation Permit Renewal for the Hillsborough County Southeast County Landfill (Report).

All revisions to the narrative reports are shown with deletions struck through (~~struck through~~) and additions underlined (underlined) along with a change line indicator in the left margin.

Responses to each of the comments in the July 11, 2013 RAI are provided below in the same order presented in the RAI. In each case the FDEP request is repeated in italics with the response immediately following in **bold**.

The following attachments are enclosed with the response document and are referenced in the responses to comments:

ATTACHMENT A	PROOF OF PUBLICATION
ATTACHMENT B	REVISED OPERATION PLAN
ATTACHMENT C	SUPPORTING INFORMATION FOR SECTION L – WATER QUALITY MONITORING REQUIREMENTS

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Tampa, FL 33609-3444
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Comment 1. *Please provide proof of publication for the notice of application as required by F.S. 62-701.320(8)(a).*

Response 1: The "Notice of Application", as shown in Attachment D.13 of the Report, was published in The Tampa Tribune on June 21, 2013. As requested, proof of publication is included in Appendix A.

Comment 2. *Section K.7 of the Operations Plan (Appendix B) has been expanded to include pre-processing of materials in the active fill area. Please specify exactly what will be included in the pre-processing and further amend the operations plan to include implementation details of the pre-processing scheme.*

Response 2: Section K.7.i of the Operations Plan has been revised to include more detail regarding the pre-processing (recycling) of materials in the active fill area. Any recycling method, other than manual extraction, will only be implemented following review and concurrence by the FDEP. Revised Operation Plan text is included in Attachment B.

Comment 3. *Please provide implementation details of the minimal equipment washing in the active fill area proposed in section K.11.a of the operations plan. Please demonstrate that all runoff generated by the equipment washing will remain within the lined area of the landfill.*

Response 3: As requested by the FDEP, Section K.11.a of the Operations Plan has been revised to include more detail regarding minimal equipment washing in the active fill area. Revised Operation Plan text is included in Attachment B.

Comment 4. *Section L.1.e Initial and Routine Sampling Frequency and Requirements. The porosity of 0.45 used to calculate the ground water flow velocities in the Surficial Aquifer is higher than the previously reported range of porosities for the site (0.2 to 0.3) and at the high end of published values for sands. A calculation using a porosity of 0.3 rather than 0.45 indicates a ground water travel distance greater than 50 feet in 6 months near well TH-58. Please provide additional justification for using a porosity of 0.45 rather than the previously reported values.*

Response 4: HDR reevaluated the porosity values of 0.2 to 0.3 (20% to 30%) that were applied in previous submittals because these values appeared to under estimate the porosity for the following reasons:

1. **The previously used porosity value of 30% was referenced to David Todd's 1959 Ground Water Hydrology publication. HDR reviewed this reference and had the following observations:**
    a. **Values applied were selected from the most conservative end of the range listed in Todd's Table 10.1 (p. 16).**

b. **Todd listed the porosity range of uniform sand as 30 to 40% (0.3 to 0.4) which is the most conservative value for sand.**
c. **Using a porosity value of 35% (mid-range), only two events reported groundwater velocities above 50 ft. per 6 months at 54 and 50.5 ft. per 6 months.**
d. **Velocity calculations in previous reports selected the porosity value from Todd's Table 10.1 based on the assumption that the surficial aquifer at the site consisted of fine to medium sand.**

2. **Hydrogeological investigations and well logs indicate that the surficial aquifer groundwater monitoring well screens at the SCLF are set in sediments that are high in clay and silt rather than a uniform sand.**
   a. **Ardaman & Associates (1983) described the typical un-mined soil profile as silty to silty fine sands from 4 to 12 ft. below ground surface (bgs), clayey sands to sandy clays from 12 to 22 ft. bgs, and clayey fine sands to sandy clays from 22 to 42 ft. bgs.**
   b. **Well logs MW-73, MW-74, and MW-75 from recently installed wells describe the saturated sediment as Sands (SP), Silty Sands (SM), and Clayey Sands (SC).**
   c. **Todd (1959) Table 10.1 indicates a porosity range of 40 to 50% for silts and 45 to 55 % for clays.**
3. **Porosity values based on other references:**
   a. **According to C.W. Fetter (1980), clays and clay rich soils can have much higher porosity values due to particle shape and electrostatic charge.**
   b. **Fetter listed porosities from Table 4.2:**
      i. **Well sorted sand and gravel – 25 to 50%**
      ii. **Silt – 35 to 50%**
      iii. **Clay – 33 to 60%**
   c. **Freeze and Cherry (1979) listed porosities from Table 2.4:**
      i. **Sand – 25 to 50%**
      ii. **Silt – 35 to 50%**
      iii. **Clay – 40 to 70%**
   d. **Hydrologic Evaluation of Landfill Performance (HELP) Model, Schroeder, et al (1994):**
      i. **Accepted industry standard publication from U.S Army Corp. of Engineers**
      ii. **Provides specific values to sediment types rather than ranges.**

iii. **All porosity values provided in Table 1 of the HELP model guidance document are above 39.7%.**

iv. **Porosity values are compared to the USDA and USCS classifications.**

The final selection of 45% as the representative porosity value for saturated surficial aquifer sediments at the SCLF was based on the HELP Model guidance document for Version 3. The default soil, waste, and geosynthetic characteristics table in this document includes the full range of soil descriptions from the USDA and USCS soil classification systems. These soil description methods are accepted standards for leachate and soil infiltration analyses for solid waste and environmental resource permitting. The soils designations in these tables are based on the experimental evidence presented in Rawls (1983), but they are presented using the full range of USDA and USCS soil designations. This wide spectrum of soils data makes the tables preferable to the tables presented in most hydrology text books. The porosities used in the HELP guidance document are also cited in J.W. Delleur's Handbook of Groundwater Engineering (1999) as an accurate assessment of porosity in natural unconsolidated soils.

The sediments described within the screened zones of the surficial aquifer at the SCLF are typically a mixture of sand, silt, and clay. Table 1 DEFAULT LOW DENSITY SOIL CHARACTERISTICS of the HELP model guidance document provides porosity values for these sediment types. HDR selected well sorted sand (SW) and silty sand (SM) to be representative of sediments at the SCLF. HDR averaged the six values provided for SW and SM sediments as follows:

Insert from Table 1 of the HELP model guidance document		
HELP	**USCS**	**Total Porosity vol/vol**
2	SW	0.437
3	SW	0.457
4	SM	0.437
5	SM	0.457
6	SM	0.453
7	SM	0.473
	Total	2.714
	Average	0.452

HDR selected the average value of 0.452 or approximately 45% as representative of typical sediment within the surficial aquifer at the SCLF site. Please refer to Attachment C for supporting information.

If you have any questions or concerns regarding the comment responses or attached documents, please contact me at (813) 262-2358.

Sincerely,
HDR Engineering, Inc.

Richard A. Siemering
Solid Waste Section Manager

Robert Curtis, P.E.
Sr. Project Engineer

cc: Steve Morgan, FDEP
Ron Cope, EPC
Patricia V. Berry, PUD
Larry E. Ruiz, PUD

ATTACHMENT A
PROOF OF PUBLICATION

State of Florida
Department of Environmental Protection
Notice of Application

The Department announces the receipt of an application for an operation permit renewal from Hillsborough County Public Utilities Department, Solid Waste Management Group, Ms. Patricia Berry, Manager. The project proposed, designated as Phases I-VI (162.4 acres) and Section 7, 8 and 9 (34.5 acres) of the Capacity Expansion Area, is for the Class I landfill permit renewal, located at the Hillsborough County Southeast Landfill, 8.8 miles east of U.S. Highway 301 on County Road 672, Hillsborough County, Florida.

This application is being processed and is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the Department of Environmental Protection, 2600 Blair Stone Road, MS 4565, Tallahassee, FL 32399.
#2407 6/21/13

The Tampa Tribune

Published Daily

Tampa, Hillsborough County, Florida

State of Florida }
County of Hillsborough } SS.

Before the undersigned authority personally appeared C. Pugh, who on oath says that she is the Advertising Billing Analyst of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of the

Legal Ads IN THE Tampa Tribune

In the matter of Legal Notices

was published in said newspaper in the issues of

06/21/2013

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, this advertisement for publication in the said newspaper.

Sworn to and subscribed by me, this 21 day of June, A.D. 2013

Personally Known ✓ or Produced Identification ___
Type of Identification Produced _____

Notary Public State of Florida
Natalie C Hidalgo
My Commission EE019080
Expires 08/22/2014

RECEIVED
JUN 25 2013
HDR, INC.
TAMPA, FLORIDA

Order # 0003307218

1005181 – HDR ENGINEERING, INC.

ATTACHMENT B
REVISED OPERATION PLAN TEXT
(Appendices and figures unchanged)

on the south and east side slopes as shown on the drawings. As required, temporary drainage berms and downchutes will be placed at the working face to control and direct stormwater runoff away from disposal areas.

K.7.h.(2) Final Cover

When portions of the Facility are brought to design grades, final cover will be placed over the areas that have attained final elevation within 180 days in accordance with Rule 62-701.500(7)(g), FAC. Vegetative cover will be established. The final cover system and sequence for final cover placement will be submitted with the application for closure at least 90 days before the partial closure of the sideslopes.

K.7.i. Scavenging and Salvaging

Except for such operations that are conducted as part of a recycling program, scavenging and salvaging are not permitted at the Facility. If the volume of recyclable goods is sufficient, as determined by the Landfill General Manager, those items may be separated from the waste which is to be disposed.

During waste placement on the landfill, recyclable items such as wood, concrete, metals, cardboard, and other recyclables may be manually pulled from the active face, segregated, and placed in the staging area/roll-off containers adjacent to the working face area. With the exception of clean concrete, the remaining materials will be transferred off-site for recycling. The clean concrete will be stored on site until sufficient quantity is stockpiled and used for on-site road base or other on-site uses.

After the recyclable materials have been removed, the remaining materials will be disposed in the active Class I waste disposal area of the landfill.

Any recycling method, other than manual extraction, will only be implemented following review and concurrence by the FDEP.

K.7.j. Litter Policing

If necessary, portable litter fences will be placed downwind of the immediate working area to confine most of the windblown material. Litter around the site and the entrance roadways will be collected regularly and picked up within 24 hours, in accordance with Rule 62-701.500(7)(i), FAC. In addition, the Contractor maintains a litter crew to provide litter control on State Road (SR) 39 from the Lithia-Pinecrest intersection to CR 672 and on CR 672 to Balm-Boyette Road.

K.7.k. Erosion-Control Procedures

The Facility fill sequence and the drainage facilities have been designed to minimize erosion of landfill sideslopes and washout of adjacent areas. The landfill surface will be inspected daily for

- Water tank truck.
- Motor grader.
- Excavator.
- Several pickup trucks.
- Other miscellaneous construction and maintenance equipment.

Where appropriate, equipment is fitted with safety cabs and fire extinguishers. The Contractor is required to have back-up equipment available within 24 hours.

K.11.a.(1) Equipment Care

Routine preventive maintenance minimizes equipment downtime and increases equipment service life. Therefore, the appropriate operation and maintenance (owner's) manual should be consulted. However, applicable maintenance activities implemented at the site include:

- A routine inspection program;
- Routine lubrication; and,
- Maintenance records up-keep.

Minimal equipment washing using low-volume, high-pressure technique may be performed on lined areas of the landfill that do not have intermediate or final cover. The activity is exempt from industrial wastewater permitting since the wash water is collected by the leachate collection system. Washing will occur within, or adjacent to, the active working face. Runoff will be contained within the limits of the lined landfill and not allowed to comingle with stormwater runoff.

K.11.b. Reserve Equipment

Sufficient backup equipment will be provided on site for equipment breakdowns and downtime for normal routine equipment maintenance. Pre-arrangements with contractors and rental equipment dealers will be made to furnish equipment on short notice in the case of a major equipment failure. The Reserve Equipment Agreement is presented in Appendix B.

K.11.c. Communications Equipment and Personnel Facilities

Telephones are located at the Administrative and Maintenance Buildings for use in emergencies. Cellular telephones and two-way radios are also used. The Administration Building is equipped with water supply, toilet facilities, emergency first-aid supplies, and electricity. The building also provides shelter for employees in case of inclement weather. The Maintenance Building is equipped with spare parts, tools, equipment, and electrical services for operations and repair.

ATTACHMENT C
SUPPORTING INFORMATION FOR SECTION L – WATER QUALITY MONITORING REQUIREMENTS

Table 10.1 Representative Porosity Ranges for Sedimentary Materials

Material	Porosity (%)
Soils	50 - 60
Clay	45 - 55
Silt	40 - 50
Uniform sand	30 - 40
Gravel	30 - 40
Sandstone	10 - 20
Shale	1 - 10

From *Ground Water Hydrology* by D. K. Todd, 1959, p. 16, John Wiley & Sons, Inc.

Chapter 4

FIELD INVESTIGATION RESULTS

4.1 Results of Boring Program

The stratigraphic profiles for all the borings and probings, as stated earlier, are presented in Appendix A.3 as Figures A.3-1 through A.3-14. Included on each of the SPT boring profiles are the Standard Penetration Test "N" values. These values greatly aid in the stratification of the soils encountered and in distinguishing trends in strength characteristics for the various strata. The soil stratigraphy presented on the boring profiles is based on an examination of recovered soil samples and interpretation of field boring logs by a geotechnical engineer. The stratification lines represent the approximate boundaries between soil types of significantly different engineering properties, although the transition may be gradual. A generalized soil profile for the unmined, areas of the subject site without tailings or waste clay on top is summarized below:

Depth (feet) From	To	Soil Description
0	4	Light to dark gray slightly silty to silty fine sands with occasional traces of roots and other organic matter
4	12	Light to dark brown slightly silty to silty fine sands with occasional seams of cemented sands (Hard pan)
12	22	Light gray to light brown clayey sands to sandy clays with traces of cementation
22	42	Greenish gray to yellowish brown clayey fine sands to sandy clays with phosphates (Bone Valley Formation)
42	142	Gray to yellowish brown consolidated calcareous silts and clays with phosphates (Hawthorn Formation)
142	Termination	Light gray to tan limestone with layers of greenish gray clay (Tampa Limestone)

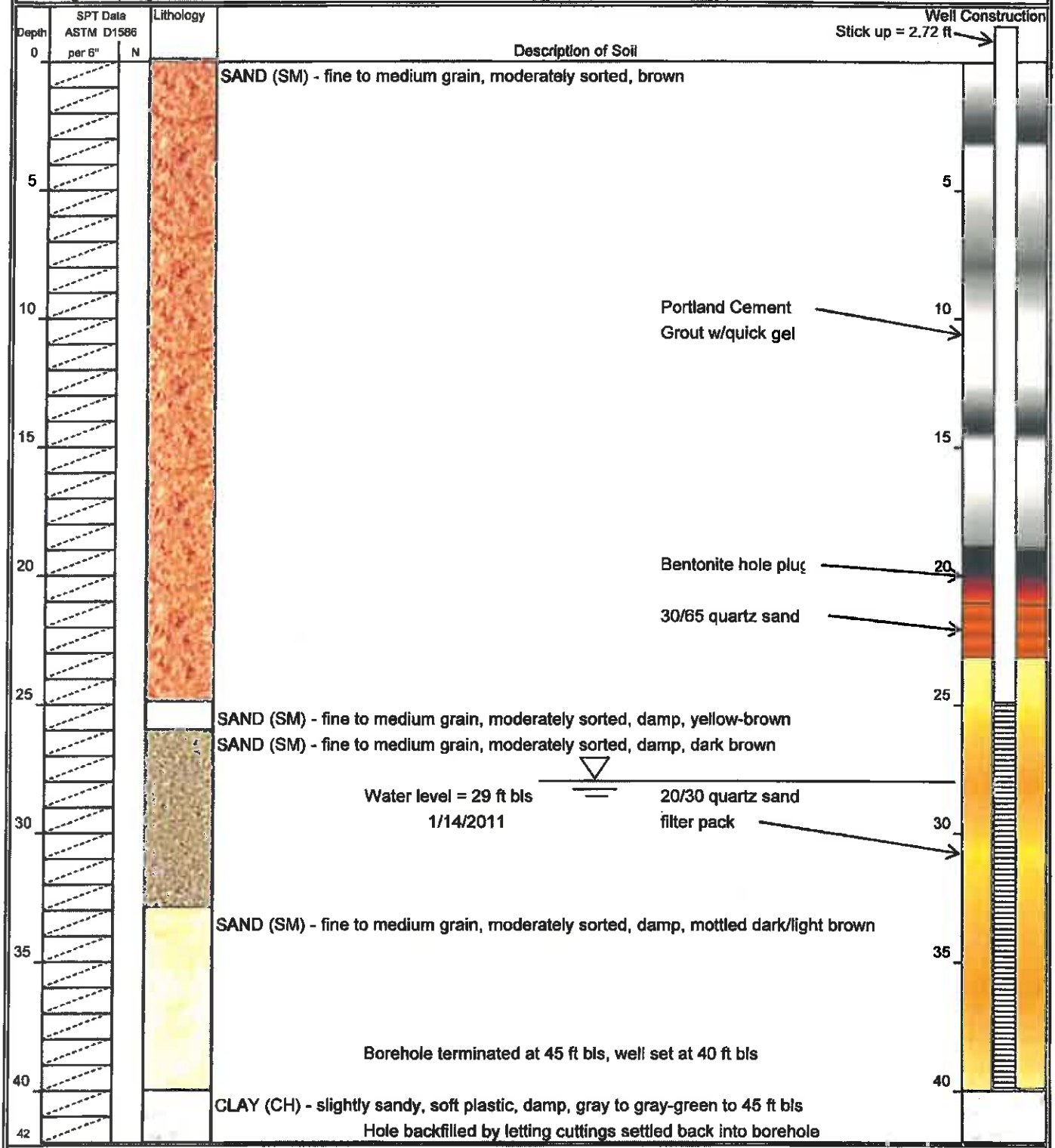
The borings revealed that the northeastern portion of Settling Area No. 1 was covered by a high, sparcely vegetated sand tailings pile overlying a very thin or nonexistent waste clay layer. The southern and western portions, on the other hand, were found to be relatively low and highly vegetated with little or no sand tailings overlying a relatively thick waste clay layer. Except for a few small sections in the northeastern portion of the settling area, the entire subject site was found to be unmined with the waste phosphatic clays resting directly on the natural ground surface sands. Within the boundaries of the site, the waste phosphatic clays varied in thickness from 0 to 18 feet. An aerial of the site showing the thickness of the waste clay encountered at each boring location is presented in Figure 4.1. This figure also shows the elevations in NGVD of the upper surface of the waste clay.

TEST BORING FIELD REPORT

Boring No.: TH-73

Project Name: Hillsborough SCLF
Project No.: 149350-010
Drillers: Groundwater Protection/Div. of Drillpro LLC
Drilling/sampling methods: Sonic/continuous

Test Boring Completed: 1/14/2011
Geologist: John S. Catches, PG
Elevations: Ground: 128.35 NGVD, Top of Casing: 131.07 NGVD
Surveyed by: Pickett & Associates, Inc.



Notes & additional data/info. (specify if other materials used):

Total well depth = 40 ft
Well casing/pipe: Dia. & type = 2-in. Sch. 40 PVC; Solid length = 25 ft; Screen = 15 ft., 0.010-in.
Sand filter pack = 11 - 50 lb. Bags; Type = 20/30 silica; Placed from 23 ft to 40 ft bls (measured)
Annular seal: Type = Bentonite/fine sand; Thickness = 4 ft.; Placed from 19 ft to 21 ft/21 ft to 23 ft bls (measured)
Grout = 2 - 94 lb. bags cement and < 1/2 bag Quik gel, grout to surface; Pad = 2ft x 2 ft x 4 in concrete; Cover = 6 in dia Al Stickup

General Notes

Notes:

1. The profiles depicted are of a generalized nature to highlight the major subsurface stratification features and material characteristics. The soil profiles include soil description, stratifications and penetration resistances. The stratifications shown on the boring profiles represent the conditions only at the actual boring location. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.
2. Groundwater levels generally fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. In addition, a seasonal effect will also occur in which higher groundwater levels or temporary perched conditions are normally recorded in rainy seasons.

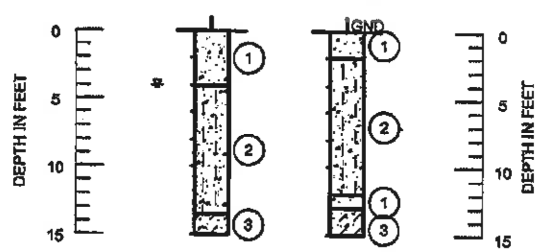
No.	Revision/Issue	Date

TEST LAB INC. GEOTECHNICAL & MATERIALS ENGINEERING TESTING & INSPECTION

Groundwater Assessment for Landfills - SE County Landfill Lithia, FL

GE 11-3643 | October 6, 2011 | NTS | 2

SOIL PROFILE



LEGEND

① Gray SAND to SAND with Silt (SP/SP-SM)

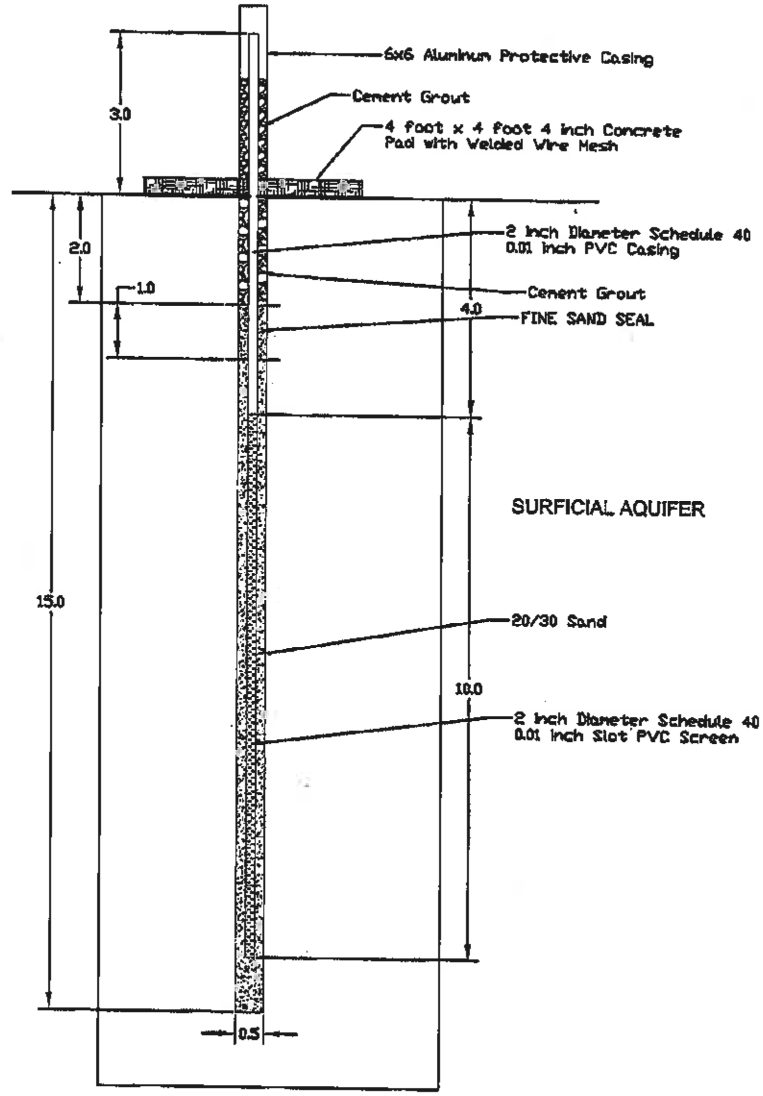
② Brown SAND to SAND With Silt (SP/SP-SM)

③ Gray SAND to Clayey SAND (SP-SC)

SP Unified Soil Classification System (ASTM D 2488) Group Symbol As Determined By Visual Review

* Groundwater Table

GND Groundwater Table Not Determine Due To Drilling Methods Utilized



TYPICAL MONITORING WELL CONSTRUCTION

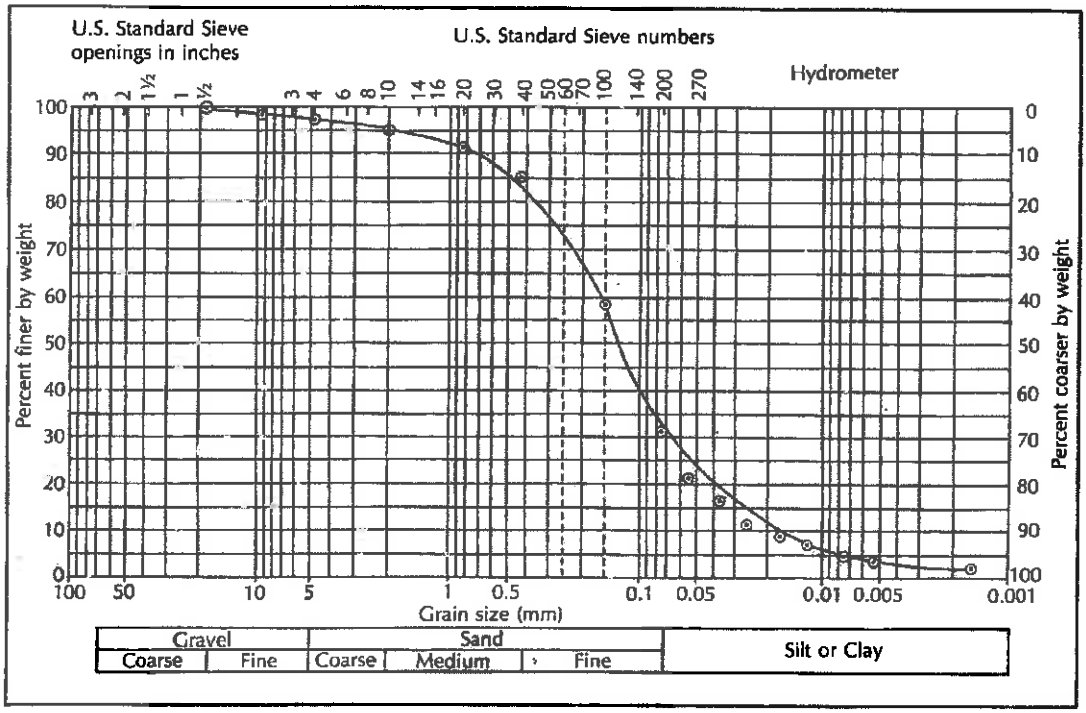


FIGURE 4.4 Grain-size distribution curve of a silty fine to medium sand.

Clays and some clay-rich or organic soils can have very high porosities. Organic materials do not pack very closely because of their irregular shapes. The dispersive effect of the electrostatic charge present on the surfaces of certain book-shaped clay minerals causes clay particles to be repelled by each other. The result is a relatively large proportion of void space.

The general range of porosity that can be expected for some typical sediments is listed in Table 4.2.

TABLE 4.2 Porosity ranges for sediments (1–4)

Well sorted sand or gravel	25–50%
Sand and gravel, mixed	20–35%
Glacial till	10–20%
Silt	35–50%
Clay	33–60%

Fetter, C.W., 1988, Applied Hydrogeology, Second Edition, Merrill Publishing Company, Columbus, OH.

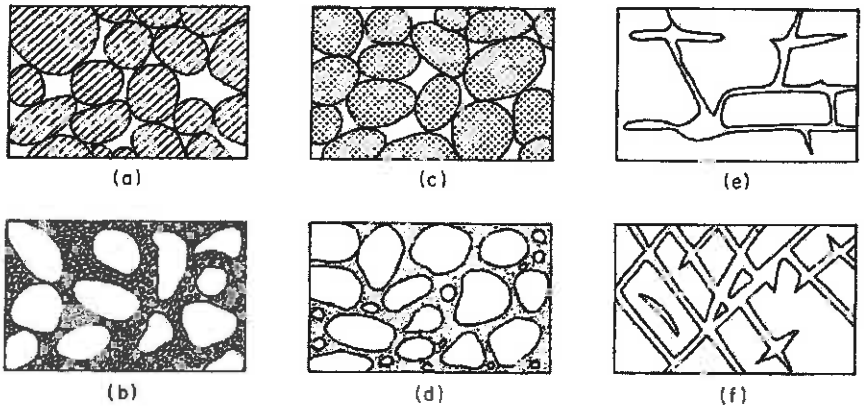


Figure 2.11 Relation between texture and porosity. (a) Well-sorted sedimentary deposit having high porosity; (b) poorly sorted sedimentary deposit having low porosity; (c) well-sorted sedimentary deposit consisting of pebbles that are themselves porous, so that the deposit as a whole has a very high porosity; (d) well-sorted sedimentary deposit whose porosity has been diminished by the deposition of mineral matter in the interstices; (e) rock rendered porous by solution; (f) rock rendered porous by fracturing (after Meinzer, 1923).

soil or rock matrix [Figure 2.11(a), (b), (c), and (d)], and *secondary porosity*, which may be due to such phenomena as secondary solution [Figure 2.11(e)] or structurally controlled regional fracturing [Figure 2.11(f)].

Table 2.4, based in part on data summarized by Davis (1969), lists representative porosity ranges for various geologic materials. In general, rocks have lower porosities than soils; gravels, sands, and silts, which are made up of angular and

Table 2.4 Range of Values of Porosity

	n(%)
Unconsolidated deposits	
Gravel	25–40
Sand	25–50
Silt	35–50
Clay	40–70
Rocks	
Fractured basalt	5–50
Karst limestone	5–50
Sandstone	5–30
Limestone, dolomite	0–20
Shale	0–10
Fractured crystalline rock	0–10
Dense crystalline rock	0–5

Freeze, A.R., and J.A. Cherry, 1979, GROUNDWATER, Prentice Hall, Englewood Cliffs, NJ.

TABLE 1. DEFAULT LOW DENSITY SOIL CHARACTERISTICS

Soil Texture Class			Total Porosity vol/vol	Field Capacity vol/vol	Wilting Point vol/vol	Saturated Hydraulic Conductivity cm/sec
HELP	USDA	USCS				
1	CoS	SP	0.417	0.045	0.018	1.0×10^{-2}
2	S	SW	0.437	0.062	0.024	5.8×10^{-3}
3	FS	SW	0.457	0.083	0.033	3.1×10^{-3}
4	LS	SM	0.437	0.105	0.047	1.7×10^{-3}
5	LFS	SM	0.457	0.131	0.058	1.0×10^{-3}
6	SL	SM	0.453	0.190	0.085	7.2×10^{-4}
7	FSL	SM	0.473	0.222	0.104	5.2×10^{-4}
8	L	ML	0.463	0.232	0.116	3.7×10^{-4}
9	SiL	ML	0.501	0.284	0.135	1.9×10^{-4}
10	SCL	SC	0.398	0.244	0.136	1.2×10^{-4}
11	CL	CL	0.464	0.310	0.187	6.4×10^{-5}
12	SiCL	CL	0.471	0.342	0.210	4.2×10^{-5}
13	SC	SC	0.430	0.321	0.221	3.3×10^{-5}
14	SiC	CH	0.479	0.371	0.251	2.5×10^{-5}
15	C	CH	0.475	0.378	0.251	2.5×10^{-5}
21	G	GP	0.397	0.032	0.013	3.0×10^{-1}

a = constant representing the effects of various fluid constants and gravity, 21 cm^3/sec

ϕ = total porosity, vol/vol

θ_r = residual volumetric water content, vol/vol

ψ_b = bubbling pressure, cm

λ = pore-size distribution index, dimensionless

A more detailed explanation of Equation 11 can be found in Appendix A of the HELP program Version 3 User's Guide and the cited references.

Schroeder,P.R., T.S. dozier, P.A. Zappi, B.M McEnroe, J.W. Sjostrom, and R.L. Peyton, 1994, THE HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE (HELP) MODEL, ENGINEERING DOCUMENTATIONFOR VERSION 3, Environmental Laboratory, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.