Environmental Consultants
and Contractors

4041 Park Oaks Blvd.
Suite 100
Tampa, FL 33610-9501

813 621-0080
FAX 813 623-6757
www.scsengineers.com

SCS ENGINEERS

November 24, 2015
File No. 09215600.01

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

Subject: Southeast County Landfill, Hillsborough County
Operation Permit Intermediate Application
Responses to Request for Additional Information (RAI)
WACS No. 41193
Permit No. 35435-023-SO-IM

Dear Mr. Freedenberg:

On behalf of the Hillsborough County Public Works Department Solid Waste Management Division (SWMD), SCS Engineers (SCS) submits the following responses to your Request for Additional Information (RAI) in a letter dated October 23, 2015.

We have provided additional information, where applicable. If a response modifies a section of the application, the respective section(s) is updated accordingly. A complete version of the documents that include all revisions made in responding to this RAI are attached to this letter, using a strikethrough (e.g., ~~deleted~~) and underline (added) format, to facilitate review. We have included the revision date as part of the header/footer for all revised pages and provided an original and two copies of all revised materials.

For ease of review, each Florida Department of Environmental Protection (FDEP) comment is reiterated in bold type, followed by our response. The following are our responses:

1. **You have indicated a desire to use on-site soils for final closure. Use of onsite soils will reduce the amount of required Financial Assurance. AS per 62-701.630(3)(d)1 F.A.C. and 62-701(3)(d)2 F.A.C, this is permitted. You have submitted a letter from Civil Design Service dated September 11, 2015 signed by Joseph H. O'Neill, P.E. which satisfies the requirements of 62-701.630(3)(d)l F.A.C. Please submit a covenant, easement, trust or other legal agreement with the Department as required by 62-701.630(3)(d)2.**

   Response: A soil covenant agreement has been drafted and reviewed by Hillsborough County and was provided to FDEP, under separate cover, on November 18, 2015. The soil covenant agreement is provided in Attachment A-1. Since the FDEP will deem

"horizontal detection/vertical compliance." As both wells TH-40 and TH-78 are located more than 50 feet from the disposal footprint of Phases I-VI, the "horizontal detection" part of the well designation is not appropriate. Please submit revisions to this table to designate wells TH-40 and TH- 78 as "compliance wells."

Response: The designations for wells TH-40 and TH-78 have been revised from "horizontal detection" to "compliance wells" in the table that lists the wells associated with the semi-annual monitoring of Phase I-VI on page L-1 of the revised Water Quality Monitoring Plan. See revised Water Quality Monitoring Plan in Attachment E.

6. <u>Water Quality Monitoring Plan:</u> **Page L-2 includes a table that lists the inactive wells reserved for future use. Well TH-35A is identified as a surficial aquifer well in this table. It is the Department's understanding that well TH-35A was previously used as a supply well when the phosphate mining activities were conducted at the property. Please submit revisions to this table to indicate well TH-35A is a Floridan aquifer well.**

Response: The aquifer description for well TH-35A has been revised from surficial aquifer well to Floridan aquifer well in the table that lists the inactive wells reserved for future use on page L-2 of the revised Water Quality Monitoring Plan. See revised Water Quality Monitoring Plan in Attachment E.

7. <u>Water Quality Monitoring Plan:</u> **Item (2) in this section refers to downgradient compliance wells. The last sentence of this section indicates that wells TH-40 and TH-78 are designated as "vertical compliance wells." Please submit revisions to this section to indicate that wells TH-40 and TH-78 are "compliance wells."**

Response: The text in Section L.1.c(2) of the revised Water Quality Monitoring Plan has been revised. Wells TH-40 and TH-78 have been revised from "vertical compliance wells" to "compliance wells" in the last sentence of Item (2) on page L-4 of the revised Water Quality Monitoring Plan. See revised Water Quality Monitoring Plan in Attachment E.

8. <u>Water Quality Monitoring Plan:</u> **Item (4) in this section refers to the survey information for the existing monitor wells in Table L-1, however this table was not provided. It is noted that previous versions of Table L-1 ("Monitoring Well Characteristics Summary, Southeast County Landfill") included northings and eastings. Please submit revisions to Table L-1 that provide degrees, minutes and seconds of latitude and longitude for each monitor well.**

Response: Table L-1 has been revised to include degrees, minutes and seconds of latitude and longitude. See revised Table L-1 attached to the Water Quality

Monitoring Plan in Attachment E.

9. **Leachate Management Plan Section 8.0 – Leachate and Effluent Disposal: This section indicated leachate is disposed via treatment at the on-site leachate treatment and reclamation facility, hauling raw leachate via tanker truck to a Hillsborough County wastewater treatment facility, and truck-mounted spray evaporation of raw leachate within the contained working surface. Based on the information provided in the Engineering Report submitted in support of the closure (long-term care) permit renewal application submitted for the Hillsborough Heights and Taylor Road Landfills (pending permit #69683-011-SF/14), received September 9, 2015, it appears that raw leachate from Southeast County Landfill is also transported via tanker truck and discharged to the 10,000 gallon storage tank located at Hillsborough Heights and Taylor Road Landfills. Leachate from the storage tank is conveyed to the main leachate pump station and then pumped via force main to the Valrico Wastewater Treatment Plan. Please submit revisions to Section 8.0 to describe all methods of leachate disposal for Southeast County Landfill.**

Response: SCS, on behalf of SWMD, provided FDEP, Solid Waste Management, Southwest District, with an Administrative Leachate Disposal Procedure Notification on February 5, 2015 (See Attachment F). This notification outlined the new procedures that the SWMD was implementing starting on February 19, 2015. The new procedures are to reroute leachate from SCLF through the existing wastewater lift station at the Hillsborough Heights Landfill to convey the leachate to the Hillsborough County Valrico wastewater treatment facility (WWTF). The two landfills already have an existing agreement in place with Hillsborough County Public Utilities Department (PUD) to discharge to the receiving WWTF and the quantity of leachate being discharged into the lift station will still be measured separately. The SWMD did not receive any comment from the Department.

The SWMD's agreement with the PUD is that the point of discharge for the SCLF is the tanker truck. Therefore, SWMD discharges leachate to the wastewater lift station as directed by PUD. Currently, SCLF may discharge to the Big Bend lift station and the Hillsborough Heights Landfill lift station, as indicated in the Leachate Management Plan (LMP). Both discharge to the Valrico WWTF. The LMP has only identified the receiving treatment faacility and not the lift stations because there are numerous lift stations and these can change per PUD's direction. For example, there are 160 lift stations that discharge to the Falkenburg WWTF; 105 lift stations that discharge to the Valrico WWTF; and 181 lift stations that discharge to the South County WWTF.

Section 8.5.2 of the LMP has been revised to include off-site disposal to the South County WWTF, as SWMD may also use the wastewater lift station at the South County Transfer Station which discharges to the South County WWTF.

As required, this response has been certified and signed by a professional engineer. We have enclosed one copy of our response. Please call if you have any questions.

Sincerely,

Bruce J. Clark, PE
Project Director
SCS ENGINEERS

BJC:bjc

cc: Kimberly A. Byer, HCSWMD
Larry Ruiz , HCSWMD
Ron Cope, HCEPC
John Morris, FDEP Tampa
Steve Morgan, FDEP Tampa

SCS ENGINEERS

Southeast County Landfill, Hillsborough County
Operation Permit Intermediate Application
Responses to Request for Additional Information (RAI)
WACS No. 41193
Permit No. 35435-023-SO-IM

Presented to:

Solid Waste Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MB 4565
Tallahassee, FL 32399

Presented by:

SCS ENGINEERS
4041 Park Oaks Blvd., Suite 100
Tampa, Florida 33610
(813) 621-0080

November 24, 2015
File No. 09215600.01

ATTACHMENT A-1

Soil Covenant Agreement

Project No. 2016-013-U
SE County Landfill Restrictive Covenant
Parcel: Future Borrow Area
Folio #:088548.0000
Sec 13 Twp 31 Rge 21

This instrument prepared by:
Eric Watkins, Real Property Supervisor
Hillsborough County Real Estate
and Facilities Services Dept.
P.O. Box 1110, Tampa, Florida 33601

DECLARATION OF RESTRICTIVE COVENANT AND ACCESS EASEMENT AGREEMENT

THIS DECLARATION OF RESTRICTIVE COVENANT AND ACCESS AGREEMENT (the "Declaration") is made by and between Hillsborough County (the "County") a Florida political subdivision of the State, and THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (the "Department").

RECITALS:

A. The County is the fee simple owner of that certain real property situated in Hillsborough County, Florida, more particularly described in Exhibit "A" attached hereto and made a part hereof (the "Entire Property"), within which lies the "Restricted Property," more particularly described in Exhibit "B" attached hereto and made a part hereof.

B. The facility name at the time of this Declaration is Hillsborough County Southeast Landfill (the "Facility"). The Department's WACS Facility Identification Number is 41193. The Facility is a Class I Landfill disposal facility.

C. Rule 62-701.630 Florida Administrative code (F.A.C.) permits the use of on-site soils rather than offsite soils as part of the Facility's final cover, as fill, or for other construction purposes when calculating the Facility's closure costs under certain circumstances including, but not limited to, entering into a legal agreement with the Department to ensure that the designated on-site soils will be available and accessible for the benefit of the Department and the County, for the proposed closure-related uses.

D. The Department may need access to and use of the property for the purpose of closure of the Facility pursuant to Rule 62-701 and the County desires to grant the Department an easement for that purpose.

E. The County deems it desirable that this Declaration of Restrictive Covenant be entered into and that the Restricted Property be held subject to the restrictions, all of which are more particularly hereinafter set forth.

NOW, THEREFORE, to meet the requirements of Rule 62-701.630 F.A.C., and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by each of the undersigned parties, the County agrees as follows:

1. The foregoing recitals are true and correct and are incorporated herein by reference.

2. The County hereby imposes on the Restricted Property the following use restrictions:

   a. Subject to the authorization through the issuance of the proper permits by the local regulatory agencies, including Hillsborough County, Florida, the on-site soils delineated in the Restricted Property shall be available and accessible for the benefit of the Department and the County for closure-related uses.

   b. The County shall not, without the written prior consent of the Department, utilize on-site soils in the Restricted Property except for closure-related uses.

   c. To ensure the designated on-site soils will be available and accessible for the benefit of the Department and the County for closure related uses, the County shall submit a report by July 1st of each year following the execution of this Declaration of Restrictive Covenant that is certified by a Florida registered Professional Engineer. This report shall certify that the quantity of suitable soils needed for use as final cover of the facility remain within the Restricted Property.

3. For the purpose of monitoring the restrictions contained herein and for the purpose of closure of the Facility pursuant to 62-701, the Department and its respective successors or assigns, as well as the Department's agents, including but not limited to contractors working on closure of the Facility pursuant to 62-701, shall have site access to the Restricted Property at reasonable times and with reasonable notice to the County, its successors and assigns.

4. It is the intention of the County that the restrictions contained in this Declaration shall touch and concern the Restricted Property, run with the land and title to the Restricted Property, and apply to, be binding upon, and inure to the benefit of the successors and assigns of the County and to the Department, its successors and assigns, and to any and all parties hereafter having any right, title or interest in the Restricted Property or any part thereof. The Department and its successors and assigns may enforce the terms and conditions of this Declaration by injunctive relief and other appropriate available legal remedies. Any forbearance on behalf of the Department or its successors or assigns to exercise its right in the event of the failure of the County, and its successors and assigns, to comply with the provisions of this Declaration shall not be deemed or construed to be a waiver of the Department's rights hereunder. This Declaration shall continue in perpetuity, unless otherwise modified in writing by the County and the Department as provided in Paragraph 6 hereof. These restrictions may be enforced in a court of competent jurisdiction by the Department or its successor agency, or by any other person, firm, corporation or governmental agency that may substantially benefit from these restrictions. If the County does not or will not be able to comply with any or all of the provisions of this Declaration, the County shall notify the Department in writing within three (3) calendar days. Additionally, the County shall notify the Department thirty (30) days prior to any conveyance or sale, granting or transferring the Restricted Property or portion thereof, to any heirs, successors, assigns or grantees, including, without limitation, the conveyance of any security interest in said Restricted Property.

5. To ensure the perpetual nature of these restrictions, the County, its successors and assigns, shall reference these restrictions in any subsequent deed of conveyance, including the Official Records Book and Page of record of this Declaration. Furthermore, prior to the entry into a landlord-tenant relationship with respect to the Restricted Property, the County agrees to notify in writing all proposed tenants of the Restricted Property of the existence and contents of this Declaration of Restrictive Covenant.

6. This Declaration is binding until a release of covenant is executed by the Department's Secretary (or its designee) and by the County (or its successors and assigns), and is recorded in the Hillsborough County Public Records. This Declaration may be modified in writing only. Any subsequent amendment must be executed by both the County and the Department or their respective successors or assigns, and thereafter recorded by the County, or its successors and assigns, as an amendment hereto.

7. If any provision of this Declaration is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provisions hereof. All such other provisions shall continue unimpaired in full force and effect.

8. The County covenants and represents that, on the date of execution of this Declaration, it is seized of the Entire Property in fee simple, and has good right to create, establish and impose this restrictive covenant on the use of the Restricted Property. The County also covenants and warrants that the Entire Property is free and clear of any and all liens, mortgages or encumbrances that could impair the County's right to impose the restrictive covenant described in this Declaration, or that would be superior to the restrictive covenant described in this Declaration.

9. The parties agree that the Declaration and all documents associated with the transaction contemplated herein may be executed by electronic signature in a manner that complies with Chapter 668, Florida Statutes, and as approved by the Hillsborough County Board of County Commissioners in Resolution R15-025 on February 4, 2015.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the County has executed this Declaration of Restrictive Covenant this _____day of _____, 20__.

Hillsborough County

By: _____
Print Name: _____
Chairman, Board of County Commissioners

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

_____
Assistant County Attorney

ATTEST: Pat Frank, Clerk of Circuit Clerk

_____
By: Deputy Clerk

[SIGNATURES CONTINUED ON FOLLOWING PAGE]

APPROVED AS TO FORM BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF GENERAL COUNSEL.

By:_____

Print Name:_____

Title:_____

Date:_____

WITNESSES:

_____

Print Name:_____

_____

Print Name:_____

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

By:_____

Print Name:_____

Title:_____

Division of:_____

STATE OF FLORIDA
COUNTY OF HILLSBOROUGH

I hereby certify that on this day, before me, an officer duly authorized in the aforesaid State and County to take acknowledgements, personally appeared _____, in his/her capacity as _____ of the Florida Department of Environmental Protection, who acknowledged that s/he freely and voluntarily executed the same under authority vested in him/her by said agency. S/he is personally known to me, or produced _____ _____as identification.

Witness my hand and official seal in _____ County, State of Florida, this _____ day of _____, 20__.

_____
Notary Public, State of Florida

My Commission Expires:_____

EXHIBIT "A"
Legal Description

PARCEL I:

North side of State Road S-672: South 1/2 of Section 21; South 1/2 of Section 22; South 1/2 of Section 23, LESS that portion of the North 200 feet of the South 1/2 of said Section 23, lying Easterly of the centerline of a 200 foot Tampa Electric Company Easement dated November 13, 1962, recorded in Official Record Book 1058, page 441, conveyed to Hillsborough County, Florida, by Deed dated October 11, 1983 and recorded October 28, 1983 in Official Record Book 4209, page 375, Public Records of Hillsborough County, Florida.

All lying and being in Township 31 South, Range 21 East, Hillsborough County, Florida.

PARCEL II:

South side of State Road S-672: West 1/2 of Northwest 1/4, Section 28; Northwest 1/4 of the Southwest 1/4, Section 28; Northeast 1/4, Section 29; East 1/2 of Northwest 1/4, Section 29; Northeast 1/4 of Southwest 1/4, Section 29; North 1/2 of Southeast 1/4, Section 29; LESS the West 15 feet of the East 1/2 of the Northwest 1/4 of Section 29.

All lying and being in Township 31 South, Range 21 East, Hillsborough County, Florida.

PARCEL III:

That part of the Southeast 1/4 of Southwest 1/4 of Section 29, lying North of the center line of the existing county drainage canal, which center line is located approximately as follows: Commencing 33 feet, more or less, South of the Northwest corner of said Southeast 1/4 of Southwest 1/4 on the West boundary of said Southeast 1/4 of Southwest 1/4, thence proceed in a northeasterly direction to the Northeast corner of said Southeast 1/4 of Southwest 1/4.

All lying and being in Township 31 South, Range 21 East, Hillsborough County, Florida.

CIP/CIT PROJECT NO:
GEOMATICS PROJECT NO. P16-0151

SECTION 13, TOWNSHIP 31 SOUTH, RANGE 21 EAST
HILLSBOROUGH COUNTY, FLORIDA
MAP OF SURVEY

EXHIBIT "B"

SCALE 1" = 200'

Description: (per HDR Engineering, Inc. 6/30/15)

From the southeast corner of the northwest 1/4 of Section 13, Township 31 South, Range 21 East, whose northing is 1,254,421.68 and whose easting is 603,720.97 thence bearing S49°38'48.71"W a distance of 576.13 to a point of beginning whose northing is 1,254,048.62 and whose easting is 603,281.94; thence bearing S00°00'00"E, a distance of 2,000.00 feet; thence bearing N90°00'00"W, a distance of 2,000.00 feet; thence bearing N00°00'00"E, a distance of 2,000.00 feet; thence bearing N90°00'00"E, a distance of 2,000.00 feet back to the point of beginning.

Surveyor Notes

1. Type of Survey: Boundary Survey
2. Unit of Measure: United States Survey Foot.
3. Bearings and coordinates as shown hereon are referenced to the Florida State Plane Coordinate System, Florida West Zone, North American Datum 1983, Adjustment 1999 (NAD 83/99) and were established by Real Time Kinematics (RTK) Global Positioning System (GPS) observations utilizing the Hillsborough County Permanent Reference Station Network.
4. Underground utilities, foundations and/or other improvements have not been located except those unexcavated visible features shown on this survey
5. Bearings based on the monumented north boundary line between points 2 and 6. The direction of said bearing being N90°00'00"E.
6. Hillsborough County is self insured in accordance with Florida Statutes
7. NO jurisdictional limits such as wetlands, setbacks, or conservation areas were established or mapped as a part of this survey

BOUNDARY SURVEY
SURVEY DATE: 8/5/15

GARY C. ALBRITTON
PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA CERTIFICATE # 5519

SURVEY MAP OR COPIES THEREOF ARE NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

THE SURVEY DEPICTED HERE IS NOT COVERED BY PROFESSIONAL LIABILITY INSURANCE.

NO.	DATE	REVISIONS DESCRIPTION	APPROVED

HILLSBOROUGH COUNTY BOCC / PUBLIC WORKS DEPT.
/ GEOMATICS SECTION / SURVEY FIELD OPERATIONS
2218 N. Falkenburg Road, Tampa, FL 33619
Phone: (813) 307-4781 Fax: (813) 272-6459

SOUTHEAST COUNTY LANDFILL
FUTURE BORROW AREA

DRAWN BY:	AIDA CAMEJO		GEOMATICS PROJECT No. P16-0837
CHECKED BY:	GARY ALBRITTON		
APPROVED BY:	GARY ALBRITTON	FIELD BOOK No.:	SHEET NO. 1 OF 1
SECTION(S)	TOWNSHIP / RANGE		
13	31S / 21E	PG.:	

ATTACHMENT A-2

Biosolids Composting Pilot Study - Final Report

kessler consulting inc.
innovative waste solutions

TECHNICAL MEMORANDUM

DATE: October 8, 2015

TO: Beth Schinella, Division Director, Operations & Maintenance, Public Utilities
Kim Byer, Division Director, Solid Waste Management, Public Works

FROM: Peter Engel, Darren Midlane & Ryan Graunke

SUBJ: Biosolids Composting Pilot: Phase 1 Summary

PROJ #: 175-00

Pilot Project Overview

In Fiscal Year 2015 Hillsborough County (County) Public Utilities and Public Works Departments implemented a pilot biosolids composting project combining two County waste streams (biosolids and yard waste). Kessler Consulting, Inc. (KCI) has worked closely with County staff during the pilot providing conceptual design, technical assistance, operational supervision, regulatory communications, and financial analysis. Phase 1 of the pilot involved composting two batches of biosolids. Based on results to date, the pilot is demonstrating four important benefits:

- Reduced biosolids management cost
- Increased landfill diversion
- Biosolids composting with very low odor
- Production of Class AA compost for which strong market demand exists.

The purpose of this technical memorandum is to provide a brief summary of Phase 1 activities and results and an assessment of operational and financial impacts.

Description of Activities

Compost Site: The pilot facility was established on an inactive section of the County's Southeast County Landfill. The County installed a working surface of recycled asphalt for the main composting activity. An adjacent area was used for subsequent compost curing and storage. Figure 1 shows the conceptual site plan. Figure 2 shows a photo of windrows in active composting on the site.

Figure 1: Pilot Project Conceptual Site Plan

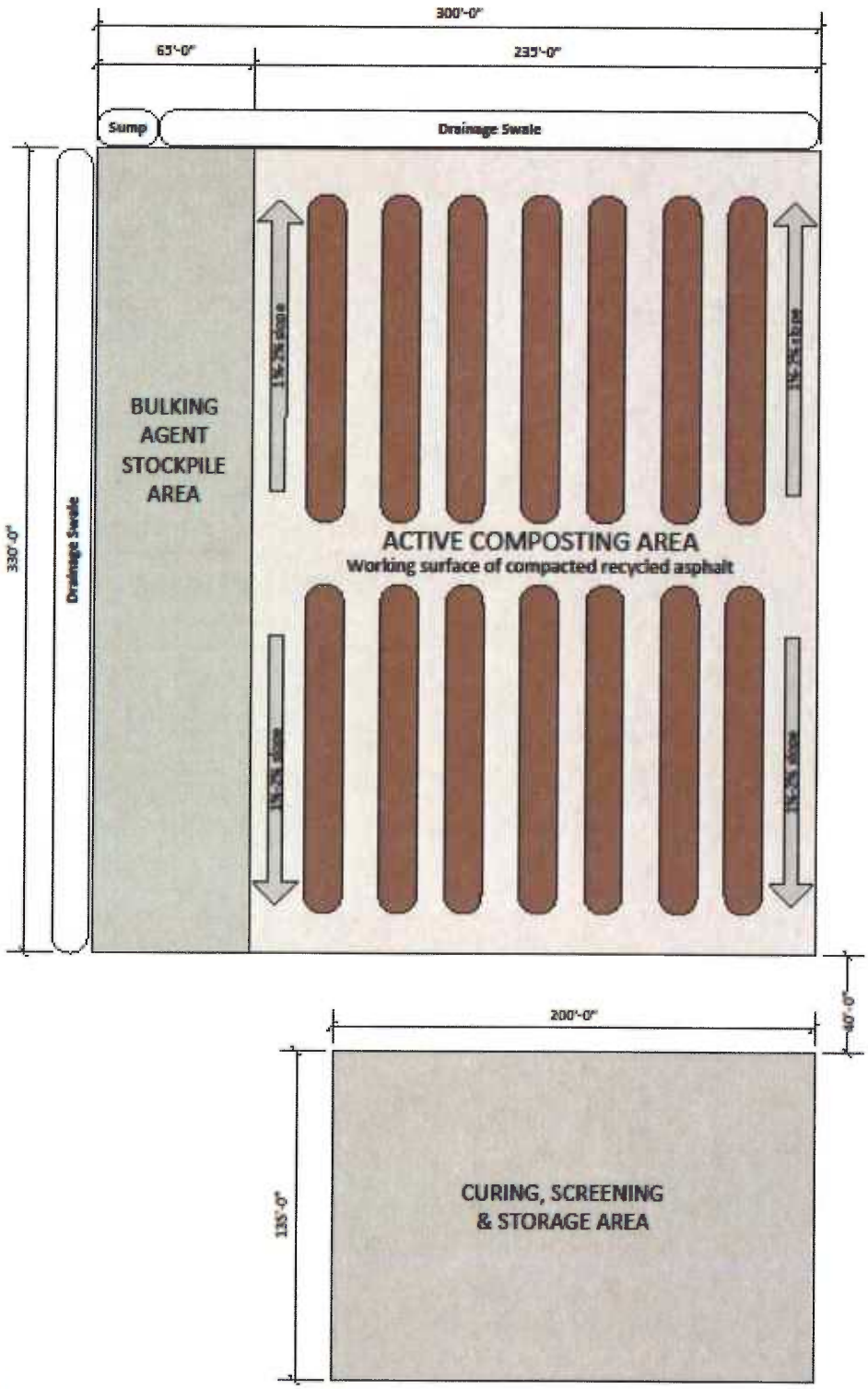


Figure 2: Compost Windrows

Source of Material: The pilot handled biosolids from the County's Falkenburg Rd. Advanced Wastewater Treatment Facility (AWTF). The pilot utilized ground yard waste from the County's Falkenburg and South County processing sites. The facility was sized to handle approximately 20 days of biosolids production. Figure 3 shows the delivery of the biosolids.

Figure 3: Biosolids Delivery

Composting Method: The County initially planned to test two different composting methods: Modified Static Aerated Pile (MSAP©) and Turned Windrow (TW). Both methods involve an active composting phase (approximately 45 days) and a curing phase (approximately 45 – 60 days) after which compost can be screened and ready for distribution and use. MSAP differs from traditional TW method in several important ways. MSAP utilizes a proprietary microbial inoculant to enhance decomposition and places an insulating cap on the windrow which reduces odor emissions and retains high temperatures in the biosolids. MSAP windrows are not turned for at least 30 days remaining in an initial static phase, after which, just two turns are employed to maintain aerobic conditions, redistribution moisture, and further accelerate breakdown.

TW methods require a minimum of 5 turns in 15 days to meet regulatory requirements for pathogen destruction. In addition, TW methods often require numerous additional turns to maintain optimum aerobic conditions beyond the pathogen reduction phase and throughout the process.

Turning windrows is typically undertaken utilizing a front-end loader or specialized turning equipment. Due to the need for fewer turnings, the MSAP method results in reduced equipment operating hours, fuel consumption, and labor hours. The reduced costs are greater than the cost of the microbial inoculant so that overall the cost for MSAP is less than TW method as summarized in the Table 1.

Table 1: Relative Cost of TW and MSAP Composting Methods

Inoculant Cost	Traditional	MSAP
Harvest Quest MSAP Inoculant ($/cy of fresh compost mix)	**$0.00**	**$0.65**
Environmental Savings		
Frequency of Windrow Turner Manipulations	12 (average)	2
% Reduction in Turns Utilizing MSAP	-	83%
Cost Savings		
Total Cost of Turning @$0.12 per cy per turn (Inclusive of labor, equipment maintenance, fuel)	$1.44	$0.24
Total Compost Process Production Costs ($/cy of fresh compost mix)	**$1.44**	**$0.89**
Cost Savings Utilizing MSAP	-	**38%**

Staffing: County staff operated the composting pilot. KCI staff provided an initial training course and site visits to operating biosolids composting facilities. KCI was present on site daily during the initial week of pilot operations to provide training on proper materials handling and site management. In subsequent weeks, KCI reduced its direct involvement in operations incrementally as County staff took full responsibility for operations. Standard operating procedures for compost sampling and equipment cleaning are attached.

Routine Monitoring: Composting is a biological process that requires regular monitoring to ensure optimal conditions are being maintained and for regulatory compliance. County staff measured windrow temperatures daily and assessed condition of windrows and odor conditions regularly. A hydrogen sulfide monitor was placed on an active windrow for the duration of active composting to

assess emissions of this one compound. In addition, concentrations for two other compounds commonly associated with composting (ammonia and dimethyl sulfide) were measured periodically.

Results

Schedule: At the end of July, 2015, the two batches of biosolids compost completed active composting and curing. The table below summarizes dates for major activities for each batch.

Table 2: Phase 1 Schedule

Activity / Milestone	Batch 1	Batch 2
Biosolids Receiving	3/16 – 4/6	5/6 – 6/1
Active Composting	3/18 – 5/21	5/9 – 7/16
Curing	5/4 – 6/1	6/22 – 7/31
Screening	5/18 – 6/1; 7/13 – 7/17	7/13 – 7/17*
Distribution to Users	6/25 – 8/14	8/19 – Ongoing

*Only a portion of Batch 2 compost was screened. A-1 Sod has been accepting unscreened compost.

Quantities Handled: Table 3 summarizes the quantities of materials handled during Phase 1.

Table 3: Phase 1 Materials Tonnage

	Biosolids	Yard Waste	Total
Batch 1	1,242	1,148	2,390
Batch 2	1,398	1,078	2,476
Total	2,640	2,226	4,866

MSAP Composting Method: Based on observations made during Batch 1, the County decided to continue using the MSAP method and not employ the TW method. This decision was based on gaining operational experience with the MSAP Method and understanding the issues that would arise when employing a TW method.

For instance, it became clear that exposed biosolids quickly attracted vectors (flies) and generated significant odors. The MSAP method utilized a capping layer to insulate the piles, creating an immediate barrier to vectors and providing an instant natural bio-filter to mitigate odors. Furthermore, the temperatures in the MSAP rows were initially highest on the outer edges of the piles, which further deterred vectors and mitigated odors.

By comparison, the TW method would not typically utilize a capping layer because the rows must be turned more frequently (a minimum of 5 times) and any capping layer, if used, would be turned into the row each time and would need to be reapplied. Therefore, with TW methods, the biosolids and yard waste would be mixed together and placed into windrows with exposed biosolids on the surface of the piles. These windrows may take up to four days to reach temperatures of 131°F (55°C), the minimum regulatory requirement for pathogen reduction, before turning commenced. When turning would begin it would be repeated every 3 days and generation of odors through this activity is unavoidable. Prior to initiating the pilot, County staff visited compost operations that utilize both MSAP and TW methods and noted that odors were significantly greater at TW biosolids operations.

Weather conditions varied significantly between Batch 1 and Batch 2. Batch 1, apart from one rain event, was very dry. Conversely, Batch 2 had significant rainfall. The MSAP windrows maintained adequate moisture during Batch 1, under very dry conditions, resulting in a desirable end product. It is expected that had the TW method been utilized, the windrows would have lost significant moisture

during turning and required addition of water to maintain efficient composting, which would have required additional equipment use and labor and thus cost.

Under the much wetter conditions experienced during Batch 2, the initial static phase employed with the MSAP method along with the capping layer helped the windrows shed heavy rainfall. The more frequent turning associated with TW methods fluffs up the material, and rain events following turning means the windrows would absorb most of that rainfall (as experienced at other sites). The MSAP method allowed greater flexibility in scheduling turning to avoid major rain events. With the TW method the regulatory five turns in fifteen days, once commenced, would have to be completed regardless of weather, otherwise the clock is reset and the pathogen reduction process begins over.

Windrows that become waterlogged can quickly become anaerobic and generate malodors. Water fills voids between particles (pore spaces) in the piles and restricts airflow generating anaerobic conditions. Overly wet windrows require additional turning to dry them out, which again increases equipment use, wear and tear, and labor costs.

In summary, it became clear that the MSAP method is better suited to varying seasonal weather patterns and provides much better control of odors and vectors. Less turning increases operational efficiencies, not just through less equipment use and labor, but also in avoiding the issues that can arise from more frequent turning.

Temperature Records: Windrows consistently maintained temperatures well above 131°F throughout the active composting phase, well in excess of minimum regulatory requirements (minimum of 15 consecutive days at 131°F or greater). An example temperature graph for Batch 1 Windrow 3 is shown in Figure 4.

Odors: Qualitative and quantitative odors assessments were conducted regularly throughout Phase 1. Qualitative assessments involved walking around the site immediately upon arriving before becoming desensitized to odors. Occasionally minimal biosolids odors were noticed at windrows immediately after being first built. Odors rapidly declined to non-detectable levels. Other odors (i.e., landfill gas odors) encountered were clearly associated with the drainage sump and gas flare. Hydrogen sulfide (H_2S) monitoring results showed predominantly low H_2S concentrations and infrequent erratic spikes (Figure 5). These spikes may have been caused by the detector picking up other landfill-based H_2S in the area (e.g. drainage sump and gas flare). H_2S spikes may have been due to unloading and mixing of biosolids; the spike on 5/14 occurred around the same time biosolids were being delivered to the site. Certain wind and weather conditions would have led to detection of these extraneous sources of H_2S, which would explain the erratic nature of these spikes.

Drager tube sampling for ammonia and dimethyl sulfide found concentrations at the windrow surface ranging from 0.25 to 27.5 ppm and 0.75 to 5.0 ppm, respectively (Table 4). Higher ammonia concentrations were detected in Batch 2. This may have been due to higher levels of nitrogen compared to Batch 1, as was measured in the laboratory analysis results discussed below.

Figure 4: Example of Active Windrow Temperature Monitoring

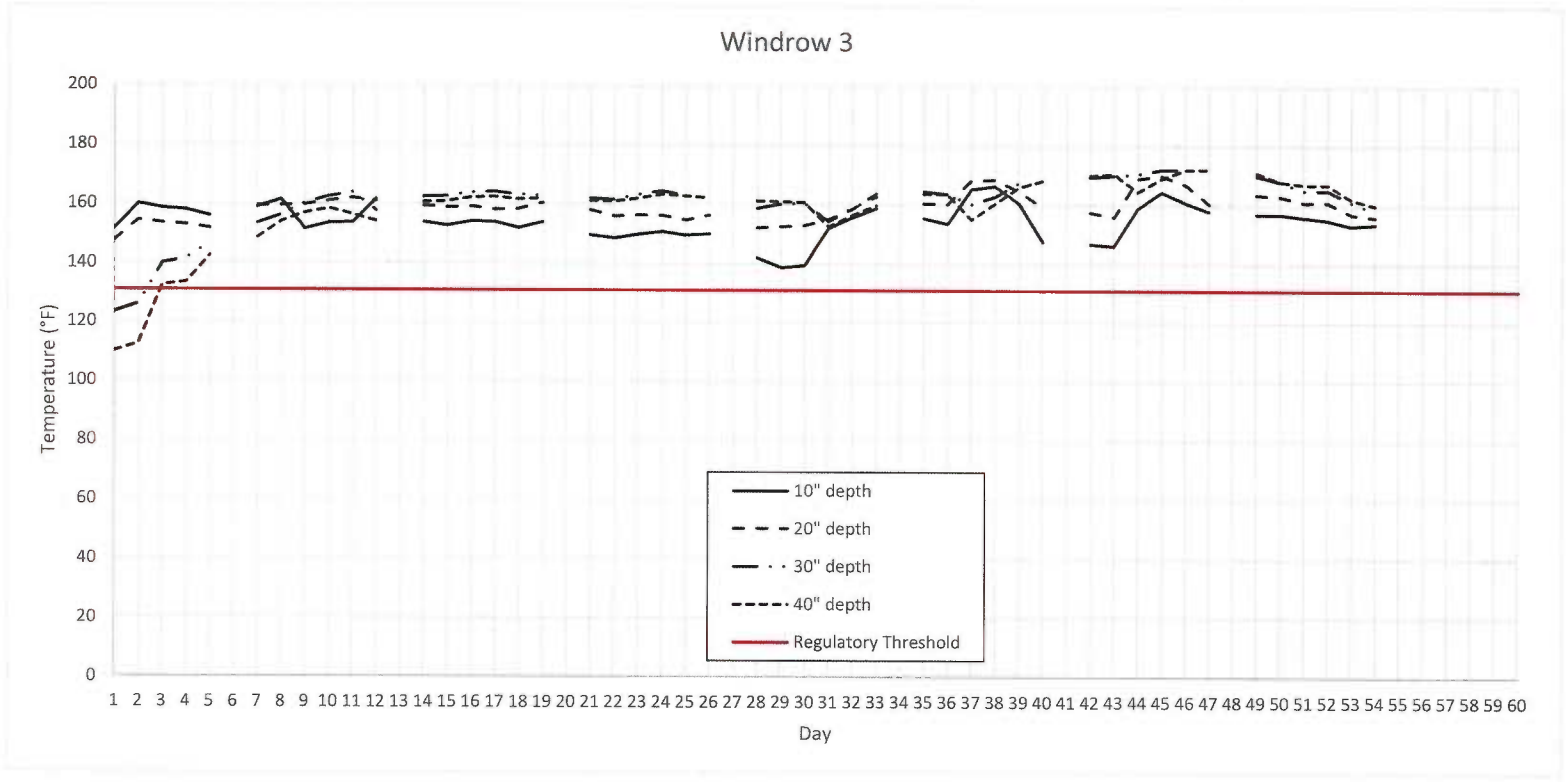


Figure 5: Hydrogen Sulfide Monitoring Results

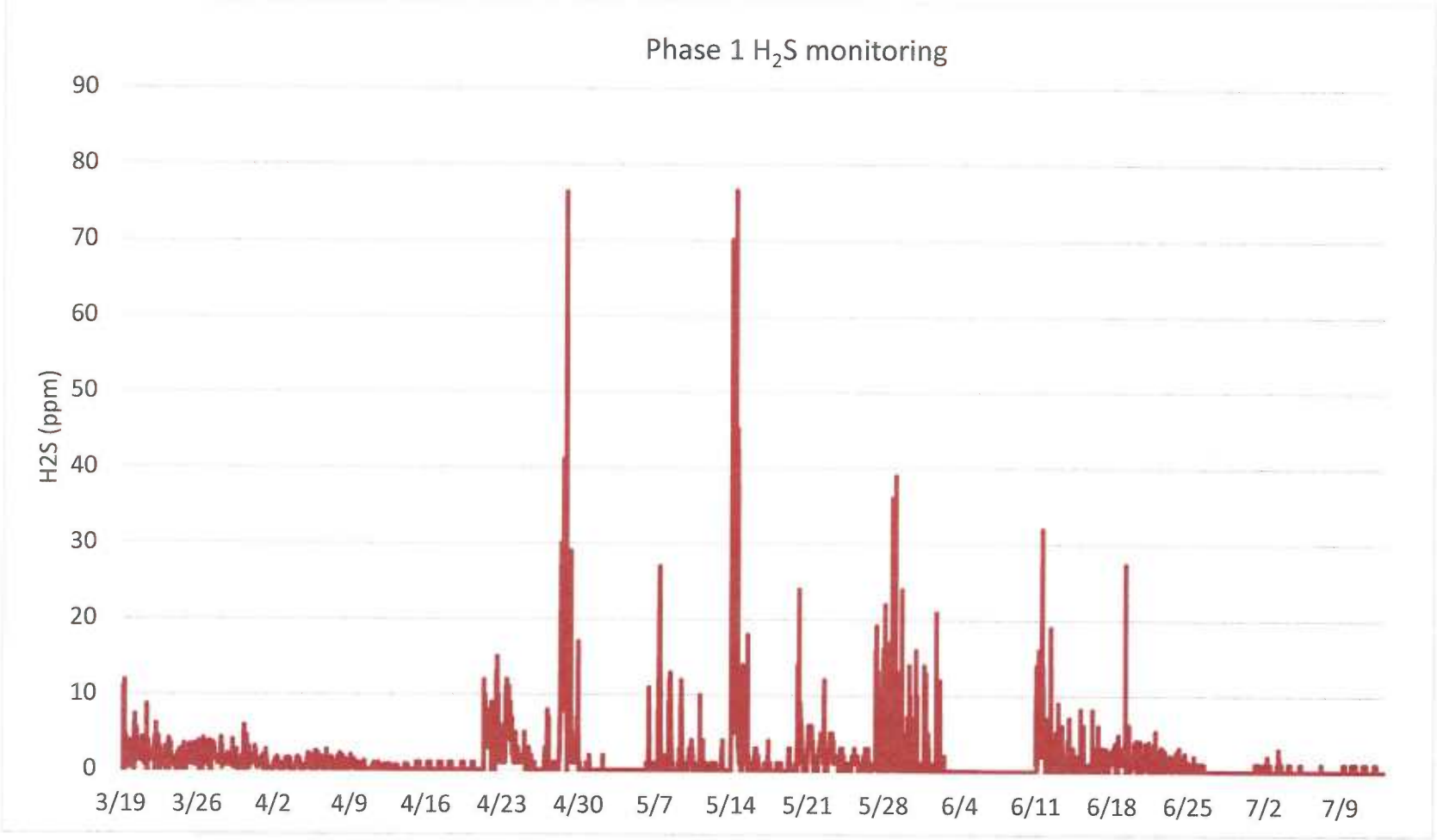


Table 4: Odor Sampling Results from Drager Tube Measurements

	Ammonia		Dimethyl sulfide	
Windrow age	**Batch #1**	**Batch #2**	**Batch #1**	**Batch #2**
14-day old windrow	10.50 ppm	22.50 ppm	1.75 ppm	5.00 ppm
7-day old windrow	11.50 ppm	14.00 ppm	4.50 ppm	4.00 ppm
3-day old windrow	2.50 ppm	27.50 ppm	0.75 ppm	1.00 ppm
1-day old windrow	0.25 ppm	25.00 ppm	1.75 ppm	4.50 ppm

Regulatory Compliance: As noted above, all windrows easily surpassed regulatory time and temperature requirements. Compost samples from Batch 1 and Batch 2 were analyzed for regulatory parameters (heavy metals and pathogens) as well as a wide array of agronomic parameters (e.g. nutrient content), as described in the Operating Plan that was proposed to and approved by FDEP (Table 5). Both batches were well below Class AA threshold concentrations for heavy metals and pathogens.

Compost Distribution: The analytical results (Table 5) indicated that the compost is a high quality compost product and was acceptable for agriculture purposes. The compost had a fertilizer rating of 1.0-1.0-0.5, which translates to 1% nitrogen, 1% phosphate, and 0.5% potash, on a wet weight basis. The agricultural index, which is a function of nutrients by the soluble salts, was greater than 10, meaning it was acceptable for all soils. The compost was slightly alkaline, which benefit farmers with acidic soils. The County could possibly market this compost as an additional source of revenue. As of June 2015, the average compost price in Florida, as reported by *Composting News*, was $13.14/cy for bulk retail and $10.50/cy for bulk wholesale.

Batch 1 generated approximately 500 tons of screened Class AA compost. Batch 2 generated approximately 1000 tons of unscreened Class AA compost, a portion of which was screened. As described in the Phase 1 Operating Plan, the County originally planned to use the compost at County owned or controlled properties with limited public access including on landfill property leased for sod farming and the University of Florida's Gulf Coast Research and Education Center. Upon successfully demonstrating that the compost met Class AA standards, the FDEP approved that the compost could be distributed to non-County-owned properties. County staff reached out to a number of potential compost markets who have expressed great interest in using the County's biosolids compost. Currently in Phase 1, the County has distributed 644 tons of screened compost to JayMar Farms (a non-County-owned property), and 467 tons of unscreened compost to A-1 Sod, a sod farm leased on County-owned property at the landfill. The full compost distribution log is shown in Table 6. JayMar applied screened compost at a rate of 10 tons per acre. A-1 Sod applied unscreened compost at 10, 20, 30, and 40 tons per acre for application rate trials.

The County plans to become a participant in the U.S. Composting Council Seal of Testing Approval (STA) program in order to label the compost as STA certified. The STA program requires the County to register with the program, submit samples for analysis to an STA-certified laboratory, and provide instructions for compost usage and application rate based on this analysis. The analysis for STA certification is similar to the laboratory analysis conducted on the Batch #1 and Batch #2 samples. Once the compost has been STA certified, the County may distribute or sell compost to wholesale or retail without restriction. Pursuant to 62-640.850(3)(b)(1) F.A.C., the STA certification can serve as an alternative to the fertilizer licensing and labeling requirements under 576.021 FS and 5E-1.003FAC, respectively.

Table 5: Results of Compost Analysis for Class AA parameters

Parameter	Unit	Unscreened Batch 1 Sample	Screened Batch 1 Sample	Unscreened Batch 2 Sample	Screened Batch 2 Sample	Ceiling Concentrations (Single sample)	Class AA Parameter Concentrations (Bimonthly Average)
Arsenic	mg/kg dw	2.3	2.3	1.9	3.0	75	41
Cadmium	mg/kg dw	0.5	0.7	n.d.	n.d.	85	39
Copper	mg/kg dw	59.0	55.5	58.2	56.5	4300	1500
Lead	mg/kg dw	5.5	6.5	n.d.	n.d.	840	300
Mercury	mg/kg dw	<.2	<.2	0.2	0.3	57	17
Molybdenum	mg/kg dw	2.9	2.5	3.7	3.0	75	n/a
Nickel	mg/kg dw	5.8	5.2	4.9	5.2	420	420
Selenium	mg/kg dw	1.0	0.8	n.d.	n.d.	100	100
Zinc	mg/kg dw	138.0	142.5	159.0	150.9	7500	2800
Fecal Coliform	MPN/g TS	n.d.	n.d.	n.d.	n.d.	n/a	1000
Total Solids		58.3%	71.2%	49.2%	56.3%	n/a	n/a
Soluble Salts	mmhos/cm	1.72	1.68	4.85	3.19	n/a	n/a
pH		6.8	7.91	7.9	8.2	n/a	n/a
Agricultural Index		17.3	17.5	>10	>10	n/a	n/a
Nitrogen – Total		1.64%	1.43%	2.83%	2.08%	n/a	n/a
Nitrogen – Organic		1.44%	1.26%	2.52%	1.72%	n/a	n/a
Nitrogen – Ammonia		0.20%	0.17%	0.31%	0.36%	n/a	n/a
Nitrogen – Nitrate		0.0002%	0.0002%	n.d.	n.d.	n/a	n/a
Total Phosphorus as P_2O_5	%dw	1.49%	1.99%	2.20%	1.95%	n/a	n/a
Total Potassium K_2O	% dw	0.49%	0.38%	0.65%	0.46%	n/a	n/a
C/N Ratio		22:1	14:1	11.4:1	13.2:1	n/a	n/a

n/a = not applicable

n.d. = not detected

Table 6: Compost Distribution Log

Date	Hauler	Farm or Company	Weight (tons)
6/25/15	Keen Farm & Grove	JayMar	11.53
6/25/15	Keen Farm & Grove	JayMar	12.25
6/25/15	Keen Farm & Grove	JayMar	13.85
6/25/15	Keen Farm & Grove	JayMar	13.83
6/25/15	Keen Farm & Grove	JayMar	13.73
9/7/15	Keen Farm & Grove	JayMar	16.61
9/7/15	Keen Farm & Grove	JayMar	16.33
9/7/15	Keen Farm & Grove	JayMar	16.01
9/7/15	Keen Farm & Grove	JayMar	16.63
10/7/15	Keen Farm & Grove	JayMar	15.05
10/7/15	Keen Farm & Grove	JayMar	16.45
10/7/15	Keen Farm & Grove	JayMar	16.84
10/7/15	Keen Farm & Grove	JayMar	18.17
10/7/15	Keen Farm & Grove	JayMar	17.38
10/7/15	Keen Farm & Grove	JayMar	16.89
10/7/15	Keen Farm & Grove	JayMar	16.76
7/13/15	Keen Farm & Grove	JayMar	15.21
7/13/15	Keen Farm & Grove	JayMar	14.96
8/13/15	Weaver Aggregate	JayMar	16.56
8/13/15	Weaver Aggregate	JayMar	18.18
8/13/15	Weaver Aggregate	JayMar	21.27
8/13/15	Weaver Aggregate	JayMar	20.23
8/13/15	Keen Farm & Grove	JayMar	17.57
8/13/15	Keen Farm & Grove	JayMar	15.09
8/13/15	Keen Farm & Grove	JayMar	14.48
8/13/15	Keen Farm & Grove	JayMar	16.62
8/13/15	Keen Farm & Grove	JayMar	17.74
8/13/15	Keen Farm & Grove	JayMar	18.47
8/13/15	Keen Farm & Grove	JayMar	17.2
8/14/15	Keen Farm & Grove	JayMar	17.69
8/14/15	Keen Farm & Grove	JayMar	15.43
8/14/15	Weaver Aggregate	JayMar	19.38
8/14/15	Weaver Aggregate	JayMar	17.57
8/14/15	Keen Farm & Grove	JayMar	15.93
8/14/15	Weaver Aggregate	JayMar	17.47
8/14/15	Weaver Aggregate	JayMar	18.82
8/14/15	Weaver Aggregate	JayMar	19.5
8/14/15	Weaver Aggregate	JayMar	15.38
8/14/15	Keen Farm & Grove	JayMar	15.33
		Subtotal (JayMar)	**644**

Table 6: Compost Distribution Log (continued)

Date	Hauler	Farm or Company	Weight (tons)
8/19/15	County	A-1 Sod	12.79
8/19/15	County	A-1 Sod	14.16
8/19/15	County	A-1 Sod	15.05
8/20/15	County	A-1 Sod	13.77
8/20/15	County	A-1 Sod	15.49
8/20/15	County	A-1 Sod	15.23
8/20/15	County	A-1 Sod	14.74
8/20/15	County	A-1 Sod	13.75
8/20/15	County	A-1 Sod	14.35
8/20/15	County	A-1 Sod	13.12
8/20/15	County	A-1 Sod	14.52
8/21/15	County	A-1 Sod	12.56
8/21/15	County	A-1 Sod	13.93
8/26/15	County	A-1 Sod	12.34
8/26/15	County	A-1 Sod	13.47
8/26/15	County	A-1 Sod	12.70
8/26/15	County	A-1 Sod	13.12
8/26/15	County	A-1 Sod	13.07
8/26/15	County	A-1 Sod	12.76
8/27/15	County	A-1 Sod	12.19
8/27/15	County	A-1 Sod	13.59
8/27/15	County	A-1 Sod	13.61
8/27/15	County	A-1 Sod	14.20
8/27/15	County	A-1 Sod	13.30
8/27/15	County	A-1 Sod	13.21
9/3/15	County	A-1 Sod	23.47
9/3/15	County	A-1 Sod	20.56
9/3/15	County	A-1 Sod	21.53
9/3/15	County	A-1 Sod	20.77
9/3/15	County	A-1 Sod	19.44
9/3/15	County	A-1 Sod	20.21
		Subtotal (A-1 Sod)	**467**
		Total distributed	**1,111**

Cost Assessment

Table 7 summarizes estimated costs for Phase 1. Capital costs are associated with developing the pilot composting site at the Southeast County Landfill. County equipment and staff operated the pilot, with limited temporary use of a windrow turner provided for demonstration purposes and a compost screener rented from a nearby compost facility.

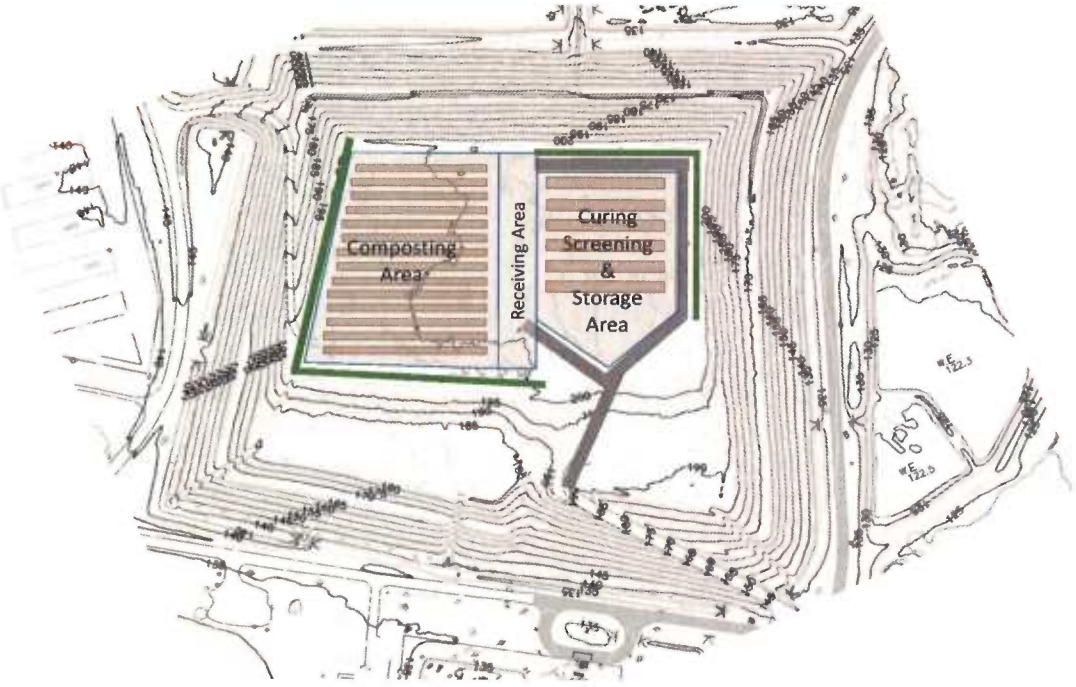
Table 7: Phase 1 Estimated Cost

Item	Total Cost
Capital Cost	
Site Development	
Mobilization, Erosion Control, Earthwork, Recycled Asphalt Hauling, Pad Construction, Sumps	$110,000
Berm Construction	$17,278
A&E Services	$23,000
KCI Consulting fees	$65,988
Total Capital Cost	***$216,266***
Operating Cost	
Labor	$24,000
Equipment & Fuel	$29,898
Screen Rental	$4,800
Tools & Supplies	$200
Lab Analyses	$1,335
Total Operating Cost	***$60,233***
Operating Cost Per Ton Biosolids	***$22.82***

Phase 2

Based on the results of Phase 1, the County is moving forward with implementing Phase 2 which entails expanding the existing biosolids composting site to handle all biosolids produced from the Falkenburg AWTF (approximately 18,600 tons per year). Using the result of Phase 1, KCI developed a mass balance to determine the quantities of bulking agent, compost mixture, and finished compost to be handled during Phase 2. In Phase 2, the composting site will be receiving an average of 60 wet tons of biosolids per day. At the mixing ratio of yard waste to biosolids used in Phase 1, this will equate to approximately 260 cubic yards of mixture per day. Assuming 45-day active compost period and 60-day curing phase, a total of 4,600 and 1,500 linear feet of windrows would be required in the active compost and curing areas, respectively. Therefore, the area required for active composting and curing would be 3.3 acres and 1.8 acres, respectively. KCI developed a conceptual layout that confirmed there is sufficient space for Phase 2 at the current location (See Figure 6).

Figure 6: Phase 2 (Full Scale) Conceptual Layout at Current Location



Based on these estimates, KCI developed cost projections for Phase 2 based on two scenarios - lease versus purchase of major rolling stock (Tables 8a and 8b on following pages). The estimate is based on site development costs provided by the County landfill engineer; composting equipment costs estimates, and operational costs derived from the results of Phase 1.

Table 8a: Phase 2 Estimated Cost Projection - Equipment Lease

Item	Total Cost
Capital Cost	
Site (Southeast County Landfill Area 9)	
Mobilization & Erosion Control	$13,000
Earthwork	$67,647
Recycled Asphalt Pad	$27,405
Sumps	$5,000
Miscellaneous & Additions	$14,760
GC, Insurance & Contingency	$21,728
	$149,540
A&E/Consulting Services & Permit	$83,000
Residuals Mgmt Facility Permit	$0
Total	*$232,540*
Annual Cost of Site	*$44,360*
Equipment	
Loader	$0
Grinder	$0
Windrow Turner	$0
Screen	$0
Total	*$0*
Annual Cost of Equipment	*$0*
Total Capital Cost	***$44,360***
Annualized Capital Cost	***$44,360***
Annualized Capital Cost Per Ton Biosolids	***$2.38***
Operating Cost	
Labor - Equipment Operator	$123,200
Labor - General	$0
Equipment O&M - FEL	$158,506
Equipment O&M - Grinder	$0
Equipment O&M - Turner (fuel)	$2,072
Equipment O&M - Screen (fuel)	$2,590
Equipment O&M - Dump Truck	$0
Lease - Turner	$156,000
Lease - Screen	$45,500
Inoculant	$51,150
Safety & Monitoring Equipment	$1,200
Lab Analyses	$9,600
Miscellaneous	$1,200
Total Operating Cost	***$551,018***
Operating Cost Per Ton Biosolids	***$29.62***
Revenue	
Biosolids Tip Fee	$0
Finished Compost Sales	$121,176
Total Revenue	***$121,176***
Revenue Per Ton Biosolids	***$6.51***
Net Annual Cost	**$474,201**
Net Annual Cost (Per Ton Biosolids)	**$25.49**

Table 8b: Phase 2 Estimated Cost Projection - Equipment Purchase

Item	Total Cost
Capital Cost	
Site (Southeast County Landfill Area 9)	
Mobilization & Erosion Control	$13,000
Earthwork	$67,647
Recycled Asphalt Pad	$27,405
Sumps	$5,000
Miscellaneous & Additions	$14,760
GC, Insurance & Contingency	$21,728
	$149,540
A&E/Consulting Services & Permit	$83,000
Residuals Mgmt Facility Permit	$0
Total	*$232,540*
Annual Cost of Site	*$44,360*
Equipment	
Loader	$0
Grinder	$0
Windrow Turner	$525,000
Screen	$375,000
Total	*$900,000*
Annual Cost of Equipment	*$110,962*
Total Capital Cost	***$944,360***
Annualized Capital Cost	***$155,322***
Annualized Capital Cost Per Ton Biosolids	***$8.35***
Operating Cost	
Labor - Equipment Operator	$123,200
Labor - General	$0
Equipment O&M - FEL	$158,506
Equipment O&M - Grinder	$0
Equipment O&M - Turner	$19,470
Equipment O&M - Screen	$53,856
Equipment O&M - Dump Truck	$0
Lease - Turner	$0
Lease - Screen	$0
Inoculant	$51,150
Safety & Monitoring Equipment	$1,200
Lab Analyses	$9,600
Miscellaneous	$1,200
Total Operating Cost	***$418,182***
Operating Cost Per Ton Biosolids	***$22.48***
Revenue	
Biosolids Tip Fee	$0
Finished Compost Sales	$121,176
Total Revenue	***$121,176***
Revenue Per Ton Biosolids	***$6.51***
Net Annual Cost	**$452,327**
Net Annual Cost (Per Ton Biosolids)	**$24.32**

Appendix A: Standard Operating Procedures – Compost Sampling Protocol

In accordance with State and Federal regulations composted biosolids shall be sampled and analyzed to ensure they meet 'Class A', Exceptional Quality (EQ), standards for distribution.

Assuming the windrows met the time and temperature requirements required by and were turned in accordance with the standard operating procedures for the MSAP Method, sampling should be performed after screening has taken place and when the screened compost has been shown to sufficiently reheat (140F +) for an acceptable period of time (minimum 7 days).

Pathogen and Heavy Metal Regulatory Standards for Biosolids Compost

Operators that produce compost shall ensure that:

- The density of fecal coliform in compost, that is or has at one time been active compost, shall be less than 1,000 Most Probable Number (MPN) per gram of total solids (dry weight basis,) or the density of Salmonella sp. bacteria in compost shall be less than three (3) MPN per four (4) grams of total solids (dry weight basis.)
- Verification of pathogen reduction requirements shall occur as close as possible to the point at which compost is sold and removed from site, bagged for sale, given away for beneficial use and removed from the site or otherwise beneficially used. This verification shall be performed by taking and analyzing at least one composite sample of compost.
- A composite sample shall consist of multiple grab samples. The grab samples shall be of equal volume and extracted from different locations within the compost pile.
- In addition, the compost must not contain any heavy metals in amounts that exceed the maximum acceptable metal concentrations shown in the table below.

Metal	ppm/mg kg
Arsenic (As)	41
Cadmium (Cd)	39
Chromium (Cr)	1200
Copper (Cu)	1500
Lead (Pb)	300
Mercury (Hg)	17
Nickel (Ni)	420
Selenium (Se)	36
Zinc (Zn)	2800

Sample Taking Procedure

The following equipment will be required:

- One clean 5 gallon bucket with lid
- One clean shovel
- One clean 1-quart sampling scoop

- Several pairs of surgical gloves
- Antiseptic cleaning wipes
- Several 1-gallon plastic Ziploc bags
- One permanent marking pen
- One clean cooler containing wet ice or frozen blue ice packs
- Chain of Custody documents

Ensure that the compost to be sampled has been in a curing pile for a sufficient time period (minimum 7 days) and has not been disturbed or relocated during this timeframe.

From the batch of screened compost take multiple grab samples from within the pile at a depth of a least eighteen (18) inches. **Do not** take samples from the surface of the pile or close to its base (stay at least two (2) feet up from ground level).

1. Look at the pile to be sampled and determine the locations from which to take the samples. The samples should be taken from both sides of the pile and at varying heights in order to provide a representative analysis of the whole matrix.
2. At each location, using the shovel, dig into the pile to a minimum depth of eighteen (18) inches. Ensure that material surrounding the hole does not fall into the hole you are excavating. To minimize this, ensure that when digging the hole your first step is to drag material downwards towards you and clear an area to a minimum depth of 12 inches. Use the shovel like a paddle and clear an area several times larger than the intended excavation hole. In screened compost this is an easy task as the material is generally loose and friable.
3. Once the sampling hole is excavated, using the clean 1-quart sample scoop or your hand with a surgical glove on it, reach in and collect a sample.
4. Clean the shovel and sampling scoop with disinfecting wipes between each sampling point. If using latex gloves, put on a clean glove at each location.
5. Place each of the samples collected in the five-gallon bucket. Keep the lid on the bucket between each sampling point to ensure no material accidently falls in and vectors, which may be present around the facility, are not getting into the samples.
6. Once you have collected all your samples, ensure you have enough material for the intended analysis. The STA Suite requires two (2) 1-gallon Ziploc bags that are at least three-quarters (¾) filled; so a total one and a half gallons (1½) of material minimum. With the lid securely on, invert, shake and agitate the bucket several times to mix the contents.
7. Clean the sample scoop with a disinfecting wipe, remove the buckets lid and using the sample scoop further mix the contents.
8. Using the permanent marker write the following on two (2) 1-gallon Ziploc bags: FACILITY NAME, DATE, BATCH #, and SAMPLE #.
9. Using the sample scoop immediately fill the two bags ¾ full of compost. Squeeze the air out of the bags and zip them closed.
10. Immediately place the sample bags into the cooler and secure the lid.
11. Record the time of sampling on the Chain of Custody paperwork.
12. Take the cooler to the site office and prepare the paperwork for shipping. The compost samples, when collected, have high temperatures and the ice packs or wet ice can quickly thaw/melt. If the site office has the facilities, it is advantageous to place the samples in a fridge or freezer for further cooling until it is time to transport them to the shipping location.
13. Samples must be delivered to the laboratory within 24 hours of sampling.

14. Clean all sample taking equipment with disinfecting soap and hot water and store in a clean place until the next sampling event.

Important Note: Moisture is another important factor to consider when taking samples for analysis. The nutrient analysis is important to the end user, particularly in an agricultural application. Keep in mind that wet compost will show much less available nutrients in the as-received reporting column than will dry compost.

Example: If the compost has 40 pounds of Nitrogen on a dry weight basis and the moisture content is 40%, the analysis will show 24 pounds of Nitrogen per ton (as received).

However, if the moisture is 55% the analysis will show 18 Lbs of Nitrogen per ton (as received).

A farmer looks primarily at the fertilizer value of compost and would have to transport significantly more tons of compost to the field to achieve the same nutrition if the material is wet. High moisture content also means they are buying water, particularly if the material is sold by the ton.

Sending excessively wet or dry samples to the lab will result in an analysis that is not representative or will result in broad fluctuations in results. Therefore, be mindful of this when taking grab samples as some areas and depths of the pile will typically be wetter or drier than others.

Appendix B: Standard Operating Procedures – Equipment Utilization, Cleaning & Decontamination

In order to prevent cross contamination of pathogens from newer materials to those that are further on in the composting process, the following recommendations and procedures should be followed.

It is of the upmost importance that equipment is dedicated to certain roles within the facility. Specifically, one front-end loader concentrates on receiving, mixing and building windrows from raw feedstock, while another unit manages materials after pathogen reduction standards (time and temperature) have been met.

Alternatively, if only one front-end loader is utilized, then a second bucket for handling material in the curing, screening and distribution phases will suffice.

- Remember - always switch buckets before moving between the stages of the composting process
- Ensure the loader is free of loose material on the arms, steps or any other surface and pay attention to tires to ensure raw feedstock is not tracked across to screening, curing or distribution areas.
- Should a loader building new piles need to switch locations and no alternative bucket is available, then the equipment should to be temporarily taken off-line to be cleaned and decontaminated by pressure washing with a biodegradable sanitizing solution.

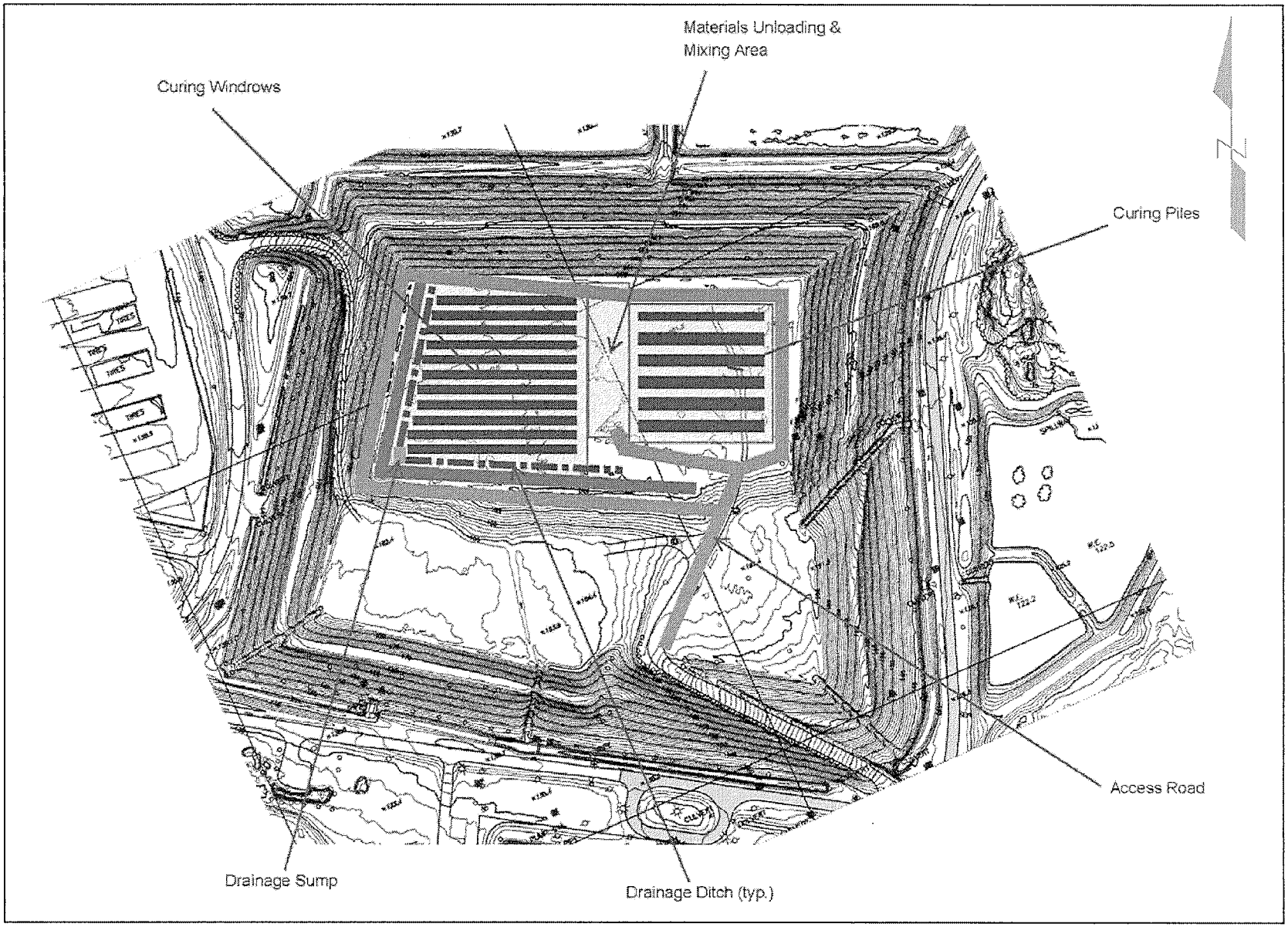
Utilization of a windrow turner should always be planned so that each day the unit begins by turning the oldest windrows first and proceeding to the newest and finally mixing of raw piles just built.

Throughout the day and at the end of each day, ensure the operating pad surface in receiving and mixing areas is scraped clean and any and all biosolids is incorporated into that day's newly constructed piles.

ATTACHMENT B

Figure 2. Compost Pad Layout

Figure 2. Compost Pad Layout



ATTACHMENT C

Table of Documents Included By Reference
And
CD with pdf of Documents Included By Reference

HILLSBOROUGH COUNTY SOUTHEAST COUNTY LANDFILL
TABLE 1. REFERENCE OF DOCUMENTS
OPERATION PERMIT INTERMEDIATE MODIFICATION APPLICATION

REFERENCE DOCUMENT NO.	REFERENCE DOCUMENT NAME	BY	DATE
1	Gas Collection and Control System Design Plan	SCS Engineers	July 11, 2008
1	Start Up, Shutdown, and Malfunction Plan	SCS Engineers	January 19, 2010
1	Title V Operating Permit - #0570854-008-AV	FDEP, Division of Air Resource Management	December 17, 2013
2	Waste Profile Program	Hillsborough County Public Works Department Solid Waste Management Division	2014
3	Pump Station Maintenance Procedures	Hillsborough County Public Works Department Solid Waste Management Division	September 2015
4	PPS-B Settlement Plate Data	Civil Design Services, Inc.	September 11,2015
5	1983 Ardaman & Associates Report	Ardaman & Associates, Inc.	February 22, 1983
6	TPS-6 Leachate Flow Data	HDR Engineering, Inc.	February 2009
7	FDEP Approval - Biosolids Composting Pilot Study	FDEP, Southwest District Office	January 22, 2015

ATTACHMENT D

Revised Cover Letter detailing significant changes from previous application

Environmental Consultants
and Contractors

4041 Park Oaks Blvd.
Suite 100
Tampa, FL 33610-9501

813 621-0080
FAX 813 623-6757
www.scsengineers.com

SCS ENGINEERS

November 24, 2015
File No. 09215600.01

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

Subject: Summary of Revisions to Operation Permit Intermediate Modification Application
Phases I-VI and Capacity Expansion Area (Sections 7, 8, and 9)
Hillsborough County, Southeast County Landfill
Permit No. 35435-022-SO/01

Dear Mr. Freedenberg,

SCS Engineers (SCS) is providing, attached to this letter, a copy of the cover letter for the Operation Permit Intermediate Modification Application for Phases I-VI and the Capacity Expansion Area (Sections 7, 8, and 9) at the Southeast County Landfill (SCLF) that was submitted on September 21, 2015 by HDR Engineering, Inc. (HDR). HDR's cover letter summarizes all significant changes from the previous application and is signed by a professional engineer.

Please call us if you require any clarifications or additional information.

Sincerely,

Bruce Clark, P.E.
Project Director
SCS ENGINEERS

BJC:bjc

cc: Kimberly A. Byer, HCSWMD
Larry Ruiz , HCSWMD
Ron Cope, HCEPC (e-mail)
Phil Ciaravella, FDEP Tallahassee (e-mail)
Steve Morgan, FDEP Tampa (e-mail)

September 21, 2015

Mr. Richard Tedder, PE
Solid Waste Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399

Subject: Operation Permit Intermediate Modification Application
Phases I-VI and Capacity Expansion Area (Sections 7, 8, and 9)
Hillsborough County, Southeast County Landfill
Permit No. 35435-022-SO/01

Dear Mr. Tedder,

On behalf of the Hillsborough County Public Works Department, Solid Waste Management Division (SWMD), HDR Engineering, Inc. (HDR) is submitting an Operation Permit Intermediate Modification Application for Phases I-VI and the Capacity Expansion Area (Sections 7, 8, and 9) at the Southeast County Landfill (SCLF). This Intermediate Modification application follows the Florida Department of Environmental Protection (FDEP) rules set forth in 62-701 (FAC).

For clarification purposes, the references to Solid Waste Management Group (SWMG) in the June 2013 Operation Plan and Leachate Management Plan were not updated at this time to reflect the new department name, the Solid Waste Management Division (SWMD). The new department name will be updated in all documents during the next Operation Permit renewal application for the Facility. However, on the permit application forms, the new department name is used where authorized County staff signatures are required.

Enclosed are the Intermediate Modification permit application documents which include the following:

- One Operation Permit Intermediate Modification Application with supporting documentation, for the solid waste operation of the Phases I-VI and Capacity Expansion Area (Sections 7, 8 and 9), signed and sealed by a Professional Engineer registered in the state of Florida.
- One CD containing electronic files (PDFs) of the complete Operation Permit Intermediate Modification Application.
- Check in the amount of $5,000 for the permit fees for the Intermediate Modification per Rule 62-701.320(4)(d), FAC.

hdrinc.com

5426 Bay Center Drive, Suite 400, Tampa, FL 33609
T 813-282-2300 F 813-282-2430

This Intermediate Modification application includes updated information previously submitted to the FDEP as part of the permit renewal application, dated June 2013, and subsequent response, dated August 1, 2013. Sections with no changes are marked as such on the Application Form 62-701.900(1), or may have a reference to direct the reader to a copied or re-typed area of the Application.

Brief Summary of Permit Modifications:

Updates and revisions have been completed for: Part K, Landfill Operations (documents are contained in Attachment A); Part K, Leachate Management Plan (documents are contained in Attachment B); Part L, Water Quality Monitoring (documents are contained in Attachment C); and, Part R, Financial Assurance (documents are contained in Attachment D). As discussed during our May 4, 2015 pre-application phone conversation, the following is a summary of changes we have included in this Intermediate Modification application:

- Part D, Permit Requirements: This section is included to provide the overall general information required for the application.
- Part K, Landfill Operations: Revisions to the Operation Plan and Leachate Management Plan (LMP) include revised sections to each plan. The following items have been updated:

  Attachment A – Revised Operation Plan

  ✓ Operation Plan Section k.2.c.(5): Information regarding biosolids composting has been added to this section. The SWMD is currently conducting a pilot study and plans to implement full scale composting of biosolids at the SCLF.

  ✓ Operation Plan Sections k.9.c to k.9.i: These sections provided information on landfill gas collection and control system (GCCS) operation and maintenance, and have been removed from the Operation Plan. The Operation Plan now references the approved GCCS Design Plan, dated July 11, 2008, Startup, Shutdown, and Malfunction Plan, dated January 19, 2010, and the current Title V Air Operating Permit dated December 17, 2013. Having the language in the Operation Plan is redundant and the above LFG documents are regularly updated as part of the Facility's air emission permits. By having the specific operations requirements in only one place, should eliminate potential conflicting requirements.

  The following documents are contained in Reference Document No. 1 for FDEP informational use:

  The GCCS Design Plan, dated July 11, 2008, Startup, Shutdown, and Malfunction Plan, dated January 19, 2010, and current Title V Air Operating Permit, dated

December 17, 2013 provide detailed information on requirements for the GCCS adjustment, operations and maintenance, monitoring, and regulatory compliance of the GCCS at the SCLF.

The GCCS at the SCLF is subject to Federal Regulations 40 CFR Part 60, Subpart WWW of the New Source Performance Standards (NSPS) and 40 CFR 63 Subpart AAA of the National Emission Standard for Hazardous Air Pollutants (NESHAP), in addition to Chapter 403, Florida Statute, and Chapters 62-4 and 62-213, Florida Administrative Code.

Based on the requirements within the documents, the SWMD is able to maintain compliance with federal and local agencies for the proper operation and maintenance of the GCCS. Information included in these reports is also used by site personnel to reference the GCCS design, operation and maintenance, troubleshooting, and regulatory requirements.

✓ Operation Plan Appendix D: This appendix entitled "Special Waste Program Guideline" has been removed from the Operation Plan. The Operation Plan now references the Waste Profile Program on the County website. The Waste Profile Program documents are internal Hillsborough County administrative documents that provide reporting formats, guidelines, and procedures (solid waste profiles) to assist "customers" with identification of the types of waste that are permitted for disposal at the Landfill in addition to the type of waste accepted at other Hillsborough County facilities. Since the documents are only administrative guidelines for customers bringing waste to the different facilities, it is continually updated to relate policy changes, contact information, and paperwork needed internally for County staff. By taking Appendix D out of the Operation Plan, it allows the information to be updated easily on the County's website and reduces paperwork and expenses associated with submitting administrative updates to the Operation Plan with the FDEP. The types of waste accepted for disposal are written into, and governed by, the permit and the removal of Appendix D will not impact the compliance, regulations and policies for the disposal of waste at the landfill.

Pages from the current Waste Profile Program on the Hillsborough County web site are provided in Reference Document No. 2 for FDEP informational use.

Attachment B – Revised Leachate Management Plan

✓ Leachate Management Plan (LMP) Appendix B, Pump Schematics: The pump schematic section has been removed from the LMP. The information contained in Appendix B is only used by SWMD staff during maintenance to identify equipment.

The overview of the entire system for the permitted management of leachate at the Facility is still shown in Figure 3.1 of the LMP.

The detailed pump schematics will be kept onsite and continually updated in a document entitled "Pump Station Maintenance Procedures". This document is applicable to SWMD maintenance procedures only. Individual valves, pumps, and piping may be changed during maintenance operation, but won't affect overall operations of the landfill or compliance with the Facility's Solid waste Operations Permit. No changes to the overall leachate management system will be made without FDEP approval.

The "Pump Station Maintenance Procedures" document is included in Reference Document No. 3 for FDEP informational use.

✓ Leachate Management Plan (LMP) Section 9.1, General Leachate Monitoring: The annual leachate monitoring requirements for Phases I-VI and the Capacity Expansion Area (Sections 7, 8, and 9) have been removed from the LMP. Leachate monitoring requirements are not required per Rule 62-701 (FAC).

✓ Leachate Management Plan (LMP) Section 9.2, Phases I-VI Monitoring: The requirement for annual survey measurement of the Permanent Pump Station B (PS-B) settlement plates has been revised in the LMP. Based upon the review of the survey data, the clay consolidation has reached a point of steady state equilibrium and only minor changes in elevations have been recorded in the last two to three years. The settlement plates have only changed approximately 0.1 to 0.2 feet in elevation over this time period. The settlement plates will remain in-place; however, and will be surveyed prior to commencement of operations in the Phase VI disposal area and then monitored annually until the settlement has reached steady state conditions again.

The top of phosphatic clay liner elevation report submitted by SMWD to the FDEP is contained in Reference Document No. 4 for FDEP informational use.

Contained in Reference Document No 5 is a CD with a PDF copy of the 1983 Ardaman and Associates report for FDEP informational use. The Report contains the geotechnical basis for the Phase I-VI disposal area. The request to temporarily suspend surveying of the settlement plates is based simply upon the fact that the changes in elevation have been minor for the last couple of years (i.e. the settlement for that loading condition has been achieved). The cost for continual annual surveying will not yield significant data until additional loading is again placed in the Phase VI disposal area. As stated in the revised Operation Plan, the

settlement plates will remain and surveying will commence upon waste placement in the disposal area.

- ✓ Leachate Management Plan Section 4.1.3, Temporary Pump Station 6 (TPS-6): Reference to above ground Temporary Pump Station 6 (TPS-6) has been removed from the LMP. The TPS-6 was installed along the west side of Phase IV to assist in pumping leachate accumulated in the southwest portions of Phases IV and VI area to the PS-B until the clays consolidated sufficiently to allow greater flow toward PS-B. The leachate from TPS-6 was pumped from Phase IV to PS-B via a 4-inch HDEP forcemain that was connected to the 18-inch HDPE west access pipe leading to PS-B. Due to the clay consolidations, leachate is now flowing directly to PS-B and subsequently no leachate was been pumped out of TPS-6. Due to the low flow rates, and maintenance costs associated with keeping the pump operable at the low flow rates (the pumps had to be replaced twice), TPS-6 was removed from service in September 2014.

  Reference Document No. 6, for FDEP informational use, contains the pump data information for TPS-6. In Reference Document No. 5, TPS-6 was shown on Figure 3-1 "only" for FDEP informational use. The revised LMP in the Operation Permit Intermediate Modification Application includes an updated Figure 3-1 without reference to TPS-6 since it has been removed.

  As indicated in the Quarterly Leachate Balance Reports, contained in Reference Document No. 6, the volume of leachate pumped from TPS-6 to PS-B (Column VI) decreased to a minimum amount by September 2014. Any reference to TPS-6 has been removed from the LMP.

- Part L, Water Quality Monitoring: Revisions to the Water Quality Monitoring Plan (WQMP) include the following:

  Attachment C – Revised Water Quality Monitoring Plan

  - ✓ Two monitoring wells, previously sampled as part of the Initial Assessment Monitoring Plan (IAMP) for the sinkhole remediation, have been added to the list of detection monitoring points in the Groundwater Monitoring Plan. These wells (TH-72 and TH-78) will provide long-term monitoring of the groundwater quality down gradient of the former sinkhole area.

- ✓ Since the sinkhole remediation project is complete, the SWMD is requesting the suspension of the IAMP sampling as part of this Intermediate Modification application. The SWMD will continue to monitor water levels in TH-73, TH-76 and TH-77.

- ✓ Seventeen Piezometers have been removed from the WQMP. These piezometers monitor groundwater elevations in and around the Capacity Expansion in preparation for the design of future cells (Sections 10, 11, and 12). Based on the current SWMD cell development plans, the construction of Section 10 will not be in the near future. Additionally, more than six years of water level data has been collected at these piezometers and will provide a baseline for future designs.

- ✓ Surface water monitoring sample point 1-D has been removed from the WQMP. This sample point monitored water quality at the north side of Mine Cut #1. Sample point 1-A, also on the north side of Mine Cut #1, will continue to monitor the water quality and surface water elevation of Mine Cut #1.

- ✓ The list of laboratory parameters for surface water samples in the WQMP has been updated to reflect the correct list of parameters as listed in Appendix 3 of the current permit.

- Part R, Financial Assurance: The Closure and Long Term Care estimates have been updated to reflect the use of on-site soils for closure, in accordance with the February 2015 revisions to FDEP 62-701.630(3)(d). All quantities and costs associated with the closure and long term care have been revised to reflect 2015 dollar amounts.

Attachment D – Revised Financial Assurance Estimates

- ✓ As part of this Intermediate Modification, the SWMD acknowledges the Rule requirement to designate the location of on-site soils for the purpose of daily and final cover operations. This will ensure that on-site soils will continue to be available and reserved to fulfill landfill closure obligations.

  As required by FDEP 62-701.630(3)(d), the designated area for on-site soils, a borrow area located east of Mine Cut No. 2, has been determined to have sufficient quantity and suitable soil properties for use as closure cover soils. A certification to this fact by a professional engineer licensed in the state of Florida is included in Part 7 of Attachment D.

Attachment E – Composting Operation and Maintenance Plan

- ✓ The FDEP requested a draft copy of the proposed Composting Operation and Maintenance Plan from the SWMD. In order to expedite the review process, a copy is included as Attachment E of this application. The plan is referenced in Section k.2.c.(5) of the revised Operation Plan (Attachment A). The SWMD understands this is the first time the FDEP has seen this plan and is willing to answer questions and/or provide additional information that may be required. Until this Modification is approved, the SWMD will continue the composting operation per the FDEP authorization provided in a letter dated January 22, 2015 and included in Reference Document No. 7.

Please call us if you require any clarifications or additional information.

Sincerely,

HDR Engineering, Inc.

Richard A. Siemering
Florida Waste Operations Manager

Robert B. Curtis, PE
Senior Project Engineer

Attachments

cc: Larry Ruiz, PWD/SWMD
Kimberly Byer, PWD/SWMD
Steve Morgan, FDEP
John Morris, FDEP
Ron Cope, EPC

ATTACHMENT E

Revised Water Quality Monitoring Plan

PART L

WATER QUALITY MONITORING REQUIREMENTS

L.1 WATER QUALITY MONITORING PLAN

HDR Engineering, Inc. prepared this Water Quality Monitoring Plan (WQMP) for the Hillsborough Southeast County Landfill to supplement Part H [Hydrogeological Investigation Requirements (62-701.410(1), F A C.)] of the June 2013 FDEP permit renewal application. This WQMP is intended to replace the monitoring plan included in the current Operating Permit #35435-~~020~~022-S0/01.

The WQMP proposes a monitoring network that includes an array of groundwater monitoring wells and surface water sampling points to detect potential impacts from the landfill. The WQMP will specify the methods of collecting and analyzing groundwater, surface water, and leachate samples and for reporting the results to the FDEP and describing actions to be taken if an impact occurs.

The monitoring network is summarized by the following lists: the locations of these wells are included in Figure L.1.

Groundwater Monitoring

Wells associated with the ~~quarterly~~ semi-annual monitoring of Phase I-VI

Well #	WACs ID	Aquifer	Designation
TH-19	821	Floridan	Background
TH-22A	19861	Surficial	Background
TH-28A	19862	Surficial	Detection
TH-40	822	Floridan	~~Horizontal Detection/Vertical~~ Compliance
TH-57	1570	Surficial	Detection
TH-58	1571	Surficial	Detection
TH-65	20530	Surficial	Detection
TH-66	20531	Surficial	Detection
TH-66A	22961	Surficial	Detection
TH-67	20532	Surficial	Detection
TH-72	27753	Floridan	Detection
TH-78	29337	Floridan	~~Horizontal Detection/Vertical~~ Compliance

Wells associated with ~~quarterly~~ semi-annual monitoring Sections 7, 8, and 9

Well #	WACs ID	Aquifer	Designation
TH-36A	20329	Surficial	Background
TH-61	20493	Surficial	Detection
TH-61A	22595	Surficial	Detection
TH-64	20494	Surficial	Detection
TH-68	22039	Surficial	Detection
TH-69A	22958	Surficial	Detection
TH-70A	22959	Surficial	Detection
TH-71A	22960	Surficial	Detection

Inactive wells reserved for future use

Well #	Aquifer	Designation
~~TH-19A~~	~~Floridan~~	~~Water level only~~
TH-20A	Surficial	Water level only
TH-20B	Surficial	Water level only
TH-22	Surficial	Water level only
TH-24	Surficial	Water level only
~~TH-26~~	~~Surficial~~	~~Water level only~~
TH-30	Surficial	Water level only
TH-32	Surficial	Water level only
~~TH-34A~~	~~Surficial~~	~~Water level only~~
TH-35	Surficial	Water level only
TH-35A	~~Surficial~~Floridan	~~Water level only~~
TH-38B	Surficial	Water level only
TH-41	~~Surficial~~Floridan	Water level only
TH-42	~~Surficial~~Floridan	Water level only
TH-73	Surficial	Water level only
TH-76	Floridan	Water level only
TH-77	Floridan	Water level only

Piezometers

Well #	Aquifer	Designation
~~P-4S~~	~~Surficial~~	~~Water level only~~
~~P-4D~~	~~Surficial~~	~~Water level only~~
~~P-5D~~	~~Surficial~~	~~Water level only~~
~~P-6D~~	~~Surficial~~	~~Water level only~~
~~P-7D~~	~~Surficial~~	~~Water level only~~
~~P-8D~~	~~Surficial~~	~~Water level only~~
P-11D	Surficial	Water level only

~~P-12S~~	~~Surficial~~	~~Water level only~~
~~P-13S~~	~~Surficial~~	~~Water level only~~
~~P-14S~~	~~Surficial~~	~~Water level only~~
~~P-15S~~	~~Surficial~~	~~Water level only~~
~~P-16S~~	~~Surficial~~	~~Water level only~~
~~P-16I~~	~~Surficial~~	~~Water level only~~
~~P-16D~~	~~Surficial~~	~~Water level only~~
~~P-17S~~	~~Surficial~~	~~Water level only~~
~~P-17I~~	~~Surficial~~	~~Water level only~~
~~P-17D~~	~~Surficial~~	~~Water level only~~
~~P-18S~~	~~Surficial~~	~~Water level only~~

Surface Water Monitoring

Surface water ~~quarterly~~ semi-annual monitoring locations

Sample Point/WACS	Location	Survey Mark and Elevation (NGVD)
1-A	Mine Cut#1 ~~Staff Gauge~~	6.00 = 124.73 ft
~~1-D **~~	~~Mine Cut#1~~	~~6.00 = 124.73 ft~~
3A/836	LFC at SW boundary	6.00 = 125.00 ft
3B2B/837	LFC WNW of TH-30	3.00 = 97.63 ft
3C2/838	LFC at NW boundary	3.00 = 91.99 ft

LFC – Long Flat Creek

~~*Water level only~~

~~**Water quality only~~

A map of site features, including the groundwater monitoring well locations, surface water sampling points, and gas monitoring probe locations is included as Figure L.1.

The following provides the required description of the proposed ground water and surface water monitoring system. ~~–~~The current permit (35435-~~014~~022-SO/01), in ~~Specific Condition E.11.~~Appendix 3: Water Quality Monitoring Plan V.E.6, ~~required~~ requires Monitoring Plan Evaluations to be prepared and submitted on December 15, ~~2010~~2015, and June 15, ~~2013~~2018. ~~These documents are included herein as Attachment L.1(a) and L.1(b) to provide and evaluation of the data collected during the previous permit period. The December 15, 2010 evaluation (Attachment L.1.a) includes a review of data collected from February 2007 through May 2010, and the June 15, 2013 evaluation includes data collected from August 2010 through December 2012.~~These evaluations will be prepared and submitted prior to the due dates.

L.1.a Sign and Seal

The WQMP is based on the information obtained in the hydrogeological investigation and the 2010 and 2013 water quality monitoring plan evaluations. It has been prepared under the supervision of and signed and sealed by John S. Catches, PG 2203, in accordance with Chapter 62-701.510(2)(a), FAC.

L.1.b Sampling and Analysis

Sampling and analyses will be performed in accordance with Chapter 62-160 (Quality Assurance), Chapter 62-701.510(2)(b) FAC, and the DEP Standard Operating Procedures 001/01. TestAmerica Laboratories in Tampa is the current analytical laboratory contracted by Hillsborough County. TestAmerica is certified by the Department of Health, Environmental Certification Program.

L.1.c Groundwater Monitoring Requirements

The WQMP was prepared based on the requirements of Chapter 62-701.510(3), FAC.

(1) Detection wells located downgradient from and within 50 feet of disposal units; The detection monitoring network consists of 3 background wells, 15 detection wells, and ~~32~~ 15 ~~piezometers~~water level monitoring locations (piezometers and inactive wells). These wells appear in the summary list above and are shown on the map in Figure L.l.

(2) Downgradient compliance wells; if the Department determines based on Detection well monitoring results that evaluation monitoring is required. Compliance wells will be installed at the limits of the Zone of Discharge within 90 days after receiving notification from the Department that they are required, in accordance with Chapter 62-701.510(~~7~~6). Currently, only TH-40 ~~is~~ and TH-78 are designated as ~~a vertical~~ compliance wells.

(3) Background wells screened in all aquifers below the landfill that may be affected by the landfill; Two aquifer zones are recognized at the SCLF – the Floridan aquifer and the surficial aquifer. Background well TH-19 is the upgradient Floridan aquifer background monitoring well, and TH-22A and TH-36A are the upgradient surficial background monitoring wells. The background well locations are shown in Figure L-1.

(4) Location information for each monitoring well;
The locations of existing and proposed monitoring wells are shown in Figure L-1. Survey information is included in Table ~~MPE~~L-1~~ of the Monitoring Plan Evaluation.~~

(5) Well spacing no greater than 500 feet apart for downgradient wells and no greater than 1500 feet apart for upgradient wells, unless site specific conditions justify alternative well spacings; No changes are proposed for the well spacing downgradient of Phases I-VI. Because of the convergent groundwater flow pattern on the downgradient western boundary of Phases I-VI, relatively few wells are required to comply with the 500-foot well spacing requirement in

Chapter 62-701.510(3)(d)3 FAC. Monitoring wells downgradient of Section 9 are spaced approximately 450 feet apart.

(6) Properly selected well screen locations; Well screens for the detection wells in unconfined surficial aquifers are designed to monitor the conditions at the water table. Screened intervals are expected to remain adequate through observation of water levels during the lifetime of the detection well. At locations where water level variance has resulted in submerged screens, an alternant monitoring well, designated with an A has been installed to ensure that a representative water table sample can be collected.

(7) Monitoring wells constructed to provide representative ground water samples; Surficial aquifer monitoring wells installed at the SCLF are intended to monitor the water table. At locations where water level variance has resulted in submerged screens, an alternant monitoring well, designated with an A has been installed to ensure that a representative water table sample can be collected. Note that only one well at each location is sampled during each event.

(8) Procedures for properly abandoning monitoring wells; Unused wells or piezometers will be abandoned properly when approved for abandonment and as specified in Chapter 40D-3.531 FAC. ~~There are currently no wells proposed for abandonment~~Abandonment of the following piezometers and wells is proposed as part of this WQMP:~~.~~

Well #	Aquifer	Designation
P-4S	Surficial	Water level only
P-4D	Surficial	Water level only
P-5D	Surficial	Water level only
P-6D	Surficial	Water level only
P-7D	Surficial	Water level only
P-8D	Surficial	Water level only
P-12S	Surficial	Water level only
P-13S	Surficial	Water level only
P-14S	Surficial	Water level only
P-15S	Surficial	Water level only
P-16S	Surficial	Water level only
P-16I	Surficial	Water level only
P-16D	Surficial	Water level only
P-17S	Surficial	Water level only
P-17I	Surficial	Water level only
P-17D	Surficial	Water level only
P-18S	Surficial	Water level only
P-19*	Surficial	Water level only
P-20*	Surficial	Water level only

P-21*	Surficial	Water level only
P-22*	Surficial	Water level only
P-23*	Surficial	Water level only
TH-19A	Floridan	Water level only
TH-34A	Surficial	Water level only
TH-74	Surficial	Assessment
TH-75	Surficial	Assessment

- Piezometers P-19 through P-23 were not included in 2013 WQMP. These piezometers used for future cell design data.

(9) Detailed description of detection sensors, if proposed;
Detection sensors have not been proposed at this time.

L.1.d Surface Water Monitoring Requirements (62-701.510(4), FAC

(1) Location of and justification for all proposed surface water monitoring points;
Two surface water bodies are currently being monitored as part of the SCLF monitoring plan: the Mining Cut #1 and Long Flat Creek (a minor tributary located along the west side of the property). Sampling points 1-A ~~(elevation only) and 1-D are~~is located in Mining Cut #1. Sampling points in Long Flat Creek (from upstream) are designated as 3A, 3B2B, and 3C. Mining Cut #1 was selected to monitor the upgradient side of the SCLF. The Long Flat Creek locations monitor downgradient of the landfill, beginning upstream at 3A where the creek is gaining from groundwater to 3B2B as the stream transitions from a gaining stream to 3C at the point where the stream leaves the site.

(2) Each surface water monitoring point location has been marked, and the position has been determined and recorded by a registered Florida land surveyor.

L.1.e Initial and Routine Sampling Frequency and Requirements (62-701.510(5), FAC

(1) Initial background ground water and surface water sampling and analysis requirements;

All new monitoring wells required by permit will be sampled for parameters listed in Rule 62-701.510(~~7~~8)(a) and (~~d~~c) before waste disposal begins, if applicable (Table L.1.e.(1)).

(2) Routine Monitoring Well Sampling and Analysis Requirements;
The detection well samples have been collected and analyzed ~~quarterly~~ semi-annually for the parameters listed in 62-701.510(~~8~~7)(a) (Table L.1.e(2)) ~~since issuance of the current~~in accordance with Operating Permit #35435-022-S0/01 ~~during the previous permit period. It is proposed to reduce the sampling frequency to semiannually for the upcoming permit period. The request is based~~

~~on groundwater flow rates as discussed in the December 2010 and June 2013 GWMP evaluations (Attachments L.1(a) and L.1(b)).~~ There are no changes being proposed to the sampling parameter list.

(3) Routine Surface Water Sampling and Analysis Requirements;
Surface water monitoring points will be sampled semi-annually for the parameters listed in Table L.1.e(3).

Table L.1.e(1) Initial Sampling Parameters

Field Parameters	Laboratory Parameters
Static water levels	Total ammonia – N
Specific Conductivity	Chlorides
Temperature	Iron
pH	~~Mercury~~ Nitrate
Dissolved Oxygen	~~Nitrate~~ Sodium
Turbidity	~~Sodium~~ Total dissolved solids (TDS)
Colors and Sheens	~~Total dissolved solids (TDS)~~ Those parameters listed in 40 CFR Part 258 Appendix II*
	~~Those parameters listed in 40 CFR Part 258 Appendix I and Appendix II~~

* Mercury not listed because it is included in Appendix II.

* Appendix I is not listed because it is a subset of Appendix II

Table L.1.e.(2) Routine Sampling Parameters

Field Parameters	Laboratory Parameters
Static water levels before purge	Total ammonia – N
Specific Conductance	Chlorides
pH	Iron
Dissolved oxygen	Mercury
Turbidity	Nitrate

Temperature	Sodium
Colors and sheens by observation	Total dissolved solids (TDS)
	Those parameters listed in 40 CFR Part 258 Appendix I

Table L.1.e.(3) Surface Water Sampling Parameters

Field Parameters	**Laboratory Parameters**
Specific Conductivity	Unionized ammonia as N
pH	Total hardness as CaCO3~~Chlorides~~
Dissolved oxygen	Biochemical Oxygen Demand (BOD_5)~~Iron~~
Turbidity	Iron~~Mercury~~
Temperature	Mercury
Colors and sheens by observation	Nitrate
	Total D~~d~~issolved S~~s~~olids (TDS)~~ Sodium~~
	Total Organic Carbon (TOC)
	Fecal Coliform
	Total Phosphorus as P
	Chlorophyll A
	Total nitrogen
	Chemical Oxygen Demand (COD)
	Total Suspended Solids (TSS)
	Those parameters listed in 40 CFR Part 258 Appendix I

L.1.f Evaluation Monitoring, Prevention Measures, and Corrective Action

If monitoring parameters are detected in detections wells at concentrations that are significantly above background water quality or that are at concentrations above the

Department's water quality standards or criteria specified in 62-520, FAC, the well will be re-sampled within 30 days after the initial analytical data are received to confirm the data. If the data are confirmed or the well is not re- sampled, the Department will be notified in writing within 14 days of the finding. It is understood that the County will initiate Evaluation Monitoring upon receipt of this notification.

Evaluation monitoring:

(1) Routine monitoring of all monitoring wells will continue according to the permit requirements.

(2) Within 90 days of initiating evaluation monitoring and annually thereafter, the background wells and all affected detection wells will be sampled for the parameters listed in 62-701.510(8)(~~d~~c). Any new parameter detected and confirmed in the downgradient wells will be added to the routine groundwater monitoring parameter list.

(3) Within 90 days of initiating evaluation monitoring, compliance monitoring wells will be installed at the compliance line of the zone of discharge and downgradient of the affected detection wells. The compliance wells will be installed in accordance with 62-701.510(3)(d) and samples from these wells and the affected detection wells will be sampled and analyzed quarterly for the parameters listed in 62-701.510(~~8~~7)(~~d~~c).

(4) Within 180 days of initiating evaluation monitoring, a contamination evaluation plan will be submitted to the Department. The contamination plan will be designed to delineate the extent and cause of contamination and to predict the probability that Department water quality standards are not violated outside of the zone of discharge and to evaluate methods to prevent any violations. Upon agreement with the Department that the plan is so designed, a contamination evaluation report will be submitted to the Department. All reasonable efforts will be taken to prevent further degradation of water quality from the landfill activities.

L.1.g Water Quality Monitoring Report Requirements

(1) Semi-annual report requirements

a. Water quality monitoring reports will be submitted to FDEP semiannually. The report shall include at least the following:

- The facility name and ID number, sample collection dates, and analysis dates,
- All analytical results, including peaks even below maximum contaminant levels,
- Identification numbers of all surface water and groundwater monitoring points,
- Applicable water quality standards,
- Quality assurance, quality control notations,

- Method detection limits,
- STORET code numbers for all parameters,
- Water levels recorded prior to evacuating wells or sample collection (continuous round) with elevations referenced to the top of casing and land surface at each well to within 0.01 foot (NGVD 1929),
- Updated groundwater table contour map signed and sealed by a P.G. or P.E. Contour intervals will be no greater than ~~1~~ 2 foot.
- A summary of water quality standards or criteria that are exceeded.

(2) Documentation that the water quality data shall be provided to the Department in an electronic format consistent with requirements for importing into the Department databases, unless an alternate form of submittal is specified in the permit; all data is currently and will continue to be submitted to the Department in ADaPT format. No changes are anticipated unless otherwise directed by the Department.

(3) Two and one-half year report requirements, or every five years if in long-term care, signed, dated, and sealed by a P.G. or P.E.

a. A technical report signed, sealed, and dated by a P.G. or P.E. will be submitted to the Department every two and one-half years and updated at the time of permit renewal. The report shall summarize and interpret the water quality and leachate monitoring results and water level measurements collected during the two and one-half year period. The .report shall include at least the following:
   - Tabular display of data showing all detected parameters
   - Graphical display of any leachate key indicator parameters
   - Trend analysis of any monitoring parameter consistently detected
   - Comparisons between shallow, medium, and deep zone wells
   - Comparisons between background water quality and the water quality in detection and compliance wells
   - Correlations between related parameters such as total dissolved solids and specific conductance
   - Discussions of erratic and/or poorly correlated data
   - Interpretation of groundwater contour maps including an evaluation of groundwater flow rates
   - An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based on site conditions

PROFESSIONAL GEOLOGIST CERTIFICATION

I hereby certify that the document titled: "Part L - Water Quality Monitoring Requirements" for the Hillsborough County Southeast County Landfill was prepared under my review.

HDR Engineering, Inc.

FL. Certificate of Authorization 004213

_____

John S. Catches, PG
Florida PG No. 2203

_____

Date

~~ATTACHMENT L-1~~

~~MONITORING PLAN EVALUATION~~

~~December 15, 2010~~

~~ATTACHMENT L-2~~

~~MONITORING PLAN EVALUATION~~

~~June 15, 2013~~

Table L-1
Monitoring Well Characteristics Summary

TABLE L-1. MONITORING WELL CHARACTERISTICS SUMMARY
SOUTHEAST COUNTY LANDFILL

Well No.	Purpose	Aquifer Monitored[1]	Appx. Elevation at Well[2] (Feet NGVD[3])	Top of Screen or Open Hole		Length of Screen Or Open Hole, Feet	Total Depth		MP[5]	MP Elev. (Feet NGVD)	Constructio n Date	Last Survey Date (Feet NGVD)		
				Feet BLS[4]	Feet NGVD		Feet BLS	Feet NGVD					Northing	Easting
Phases I-VI														
TH-19	Background	Floridan	127.5	146	-18.68	5	151	-23.68	TPVC[6]	130.27	12/82	10/03	1251881.66	601109.56
TH-22A	Background	Surficial	126.37	2	124.37	10	12	114.37	TPVC	129.27	10/01/02	10/03	1249173.95	596141.21
TH-28A	Detection	Surficial	128.35	18	108.09	10	28	98.09	TPVC	131.1	9/30/02	10/03	1251142.63	595108.87
TH-40	Detection	Floridan	122.05	158	-35.7	5	163	-40.7	TPVC	124.99	12/82	10/03	1249638.56	594421.74
TH-57	Detection	Surficial	125.39[7]	14	111.39	10	24	101.39	TPVC	128.39	12/82	10/03	1250804.20	594956.34
TH-58	Detection	Surficial	124.88[7]	18	106.88	10	28	96.88	TPVC	127.88	12/82	10/03	1251831.71	595424.69
TH-65	Detection	Surficial	132.39	10	122.39	10	20	112.39	TPVC	135.4	08/26/03	10/03	1250507.63	599135.69
TH-66	Detection	Surficial	127.53	9	118.53	10	19	108.53	TPVC	130.58	02/28/01	10/03	1249888.33	598872.29
TH-66A	Detection	Surficial	127.4	2	125.4	10	12	115.4	TPVC	130.48	5/15/2008	6/08	1249981.34	598760.55
TH-67	Detection	Surficial	126.46	2	124.46	10	12	114.46	TPVC	129.51	08/26/03	10/03	1249549.35	596706.18
TH-72	Detection	Floridan	128.36	170	-41.64	15	185	-56.64	TPVC	130.96	1/13/2011	1/11	1251475.50	595167.17
TH-78	Detection	Floridan	117.5	159	-41.5	15	174	-56.5	TPVC	120.65	6/11/14	6/14	1252004.82	594950.88
Capacity Expansion Area														
TH-36A	Background	Surficial	150.09	26	124.09	10	36	114.09	TPVC	152.70[8]	7/11/97	10/03	1252082.28	600749.87
TH-61	Detection	Surficial	135.78	13	122.78	10	23	112.78	TPVC	138.73	02/28/01	10/03	1250909.11	599333.51
TH-61A	Detection	Surficial	135.9	10	125.9	10	20	115.9	TPVC	138.94	5/15/2008	6/08	1250846.48	599260.31
TH-64	Detection	Surficial	136.03	10	126.03	10	20	116.03	TPVC	139.64	08/26/03	10/03	1251203.95	599440.41
TH-68	Detection	Surficial	136.5	10	126.5	10	20	116.5	TPVC	139.5	2/20/06	ND[9]	1251739.20	599657.17
TH-69A	Detection	Surficial	141.8	17	124.8	15	32	109.8	TPVC	144.97	5/15/2008	6/08	1251740.45	598074.06
TH-70A	Detection	Surficial	143.4	18	125.4	15	33	110.4	TPVC	146.63	5/15/2008	6/08	1252055.75	598326.51
TH-71A	Detection	Surficial	143.9	19	124.9	15	34	109.9	TPVC	146.95	5/15/2008	6/08	1252396.74	598569.61

Notes:

1 Aquifer from which the well is deriving its water.
2 Elevation of brass disk set in concrete pad
3 National Geodetic Vertical Datum of 1929
4 Below land surface
5 Measuring Point
6 Top of PVC casing
7 Land surface estimate at 3 feet below TPVC
8 Elevation is based on September 1997 survey
9 ND: No Data

ATTACHMENT F

Administrative Leachate Disposal Procedure Notification dated February 5, 2015

Environmental Consultants
and Contractors

3298 Summit Blvd.
Suite 31-A
Pensacola, FL 32503

850 432-6211
FAX 850 432-6220
www.scsengineers.com

SCS ENGINEERS

February 5, 2015
File No. 09214500.01

Mr. Steve Morgan
Solid Waste Management
Florida Department of Environmental Protection
3051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

Subject: Administrative Leachate Disposal Procedure Notification

Dear Mr Morgan:

SCS Engineers (SCS) is submitting this notification on behalf of the Hillsborough County Public Works Department, Solid Waste Management Division (SWMD).

The new procedure is to reroute leachate from the Hillsborough Southeast County Landfill through the existing wastewater lift station at the Hillsborough Heights Landfill to convey the leachate to the Hillsborough County Valrico wastewater treatment plant (WWTP). The two landfills already have an existing agreement with the County WWTP and the quantity of leachate being discharged into the lift station will be measured separately.

Hillsborough County Solid Waste is planning to start with the new procedure on February 19, 2015, two weeks from today.

Please feel free to contact SCS at 813-621-0080 or Walter Gray of SWMD at 813-272-5977 ext. 43518 should you have any questions or require additional information.

Sincerely,

Orion J. Holtey, P.E.
Senior Project Engineer
SCS ENGINEERS

Daniel R. Cooper, P.E.
Project Director
SCS ENGINEERS

cc: Walter J. Gray, SWMD

ATTACHMENT G

Revised Leachate Management Plan

LEACHATE MANAGEMENT PLAN
PHASES I-VI AND THE
CAPACITY EXPANSION AREA
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

Prepared for:

HILLSBOROUGH COUNTY
PUBLIC UTILITIES DEPARTMENT
SOLID WASTE MANAGEMENT GROUP (SWMG)
~~925 East Twiggs Street~~
~~Tampa, Florida 33602~~
332 N. Falkenburg Road
Tampa, FL 33619

Prepared by:

HDR ENGINEERING, INC.
5426 Bay Center Drive, Suite 400
Tampa, FL 33609

Certificate of Authorization #4213

~~June 2013~~
~~September~~November 2015

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1.0 LEACHATE MANAGEMENT

The Hillsborough County Southeast County Facility includes the Southeast County Landfill (SCLF), which is permitted by the Florida Department of Environmental Protection (FDEP) as a Class I landfill for Phases I-VI and the Capacity Expansion Area (CEA). This Leachate Management Plan (LMP) includes Phases I-VI and Sections 7, 8, and 9 of the CEA.

This plan will give the SCLF employees a general understanding of the requirements for managing the leachate generated from the Class I landfill operations within the Phases I-VI and CEA disposal areas. As defined in Rule 62-701.200(59), FAC, leachate is liquid that has passed through or emerged from solid waste and may contain soluble, suspended, or miscible ~~(mixed)~~ materials. Leachate must be contained and kept separate from any groundwater or surface waters.

2.0 LEACHATE GENERATION

One of the goals of the landfill design and daily operation is to minimize leachate production from the landfill to reduce the cost associated with leachate treatment and thus minimize the potential environmental contamination risks. The methods described in this section can be used separately or simultaneously to achieve leachate reduction.

Leachate is generated as water passes through solid waste or as liquids drain from solid waste materials. Water may be from stormwater infiltration, irrigation, groundwater, or other sources added to the waste material. Liquids from the solid waste include moisture from food or waste products and fluids disposed of in the waste. Water and liquids that drain through or from the waste materials eventually drain via gravity into the collection systems at the bottom of the Class I disposal areas. Once collected, the leachate is pumped to the leachate storage tank. From the storage tank the leachate can be conveyed to the on-site Leachate Treatment and Reclamation Facility (LTRF) for treatment or hauled off site for treatment at a permitted wastewater treatment facility.

In addition, leachate is generated in the form of condensate from the collection of landfill gas from Phases I-VI and the CEA. Condensate is managed by several methods, including drainage back to the landfill or collection in sumps at low areas. While landfill gas condensate collection and transmission are not addressed in the leachate management plan, condensate management is addressed within the Gas Collection and Control System Plan for the SCLF referenced as part of the SCLF Title V operating permit. This plan should be referenced for details regarding condensate management.

3.0 LEACHATE COLLECTION SYSTEMS

The leachate collection system for Phases I-VI and the leachate collection and detection systems for the CEA are depicted in Figure 3-1 and Figure 3-2, respectively. Additional descriptions of these systems are provided in the following sections.

3.1 PHASES I-VI LEACHATE COLLECTION

Phases I-VI of the Southeast County Landfill Facility were constructed directly above a waste clay settling area for a former phosphate mine known as *Lonesome Phosphate Mine* or *Boyette Mine.* The Phases I-VI landfill is approximately 162.4 acres. The settling area, also known as *Settling Area No. 1*, was built on natural ground with a perimeter dike constructed of sand borrowed from surrounding areas. As part of the phosphate mining operations, waste phosphatic clay and other soils were washed and phosphate minerals removed from the surrounding soils.

The washed waste phosphatic clays and soils were pumped to the settling areas and allowed to settle to the bottom of the settling ponds. The low-permeability waste phosphatic clays now form the bottom containment liner for the disposal of waste in the Phase I-VI area. A single layer of 36-mil chlorosulfonated polyethylene (CSPE) or high-density polyethylene (HDPE) liner, depending on the phase, is tied into the waste phosphatic clay layer as a side containment liner barrier.

The leachate collection and removal system for Phases I-VI consists of crushed granite rock and tire-chip-filled trenches, 8-inch diameter perforated Schedule 80 polyvinyl chloride (PVC) pipes in granite rock-filled trenches, and 8-inch diameter perforated HDPE pipes in granite rock-filled trenches. The gravel- and tire-filled trenches drain to the 8-inch pipes which then drain to Pump Station B (PS-B) located in the Phase VI disposal area. PS-B was designed to be the ultimate low point for the entire footprint of Phases I-VI after final placement of waste material and loading of the waste phosphatic clays. As the waste phosphatic clays are loaded, the clays settle. Excess water from within the clays is squeezed out during the loading of the clays and enters the leachate collection system. ~~During interim operating conditions, when a portion of the bottom liner of Phases I-VI may not drain to PS-B, Temporary Pump Station 6 (TPS-6) in Phase IV is operated to collect leachate that does not flow to PS-B.~~

3.2 CAPACITY EXPANSION AREA LEACHATE COLLECTION

3.2.1 Section 7

3.2.1.1 Leachate Collection System

Section 7 of the CEA landfill is approximately 12.5 acres. The dimensions of Section 7 are approximately 750 feet long (southwest to northeast) and 800 feet wide (northwest to southeast). Section 7 was designed with a double-liner system—one for leachate collection on the primary liner and the other for detection (secondary liner) of any leachate that may leak through the

collection liner. A 300-mil bi-planar geocomposite was installed on the top of each of the 60-mil HDPE geomembranes to convey leachate toward collection trenches. Twelve inches of drainage sand and 12 inches of chipped tires were placed above the primary collection system to provide additional drainage collection and provide puncture protection of the underlying HDPE liners.

Leachate travels through the primary geocomposite and sand/tire-chip drainage layer and is collected in the leachate collection trench. This trench consists of 8-inch perforated HDPE leachate collection pipes and gravel wrapped in a geotextile to minimize migration of sand into the pipes. Leachate that collects in the trench flows to a collection header and then toward a collection sump in the southwest corner of Section 7. The sump was designed as the lowest point in Section 7 and was filled with gravel. A riser pipe was installed in the gravel fill of the sump and contains a submersible pump for leachate removal.

3.2.1.2 Leachate Detection System

The leachate detection system of Section 7 consists of a bi-planar geocomposite between the primary and secondary geomembranes. The geocomposite drains leachate toward an 8-inch perforated HDPE pipe in a gravel-filled trench. The lateral pipes drain to a main header on the southwest end of Section 7. The main header drains to the low point of Section 7 containing a sump with gravel fill and a riser pipe. Leachate is removed from the Section 7 leachate detection system via the riser pipe using an above-grade pump.

During standard practices, the detection system is expected to collect a small volume of leachate. Leakage rates collected in the detection system will be used to monitor the performance of the collection system. The action leakage rate for the CEA is discussed in Section 9.3.3.

3.2.2 Section 8

3.2.2.1 Leachate Collection System

Section 8 of the CEA is approximately 6.8 acres. The dimensions of Section 8 are approximately 500 feet long (southwest to northeast) and 660 feet wide (northwest to southeast). Section 8 was designed with a double-liner system—one for leachate collection (primary liner) and the other (secondary liner) for detection of any leachate that may leak through the collection liner. A 300-mil tri-planar geocomposite was installed on the top of each of the 60-mil HDPE geomembranes to convey leachate toward leachate collection trenches. Twelve inches of drainage sand and 12 inches of chipped tires were placed above the primary collection system to provide additional drainage collection and provide puncture protection of the underlying HDPE liners.

Figure 3-1 Phases I-VI Leachate Collection System

Figure 3-2 Capacity Expansion Area Leachate Collection System NO CHANGE

The design of Section 8 included connecting the leachate collection and detection system components to Section 7. Therefore, leachate travels through the upper geocomposite and sand/tire drainage layer and is collected in the leachate collection trenches in Section 8. These trenches consist of an 8-inch perforated HDPE leachate collection pipe and several feet of gravel wrapped in woven geotextile. Leachate that collects in the Section 8 trenches continues to flow though Section 7 trenches. Once in the Section 7 collection system, leachate drains to the sump in the southwest corner of Section 7.

3.2.2.2 Leachate Detection System

The leachate detection system of Section 8 consists of a tri-planar geocomposite between the primary and secondary geomembranes. The Section 8 tri-planar geocomposite was connected to the Section 7 bi-planar geocomposite. The geocomposite drains leachate to 8-inch perforated HDPE pipes in gravel filled trenches. The trenches flow through Sections 7 and 8. The lateral pipes drain to a main header on the southwest end of Section 7. The main header drains to the leachate sumps in the southwest corner of Section 7 as described in previous sections.

During standard practices the detection system should collect a small amount of leachate. Leakage rates collected in the Section 8 detection system cannot be measured independently from Section 7; however, since each system is connected, the total leakage measured in the Section 7 sump will be used to monitor the performance of the Sections 7 and 8 leachate detection systems.

3.2.3 Section 9

3.2.3.1 Leachate Collection System

Section 9 of the CEA landfill is approximately 15.2 acres. Section 9 is approximately 980 feet long (southwest to northeast) and 580 feet wide (northwest to southeast). The primary leachate collection system is composed of a combination of synthetic materials and natural granular materials. A geocomposite consisting of an HDPE geonet with the top and bottom sides bonded to a geotextile is directly above the primary 60-mil HDPE geomembrane. The geocomposite is overlain by a 12-inch-thick natural granular (sand) drainage layer and a 12-inch-thick chipped-tire drainage layer.

Leachate flows by gravity to a central leachate collection trench that conveys the leachate to the leachate collection sump on the south side of Section 9. The leachate collection pipe is a perforated 8-inch-diameter SDR 11 HDPE pipe surrounded by gravel and geotextile. From the sumps, leachate is pumped via a 6-inch SDR 11 HDPE forcemain to the LTRF located northeast of Sections 7 and 8.

3.2.3.2 Leachate Detection System

The leachate detection system for Section 9 includes a geocomposite consisting of a HDPE geonet with the top and bottom sides bonded to a geotextile installed between the primary and secondary geomembranes. Leachate entering the secondary LCRS flows by gravity through the geonet to the leak-detection trench. The trench, constructed at a slope of approximately 0.75%, conveys leachate to a leachate-detection sump on the south side of Section 9. From the sump, leachate is pumped via a 6-inch SDR 11 HDPE forcemain to the LTRF.

During standard practices, the detection system is expected to collect a small volume of leachate. Leakage rates collected in the detection system will be used to monitor the performance of the collection system. The action leakage rate for the CEA is discussed in Section 9.3.3.

4.0 LEACHATE TRANSMISSION

A schematic of the leachate management system at the SCLF is shown in Figure 4-1. The following sections provide additional details for the transmission components of the leachate management system at the SCLF.

4.1 PHASES I-VI

4.1.1 Pump Station A (PS-A)

PS-A consists of an 8-foot inside-diameter below-grade concrete sump with a single submersible pump. From PS-A, leachate is pumped to the Main Leachate Pump Station (MLPS) via force main. The pump operation is set with the "on" float at 42 inches from the sump bottom and the "off" float at 18 inches from the sump bottom.

If a high-level condition occurs, the PS-A sump control panel will shut down Pump Station B (PS-B). It will also transmit a signal, via a transceiver, with the sump condition to the control computer in the LTRF, the effluent/leachate storage tank (T6), and the landfill administration office located at the scalehouse at the entrance of the SCLF. If PS-A will be inoperable for more than 8 hours, leachate from PS-B will be pumped through the bypass line directly to the MLPS.

~~Operational procedures and valve settings including a representational schematic of the pump and piping system for PS-A and PS-B are provided in Appendix B.~~

4.1.2 Pump Station B (PS-B)

PS-B sump (located in Phase VI) is the primary leachate collection point for Phases I-VI. Upon consolidation of the phosphatic clay liner, the low point for the final collection and removal of leachate within the landfill is projected to be at the PS-B sump location. The LCRS for the landfill was designed to drain to the PS-B sump.

PS-B sump consists of an 8-foot square (inside dimension) below-grade concrete vault. The vault has two 18-inch diameter HDPE horizontal access pipes, the main access pipe leading to PS-A, and an alternate access pipe leading toward the western perimeter of the landfill between cleanouts 4-1 and 6-1.

The primary pump used to remove leachate from the PS-B sump is a ~~Godwin vacuum-assisted pump. The~~ self-priming pump ~~has~~ with a capacity of 150 gallons per minute (GPM). If the primary pump fails, the ~~Hillsborough County, Public Utilities Department, Solid Waste Management Group (SWMG)~~ operations contractor has a secondary ~~stored a Godwin~~ vacuum-assisted diesel pump that may be used as backup. PS-B sump is equipped with a level indicator located at the control panel near PS-A, and the SWMG monitors the liquid level daily to ensure that the levels noted below are maintained. Maintaining the operation of PS-B as proposed will

provide reasonable assurance that Phases I-VI will maintain a leachate head over the liner of 12 inches or less during routine landfill operation.

PS-B pumps leachate to PS-A via a vacuum-assisted pump. The bubbler leveling system with an "on" sensor is set at 24 inches above the sump bottom and the "off" sensor is set at 15 inches from the bottom. The settings provide for free flow of leachate into the landfill lower sump area~~vault~~ from the surrounding Phase I-VI disposal areas~~, thereby maximizing the leachate collection efficiency~~.

~~Operational procedures and valve settings including a representational schematic of the pump and piping system for PS-A and PS-B are provided in Appendix B.~~

4.1.3 Temporary Pump Station 6 (TPS-6)

The Temporary Pump Station 6 (TPS-6) was removed from service in September 2014 due to low flow production. The low leachate withdrawal from this area is an indication that the landfill PS-B sump has settled such that the leachate from all Phases is flowing by gravity to PS-B.

~~TPS-6 consists of an above-ground pump station to remove leachate from Phase IV from the 8-inch diameter header line connected to Cleanout 4-1 as shown in Figure 3-1. The leachate is removed via a 3-inch diameter HDPE suction line that was inserted 1,100 feet into the 8-inch header. TPS-6 pumps leachate to the PS-B sump through the west 18-inch diameter access pipe via a 4-inch diameter HDPE force main. TPS-6 operates in tandem with PS-B via radio telemetry.~~

~~The primary pump at TPS-6 is a self-priming pump with a minimum capacity of 150 gpm. If the primary pump fails, the SWMG can use the stored vacuum-assisted diesel pump as backup or use the reserve equipment agreement to bring a pump on site. The SWMG monitors the flow daily to ensure that the levels noted above are maintained. Maintaining the operation of TPS-6 will provide reasonable assurance that leachate storage within Phases IV and VI is minimized.~~

~~Operational procedures and valve settings including a representational schematic of the pump and piping system for TPS-6 are provided in Appendix B.~~

4.2 CAPACITY EXPANSION AREA

4.2.1 Section 7 – Pump Station 7 (PS-7)

The leachate collection and leachate detection system piping for Sections 7 and 8 drain to sumps in the southwest corner of Section 7 as shown in Figure 3-2. The leachate detection sump is pumped to the leachate collection sump by an above-grade pump located at PS-7. The leachate collection sump pumps leachate using a submersible pump in the sump to the MLPS via an underground force main.

Figure 4-1 Leachate Management System Schematic

There are separate pumps for the leachate collection (submersible pump) and detection (above grade pump) sideslope risers. The levels in each sump are controlled with pressure transducers at the bottom of the riser pipes. These transducers are programmed for a high-level alarm at 48 inches, pump on at 24 inches, and pump off at 12 inches. All elevations are from the bottom of the Section 7 sump. Flow measurements are taken using readings from magnetic flow meters on each discharge line. Separate sampling ball valves allow separate leachate samples to be taken from either the collection or detection sumps.

~~Operational procedures and valve settings including a representational schematic of the pump and piping system for Sections 7 and 8 are provided in Appendix B.~~

4.2.2 Section 8

Section 8 was constructed by connecting the leachate collection and detection systems to the Section 7 systems. No pumping systems are included in the Section 8 design. Section 8 uses the sumps and pumps for Section 7 to pump leachate to the MLPS.

4.2.3 Section 9 – Pump Station 9 (PS-9)

The Section 9 area includes sideslope riser pipes—two for the primary leachate collection and one for the leachate detection systems—with submersible pumps. All the pumps for the Section 9 area are controlled by a separate control panel located on the south side of Section 9. Leachate is conveyed by a buried forcemain which connects to the existing forcemain on the south side of Section 7. The forcemain then continues to the ~~LTRF~~ leachate storage tank (T1) or effluent/leachate storage tank (T6) northeast of the CEA.

The Section 9 pumps are controlled by a bubbler level sensing system at the PS-9 control panel. The standard practice bubbler settings for the leachate collection pumps from the bottom of the sump are high-level alarm at 36 inches, lag pump on at 33 inches, lead pump on at 27 inches, and low level alarm at six inches. The standard practice bubbler settings for the detection pump from the bottom of the sump are high-level alarm at 36 inches, pump on at 27 inches, and pump off at 21 inches.

In addition, the Section 9 pumps are deactivated when the leachate storage tank (T1) senses a high-level alarm.

~~Operational procedures and valve settings including a representational schematic of the pump and piping system for Section 9 are provided in Appendix B.~~

4.3 MAIN LEACHATE PUMP STATION (MLPS)

The MLPS consists of a 7-foot-square (inside dimension) below-grade concrete sump with dual submersible pumps (i.e., one operating and one stand-by). Each submersible pump is rated to pump at a maximum discharge rate of 240 gpm. The operating pump is set for a 24-hour operation cycle with the "on" float at 48 inches from the sump bottom and the "off' float at 24 inches from the sump bottom.

If a high-level condition occurs at the MLPS sump, the control panel will shut down PS-7, PS-A and PS-B. It will also transmit a signal, via a transceiver, with the sump condition to the control computer in the LTRF effluent/leachate storage tank (T6) and the administration office. Maintenance and inspection of the MLPS pump are described in Section 10.0.

From the MLPS, leachate is pumped to the 575,000-gallon leachate storage tank (T1) or to the 575,000-gallon effluent/leachate storage tank (T6) [effluent/leachate storage tank (T6)—for emergency use only, as described in Section 7.0] at the LTRF.

~~Operational procedures and valve settings, including a representational schematic of the pump and piping system for the MLPS, are provided in Appendix B. In addition, Ponds A and B, discussed in more detail in Section 8.0, are included with the MLPS instruction sheets and schematic.~~

5.0 LEACHATE STORAGE TANK (T1)

Leachate from Phases I-VI and the CEA is currently stored in a 575,000-gallon (maximum capacity) glass-fused-to-steel aboveground raw leachate holding tank before being treated or hauled. The leachate level in the leachate storage tank (T1) is maintained to provide for the maximum storage capacity possible. The leachate storage tank (T1) is maintained with an average low level of six feet (as measured from the top of the tank) or 173,000 gallons ~~(3 days' storage)~~ to ensure that enough leachate is available for the LTRF to operate 3 days without interruptions. When the level in the leachate storage tank (T1) is below six feet, leachate hauling and spray evaporation will be temporarily reduced or stopped. Similarly, an action level is established for a high level of 11 feet (from top of tank) in the leachate storage tank (T1). A level of 11 feet provides a storage capacity in the leachate storage tank (T1) of 259,000 gallons (4 days' storage) to allow continuous operation of the landfill pump stations. When levels are above 11 feet, treatment, hauling, and/or spray evaporation will be increased.

If a high-level alarm condition occurs (at 16.5 feet) in the leachate storage tank (T1), the LTRF will continue to operate, and the MLPS, PS-9, PS-10, and the LTRF filtrate pumps will be shut down. A signal indicating the leachate storage tank (T1) condition will be sent to the control computer in the LTRF and the administration office. When a high-level alarm condition exists, additional hauling trucks will be used to transport the leachate to a (WWTP), thus lowering the leachate level in the tank.

~~Additional operational procedures and valve settings, including a representational schematic of the pump and piping system associated with the leachate storage tank (T1) and operation of the effluent/leachate storage tank (T6) discussed in Section 7.0, are provided in Appendix B.~~

5.1 T1 SECONDARY CONTAINMENT SYSTEM

The LTRF leachate tank system is located within a concrete containment area. The secondary containment area has two sumps for stormwater drainage with 6-inch diameter HDPE pipes. The gate valves from the HDPE pipes are normally closed, in the event of an uncontrolled release. The gate valves are occasionally opened to release stormwater from the impoundment as needed. The LTRF secondary containment area was designed to hold 110% of the volume of the largest storage tank in case of failure of the tanks. Therefore, the concrete flooring and containment walls will be inspected weekly for cracks or structural deficiencies as discussed in Section 5.3. Any cracks will be immediately sealed using flexible concrete grout. Any structural deficiencies will be identified and corrective action taken to repair the walls.

5.2 T1 LIQUID LEVEL MONITORING

The leachate storage tank (T1) contains an overflow pipe. The overflow pipe is installed outside of the storage tank, with the tank sidewall penetration within 30 inches of the top of the sidewall of the tank. The tank is equipped with liquid level indicators that are float-operated with a direct readout. The level gauge boards are mounted in a highly visible location on the exterior of the

tank. A visual and audible alarm (a light and horn) is located on the gauge boards to alert staff to a potential problem before overflow. The tank level is recorded daily on the leachate reporting forms. An example form is provided in Appendix A.

5.3 T1 EXTERIOR AND INTERIOR INSPECTIONS

The following describes the inspections of the leachate storage tank (T1) and procedures to be followed after the inspections:

- Overfill Prevention System: The overfill prevention system components will be inspected weekly. These components include level sensors, gauges, high-level alarm, and automatic shutoff controls.

- Tank Exterior: The exterior of the tanks and the secondary containment system will be inspected weekly for adequacy of the impressed current cathodic protection system, leaks, corrosion, and maintenance deficiencies. The control panel for the impressed current cathodic protection system (located on the outside of the secondary containment walls next to the truck loading station) will be inspected to ensure that it is working properly. In addition, the inspection includes evaluating structural damage to the tank, damage to the coating system, loose connections, corrosion, visible leaks, and maintenance deficiencies. The inspector will also look for any structural damage to the concrete slab, peeling of the paint system, and visible leaks.

- Tank Interior: The interior of the tanks will be inspected whenever the tanks are drained or at least every three years. The inspector will look for any damage to the interior coating system, structural damage, cracking of the tank, visible leaks, and any accumulation of sludge.

- Procedures for Corrective Actions: If inspections reveal any deficiencies with the tank or the secondary containment system that could result in the system's failing to contain the leachate, the SWMG shall take immediate action to correct the situation by assessing the problem and coordinating the required actions. Failures or damage to the tanks will be repaired by the tank manufacturer or a designated contractor. The SWMG shall notify the manufacturer or designated contractor of the situation; the tank manufacturer or designated contractor will remediate the tanks and prepare a detailed damage-assessment report. FDEP will be notified in writing of the situation and of the proposed corrective action.

- Inspection Reports: Inspection reports and reports of any remedial action measures taken will be maintained at the SCLF and will be made available to FDEP upon request. The weekly inspection report form is provided in Appendix A. All reports will be maintained for the life of the tanks and the containment system.

6.0 LEACHATE TREATMENT AND RECLAMATION FACILITY (LTRF)

In December 1994, the SWMG constructed an on-site LTRF. The LTRF system and operation are described in detail in the *General Process and Operation Manual for the Powder Activated Carbon Treatment (PACT) system*, Volume III, prepared by Zimpro Environmental, Inc. dated March 1994.

Process tanks and equipment are maintained in accordance with *General Process and Operation Manual for the Powder Activated Carbon Treatment (PACT) PACT System*, dated March 1994.

The treatment system of the LTRF includes biological treatment components. The LTRF is operated according to the operation manual listed above provided by the manufacturer with the exception that the powder-activated carbon is no longer used. The maximum treatment capacity of the LTRF is 60,000 gallons per day.

After treatment, the leachate is pumped through a 4-inch-diameter single-walled HDPE pipe to the effluent storage pond (Pond A) or the effluent/leachate storage tank (T6) described in Section 7.0. The effluent from the LTRF must meet pre-treatment standards before being pumped to a tanker truck for transport to Hillsborough County's wastewater treatment facilities.

~~The primary process tank at the LTRF includes a skirt on the southeast quadrant at the top perimeter of the tank intended to minimize process foam from the tank from blowing outside the tank to the containment area. If the foam is found outside the tank in the containment area, the following cleaning process shall be followed.~~

~~1. Pressure wash the affected areas.~~

~~2. The wash water will be collected and placed in the leachate storage tank.~~

7.0 EFFLUENT/LEACHATE STORAGE TANK (T6)

The effluent/leachate storage tank (T6) is a welded steel aboveground tank with a maximum capacity of 575,000 gallons. The effluent/leachate storage tank (T6) receives treated leachate (effluent) from the LTRF and pumps effluent to the effluent storage pond (Pond A) or stores the effluent for transport to Hillsborough County's wastewater treatment facilities. If leachate must be stored in the effluent/leachate storage tank (T6) from the MLPS while the leachate storage tank (T1) is repaired or inspected, normal operations at the LTRF will stop. Once the leachate storage tank (T1) is repaired or inspected, the leachate stored in the effluent/leachate storage tank (T6) will be pumped back to the leachate storage tank (T1). The effluent/leachate storage tank (T6) will be cleaned of leachate before effluent storage resumes.

The following standard and special setting conditions are applicable to T6: ~~and associated valve settings are provided on instruction sheets and a schematic in Appendix B.~~

1. Pump effluent from the LTRF to the effluent/leachate storage tank (T6) (standard practice).

2. Pump effluent from the effluent/leachate storage tank (T6) to Pond A or the truck loading area (standard practice).

3. Pump leachate from the MLPS to the effluent/leachate storage tank (T6) (special condition).

4. Pump leachate from the effluent/leachate storage tank (T6) to the leachate storage tank (T1) (special condition).

7.1 T6 SECONDARY CONTAINMENT SYSTEM

The secondary containment system for the effluent/leachate storage tank (T6) can contain a minimum of 110% of the total volume of the tank. The effluent/leachate storage tank (T6) provides 575,000 gallons of maximum storage.

The secondary containment system consists of a 60-mil HDPE geomembrane lined basin. The tank is constructed at the bottom of the basin on a reinforced concrete pad and surrounded by a 6-inch thick reinforced concrete walkway. The lined basin is connected at the walkway slab and runs up 3H:1V sideslopes where it is anchored at a 12-foot wide berm.

The precipitation collected in the containment area is pumped into the adjacent stormwater management system via a horizontal submersible pump and sideslope riser. The sideslope riser system includes an additional camlock connection to be used for emergency effluent/leachate removal using an additional pump. Any spilled leachate and/or effluent that accumulates in the secondary sump is pumped to the leachate storage tank (T1) via a suction line originating from the horizontal centrifugal pump at the loading pad. The centrifugal pump is equipped with valves

to operate in suction mode to remove any spilled effluent/leachate from the secondary sump. The submersible sump pump is manually operated to remove stormwater or used as an alternate for effluent/leachate removal.

Accumulated precipitation will be removed within 24 hours of observation. The precipitation will be pumped into the adjacent stormwater management system.

Accumulated liquid in the trench drain that is not precipitation resulting from a recent storm event will be treated as effluent and pumped into the effluent/leachate storage tank (T6).

7.2 T6 LIQUID LEVEL MONITORING

The effluent/leachate storage tank (T6) contains an 8-inch overflow pipe. The overflow pipe is installed outside of the effluent/leachate storage tank (T6) with the tank sidewall penetration within 30 inches of the top of the sidewall of the tank. The tank is equipped with liquid level indicators that are float operated with a direct readout. The level gauge boards are mounted in a highly visible location on the exterior of the tank. A visual and audible alarm (a light and horn) are located on the gauge boards to alert staff of a potential problem before overflow. The effluent/leachate storage tank (T6) level is recorded daily on the leachate reporting forms provided in Appendix A.

7.3 T6 EXTERIOR AND INTERIOR INSPECTIONS

The following describes the inspections of the effluent/leachate storage tank (T6) and steps to be followed after the inspections.

- Overfill Prevention System: The overfill prevention system components will be inspected weekly. These components include level sensors, gauges, high-level alarm, and automatic shutoff controls.

- Tank Exterior: The exterior of the tank and the secondary containment system will be inspected weekly for adequacy of the cathodic protection system, leaks, corrosion, and maintenance deficiencies. In addition, the inspection includes an evaluation of any structural damage to the tank, damage to the coating system, loose connections, corrosion, visible leaks, and maintenance deficiencies. The inspector will also look for any structural damage to the concrete slab or HDPE lining of the secondary containment system, peeling of the paint system, and visible leaks.

- Tank Interior: The interior of the tank will be inspected whenever the tank is drained or at least every three years. The inspector will look for any damage to the interior coating system, structural damage, cracking of the tank, visible leaks, and accumulation of sludge.

- Procedures for Corrective Actions: If inspections reveal any deficiencies with the tank or the secondary containment system that could result in failure of the system to contain the leachate, the SWMG shall take immediate action to correct the situation by assessing the problem and coordinating the required actions. Failures or damage to the tanks will be repaired by the tank manufacturer or a designated contractor. The SWMG shall notify the manufacturer or designated contractor of the situation; the tank manufacturer or designated contractor will remediate the tanks and prepare a detailed damage assessment report. FDEP will be notified in writing of the situation and of the proposed corrective action.

- Inspection Reports: Inspection reports and reports of any remedial action measures taken will be maintained at the SCLF and will be made available to FDEP upon request. The weekly inspection report form is provided in Appendix A. All reports will be maintained for the life of the tanks and the containment system.

7.4 ACID MIXER AND TANK

The acid dosing pumps at the effluent/leachate storage tank (T6) pump station inject sulfuric acid into the 4-inch effluent pipe. Landfill personnel monitor the pH by pulling grab samples from the sampling port or reading from the pH meter at the control panel, thereby allowing the acid dosing to be optimized and preventing large swings in pH. The acid dosing rate is controlled by an operator at the control panel using the pH readout to adjust the acid dose to achieve the appropriate pH range. Also, the system includes controls between the acid dosing pumps and the pH meter to allow automatic acid dosing. The acid dosing pump controls are connected to the booster pump controls so acid dosing will only occur when the booster pumps are running. In addition, when the booster pumps are signaled off, the acid dosing pumps stop and the booster pumps continue to run for approximately 30 seconds to allow the piping system to be flushed of any residual acid.

8.0 LEACHATE AND EFFLUENT DISPOSAL

Leachate is disposed of at the SCLF by various methods, including treatment at the on-site LTRF, hauling of raw leachate via tanker truck to a Hillsborough County ~~WWTP~~ WWTF, and truck-mounted spray evaporation of raw leachate within the contained working surface. Effluent from the on-site LTRF is disposed of by an effluent spray irrigation system, effluent evaporation, or transporting effluent via tanker trucks to a county ~~WWTP~~ WWTF.

8.1 EFFLUENT STORAGE POND A

The effluent storage pond (Pond A) receives treated leachate (effluent) from the LTRF or the effluent/leachate storage tank (T6). The pond was lined with 80-mil HDPE and provides for temporary effluent storage of 120,000 gallons plus one foot of freeboard. Using the existing staff gauge in the pond, Pond A is maintained at a maximum depth of 3.7 feet (elevation 136.9) and a minimum depth of six inches. The minimum depth of six inches provides head over the liner to prevent damage due to uplift from wind and other elements. Off-site hauling could increase if levels in Pond A reach the maximum level of 3.7 feet. In addition, an overflow pipe allows flow from Pond A into Pond B. Similarly, if levels are below six inches, irrigation, evaporation, and off-site hauling from Pond A will be temporarily reduced.

The following standard and special setting conditions are applicable at Effluent Storage Pond A: ~~and associated valve settings are provided on the MLPS operation instruction sheet and schematic in Appendix B.~~

1. Pump effluent from Pond A to spray irrigation system (standard condition).
2. Pump effluent from Pond A to truck loading arm (standard condition).
3. Recirculate effluent in Pond A to stabilize pH (special condition).

8.2 EFFLUENT/LEACHATE STORAGE POND B

The effluent/leachate storage pond (Pond B) provides an additional storage volume of 236,000 gallons and is located next to Pond A, as shown in Figure 3-1. Pond B was designed with one foot of storage for the 25-year/24-hour storm and one foot of freeboard. The pond was designed to store either raw leachate or effluent; however, Pond B's primary use is for additional storage of effluent from the LTRF or the effluent/leachate storage tank (T6). If the need for leachate storage arises, the SWMG will notify FDEP before using the pond for leachate storage. The notification to FDEP will include the reason(s) for leachate storage in the pond and the anticipated duration.

Pond B was designed with an upper and lower 60-mil HDPE geomembrane. An HDPE geonet was installed between the two liners. The subbase for the lower geomembrane consists of six inches of soil with a saturated hydraulic conductivity of 1×10^{-5} centimeters per second or

less, installed over the on-site soil which was cleared of vegetation and graded. Supplemental effluent evaporation in Pond B is provided using a spray evaporation system. The spray evaporation nozzle system was designed around the perimeter of the pond and consists of 30 nozzles, with an estimated flow capacity of 17 gpm per nozzle and a 510-gpm pump.

In general, the SWMG operates the spray evaporation system manually and only during the hours the landfill is open. The spray evaporation system is not operated during windy conditions (i.e., over 10 miles per hour) to prevent overspray outside the limits of the pond liner system.

The following standard and special setting conditions are applicable at Leachate Storage Pond B: ~~and associated valve settings are provided as part of the MLPS operation instruction sheets and schematic in Appendix B.~~

1. Effluent storage and spray evaporation operation in Pond B (standard practice).

2. Leachate storage in Pond B (special condition).

3. Resuming effluent storage in Pond B following leachate storage (special condition).

8.3 EFFLUENT IRRIGATION

8.3.1 Effluent Irrigation Pump Station

The effluent irrigation pump station consists of a 5-foot square (inside dimension) below-grade concrete sump with dual vertical turbine pumps (one operating and one stand-by). From the effluent irrigation pump station, effluent is pumped to the spray irrigation system on the landfill. The pump in operation is set manually depending on weather conditions.

The effluent irrigation pump station is hydraulically connected to Effluent Pond A, and Effluent Pond A is hydraulically connected via pipe to Effluent/Leachate Pond B; therefore, if the effluent irrigation pump station reaches high level, it will drain to Ponds A and B and not overflow. Ponds A and B are visually monitored by landfill operations personnel and if high level conditions occur, steps are initiated as described in Sections 8.1 and 8.2 for Ponds A and B, respectively.

8.3.2 Effluent Spray Irrigation on Phases I-VI

The SWMG operates a mobile irrigation system consisting of two irrigation reels ~~manufactured by ABI Irrigation, Model ABI Series 700 Model No. 110JX1312 with a GXE 1312 spray nozzle with a maximum application rate of 192 gpm~~. The mobile irrigation reels in Figure 8-1 are shown positioned on the west side of Phase I and on the east side of Phase II. These locations are shown for information purposes only since the position will change due to operational

constraints with waste filling in Phase I-VI. Only effluent will be disposed of through the spray irrigation system.

Figure 8-1 Location of Irrigation Sprinkler Reels – NO CHANGE

The operational sequence of the mobile reel irrigators is as follows:

- Before each irrigation event, the medium-density polyethylene (PE) hose is stretched out with a vehicle (approximately 1,200 linear feet). At the end of the PE hose is a spray nozzle that applies the effluent across a large area to maximize evaporation and prevent runoff from draining into the stormwater system.

- Once both PE hoses have been stretched out across the top of the landfill, personnel manually turn on the irrigation pump. The pumps maintain an operating pressure in the irrigation reel. The reel is equipped with a drive system that automatically reels in the PE hose and spray irrigation nozzle at a preset rate (i.e., 200 feet per hour).

- At the end of the irrigation cycle, personnel manually turn off the irrigation pump.

Spray irrigation occurs under the following conditions:

- Spray irrigation is applied at a rate of one pass per day with a maximum application rate of 0.30 inch per day of effluent. Under no circumstances is effluent allowed to discharge as runoff to adjacent stormwater systems. Effluent is not sprayed during severe weather conditions or in quantities that may cause runoff, surface seeps, wind-blown spray outside of the landfill footprint, or ponding on the cover.

- Spraying takes place only when rainfall runoff into the on-site retention areas down gradient from the spray areas has terminated for two hours based on daily inspections of the influent point to each related retention area.

- Spray irrigation of effluent is not conducted within 100 feet of the landfill liner trench, on slopes steeper than 10%, nor on areas with permanent final cover.

- Spray irrigation may be used on areas with bare ground (little or no grass) or on areas which have been seeded to help with grass growth. These areas will not allow runoff to the stormwater system, as described in this Section.

- Spray irrigation of treated effluent will only be conducted only between 8:00 A.M. and 4:00 P.M.

The leachate reporting forms provided in Appendix A are completed monthly and submitted at least quarterly to FDEP and the Environmental Protection Commission (EPC) by the 15th of January, April, July, and October of each year. At a minimum, the following data are recorded daily.

- Effluent sprayed in gal/day.

- Rainfall on site in inches/day and time of day.
- Observed runoff influent to retention areas (yes and/or no).
- Time of day of inspection.

8.4 LEACHATE AND EFFLUENT EVAPORATION VIA TRUCK-MOUNTED SPRAYING

Evaporation is employed as a supplemental method of disposing of leachate. The supplemental evaporation of leachate involves spraying small quantities of leachate—an average of 9,700 gallons per day—from a spray bar mounted on the rear of a tank truck onto active-fill areas of the landfill. This approach has been used successfully at the SCLF since 1984. The advantages of this method are the reduction of leachate by evaporation, the promotion of the decomposition of organic matter in the landfilled refuse, and dust control.

The SWMG monitors the rate of application, soil moisture conditions, and the specific landfill areas used so that this leachate disposal method does not generate runoff. Leachate spray evaporation is applied under the following conditions.

- Leachate is only sprayed on active-fill areas, including the working face, and areas with the required six inches of initial cover.

- Leachate is not sprayed on areas with intermediate or final cover, seeded or unseeded.

- The maximum grade leachate may be sprayed on is 10H:1V slope. Areas within 150 feet of a 4H:1V or steeper sideslope may not be sprayed on. At all times, areas receiving leachate are controlled to prevent leachate runoff from entering the stormwater system.

- Leachate is not sprayed when it is raining.

- The tank truck spray bar method maximizes evaporation. The application rate of leachate will be such that leachate does not accumulate on the landfill surface nor infiltrate quickly into the covered refuse. Evaporation is the main goal of this leachate disposal method.

- Leachate is not sprayed at the end of the day on the initial cover of the working face or other areas. Spraying is done early in the morning after any dew evaporates and continues until early afternoon or until all available areas have been sprayed.

The SWMG evaporates leachate and effluent in full conformance with Chapter 62-701, FAC. The SWMG notifies FDEP of all evaporated quantities in the monthly water balance reports.

8.5 EFFLUENT AND LEACHATE TRUCK LOADING FACILITIES

8.5.1 Truck Loading Procedures

Truck loading facilities are located at the LTRF, Effluent Pond A, and the effluent/leachate storage tank (T6). ~~Operating procedures and valve settings for each station are provided in the instruction sheets and schematics provided in Appendix B.~~

The truck loading stations include a loading arm for discharging stored leachate or effluent from the leachate storage tank (T1), effluent/leachate storage tank (T6) and Pond A to a transfer tanker for disposal. Tanker trucks remove the liquid from the LTRF, effluent/leachate storage tank (T6), or Pond A and transport the liquid to a County ~~WWTP~~WWTF.

The truck loading facilities are equipped with flow meters that provide readout of the gallons of liquid that have been pumped into the tanker trucks. The capacity of each tanker truck is approximately 6,000 to 8,000 gallons, and the leachate tankers are normally filled. If the flow meter gauges are inoperable or not accurate, the quantity of leachate removed can be determined by converting the weight for the truck scale weight tickets to gallons (tons x 2,000 lb/ton/ 8.34 lb/gal = gallons).

Appendix A includes a Leachate Hauling/Disposal Reporting Form for use when loading leachate or effluent for off-site disposal. The daily field data entry form provided in Appendix A includes recording leachate storage tank (T1) levels. The external level indicators provide a measured indication of the depth of the leachate or effluent in the storage tanks. Information required includes the time of day and the level indicated on the side of the storage tank. Each reading of the storage tanks should be conducted at approximately the same time each day. This will provide the landfill operations personnel with a relative basis for comparing the amount of leachate stored daily and generated daily.

The SWMG has its own tanker trucks as well as a contract with haulers and ~~WWTPs~~ WWTFs to haul and treat leachate stored in the tanks for disposal. The private tanker vehicles are required to have onboard pump systems or provide portable pumps if the storage system pumps fail.

8.5.2 Wastewater Treatment ~~Plants~~Facilities

Leachate can be disposed of off site at a county-owned ~~WWTP~~ WWTF. Agreements exist with the ~~two of~~ Hillsborough County~~'s~~Public Utilities Department (PUD) allowing the discharge of leachate or effluent to three (3) of Hillsborough County's ~~WWTPs~~ WWTFs (Valrico, Falkenburg, and South County WWTF)~~for leachate or effluent disposal~~. Hillsborough County and private contract fleets are used to haul the leachate to ~~the WWTP~~ ~~WWTF~~a lift station designated by PUD which discharges to one of the approved WWTFs. Leachate will be measured by a flow meter as the tanker trucks are loaded at the LTRF truck loading stations.

9.0 LEACHATE ~~MONITORING,~~ FLOW MEASUREMENT, DATA COLLECTION, AND REPORTING

~~9.1 GENERAL LEACHATE MONITORING~~

~~SWMG field sampling personnel conduct leachate sampling activities in accordance with applicable FDEP standard operating procedures for field sampling. The leachate samples are collected from Location No. 001 (see Figure 3-1); at the PS-A sump; and from Locations No. 007 and No. 009 at the Sections 7, 8, and 9 (see Figure 3-2) sumps by grab sample using a decontaminated Teflon bailer. A Teflon flow control valve attached to the bailer is used to empty the contents into the volatile organic compound (VOC) sample container to minimize aeration. The samples are containerized in the appropriate sample containers and labeled, sampling procedures are summarized in field documentation, and the sample containers are secured in a cooler on wet ice. A standard chain of custody log will be completed and included with the samples. The cooler is sealed with a custody Seal and shipped by common carrier to an FDEP and Florida Department of Health (FDH) approved environmental laboratory for analysis.~~

~~Leachate is collected and analyzed annually for the parameters listed in section 9.1.1.~~

9.1 GENERAL LEACHATE FLOW MEASUREMENT

Once collected, the leachate is pumped to the leachate storage tank (T1). From the storage tank (T1), the leachate can be conveyed to the on-site Leachate Treatment and Reclamation Facility (LTRF) for treatment or hauled off-site to a permitted wastewater treatment facility. Leachate quantities from each landfill area are measured via flow meters~~,~~ at each pump station~~,~~ that can provide readout of gallons of liquid removed.

If leachate is classified as a hazardous waste, it will be managed in accordance with Chapter 62-730, FAC, "Hazardous Waste."

~~9.1.1 Leachate Quality~~

~~Annual leachate influent sampling is conducted for analysis of the following parameters.~~

~~Field Parameters~~	~~Laboratory Parameters~~
~~Specific conductivity~~	~~Total ammonia - N~~
~~pH~~	~~Total alkalinity (as mg/L CaCO3)~~
~~Dissolved oxygen~~	~~Bicarbonate~~
~~Colors and sheens~~	~~Chlorides~~
~~(by observation)~~	~~Iron~~
	~~Mercury~~
	~~Nitrate~~
	~~Sodium~~
	~~Total dissolved solids (TDS)~~
	~~Biochemical oxygen demand (BOD_5)~~

~~Chemical oxygen demand (COD)~~
~~Those parameters listed in 40 CFR Part 258, Appendix II~~

~~9.1.2~~9.1.1 Effluent Quality

To provide reasonable assurance of adequate leachate treatment, the SWMG samples and analyzes the treated leachate (effluent) semi-annually for primary and secondary drinking water parameters and EPA priority pollutants. Samples will be taken after the LTRF has achieved steady-state conditions with regard to its treatment capability or within 30 days after downtime due to maintenance or repairs, whichever is less.

In addition, effluent grab samples before disposal are taken for the following parameters at the frequency indicated:

Parameter	Frequency	Units
pH	weekly	Std. Units
BOD_5	monthly	mg/L
COD	monthly	mg/L
TSS	monthly	mg/L
$N0_3$-N	monthly	mg/L
TDS	monthly	mg/L

~~9.1.3~~9.1.2 Biosolids Quantity and Disposal

The biosolids from the LTRF are disposed of at the SCLF if they are found to be non-hazardous and pass the paint filter test. The biosolids are sampled and analyzed annually for EPA priority pollutants, the toxicity characteristic leaching procedure (TCLP), and for the following parameters:

Parameters	Units
Total nitrogen	percent (dry weight)
Total phosphorus	percent (dry weight)
Total potassium	percent (dry weight)
Arsenic	mg/kg (dry weight)
Cadmium	mg/kg (dry weight)
Copper	mg/kg (dry weight)
Lead	mg/kg (dry weight
Mercury	mg/kg (dry weight)
Molybdenum	mg/kg (thy weight)
Nickel	mg/kg (dry weight)
Selenium	mg/kg (dry weight)
Zinc	mg/kg (dry weight)
pH	std. units
Solids	percent

If the biosolids are found to be hazardous, the material will be managed in accordance with Chapter 62-730, FAC, "Hazardous Waste."

9.2 PHASES I-VI MONITORING

~~9.2.1 Leachate Sampling Locations~~

~~Leachate from the Phases I-VI area is sampled annually from Sample Location No. 001 at PS-A (see Figure 3-1). The applicable FDEP standard operating procedures are used to collect a leachate grab sample from the PS-A sump. The results of the leachate analyses will be documented.~~

~~9.2.2~~9.2.1 Flow Measurement

For Phases I-VI, the leachate quantity is recorded by flow meters at PS-A ~~and TPS-6~~. SWMG personnel record flow meter readings each day the SCLF is open and the quantities are reported to FDEP. Sample leachate reporting forms are included in Appendix A.

~~When pumping records from TPS-6 and PS-B show that in two consecutive months the average daily flow rate from TPS-6 is less than 250 gallons per day, TPS-6 will be shut down and removed from operation.~~

~~9.2.3~~9.2.2 PS-B Settlement Plates

Four settlement plates were installed at the bottom of each corner of the vault for PS-B in Phase VI. The rods for these plates have been extended during operation of the landfill. The elevation of these plates will be measured ~~annually~~prior to commencement of operations in the Phase VI disposal area. The historical measurements are provided in Appendix C. ~~These records have shown that PS-B has been settling as predicted and as discussed in Part I of the June 2013 Phases I-VI and Capacity Expansion Area (Sections 7, 8, and 9) Permit Renewal Application.~~ The rods for the settlement plates will be less accurate as operations continue due to deformation from settlement of the waste between the top of waste and PS-B. If, after two consecutive annual measurements from any of the four settlement plates there is no change in elevation, that settlement plate is assumed to be malfunctioning and will not be measured in future events. The settlement at malfunctioning settlement plates is assumed to be the same as the settlement measured at adjacent functioning plates.

~~9.2.4~~9.2.3 Bottom Liner Clay Evaluation

Approximately one year before a particular phase of Phases I-VI is entered, an in-situ, undisturbed, clay sample will be collected from beneath the phase proposed to be filled. The collected clay sample will be tested and the shear strengths computed.

The in-situ, undisturbed, clay sample will be tested either using a direct shear test (ASTM D-3080) or tri-axial test (ASTM D-2850/4767) method to determine the clay strength. Three

individual testing points—covering the existing, proposed filling, and proposed final build-out pressures—will be conducted. A representative phi and cohesion value will be determined to cover proposed filling and final build-out strengths.

Slope stability models, using both sliding block and circular failure methods, will be conducted on the proposed filling and the final-build out conditions. If a factor of safety (FS) of 1.5 or greater is achieved for a particular filling scenario, that particular phase is deemed complete and no further testing for that phase is necessary. If a particular filling scenario does not achieve a FS of 1.5 or greater, recommendations for filling the phase will be provided.

Results of the slope stability models, along with a report and recommendations signed and sealed by a professional engineer, will be submitted to FDEP for approval at least six months before filling begins in that phase.

9.3 CAPACITY EXPANSION AREA MONITORING

~~9.3.1 Sampling Locations~~

~~Leachate from Sections 7, 8, and 9 of the CEA are sampled annually from Sample Port No. 007 and No. 009 located at the sideslope riser at the Section 7 valve vault and the Section 9 sideslope riser, respectively, as shown in Figure 3-2. The sampling ports for these locations are shown in the associated schematics provided in Appendix B. Note that there are multiple sampling ports—labeled 007, 007a, 009, 009a, and 009b—at the Section 7 and Section 9 pump stations. These names are given to help the operator identify each valve; however, only one leachate sample will be collected from Section 7 and Section 9 for leachate monitoring. The appropriate sampling port will be used by the sampling team. The results of the leachate analyses will be documented.~~

~~9.3.2~~9.3.1 Flow Measurement

Under standard practice, leachate from Sections 7 and 8 is collected from the sump risers in the southwest corner of Section 7 at PS-7 and leachate from Section 9 is collected from the south slide slope riser at PS-9. The leachate from Sections 7 and 8 is pumped to the MLPS and then via force main to the leachate storage tank (T1). The leachate force main from PS-9 is tied into the MLPS force main to the leachate storage tank (T1); therefore, leachate is pumped directly from Section 9 to the leachate storage tank (T1). The leachate quantities from Section 9 and the MLPS are recorded by separate flow meters before the flow combines in the force main to the leachate storage tank (T1). SWMG personnel record flow meter readings each day the SCLF is open, and report the quantities to FDEP. Sample leachate reporting forms are included in Appendix A.

~~9.3.3~~9.3.2 Leachate Detection Action Leakage Rate

The action leakage rate (ALR) is defined in 40 CFR 265.302 as the maximum design flow rate that the leak detection system (LDS) can remove without the leachate head on the bottom of the liner exceeding one foot. In accordance with Rule 62-701.400(3)(c)2., FAC, the LDS should be

designed to limit the head in the LDS to less than one inch of head or the thickness of the geocomposite.

The ALR for Sections 7 and 8 is 100 gal/acre/day. The total estimated footprint area of Sections 7 and 8 is approximately 19.3 acres. An initial response ALR of 1,930 gpd (19.3 acres x 100 gal/acre/day) will be used for the flow rate measured from Sections 7 and 8. The leachate flow from the Section 7 and 8 LDS system is measured by the flow meter from the LDS pump in the southeast corner sump of Section 7.

The ALR for Section 9 is 306 gal/acre/day. The total estimated footprint of Section 9 is 15.2 acres. An initial response ALR of 4,651 gpd will be used for the flow rate measured from Section 9. The leachate flow from the Section 9 LDS system is measured by the flow meter from the LDS submersible pump in the south end sump of Section 9.

Initial ALR actions will include the following.

- Check the pump and flow meter at the LDS sideslope riser for proper operation.
- Increase the pumping rate from the LDS to lower the stored levels of leachate. A pocket or slug of leachate may have been conveyed to the LDS riser. Upon further pumping, the levels or flow rates may be lowered below the ALR.
- Check the cover or capping systems over Sections 7 and 8 or Section 9 to reduce infiltration into the LDS.
- Continue monitoring the flow rates out of the LDS, based on the recommendations above to determine further action, if needed.

If the ALR for Sections 7, 8 or 9 is exceeded, FDEP and EPC will be notified and a written assessment provided within seven days. The written assessment shall demonstrate continued compliance with the double-liner requirements specified in Rule 62-701.400(3)(c)2, FAC, or a corrective action plan and schedule for implementation shall be submitted for FDEP approval.

9.4 MAIN LEACHATE PUMP STATION

Operation of the MLPS is described in Section 4.3.

9.5 LEACHATE TREATMENT AND RECLAMATION FACILITY

Sampling of the LTRF effluent and biosolids ~~and effluent~~ is described in Sections 9.1.~~2~~ 1 and 9.1.~~3~~2.

10.0 MAINTENANCE AND INSPECTION

10.1 LEACHATE COLLECTION SYSTEM SCHEDULE FOR MAINTENANCE AND INSPECTION

The leachate facilities are inspected daily. The leachate collection and removal systems will be water pressure cleaned or video inspected as needed during the duration of the permit. The leachate system components will also be maintained as needed. Routine maintenance for these components at the SCLF is performed following the schedule in Table 10-1.

10.2 STORAGE TANK MAINTENANCE AND INSPECTION

Storage tank maintenance and inspection procedures are discussed in Sections 5.0 and 7.0.

Table 10-1 Schedule for Maintenance

Component	Frequency	Performance Criteria	Corrective Action
Pump Station A (PS-A)	Pump: semi-annual. Sump: annual.	Pump is unable to maintain the required levels in the sump. Inspect for sediment in sump and adequacy of level controls by testing the automatic on/off float settings (see LMP Section 4.1.1 for PS-A float settings).	Pump inspected for damage or other problems and repaired or replaced as needed. Replacement pump will be installed within 24 hours. If PS-A cannot be repaired before pumping is required, the bypass line will be used to pump leachate from PS-B directly to the MLPS. For level controls (i.e., floats and control panel), if testing fails, remedial measures will be initiated immediately by contacting an electrician and the condition will be corrected within 48 hours. Excessive sediment in the sump will be removed within two weeks after inspection.
Pump Station B (PS-B)	Pump: semi-annual. 18-inch access pipes; at time of permit renewal.	Pump is unable to maintain the required levels in the sump. Inspect for adequacy of level controls. Manually pump sump until air enters the pump; at that time bubbler should read between 0 to 4 inches (see LMP Section 4.1.2 for PS-B sensor settings). If blockage of the 4-inch suction line or the bubbler pressure tube is suspected, remove the suction line for inspection.	Pump inspected for damage or other problems and repaired or replaced as needed. Replacement pump will be installed within 24 hours. For level controls failure, remedial measures will be initiated immediately by contacting DCC and the condition will be corrected within 48 hours. If needed, water pressure clean the interior of the 4-inch suction line. The 18-inch access pipes will be water pressure cleaned and video inspected as needed at time of permit renewal. If the 18-inch access pipes are not performing adequately, the

Table 10-1 Schedule for Maintenance

Component	Frequency	Performance Criteria	Corrective Action
			SWMG will submit to FDEP and EPC an evaluation report with proposed remedy.
Main Leachate Pump Station (MLPS)	Pump: semi-annual. Sump: annual.	Pump is unable to maintain the required levels in the sump. Inspect for sediment in sump and adequacy of level controls by testing the automatic on/off float settings (see LMP Section 4.3 for MLPS float settings).	Pump inspected for damage or other problems and repaired or replaced as needed. Replacement pump will be installed within 24 hours. For level controls (i.e., floats and control panel), if testing fails remedial measures will be initiated immediately by contacting an electrician and the condition will be corrected within 48 hours. Excessive sediment in the sump will be removed within two weeks after inspection.
~~Temporary Pump Station 6 (TPS-6)~~	~~Pump: semi-annual.~~	~~Pump is not operational. Inspect mechanical operation of pump. Manually check radio telemetry to ensure signal is reaching PS-B. Inspect for adequacy of level controls at PS-B. If blockage of the 3-inch suction line or the bubbler pressure tube is suspected, remove the suction line for inspection.~~	~~Pump inspected for damage or other problems and repaired or replaced as needed. Replacement pump will be installed within 48 hours. For level controls failure, remedial measures will be initiated immediately by contacting DCC and the condition will be corrected within 48 hours. If needed, water pressure clean the interior of the 3-inch suction line.~~
Storage Pond A	Surface: annual.	Empty, water pressure clean, and remove sediment. Visually inspect geomembrane for punctures, seam continuity, and defects around concrete sump.	Defects found will be repaired before reusing the pond.
Storage Pond B	Surface: annual Leak detection: weekly.	Empty, water pressure clean, and remove sediment. Visually inspect geomembrane for punctures, seam continuity, and defects around concrete sump. If leak detection rate is higher than 1,500 gpd, empty pond and inspect geomembrane for defects.	Defects found will be repaired before reusing the pond.
Storage Tanks	Exterior: weekly. Interior: whenever the tank is drained or every three years.	Inspect for adequacy of the cathodic protection system, leaks, corrosion, level controls, and maintenance deficiencies	Deficiencies that could result in failure of the tank or leaks will be corrected before reusing the tank. For level controls failure, remedial measures will be initiated immediately by contacting an electrician and the condition will be corrected within 48 hours.
Section 7 Pump	Semi-annual.	Pump is unable to maintain the required levels in the sump.	Pump inspected for damage or other problems and repaired or replaced as needed.
Section 9 Pump	Semi-annual.	Pump is unable to maintain the required levels in the	Pump inspected for damage or other problems and

Table 10-1 Schedule for Maintenance			
Component	Frequency	Performance Criteria	Corrective Action
		sump.	repaired or replaced as needed.
Leachate collection and removal system	Twice during permit period	Water pressure clean or video inspect as needed at the existing cleanout locations.	If any component is not performing adequately or if a problem is shown by the video inspection, the SWMG will submit to FDEP and EPC an evaluation report with proposed remedy.

11.0 CONTINGENCY PLANS

FDEP and EPC will be notified of any equipment failure or event that disrupts the routine operation of the leachate management system. If the need for storing leachate in Pond B and/or the effluent/leachate storage tank (T6) arises as described in Sections 8.2 and 7.0, respectively, the SWMG will notify the FDEP and EPC. The person responsible for operation of the SCLF is the Landfill ~~General~~ Operations Manager (currently Mr. Larry E. Ruiz). The Landfill ~~General~~ Operations Manager reports to the Solid Waste Management Group ~~Manager~~ Director (currently Ms. ~~Patricia V. Berry~~ Kimberly A. Byer). The SWMG will continue to evaluate the accuracy and applicability of this leachate management plan and will propose modifications as necessary to accomplish the objectives of the leachate management plan and continue the proper management of leachate at the SCLF. The following sections provide information regarding contingency operations for specific events which may occur at the SCLF.

11.1 REPLACEMENT OF FLOW METERS

If a flow meter ceases to operate, maintenance personnel will remove the instrument and insert a spare flow meter. If the spare flow meter is not available or not working, a pipe spool piece will be inserted in its place to allow the leachate to flow from the transfer pump. The instrument will be shipped to the service representative or manufacturer for repair or replacement. It is anticipated that the instrument could be removed from service for up to three months. This schedule includes the issue of a Hillsborough County purchase order, shipping, and maintenance time or new part delivery. During this time, leachate production will be determined by recording the run-time meter on the transfer pumps. Leachate production of a specific pump can be estimated by taking the difference in the run-time readings and the rated pump test flow rate.

11.2 STORAGE TANK SECONDARY CONTAINMENT SPILL COUNTERMEASURES

As discussed in previous sections, the LTRF leachate tank system is contained within a concrete containment area. The containment area has two sumps for stormwater drainage with 6-inch diameter HDPE pipes and gate valves that are normally closed. The effluent/leachate storage tank (T6) is contained within a high-density polyethylene (HDPE) liner. The containment area has one secondary sump for stormwater, effluent/leachate drainage. Before draining stormwater from the containment areas, the SWMG will visually inspect the stormwater and the tanks to ensure that no leaks have occurred. If no spills have occurred, the sump valves will be opened to drain the stormwater accumulated in the containment area. Under supervision by the Landfill General Manager (or qualified designee), the sump valves will be closed immediately after the stormwater is drained.

If a liquid spills from the LTRF tankage system, the following will be done.

1. Assess the cause of the spill and correct the condition promptly.

2. If the spill condition is at the leachate storage tank (T1) (575,000 gallons):

a. Shut down the MLPS and PS-9.
b. Shut down the LTRF filtrate pumps. The LTRF may continue to operate.
c. With a sump pump, transfer the spilled liquid directly into tanker trucks for disposal at an off-site Hillsborough County ~~WWTP~~WWTF.

3. If the spill condition is at the LTRF process tank (T2) or the secondary stage clarifier tank (T3):
   a. Shut down the LTRF.
   b. The MLPS continues to operate.
   c. With a sump pump, transfer the spilled liquid directly into tanker trucks for disposal at an off-site Hillsborough County ~~WWTP~~ WWTF or into the leachate storage tank (T1).

4. If the spill condition is at the effluent storage tank (T5):
   a. Shut down the LTRF.
   b. The MLPS continues to operate.
   c. With a sump pump, transfer the spilled liquid directly into tanker trucks for disposal at an off-site Hillsborough County ~~WWTP~~ WWTF or into the leachate storage tank (T1).

5. If the spill condition is at the effluent/leachate storage tank (T6):
   a. Shut down the LTRF effluent pumps. The LTRF may continue to operate.
   b. With a sump pump, transfer the spilled liquid directly into tanker trucks for disposal at an off-site Hillsborough County ~~WWTP~~ WWTF or into the leachate storage tank (T1). ~~Refer to the instruction sheet for this condition in Appendix B.~~

6. If the spill condition is at the methanol tank (red tank at LTRF):
   a. Shut down the LTRF.
   b. Turn the LTRF electrical power off at the circuit breaker located outside the LTRF office on the south wall and evacuate staff.
   c. Shut down the MLPS and PS-9.
   d. Contact the current hazardous waste contractor. The contractor will manage the removal, off-site disposal, and containment area cleanup for methanol.

7. For spill conditions No. 2, 3, and 4 above, after the spilled liquid is removed, SWMG personnel will water pressure wash the containment area and the rinse water will be pumped directly into a tanker truck for disposal at an off-site county ~~WWTP~~WWTF.

8. If the leachate storage tank (T1) will remain out of service for more than 48 hours, the SWMG will resume leachate removal from the SCLF to either the effluent/leachate storage tank (T6) or Storage Pond B ~~by following the procedures~~

~~detailed in the instruction sheets provided in Appendix B~~. Leachate hauling off site can resume from the effluent/leachate storage tank (T6) or Pond B ~~by following the procedures included on the instruction sheets for these areas provided in Appendix B~~. If the effluent/leachate storage tank (T6) is unavailable for leachate or effluent storage, Pond B can also be used for back-up storage capacity. Leachate can be diverted back to the leachate storage tank (T1) via the MLPS or to the truck loading facility from Pond B. Leachate can also be diverted back to the leachate storage tank (T1) from the effluent/leachate storage tank (T6).

9. Within 24 hours of the spill occurrence, the SWMG will verbally notify FDEP and EPC. A written report with remedial measures taken will be submitted to FDEP and EPC within seven days after the leachate spill incident.

APPENDIX A

LEACHATE REPORTING AND INSPECTION FORMS

APPENDIX B

~~LEACHATE MANAGEMENT SYSTEM INSTRUCTION SHEETS AND SCHEMATICS~~ NOT USED

APPENDIX C

~~SETTLEMENT DATA FORM~~NOT USED