Johnson, Sabrina O

From: Madden, Melissa
Sent: Wednesday, November 7, 2018 9:22 AM
To: SWD_Waste
Subject: FW: Five-Year Submittal for Hillsborough County Southeast Landfill WACS ID 41193
Attachments: R20181105 Five-Year Submittal - Compressed.pdf

Ben - fyi

Please feel free to contact me with any questions or concerns.

Thanks, Melissa

Melissa Madden
Environmental Consultant – Solid Waste
Florida Department of Environmental Protection, Southwest District
13051 N Telecom Parkway, Suite 101, Temple Terrace, FL 33637
(813) 470-5795 Phone | (813) 470-5995 Fax
melissa.madden@floridadep.gov NEW!

Note: All your favorite people at the FDEP have new email addresses (@floridadep.gov)! Please make sure to update your contact list!

From: Spradlin, Kollan [mailto:KSpradlin@scsengineers.com]
Sent: Wednesday, November 7, 2018 9:02 AM
To: Ciaravella, Philip
Cc: Madden, Melissa ; Morgan, Steve ; Dilmore, Cory ; Ruiz, Larry ; ONeillJ@hillsboroughcounty.org; Byer, Kimberly ; Curtis, Bob ; Guilbeault, Ken ; Devitt, Caroline ; Cope, Ron ; Ortega, Alex
Subject: Five-Year Submittal for Hillsborough County Southeast Landfill WACS ID 41193

Dear Mr. Ciaravella,

On behalf of the Hillsborough County Transportation and Utilities Services, Solid Waste Management Division, SCS Engineers is submitting the attached five-year submittal for the Southeast County Landfill as required by Specific Permit Condition 2.A.6. This submittal includes the revised Financial Assurance Cost Estimate and the Leachate Collection and Removal System Cleaning and Inspection Report. A revised Closure Plan was submitted as part of the July 2017 Fill Sequence Minor Modification and a revised Operations Plan was submitted in October 2018 as part of the response to the Leachate Management Plan Minor Modification Request for Additional Information.

Please feel free to contact Ken Guilbeault (813-804-6716) or I (813-804-6706) should you have any questions.

Thank you,

Kollan Spradlin, PE, CHMM
Project Professional
SCS Engineers
3922 Coconut Palm Drive, Suite 102
Tampa, Florida 33619

813-804-6706 (W)
813-955-4906 (C)
KSpradlin@scsengineers.com

Driven by Client Success
www.scsengineers.com

November 7, 2018
File No. 09215600.07

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

Subject: Southeast County Landfill, Hillsborough County
Five-Year Submittal of the Revised Closure Estimate and Leachate Collection and Removal System Cleaning and Inspection Report
Operations Permit Number 35435-022-SO/01
Facility I.D. Number SWD/29/41193

Dear Mr. Ciaravella:

On behalf of the Hillsborough County Transportation and Utilities Services, Solid Waste Management Division (SWMD), SCS Engineers (SCS) is pleased to submit the attached documents as part of the Southeast County Landfill (SCLF) Specific Permit Condition 2.A.6. This permit condition requires that the SWMD submit an updated closure plan, a revised closure cost estimate, a demonstration that the leachate collection system has been water pressure cleaned or inspected, and an updated Operations Plan to the Florida Department of Environmental Protection (FDEP) by November 7, 2018.

A revised closure plan was submitted in April 2017 as part of a Fill Sequence Minor Modification Application and was approved in July 2017. No changes to the closure plan have been made since that time. A revised Operations Plan was submitted to the FDEP as part of a Leachate Management Plan Minor Modification Request for Additional Information response letter in October 2018.

The attached documents include a revised FDEP Form 62-701.900(28) closure cost estimate for the SCLF Phases I-VI and the Capacity Expansion Area Sections 7, 8, and 9 (CEA). An explanation of how the line items were calculated and backup information are provided as attachments to the revised cost estimate. SCS has calculated the total closure and long-term care costs for Phases I-VI and the CEA to be $68,319,065.87.

Also attached is the Leachate Collection and Removal System Cleaning and Inspection Report. The SWMD conducted operations to locate all header pipes within the landfill and install cleanouts throughout 2017 and 2018. Header pipes in Phases I-VI and the CEA have been water pressure cleaned and convey liquid to the appropriate sump.

Additionally, a check in the amount of $10,000.00 is being mailed to the FDEP in a separate package in accordance with Rule 62-701.315(13) FAC.

Please contact us at 813-804-6716 (Ken Guilbeault) or 813-804-6706 (Kollan Spradlin) should you have any questions.

Sincerely,

Kollan L. Spradlin, P.E.
Project Professional
SCS Engineers

Ken E. Guilbeault, P.G.
Project Director
SCS Engineers

KLS/KEG:kls

cc: Kimberly Byer, SWMD
Larry Ruiz, SWMD
Joseph O'Neill, SWMD
Melissa Madden, FDEP
Cory Dilmore, FDEP
Steve Morgan, FDEP
Ron Cope, EPC

Encl.

Attachment 1

Southeast County Landfill
Financial Assurance
Closure and Long-Term Care Cost Estimates

Phases I-VI and the Capacity Expansion Area (Sections 7, 8, and 9)

Facility I.D. Number: SWD/29/41193
Permit Number: 35435-022-SO/01

Hillsborough County
Transportation & Utilities Services
Solid Waste Management Division
332 N. Falkenburg Rd
Tampa, FL 33619

SCS ENGINEERS

09215600.07 | November 07, 2018

3922 Coconut Palm Drive, Suite 102
Tampa, FL 33619
813-621-0080

Table of Contents

PART 1
INTRODUCTION

SCS Engineers (SCS) has prepared this Financial Assurance Closure and Long-term Care Cost Estimates document for Phases I-VI and Sections 7, 8, and 9 of the Capacity Expansion Area (CEA) as required by Rule 62-701.630, FAC. The cost estimates were completed using Florida Department of Environmental Protection (FDEP) Form 62-701.900 (28) and signed by the authorized representative of the Owner of the facility and signed and sealed by the Engineer of Record. The Financial Assurance Cost Estimate Forms are provided in Part 2 of this report. Accompanying the cost estimate forms is an Explanation of Document Report provided in Part 3. The Explanation of Document Report includes general information regarding the cost estimates, the assumptions and calculations used in preparing the cost estimates, and the unit cost references associated with each line item. The source information for the cost references and contractors' quotes used in Part 3 is provided in Part 4, Unit Cost References. The references to the material quantities used in Part 3 are provided in Part 5, Materials Quantity References. SCS either requested unit costs from third party vendors/contractors, or used unit costs from RS Means construction cost estimating database for the Tampa, Florida area.

PART 2
FINANCIAL ASSURANCE COST ESTIMATE FORMS

Print Form Reset Form

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form # 62-701.900(28), F.A.C.

Form Title: Closure Cost Estimating Form For Solid Waste Facilities

Effective Date: January 6, 2010

Incorporated in Rule 62-701.630(3), F.A.C.

CLOSURE COST ESTIMATING FORM FOR SOLID WASTE FACILITIES

Date of DEP Approval: _____

I. GENERAL INFORMATION:

Facility Name: Hillsborough County Southeast Landfill - Phases I-VI SWD/29/4119 WACS ID: SWD/29/41193

Permit Application or Consent Order No.: 35435-022-SO/01 Expiration Date: 11/07/2023

Facility Address: 15960 CR 672 Lithia, FL 33547 (8.8 miles east of U.S. 301 on County Road 672)

Permittee or Owner/Operator: Hillsborough County Solid Waste Management Division

Mailing Address: P.O. Box 1110, Tampa, FL 33601

Latitude: 27 ° 46 ' 26 " Longitude: 82 ° 11 ' 01 "

Coordinate Method: AutoCAD Survey Datum: NAD 83

Collected by: SCS Engineers Company/Affiliation SCS Engineers

Solid Waste Disposal Units Included in Estimate:** Remaining life from 2018 Remaining Capacity Report dated 8/23/2018

Phase / Cell	Acres	Date Unit Began Accepting Waste	Active Life of Unit From Date of Initial Receipt of Waste	If active: Remaining life of unit	If closed: Date last waste received	If closed: Official date of closing
Phases I-VI	162.4	1984	56 Years	20.9 years**	N/A	N/A
Waste Tire Site	9,645 tn	N/A	N/A	N/A	N/A	N/A

Total disposal unit acreage included in this estimate: Closure: 162.4 Long-Term Care: 162.4

Facility type: (Check all that apply) ☒ Class I ☐ Class III ☐ C&D Debris Disposal ☐ Other: _____

II. TYPE OF FINANCIAL ASSURANCE DOCUMENT (Check type)

☐ Letter of Credit* ☐ Insurance Certificate ☐ Escrow Account

☐ Performance Bond* ☒ Financial Test ☐ Form 29 (FA Deferral)

☐ Guarantee Bond* ☐ Trust Fund Agreement

* - Indicates mechanisms that require the use of a Standby Trust Fund Agreement

Northwest District
160 Government Center
Pensacola, FL 32502-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-807-3300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
13051 N. Telecom Pky.
Temple Terrace, FL 33637
813-632-7600

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
239-332-6975

Southeast District
400 N. Congress Ave., Ste. 200
West Palm Beach, FL 33401
561-681-6600

III. ESTIMATE ADJUSTMENT

40 CFR Part 264 Subpart H as adopted by reference in Rule 62-701.630, Florida Administrative Code, (F.A.C.) sets forth the method of annual cost estimate adjustment. Cost estimates may be adjusted by using an inflation factor or by recalculating the maximum costs of closure in current dollars. Select one of the methods of cost estimate ajustment below.

☐ **(a) Inflation Factor Adjustment** ☒ **(b) Recalculated or New Cost Estimates**

Inflation adjustment using an inflation factor may only be made when a Department approved closure cost estimate exists and no changes have occurred in the facility operation which would necessitate modification to the closure plan. The inflation factor is derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflatory by the Deflator for the previous year. The inflation factor may also be obtained from the Solid Waste website www.dep.state.fl.us/waste/categories/swfr or call the Financial Coordinator at (850) 245-8706.

This adjustment is based on the Department approved closing cost estimate dated: _____

Latest Department Approved **Closing Cost** Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Closing Cost Estimate:
_____	×	_____	=	_____

This adjustment is based on the Department approved long-term care cost estimate dated: _____

Latest Department Approved Annual **Long-Term Care** Cost Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Annual Long-Term Care Cost Estimate:
_____	×	_____	=	_____

Number of Years of Long Term Care Remaining: × _____

Inflation Adjusted Long-Term Care Cost Estimate: = _____

Signature by: ☐ **Owner/Operator** ☐ **Engineer** (check what applies)

_____ Signature

_____ Address

_____ Name & Title

_____ City, State, Zip Code

_____ Date

_____ E-Mail Address

_____ Telephone Number

IV. ESTIMATED CLOSING COST (check what applies)

☒ **Recalculated Cost Estimate** ☐ **New Facility Cost Estimate**

Notes: 1. Cost estimates for the time period when the extent and manner of landfill operation makes closing most exp
2. Cost estimate must be certified by a professional engineer.
3. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.
4. In some cases, a price quote in support of individual item estimates may be required.

Description	Unit	Number of Units	Cost / Unit	Total Cost
1. Proposed Monitoring Wells (Do not include wells already in existence.)				
	EA			
			Subtotal Proposed Monitoring Wells:	
2. Slope and Fill (bedding layer between waste and barrier layer):				
Excavation	CY			
Placement and Spreading	CY			
Compaction	CY			
On ~~Off~~-Site Material (Installed Cost)	CY	73,985	$5.83	$431,332.55
Delivery	CY			
			Subtotal Slope and Fill:	$431,332.55
3. Cover Material (Barrier Layer):				
Off-Site Clay	CY			
Synthetics - 40 mil	SY	845,548	$5.22	$4,413,760.56
Synthetics - GCL	SY			
Synthetics - Geonet	SY			
Synthetics - Other (explain) Geo-composite	SY	845,548	$5.85	$4,946,455.80
			Subtotal Cover Material:	$9,360,216.36
4. Top Soil Cover:				
On ~~Off~~-Site Material (Installed Cost)	CY	591,884	$5.47	$3,237,605.48
Delivery	CY			
Spread	CY			
			Subtotal Top Soil Cover:	$3,237,605.48
5. Vegetative Layer				
Sodding	SY	399,300	$3.32	$1,325,676.00
Hydroseeding	AC	83.9	$1,233.62	$103,500.72
Fertilizer	AC			
Mulch	AC			
Other (explain)				
			Subtotal Vegetative Layer:	$1,429,176.72
6. Stormwater Control System:				
Earthwork	CY			
Grading	SY			
Piping	LF			
Ditches	LF			
Berms	~~LF~~ CY	58,378	$5.83	$340,343.74
Control Structures	EA			
Other (explain) See Explanation (Part 3)	LS	1	$1,095,694.00	$1,095,694.00
			Subtotal Stormwater Control System:	$1,436,037.74

Description	Unit	Number of Units	Cost / Unit	Total Cost
7. Passive Gas Control:				
Wells	EA			
Pipe and Fittings	LF			
Monitoring Probes	EA			
NSPS/Title V requirements	LS	~~1~~		
			Subtotal Passive Gas Control:	
8. Active Gas Extraction Control:				
Traps	EA			
Sumps	EA			
Flare Assembly	EA			
Flame Arrestor	EA			
Mist Eliminator	EA			
Flow Meter	EA			
Blowers	EA			
Collection System	LF			
Other (explain)				
			Subtotal Active Gas Extraction Control:	
9. Security System:				
Fencing	LF			
Gate(s)	EA			
Sign(s)	EA	1	$2,000.00	$2,000.00
			Subtotal Security System:	$2,000.00
10. Engineering:				
Closure Plan Report	LS	1	$778,410.44	$778,410.44
Certified Engineering Drawings	LS	~~1~~		
NSPS/Title V Air Permit	LS	~~1~~		
Final Survey	LS	1	$41,239.21	$41,239.21
Certification of Closure	LS	~~1~~		
Other (explain)	LS	1	$7,500.00	$7,500.00
Permit Fee per chapter 62-701			Subtotal Engineering:	$827,149.65

Description	Hours	Cost / Hour	Hours	Cost / Hour	Total Cost
11. Professional Services					
	Contract Management		Quality Assurance		
P.E. Supervisor	1,440	$143.91	1,440	$143.91	$414,460.80
On-Site Engineer			720	$73.74	$53,092.80
Office Engineer	1,440	$92.79	720	$92.79	$200,426.40
On-Site Technician			6,912	$55.00	$380,160.00
Other (explain)	2,880	$76.00			$218,880.00
Admin. Asst./Designer					

Description	Unit	Number of Units	Cost / Unit	Total Cost
Quality Assurance Testing	LS	1	$250,000.00	$250,000.00
			Subtotal Professional Services:	$1,517,020.00

	Subtotal of 1-11 Above:	$18,240,538.50
12. Contingency 5 % of Subtotal of 1-11 Above		$912,026.92
	Subtotal Contingency:	$912,026.92
	Estimated Closing Cost Subtotal:	$19,152,565.42

Description	**Total Cost**
13. Site Specific Costs	
Mobilization	$836,175.93
Waste Tire Facility	$207,139.00
Materials Recovery Facility	
Special Wastes	
Leachate Management System Modification	
Other (explain)	
Subtotal Site Specific Costs:	$1,043,314.93

TOTAL ESTIMATED CLOSING COSTS ($): $20,195,880.35

V. ANNUAL COST FOR LONG-TERM CARE

See 62-701.600(1)a.1., 62-701.620(1), 62-701.630(3)a. and 62-701.730(11)b. F.A.C. for required term length. For landfills certified closed and Department accepted, enter the remaining long-term care length as "Other" and provide years remaining.

(Check Term Length) ☐ 5 Years ☐ 20 Years ☒ 30 Years ☐ Other, ___ Years

Notes: 1. Cost estimates must be certified by a professional engineer.

2. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.

3. In some cases, a price quote in support of individual item estimates may be required.

All items must be addressed. Attach a detailed explanation for all entries left blank.

Description	Sampling Frequency (Events / Year)	Number of Wells	(Cost / Well) / Event	Annual Cost
1. Groundwater Monitoring [62-701.510(6), and (8)(a)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	12	$450.00	$10,800.00
Annually	1			
			Subtotal Groundwater Monitoring:	$10,800.00
2. Surface Water Monitoring [62-701.510(4), and (8)(b)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	2	$450.00	$1,800.00
Annually	1			
			Subtotal Surface Water Monitoring:	$1,800.00
3. Gas Monitoring [62-701.400(10)]				
Monthly	12			
Quarterly	4	1	$1,565.00	$6,260.00
Semi-Annually	2			
Annually	1			
			Subtotal Gas Monitoring:	$6,260.00
4. Leachate Monitoring [62-701.510(5), (6)(b) and 62-701.510(8)c]				
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1			
Other (explain) _____	_____			
_____			Subtotal Leachate Monitoring:	

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. Leachate Collection/Treatment Systems Maintenance				
Maintenance				
Collection Pipes	LF			
Sumps, Traps	EA	1	$750.00	$750.00
Lift Stations	EA	1	$750.00	$750.00
Cleaning	LS	1	$1,800.00	$1,800.00
Tanks	EA	1	$4,500.00	$4,500.00

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. (continued)				
Impoundments				
Liner Repair	SY			
Sludge Removal	CY			
Aeration Systems				
Floating Aerators	EA			
Spray Aerators	EA			
Disposal				
Off-site (Includes transportation and disposal)	1000 gallon	24,693	$34.40	$849,439.20
			Subtotal Leachate Collection / Treatment Systems Maintenance:	$857,239.20
6. Groundwater Monitoring Well Maintenance				
Monitoring Wells	LF	1	$500.00	$500.00
Replacement	EA			
Abandonment	EA			
			Subtotal Groundwater Monitoring Well Maintenance:	$500.00
7. Gas System Maintenance				
Piping, Vents	LF	1	$5,000.00	$5,000.00
Blowers	EA	1	$1,200.00	$1,200.00
Flaring Units	EA	1	$400.00	$400.00
Meters, Valves	EA	1	$500.00	$500.00
Compressors	EA	1	$500.00	$500.00
Flame Arrestors	EA	1	$1,200.00	$1,200.00
Operation	LS	1		
			Subtotal Gas System Maintenance:	$8,800.00
8. Landscape Maintenance				
Mowing	AC	166.4	$264.84	$44,069.38
Fertilizer	AC	166.4	$132.42	$22,034.69
			Subtotal Landscape Maintenance:	$66,104.06
9. Erosion Control and Cover Maintenance				
Sodding	SY	13,807	$3.32	$45,839.24
Regrading	AC	2.85	$3,726.80	$10,621.38
Liner Repair	SY	1,255	$16.00	$20,080.00
Clay	CY	2,092	$5.47	$11,443.24
			Subtotal Erosion Control and Cover Maintenance:	$87,983.86
10. Storm Water Management System Maintenance				
Conveyance Maintenance	LS	1	$10,076.00	$10,076.00
			Subtotal Storm Water Management System Maintenance:	$10,076.00
11. Security System Maintenance				
Fences	LS	1	$500.00	$500.00
Gate(s)	EA			
Sign(s)	EA			
			Subtotal Security System Maintenance:	$500.00

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
12. Utilities	LS	1	$3,000.00	$3,000.00
			Subtotal Utilities:	$3,000.00
13. Leachate Collection/Treatment Systems Operation				
Operation				
P.E. Supervisor	HR			
On-Site Engineer	HR			
Office Engineer	HR			
OnSite Technician	HR	96	$55.00	$5,280.00
Materials	LS	1	$1,000.00	$1,000.00
	Subtotal Leachate Collection/Treatment Systems Operation:			$6,280.00
14. Administrative				
P.E. Supervisor	HR	16	$143.91	$2,302.56
On-Site Engineer	HR			
Office Engineer	HR			
OnSite Technician	HR	96	$55.00	$5,280.00
Other (1 full time treatment plant operator & 2 part time laborers)	HR	4,160	$30.00	$124,800.00
			Subtotal Administrative:	$132,382.56
			Subtotal of 1-14 Above:	$1,191,725.68
15. Contingency	5	% of Subtotal of 1-14 Above		$59,586.28
			Subtotal Contingency:	$59,586.28

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
16. Site Specific Costs				
			Subtotal Site Specific Costs:	
			ANNUAL LONG-TERM CARE COST ($ / YEAR):	$1,251,311.97
			Number of Years of Long-Term Care:	30
			TOTAL LONG-TERM CARE COST ($):	$37,539,359.05

VI. CERTIFICATION BY ENGINEER

This is to certify that the Cost Estimates pertaining to the engineering features of this solid waste management facility have been examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, the Cost Estimates are a true, correct and complete representation of the financial liabilities for closing and/or long-term care of the facility and comply with the requirements of Rule 62-701.630 F.A.C. and all other Department of Environmental Protection rules, and statutes of the State of Florida. It is understood that the Cost Estimates shall be submitted to the Department annually, revised or adjusted as required by Rule 62-701.630(4), F.A.C.

Signature

3922 Coconut Palm Drive, Ste. 102
Mailing Address

Kollan L. Spradlin, Project Professional
Name and Title (please type)

Tampa, FL 33619
City, State, Zip Code

11/2/2014
Date

kspradlin@scsengineers.com
E-Mail address (if available)

FL PE #82852
Florida Registration Number
(please affix seal)

KOLLAN LEE SPRADLIN * LICENSE * No. 82852 STATE OF FLORIDA PROFESSIONAL ENGINEER
11/2/2014

813-621-0080
Telephone Number

VII. SIGNATURE BY OWNER/OPERATOR

Signature of Applicant

332 N. Falkenburg Road
Mailing Address

Kimberly A. Byer, SWMD Director
Name and Title (please type)

Tampa, FL 33619
City, State, Zip Code

ByerK@HillsboroughCounty.org
E-Mail address (if available)

813-612-7718 Ext. 43131
Telephone Number

Print Form Reset Form

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form # 62-701.900(28), F.A.C.
Form Title: Closure Cost Estimating Form For Solid Waste Facilities
Effective Date: January 6, 2010
Incorporated in Rule 62-701.630(3), F.A.C.

CLOSURE COST ESTIMATING FORM FOR SOLID WASTE FACILITIES

Date of DEP Approval: _____

I. GENERAL INFORMATION:

Facility Name: Hillsborough County Southeast Landfill - CEA WACS ID: SWD/29/41193
Permit Application or Consent Order No.: 35435-022-SO/01 Expiration Date: 11/07/2023
Facility Address: 15960 CR 672 Lithia, FL 33547 (8.8 miles east of U.S. 301 on County Road 672)
Permittee or Owner/Operator: Hillsborough County Solid Waste Management Division
Mailing Address: P.O. Box 1110, Tampa, FL 33601

Latitude: 27 ° 46 ' 38 " Longitude: 82 ° 10 ' 38 "
Coordinate Method: AutoCAD Survey Datum: NAD 83
Collected by: SCS Engineers Company/Affiliation SCS Engineers

Solid Waste Disposal Units Included in Estimate: **Remaining life from 2018 Remaining Capacity Report dated 8/23/2018

Phase / Cell	Acres	Date Unit Began Accepting Waste	Active Life of Unit From Date of Initial Receipt of Waste	If active: Remaining life of unit	If closed: Date last waste received	If closed: Official date of closing
Sections 7, 8, and 9	34.5	1/5/2004	18.5	5.5 years**	N/A	N/A

Total disposal unit acreage included in this estimate: Closure: 34.5 Long-Term Care: 34.5

Facility type: (Check all that apply) ☒ Class I ☐ Class III ☐ C&D Debris Disposal
☐ Other: _____

II. TYPE OF FINANCIAL ASSURANCE DOCUMENT (Check type)

☐ Letter of Credit* ☐ Insurance Certificate ☐ Escrow Account
☐ Performance Bond* ☒ Financial Test ☐ Form 29 (FA Deferral)
☐ Guarantee Bond* ☐ Trust Fund Agreement

* - Indicates mechanisms that require the use of a Standby Trust Fund Agreement

Northwest District
160 Government Center
Pensacola, FL 32502-5794
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Northeast District
7825 Baymeadows Way, Ste. B200
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239-332-6975

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400 N. Congress Ave., Ste. 200
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40 CFR Part 264 Subpart H as adopted by reference in Rule 62-701.630, Florida Administrative Code, (F.A.C.) sets forth the method of annual cost estimate adjustment. Cost estimates may be adjusted by using an inflation factor or by recalculating the maximum costs of closure in current dollars. Select one of the methods of cost estimate ajustment below.

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Inflation adjustment using an inflation factor may only be made when a Department approved closure cost estimate exists and no changes have occurred in the facility operation which would necessitate modification to the closure plan. The inflation factor is derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflatory by the Deflator for the previous year. The inflation factor may also be obtained from the Solid Waste website www.dep.state.fl.us/waste/categories/swfr or call the Financial Coordinator at (850) 245-8706.

This adjustment is based on the Department approved closing cost estimate dated: _____

Latest Department Approved **Closing Cost** Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Closing Cost Estimate:
_____	×	_____	=	_____

This adjustment is based on the Department approved long-term care cost estimate dated: _____

Latest Department Approved Annual **Long-Term Care** Cost Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Annual Long-Term Care Cost Estimate:
_____	×	_____	=	_____

Number of Years of Long Term Care Remaining: × _____

Inflation Adjusted Long-Term Care Cost Estimate: = _____

Signature by: ☐ **Owner/Operator** ☐ **Engineer** (check what applies)

_____ _____
Address

_____ _____
Name & Title City, State, Zip Code

_____ _____
Date E-Mail Address

_____
Telephone Number

IV. ESTIMATED CLOSING COST (check what applies)

☒ **Recalculated Cost Estimate** ☐ **New Facility Cost Estimate**

Notes: 1. Cost estimates for the time period when the extent and manner of landfill operation makes closing most exp
2. Cost estimate must be certified by a professional engineer.
3. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.
4. In some cases, a price quote in support of individual item estimates may be required.

Description	Unit	Number of Units	Cost / Unit	Total Cost
1. Proposed Monitoring Wells (Do not include wells already in existence.)				
	EA			
			Subtotal Proposed Monitoring Wells:	
2. Slope and Fill (bedding layer between waste and barrier layer):				
Excavation	CY			
Placement and Spreading	CY			
Compaction	CY			
On ~~Off~~-Site Material (Installed Cost)	CY	16,178	$5.83	$94,317.74
Delivery	CY			
			Subtotal Slope and Fill:	$94,317.74
3. Cover Material (Barrier Layer):				
Off-Site Clay	CY			
Synthetics - 40 mil	SY	184,888	$5.22	$965,115.36
Synthetics - GCL	SY			
Synthetics - Geonet	SY			
Synthetics - Other (explain) Geo-Composite	SY	184,888	$5.85	$1,081,594.80
			Subtotal Cover Material:	$2,046,710.16
4. Top Soil Cover:				
On ~~Off~~-Site Material (Installed Cost)	CY	129,422	$5.47	$707,938.34
Delivery	CY			
Spread	CY			
			Subtotal Top Soil Cover:	$707,938.34
5. Vegetative Layer				
Sodding	SY	109,384	$3.32	$363,154.88
Hydroseeding	AC	13.8	$1,233.62	$17,023.96
Fertilizer	AC			
Mulch	AC			
Other (explain)				
			Subtotal Vegetative Layer:	$380,178.84
6. Stormwater Control System:				
Earthwork	CY			
Grading	SY			
Piping	LF			
Ditches	LF			
Berms	~~LF~~ CY	30,293	$5.83	$176,608.19
Control Structures	EA			
Other (explain) See Explanation (Part 3)	LS	1	$617,194.00	$617,194.00
			Subtotal Stormwater Control System:	$793,802.19

Description	Unit	Number of Units	Cost / Unit	Total Cost
7. Passive Gas Control:				
Wells	EA			
Pipe and Fittings	LF			
Monitoring Probes	EA			
NSPS/Title V requirements	LS	1		
			Subtotal Passive Gas Control:	
8. Active Gas Extraction Control:				
Traps	EA			
Sumps	EA			
Flare Assembly	EA			
Flame Arrestor	EA			
Mist Eliminator	EA			
Flow Meter	EA			
Blowers	EA			
Collection System	LF			
Other (explain)				
			Subtotal Active Gas Extraction Control:	
9. Security System:				
Fencing	LF			
Gate(s)	EA			
Sign(s)	EA	1	$2,000.00	$2,000.00
			Subtotal Security System:	$2,000.00
10. Engineering:				
Closure Plan Report	LS	1	$165,117.36	$165,117.36
Certified Engineering Drawings	LS	1		
NSPS/Title V Air Permit	LS	1		
Final Survey	LS	1	$8,760.79	$8,760.79
Certification of Closure	LS	1		
Other (explain)	LS	1	$7,500.00	$7,500.00
Permit Fee per chapter 62-701			Subtotal Engineering:	$181,378.15

Description	Hours	Cost / Hour	Hours	Cost / Hour	Total Cost
11. Professional Services					
	Contract Management		Quality Assurance		
P.E. Supervisor	480	$143.91	480	$143.91	$138,153.60
On-Site Engineer			240	$73.74	$17,697.60
Office Engineer	480	$92.79	240	$92.79	$66,808.80
On-Site Technician			1,152	$55.00	$63,360.00
Other (explain)	960	$76.00			$72,960.00
Admin. Asst./Designer					

Description	Unit	Number of Units	Cost / Unit	Total Cost
Quality Assurance Testing	LS	1	$50,000.00	$50,000.00
			Subtotal Professional Services:	$408,980.00

	Subtotal of 1-11 Above:	$4,615,305.42
12. Contingency 5 % of Subtotal of 1-11 Above		$230,765.27
	Subtotal Contingency:	$230,765.27
	Estimated Closing Cost Subtotal:	$4,846,070.69

Description	Total Cost
13. Site Specific Costs	
Mobilization	$168,253.00
Waste Tire Facility	
Materials Recovery Facility	
Special Wastes	
Leachate Management System Modification	
Other (explain)	
Subtotal Site Specific Costs:	$168,253.00

TOTAL ESTIMATED CLOSING COSTS ($): $5,014,323.69

V. ANNUAL COST FOR LONG-TERM CARE

See 62-701.600(1)a.1., 62-701.620(1), 62-701.630(3)a. and 62-701.730(11)b. F.A.C. for required term length. For landfills certified closed and Department accepted, enter the remaining long-term care length as "Other" and provide years remaining.

(Check Term Length) ☐ 5 Years ☐ 20 Years ☒ 30 Years ☐ Other, ___ Years

Notes: 1. Cost estimates must be certified by a professional engineer.

2. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.

3. In some cases, a price quote in support of individual item estimates may be required.

All items must be addressed. Attach a detailed explanation for all entries left blank.

Description	Sampling Frequency (Events / Year)	Number of Wells	(Cost / Well) / Event	Annual Cost
1. Groundwater Monitoring [62-701.510(6), and (8)(a)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	8	$450.00	$7,200.00
Annually	1			
			Subtotal Groundwater Monitoring:	$7,200.00
2. Surface Water Monitoring [62-701.510(4), and (8)(b)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	2	$450.00	$1,800.00
Annually	1			
			Subtotal Surface Water Monitoring:	$1,800.00
3. Gas Monitoring [62-701.400(10)]				
Monthly	12			
Quarterly	4	1	$1,565.00	$6,260.00
Semi-Annually	2			
Annually	1			
			Subtotal Gas Monitoring:	$6,260.00
4. Leachate Monitoring [62-701.510(5), (6)(b) and 62-701.510(8)c]				
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1			
Other (explain) _____	_____			
_____			Subtotal Leachate Monitoring:	

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. Leachate Collection/Treatment Systems Maintenance				
Maintenance				
Collection Pipes	LF			
Sumps, Traps	EA	1	$750.00	$750.00
Lift Stations	EA	1	$750.00	$750.00
Cleaning	LS	1	$1,800.00	$1,800.00
Tanks	EA	1	$4,500.00	$4,500.00

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. (continued)				
Impoundments				
Liner Repair	SY			
Sludge Removal	CY			
Aeration Systems				
Floating Aerators	EA			
Spray Aerators	EA			
Disposal				
Off-site (Includes transportation and disposal)	1000 gallon	1,936	$34.40	$66,598.40
			Subtotal Leachate Collection / Treatment Systems Maintenance:	$74,398.40
6. Groundwater Monitoring Well Maintenance				
Monitoring Wells	LF	1	$500.00	$500.00
Replacement	EA			
Abandonment	EA			
			Subtotal Groundwater Monitoring Well Maintenance:	$500.00
7. Gas System Maintenance				
Piping, Vents	LF			
Blowers	EA			
Flaring Units	EA			
Meters, Valves	EA			
Compressors	EA			
Flame Arrestors	EA			
Operation	LS	1	$19,200.00	$19,200.00
			Subtotal Gas System Maintenance:	$19,200.00
8. Landscape Maintenance				
Mowing	AC	36.4	$264.84	$9,640.18
Fertilizer	AC	36.4	$132.42	$4,820.09
			Subtotal Landscape Maintenance:	$14,460.26
9. Erosion Control and Cover Maintenance				
Sodding	SY	2,930	$3.32	$9,727.60
Regrading	AC	0.61	$3,725.80	$2,272.74
Liner Repair	SY	266	$16.00	$4,256.00
Clay	CY	444	$5.47	$2,428.68
			Subtotal Erosion Control and Cover Maintenance:	$18,685.02
10. Storm Water Management System Maintenance				
Conveyance Maintenance	LS	1	$3,072.00	$3,072.00
			Subtotal Storm Water Management System Maintenance:	$3,072.00
11. Security System Maintenance				
Fences	LS	1	$500.00	$500.00
Gate(s)	EA			
Sign(s)	EA			
			Subtotal Security System Maintenance:	$500.00

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
12. Utilities	LS	1	$3,000.00	$3,000.00
			Subtotal Utilities:	$3,000.00
13. Leachate Collection/Treatment Systems Operation				
Operation				
P.E. Supervisor	HR			
On-Site Engineer	HR			
Office Engineer	HR			
OnSite Technician	HR	96	$55.00	$5,280.00
Materials	LS	1	$1,000.00	$1,000.00
	Subtotal Leachate Collection/Treatment Systems Operation:			$6,280.00
14. Administrative				
P.E. Supervisor	HR	25	$143.91	$3,597.75
On-Site Engineer	HR	144	$73.74	$10,618.56
Office Engineer	HR	78	$92.79	$7,237.62
OnSite Technician	HR			
Other On-site tech. & Other hours are added in Phase I-VI Costs				
			Subtotal Administrative:	$21,453.93
			Subtotal of 1-14 Above:	$176,809.61
15. Contingency	5	% of Subtotal of 1-14 Above		$8,840.48
			Subtotal Contingency:	$8,840.48

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
16. Site Specific Costs				
			Subtotal Site Specific Costs:	
			ANNUAL LONG-TERM CARE COST ($ / YEAR):	$185,650.09
			Number of Years of Long-Term Care:	30
			TOTAL LONG-TERM CARE COST ($):	$5,569,502.78

VI. CERTIFICATION BY ENGINEER

This is to certify that the Cost Estimates pertaining to the engineering features of this solid waste management facility have been examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, the Cost Estimates are a true, correct and complete representation of the financial liabilities for closing and/or long-term care of the facility and comply with the requirements of Rule 62-701.630 F.A.C. and all other Department of Environmental Protection rules, and statutes of the State of Florida. It is understood that the Cost Estimates shall be submitted to the Department annually, revised or adjusted as required by Rule 62-701.630(4), F.A.C.

Kollan Spradlin
Signature

Kollan L. Spradlin, Project Professional
Name and Title (please type)

11/2/2018
Date

FL PE #82852
Florida Registration Number 82852
(please affix seal)

KOLLAN LEE SPRADLIN * LICENSE * STATE OF FLORIDA PROFESSIONAL ENGINEER 11/2/2018

3922 Coconut Palm Drive, Ste. 102
Mailing Address

Tampa, FL 33619
City, State, Zip Code

kspradlin@scsengineers.com
E-Mail address (if available)

813-621-0080
Telephone Number

VII. SIGNATURE BY OWNER/OPERATOR

Kimberly A. Byer
Signature of Applicant

Kimberly A. Byer, SWMD Director
Name and Title (please type)

ByerK@HillsboroughCounty.org
E-Mail address (if available)

332 N. Falkenburg Road
Mailing Address

Tampa, FL 33619
City, State, Zip Code

813-612-7718 Ext. 43131
Telephone Number

PART 3
EXPLANATION OF DOCUMENT REPORT

CLOSURE AND LONG-TERM CARE COST ESTIMATES REPORT

November 2018

Note that some of the quantities have been obtained from previously calculated Financial Assurance Cost Estimates (FACE) included as part of the Operation Permit Minor Modification Application, dated April 2015.

GENERAL INFORMATION AND ASSUMPTIONS

Closure Area Phases I-VI

Surface area of Phase I-VI = 162.4 acres

The 3D surface area of Phases I-VI at closure = 166.4 acres
(Obtained from CAD Civil 3-D)

For Closure Items 2 through 4, assume an overall loss factor of 5% to count for soil losses & testing, geosynthetics losses & testing, and miscellaneous materials uses (such as installation of anchor trenches) during construction. Following quantities for geosynthetics & soils are calculated using 5% loss factor.

Geosynthetics:

Area (with 5% loss factor) = 174.7 acres = 7,609,932 ft^2 = 845,548 yd^2

Soils:
7,609,932 ft^2 x 0.25 ft (3") cover = 1,902,483 ft^3 / 27 = 70,462 yd^3
7,609,932 ft^2 x 0.5 ft (6") cover = 3,804,966 ft^3 / 27 = 140,925 yd^3
7,609,932 ft^2 x 1.5 ft (18") cover = 11,414,898 ft^3 /27 = 422,774 yd^3
7,609,932 ft^2 x 2.0 ft (24") cover = 15,219,864 ft^3/27 = 563,699 yd^3

Closure Area Sections 7 to 9:

Surface area of Sections 7 to 9 = 34.5 acres

The 3D surface area of Sections 7 to 9 = 36.4 acres
(Assuming uniform 3:1 side slopes)

For Closure Items 2 through 4, assume an overall loss factor of 5% to count for soil losses & testing, geosynthetics losses & testing, and miscellaneous materials uses (such as installation of anchor trenches) during construction. Following quantities for geosynthetics & soils are calculated using 5% loss factor.

Geosynthetics:
Area (with 5% loss factor) = 38.2 acres = 1,663,992 ft^2 = 184,888 yd^2

Soils:
1,663,992 ft^2 x 0.25 ft (3") cover = 415,998 ft^3 / 27 = 15,407 yd^3

1,663,992 ft^2 x 0.5 ft (6") cover = 831,996 ft^3 / 27 = 30,815 yd^3
1,663,992 ft^2 x 1.5 ft (18") cover = 2,495,988 ft^3 /27 = 92,444 yd^3
1,663,992 ft^2 x 2.0 ft (24') cover = 3,327,984 ft^3/27 = 123,259 yd^3

Unit Cost Estimations and Calculations:

All unit costs are explained in the following parts for each item. The RS Means 2018 Online Cost Database was used to estimate some unit costs. The cost references third party contractors' quotes, recent construction costs at the SCLF, and RS Means pages, have been provided in Part 4.

The final cover for the landfill will consist of 12 inches of intermediate cover material over the landfilled waste, a 40-mil LLDPE geomembrane, geocomposite drainage layer, and 24 inches of top soil.

CLOSURE COSTS

Item No. 1 Proposed Monitoring Wells

No additional monitoring wells are proposed for closure of the landfill.

Item No. 2 Slope and Fill

The slope and intermediate cover will be maintained during the operation of the landfill. During closure, there will be a need to shape and compact the intermediate cover existing at the time of closure. It is assumed that, on average, approximately three inches of soil will need to be installed during closure for fine grading. This assumption was used to generate grading/compaction costs associated with the intermediate cover. Also, soil quantities were increased by an additional 5% to account for shrinkage & bulking losses.

Phases I to VI: Quantity of 3" soil fill = 70,462 CY * 1.05 = 73,985 CY
Sections 7 to 9: Quantity of 3" soil fill = 15,407 CY * 1.05 = 16,178 CY

Soil cost is based on third party contractors' quotations for landfill closure projects at the SCLF and similar landfill facilities in Florida. Three quotes from different contractors were used to determine average unit cost for the soil. For this submittal, on-site soils will be used for cover soil and fill material, per February 2015 revisions to FDEP 62-701.630(3)(d).

- Soil unit cost from 2018 contractor quotes (on-site source) = $5.83 per CY

Item No. 3 Barrier Layer

The landfill barrier layer will consist of a layer of 40-mil textured LLDPE (linear low-density polyethylene) geomembrane.

Phases I to VI: Quantity of geosynthetics = 845,548 SY

Sections 7 to 9: Quantity of geosynthetics = 184,888 SY

Geosynthetics costs are based on third party contractors' quotations. Three quotes from different contractors were used to determine average unit cost for the installed geosynthetics.

- Geomembrane unit cost from 2018 contractor quotes = $5.22 per SY
- Drainage geocomposite unit cost from 2018 contractor quotes = $5.85 per SY

Item No. 4 Final Cover Material

The quantity for this item was based on 24 inches of top vegetative soil layer above the geosynthetics. Also, soil quantities were increased by additional 5% to count for shrinkage & bulking losses.

Phases I to VI: Quantity of 24" topsoil layer = 563,699 CY * 1.05 = 591,884 CY

Sections 7 to 9: Quantity of 24" topsoil layer = 123,259 CY * 1.05 = 129,422 CY

Topsoil cost is based on third party contractors' quotations for landfill closure projects at the SCLF and similar landfill facilities in Florida. Three quotes from different contractors were used to determine average unit cost for the soil. On-site soils will be used for cover soil and fill material, per February 2015 revisions to FDEP 62-701.630(3)(d).

- Topsoil unit cost from 2018 contractor quotes (on-site source) = $5.47 per CY

Item No. 5 Vegetative Cover

Phases I-VI:
Hydroseeding quantity based on area at the top of final build out for Phases I-VI = 406,222 SY = 83.9 AC

Sodding quantity based on side slopes 3D surface area = (total 3D surface area – top flat area) = 166.4 AC – 83.9 AC = 82.5 AC = 399,300 SY

Sections 7 to 9:
Hydroseeding quantity based on area at the top of final build out for Sections 7 to 9 = 66,859 SY = 13.8 AC

Sodding quantity based on side slopes 3D surface area = (total 3D surface area – top flat area) = 36.4 AC – 13.8 AC = 22.6 AC = 109,384 SY

Hydroseeding cost is based on 2018 RS Means data for Tampa, FL.

- Hydroseeding unit cost from RS Means = $28.32 per 1,000 SF = $1,233.62 per AC

Sodding cost is based on three 2018 third party contractor quotations received on landfill closure projects for the SCLF and similar landfill facilities in Florida.

- Sodding unit cost from 2018 contractor quotes = $3.32 per SY

Item No. 6 Stormwater Control Systems

Phases I-VI:

Berms:

Embankments (stormwater berms for side slopes of closure) are 50 square feet cross section and a total length of 31,524 ft taken from the conceptual closure drawings (included in Part 5).

Total quantity of fill soil required = 50 x 31,524 CF = 1,576,200 CF = 58,378 CY

The unit cost for the structural fill/soil is assumed same as that of the Item 2, or $5.83 per CY.

Other:

Downchutes: A typical downchute for Phase I-VI is comprised of three major components (see typical downchute detail provided in Part 5): textured geomembrane liner, non-woven geotextile, and 6" thick concrete. Cross-sectional linear length of each component is calculated from the typical downchute design as: textured geomembrane = 24 ft; geotextile = 16 ft; and 6" thick concrete = 16 ft.

Total length of downchutes = 2,850 ft; therefore, quantity of each of the three components is: textured geomembrane = 7,600 SY; geotextile = 5,067 SY; and 6" thick concrete = 845 CY.

Unit cost of installed textured geomembrane is assumed same as Item No. 3. Unit cost of installed nonwoven geotextile is conservatively assumed as 50% of the liner cost based on SCS's experience on similar closure projects. Unit cost of 6" concrete is based on RS Means $143.65 per CY ($118.62 materials + $25.03 placement).

- Liner unit cost from 2018 contractor quotes = $5.22 per SY, geotextile is conservatively estimated to be 50% of liner cost or $2.61 per SY.

Control Structures: The control structure is comprised of the velocity dissipater gabions (three feet wide & conservatively assumed nine feet deep), and the modified downchute, same as typical downchutes but with 6" grout filled fabric revetment (GFFR) instead of 6" concrete.

Total length of gabions = 45 ft (Downchute 1) + 48 ft (Downchute 3) + 90 ft (Downchute 3 – two 45 ft rows) + 45 ft (Downchute 4) + 48 ft (Downchute 5) + 42 ft (Downchute 6) = 318 ft; therefore, plan area of gabions = 318 ft x 3 ft = 954 SF = 106 SY.

Total length of modified downchutes = 243 ft; therefore, the total quantity of each of the three components of downchute is: textured geomembrane = 648 SY; geotextile = 432 SY; and 6" thick fabric reinforced concrete = 72 CY.

Unit cost of gabions is based on RS Means: $170.96 per SY; Unit cost of GFFR is assumed to be same as fabric reinforced concrete for financial assurance purposes. The unit cost of fabric reinforced concrete is based on RS Means ($8.22 per CY + $143.65 per CY for

concrete). Therefore adjusted total cost of installed fabric reinforced concrete = $151.87 per CY.

Terrace Swale: Terrace swale along the side slope is comprised of 4" lime rock base with 2" asphalt pavement (refer to side slope ditch detail in Part 5). For financial assurance purposes, it is assumed that bottom 4" is gravel fill and top 2" is asphalt pavement. Cross-sectional length of the terrace swale pavement = 14 ft (approx); total length of the swale = 31,524 ft (conservatively top swale is assumed as part of side slope swale configuration); therefore, total quantity of gravel = 5,449 CY, and total quantity of asphalt pavement = 49,037 SY. Unit cost of gravel is based on RS Means: $66.28 per CY. Unit cost of asphalt pavement is based on RS Means: $8.72 per SY.

See Table 1 below for total cost and individual breakup of "Other" costs. Note that 10% contingency is added to count for any miscellaneous storm water control activities required during closure such as temporary stormwater control measures etc. This total cost is added as lump sum amount on the FDEP Form.

Table 1. Breakup of "Other" Costs for Phase I to VI

Item	Component	Quantity	Unit	Unit Cost	Total
Downchutes	Liner	7,600	SY	$5.22	$39,672
Downchutes	Geotextile	5,067	SY	$2.61	$13,225
Downchutes	6" Concrete	845	CY	$143.65	$121,384
Control Structure	Gabions	106	SY	$170.96	$18,122
Control Structure	Liner	648	SY	$4.41	$2,858
Control Structure	Geotextile	432	SY	$2.61	$1,128
Control Structure	6" Reinforced Concrete	72	CY	$151.87	$10,935
Terrace Swale	4" Gravel Fill	5,449	CY	$66.28	$361,160
Terrace Swale	2" Asphalt Pavement	49,037	SY	$8.72	$427,603
				Subtotal	$996,085
				10% Contingency	$99,609
				Total	$1,095,694

Sections 7 to 9:

Berms:

Embankments (stormwater berms for side slopes of closure) are 50 square feet cross section and a total length of 16,358 ft taken from the conceptual closure drawings (included in Part 5).

Therefore, total quantity of fill soil required = 50 x 16,358 CF = 817,900 CF = 30,293 CY

The unit cost for the structural fill/soil is assumed same as that of the Item 2, or $5.83 per CY.

Other:

Downchutes: A typical downchutes for Sections 7 to 9 landfill area is comprised of three major components (see typical downchute detail provided in Part 5): textured geomembrane liner, non-woven geotextile, and 6" thick GFFR. Cross-sectional linear length of each component is calculated from the typical downchute design as: textured geomembrane = 20 ft; geotextile = 16 ft; and 6" thick GFFR = 16 ft.

Total length of downchutes = 2,436 ft; therefore, quantity of each of the three components is: textured geomembrane = 5,413 SY; geotextile = 4,331 SY; and 6" thick GFFR = 722 CY.

Control Structures: The control structures for the each downchute are assumed to be comprised of the velocity dissipater gabions (three feet wide & conservatively assumed nine feet deep). Assume one gabion of 30 ft length (twice the plan width of typical downchute) will be required per downchute.

Total length of gabions = 30 ft x 5 (number of downchutes) = 150 ft; therefore, plan area of gabions = 150 ft x 3 ft = 50 SY.

Terrace Swale: Terrace swale along the side slope is assumed to be comprised of 4" gravel fill at bottom and 2" asphalt pavement on top. Cross-sectional length of the terrace swale pavement = 14 ft (assumed same as that of Phase I to VI); total length of the swale = 16,358 ft; therefore, total quantity of gravel = 2,827 CY, and total quantity of asphalt pavement = 25,446 SY.

See Table 2 below for total cost and individual breakup of "Other" costs. Note that 10% contingency is added to count for any miscellaneous storm water control activities required during closure such as temporary stormwater control measures etc. This total cost is added as lump sum amount on the FDEP Form.

Table 2. Breakup of "Other" Costs for Sections 7-9

Item	Component	Quantity	Unit	Unit Cost	Total
Downchutes	Liner	5,413	SY	$5.22	$28,256
Downchutes	Geotextile	4,331	SY	$2.61	$11,304
Downchutes	6" Concrete	722	CY	$143.65	$103,715
Control Structure	Gabions	50	SY	$170.96	$8,548
Terrace Swale	4" Gravel Fill	2,827	CY	$66.28	$187,374
Terrace Swale	2" Asphalt Pavement	25,446	SY	$8.72	$221,889
				Subtotal	$561,086
				10% Contingency	$56,109
				Total	$617,194

Item No. 7 Gas Controls: Passive

No passive gas collection system is proposed as the facility has an active gas collection system installed.

Item No. 8 Gas Control: Active Extraction

The gas collection system installation is considered as part of the operational costs of the facility; therefore, no additional cost for the active extraction is considered for closure of the facility. Note that the Southeast County Landfill is a Title V facility that falls under the New Source Performance Standards (NSPS) compliance, and therefore, an active gas collection system is required by the regulations. The facility has an active gas collection system installed in Phases I-VI and Sections 7, 8, and 9.

Item No. 9 Security System

Perimeter fencing, gates and signs already exist at the facility. A $2,000 lump sum is allocated in the cost estimates for additional signs or fence modifications required at the time of closure.

Item No. 10 Engineering Permitting and Design

The closure permit application (including plan report), engineering drawings, and certification of closure reports will be required as part of the landfill closure. All three services are included under the closure plan report for financial assurance purposes. SCS reevaluated the working hours estimated to complete these services for this cost estimate.

In accordance with Rule 62-701.610(3), a final survey of the Class I landfill will be required. The final survey cost is estimated to be $50,000 for the landfill. Note that the surveying cost has been split on the FDEP forms based on footprint area of Phases I to VI and CEA Sections 7 to 9.

The facility already falls under NSPS compliance and has an assigned Title V permit; therefore, no cost has been considered. Closure permit fee is based on Chapter 62-701.

Item No. 11 Construction-Phase Engineering

The hours shown in Item 11 include professional services required during construction (submittal review, site visits and quality testing review). SCS reviewed the working hours estimated in the April 2015 cost estimates, and found the numbers to be conservative for financial assurance purposes. These working hours are repeated in the current estimates.

Item No. 12 Contingency

A contingency of 5% is added to the sub-total of Items 1-11.

Item No. 13 Site-Specific Cost

Mobilization & Insurance: A mobilization & insurance cost is assumed as approximately 5% of the construction cost.

Waste Tire Processing Facility: The Waste Tire Processing Facility (WTPF) has a total storage capacity of 29,065 CY of tires, 15,065 CY whole tires and 14,000 CY processed tires (source: April 2015 WTPF Permit Renewal Application). Based on the 2015 Permit Renewal Application, the total cost of closing waste tire facility = $207,139.

The Waste Tire Processing Facility has currently ceased tire shredding operations and contracted for disposal of whole tires by an outside contractor. If the County does not resume on-site shredding of times, the cost of closing the waste tire facility will likely be lower than the above estimate. However, the option to resume on-site shredding of tires remains, and the estimate therefore remains at $207,139.

LONG-TERM CARE COSTS:

In accordance with Rule 62-701.630(3)(a), F.A.C., the owner or operator of a Class I facility shall continue to monitor and maintain the facility for 30 years from the date of closure.

Item No. 1 Groundwater Monitoring

Phases I to VI: There are 12 wells that are included in regular semi-annual groundwater monitoring for the Phase I to VI area at the facility.

Sections 7 to 9: There are eight wells that are included in regular semi-annual groundwater monitoring for the Sections 7 to 9.

SCS evaluated unit sampling cost for various similar landfill facilities, and conservatively estimated the unit cost of sampling to be $450 per location per monitoring event.

Item No. 2 Surface Water Monitoring

There are four surface water monitoring locations at the facility that are required to be monitored and analyzed semiannually. SCS evaluated unit sampling cost for various similar landfill facilities, and conservatively estimated the unit cost of sampling to be $450 per location per monitoring event. Note that the cost has been evenly distributed between Phases I to VI, and CEA Sections 7 to 9.

Item No. 3 Gas Monitoring

Quarterly gas monitoring is split into two separate tasks:

Gas Probes & Buildings: Perimeter gas probes and on-site buildings are monitored with LandGEM or other similar equipment. LandGEM rental cost is approximately $110 per day (see recent invoice from Pine Environmental). On-site technician ($55 hourly rate, see SCS fee schedule) will require 10 hours for sampling & reporting results to the department. Therefore, total cost for the sampling event = $110 (equipment) + $550 (technician) + $250 (miscellaneous expenses) = $910.

Surface Emissions Monitoring (SEM): Surface emissions monitoring will be performed with MicroFID or similar equipment. The equipment's daily rental rate is approx. $90 (see quote from Pine Environmental). It requires approximately 20 hours for the technician to perform the SEM and another 8 hours to compile and submit the report to the department. Miscellaneous cost of $500 is considered that includes mileage, food, and lodging reimbursements. Therefore, total cost of the SEM event = $180 (equipment) + $1,540 (technician) + $500 (miscellaneous) = $2,220.

Total cost of quarterly gas monitoring is estimated to be $3,130. Note that the cost has been evenly distributed between Phases I to VI, and CEA Sections 7 to 9 ($1,565 each).

Item No. 4 Leachate Monitoring (Class I Only)

Per Chapter 62-701 of the Florida Administrative Code (FAC), annual leachate monitoring is no longer required and therefore, is not included as part of the long-term care cost estimates.

Item No. 5 Leachate Collection/Treatment Systems Maintenance

Collection Pipe: Based on a quotation from Florida Jetclean, the cost of jet cleaning is estimated as $15,000 (=$250 per hour x 60 hours). Assuming that pipe cleaning will be required once every five years, annualized cost of jet cleaning the collection pipes is $3,000. Cost is evenly split between Phases I to VI and CEA Sections 7 to 9.

Assuming video inspections will be required for 12 hours once every five years, annualized video inspection cost is $600 (= $250 per hour x 12 hours / 5 years). Cost is evenly split between Phases I to VI and CEA Sections 7 to 9.

Tanks: Inspection and cleaning services for the effluent and leachate storage tanks is assumed to be $45,000 every 5 years = $9,000 /yr. Note that the cost has been evenly distributed between Phases I to VI and CEA Sections 7 to 9.

Disposal: Leachate generation varies by year, therefore the average leachate generation for the past 5 years (2013 through 2017) was used to estimate the quantity for this item. Based on annual Leachate Balance Reports from 2013 through 2017, the Southeast County Landfill had an annual average of 24,693,238 gallons of leachate generated for Phases I-VI, and 1,936,494 gallons of leachate generated for Sections 7 to 9. Note that landfill will receive a barrier cover (40-mil LLDPE) during closure, limiting the stormwater percolation significantly, and thus, decreasing amount of generated leachate. Therefore, using 2013 through 2017 leachate generation is a conservative assumption. The LTRF will close operations for long term care; therefore, all leachate generated at the SCLF will be hauled outside for treatment.

The cost of disposal was assumed as $34.40 per 1,000 gallons based on the County's third party leachate hauler and WWTP disposal costs provided in a 2016 SCLF leachate disposal operating cost analysis report. Per SCS experience in similar projects at other landfill facilities in Florida, the unit cost is appropriate for leachate hauling and disposal.

Sumps & Lift Stations: For financial assurance purposes, an amount of $3,000 per year was allocated for maintenance of sumps and lift stations. Note that the cost has been evenly distributed between Phases I to VI and CEA Sections 7 to 9.

Note that the Leachate Treatment and Reclamation Facility will close operations for long term care. All leachate generated will be stored in the leachate and effluent tanks and hauled off-site for treatment. Therefore, no costs have been allocated for the maintenance of impoundments & aeration systems.

Item No. 6 Maintenance of Groundwater Monitoring Wells

$500 per year is provided for groundwater well maintenance.

Item No. 7 Gas System Maintenance

To estimate the cost of maintaining the active gas collection system, maintenance of the well field and flare station were taken into consideration. Routine maintenance includes replacing the thermocouples in the flare stack every few months, inspecting and cleaning of the flare arrestor and replacing the bearings on the blower. An annual lump sum amount of $5,000 was allocated for installation of replacement wells. Note that after the landfill closure, landfill gas generation should decrease, and thus, any need for replacement wells should also decrease. An amount of $1,200 per year was budgeted for replacement of the blower every fifteen years. Also, $500 each was budgeted for maintenance of the compressor and meters & valves, $400 for the maintenance of the flaring units, and $1,200 for the flame arrestors. Note that the above gas system maintenance costs have been considered as part of Phases I-VI for financial assurance purposes.

For the operations cost, it was assumed that a field technician would be needed for two days per month (20 hours @ $55 per hour, $500 misc. expenses) to monitor the collection wells, perform well field adjustments and document readings. This operations cost has been considered as part of CEA Sections 7 to 9 for financial assurance purposes.

Item No. 8 Landscape

The cost for this item is based on mowing both the landfill areas at an estimated frequency of four times a year and fertilizing once a year. See Part 4 of this report for backup of these costs.

Mowing:

Unit cost from RS Means 2018 riding mower, 48" – 58"

[($1.52/ MSF) x (1 MSF/ 1000 SF) x (43,560 SF/ 1 AC)] = $66.21/AC. Mowing is projected to occur four times per year, for an annual cost of $264.84/AC/YR.

Fertilization: Unit cost from RS Means 2018

[($3.04/ MSF) x (1 MSF/ 1000 SF) x (43,560 SF/ 1 AC)] = $132.42/AC/YR. Fertilization will occur annually.

Item No. 9 Erosion Control & Cover Maintenance

To account for erosion control and cover maintenance in the post closure care period, reconstruction of the final cover (including sod, liner, and soil fill material) and re-grading were considered. Annual average soil losses of 2,092 CY & 444 CY were calculated using the universal soil loss equation (USLE) for Phases I to VI and CEA Sections 7 to 9 respectively. This is a conservative value since it is assumed that 60% of the ground is covered by vegetation. Please refer to Part 6 for further explanation of the USLE equation.

For liner repair, it is assumed that 10% of the total liner area will require repair.

Phase I to VI:

For financial assurance purposes, it is assumed that soil will erode in channels that will cut an average of six inches deep into the final cover.

- Sodding: 2,092 CY * 110% machinery disturbance / (0.5 FT average depth) = 13,807 SY
- Regrading: 2.85 AC = 124,265 SF = 2,092 CY * 27 CF/CY * 110% machinery disturbance / (0.5 FT average depth)
- Liner: 1,255 SY = 11,297 SF = 2,092 CY * 27 CF/CY * 10% / 0.5 FT
- Soil: 2,092 CY

Sections 7 to 9:

For financial assurance purposes, it is assumed that soil will erode in channels that will cut an average of six inches deep into the final cover.

- Sodding: 26,374 SF = 2,930 SY = 444 CY * 27 CF/CY * 110% machinery disturbance / (0.5 FT average depth)
- Regrading: 0.61 AC = 26,374 SF = 444 CY * 27 CF/CY * 110% machinery disturbance / (0.5 FT average depth)
- Liner: 266 SY = 2,398 SF = 444 CY * 27 CF/CY * 10% / 0.5 FT
- Soil: 444 CY

Sodding cost is based on Item 5 of the Closure Cost Estimates ($3.32/SY).

Regrading cost: Unit cost is based on RS Means

[($0.77/SY) x (SY/ 9 SF) x (43,560 SF/ AC)] = $3,726.80 / AC

Liner repair cost is assumed to be $16/SY. This assumption is based on materials cost of geosynthetics (see Item 3 of the Closure Cost Estimates) and miscellaneous cost associated with the repairs.

Soil Cost of vegetative top soil is based on the Item 4 of the Closure Cost Estimates ($5.47/CY).

Item No. 10 Stormwater Management System Maintenance

As in Item 9, the eroded soil volume calculated in the USLE was used in the cost estimate for soil excavation from the stormwater pond.

A cost of $4.25 per CY for excavation of sediment, debris, and vegetation was used from a contract for a nearby landfill. An additional $2,370 was added to the cost to account for cleaning of inlets, culverts and additional stormwater appurtenances once every 5 years, split evenly between Phases I-VI and the CEA. The total cost of conveyance maintenance for the landfill is estimated as follows.

Phase I to VI: [($4.25/CY * 2,092 CY) + $1,185] = $10,076.00.

Sections 7 to 9: [($4.25/CY * 444 CY) + $1,185] = $3,072.00.

The stormwater maintenance cost sheet is provided in Part 4.

Item No. 11 Security System Maintenance

An amount of $500 per year is allocated for fence & other repairs.

Item No. 12 Utilities

Utilities cost is assumed as $500 per month ($6,000 annually). The cost has been evenly split between Phases I to VI and CEA Sections 7 to 9.

Item No. 13 Leachate Systems Operation

The leachate collection system at the facility will require an on-site technician for maintenance. The cost of an onsite technician has been estimated at $55/hour for 16 hrs/month. In addition to the technician cost, an amount of $2,000 is budgeted for any materials required for general maintenance. The cost has been evenly split between Phases I to VI and CEA Sections 7 to 9.

Item No. 14 Administrative

Professional engineering services expected during the long-term care period include semiannual and water quality technical reports, ten-year closure permit renewal applications, inspections required by FDEP rules for closure permits. SCS reviewed the working hours estimated in the April 2015 cost estimates, and found the numbers to be conservative for financial assurance purposes. These working hours are repeated in the current estimates; however, hourly rates have been revised.

Item No. 15 Contingency

A contingency of 5% is included with the total cost of Items No. 1 - 14.

PART 4
UNIT COST REFERENCES

Hillsborough County- Southeast County Landfill
Class I Landfill - Financial Assurance Closure Cost
Average of Third Party Quotations[1]

Closure Item	Approximate Quantity	Unit	Unit Cost			
			Comanco	RCS	T&K	Average[2]
3" Intermediate Cover Soil Layer (on-site soils)	90,163	CY	$6.00	$4.37	$7.12	$5.83
Topsoil (18" Cover Soil & 6" Top Vegetative Soil from on-site source)	721,306	CY	$5.00	$5.45	$5.97	$5.47
Textured 40-mil LLDPE	1,030,436	SY	$4.95	$4.41	$6.30	$5.22
Double sided Geo-Composite	1,030,436	SY	$5.85	$5.67	$6.03	$5.85
Sodding	496,381	SY	$3.60	$3.15	$3.20	$3.32

Note:
1. Quotes were received from 3rd party contractors for the SCLF and similar landfill facilities in Florida
2. Average cost was used for FACE

From: David Scherbaty
To: Devitt, Caroline
Subject: RE: Request for Unit Cost Data - Southeast County Landfill
Date: Thursday, October 4, 2018 8:13:13 AM
Attachments:

Caroline,

I apologize for the delayed response. Please see our budgetary unit prices listed below in red. Please let me know if you have any questions or if you need any additional information.

Thanks,
David

David Scherbaty | Director of Sales
4301 Sterling Commerce Drive | Plant City, FL 33566
Office: 813-988-8829 | Cell: 813-323-3584
E-mail: dscherbaty@comanco.com | web: www.comanco.com

From: Devitt, Caroline [mailto:CDevitt@scsengineers.com]
Sent: Thursday, September 27, 2018 1:03 PM
To: David Scherbaty <dscherbaty@comanco.com>
Subject: Request for Unit Cost Data - Southeast County Landfill

Mr. Scherbaty,

As you know, landfills are required per FDEP to provide 3rd party quotes for items in their closure cost estimate. I am working on the financial assurance for the Southeast County Landfill in Hillsborough County, FL and I would appreciate it if you could provide quotes for the following items on a unit price basis based on the following assumptions:

- Assume on-site borrow source for cover soil and topsoil and using off-road trucks for hauling. Estimate typical on-site haul distance of approximately 1 mile, if necessary
- All costs shall include material transportation, and installation
- These costs shall be based on current (2018) prices

Closure Item	Approximate Quantity	Unit	Unit Cost
3" Intermediate Cover Soil Layer (on-site soils)	90,163	CY	$6.00
Topsoil (18" Cover Soil & 6" Top Vegetative Soil from on-site source)	721,306	CY	$5.00
Textured 40-mil LLDPE	1,030,436	SY	$4.95
Double sided Geo-Composite	1,030,436	SY	$5.85
Sodding	496,381	SY	$3.60

Please let me know if you have any questions or need any additional information. Thank you for your assistance on this.

Caroline Devitt, E.I.T.
Staff Professional
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(P) 863-699-1727 ● (F) 863-582-9292

Southeast Landfill
Closure Cost Estimate 2018

Closure Item	Approximate Quantity	Unit	Unit Cost
3" Intermediate Cover Soil Layer (on-site soils)	90,163	CY	$4.37
Topsoil (18" Cover Soil & 6" Top Vegetative Soil from on-site source)	721,306	CY	$5.45
Textured 40-mil LLDPE	1,030,436	SY	$4.41
Double sided Geo-Composite	1,030,436	SY	$5.67
Sodding	496,381	SY	$3.15

Note: Estimate based on assumption that on-site borrow source for cover soil and topsoil and using off-road trucks for hauling with typical on-site haul distance of approximately 1 mile, if necessary.

T&K Construction Closure Cost Quote

Hillsborough County- Southeast County Landfill

Closure Item	Approximate Quantity	Unit	Unit Cost
3" Intermediate Cover Soil Layer (on-site soils)[1]	90,163	CY	$7.12
Topsoil (18" Cover Soil & 6" Top Vegetative Soil from on-site source)[1]	721,306	CY	$5.97
Textured 40-mil LLDPE[2]	1,030,436	SY	$6.30
Double sided Geo-Composite[2]	1,030,436	SY	$6.03
Sodding	496,381	SY	$3.20

Note:

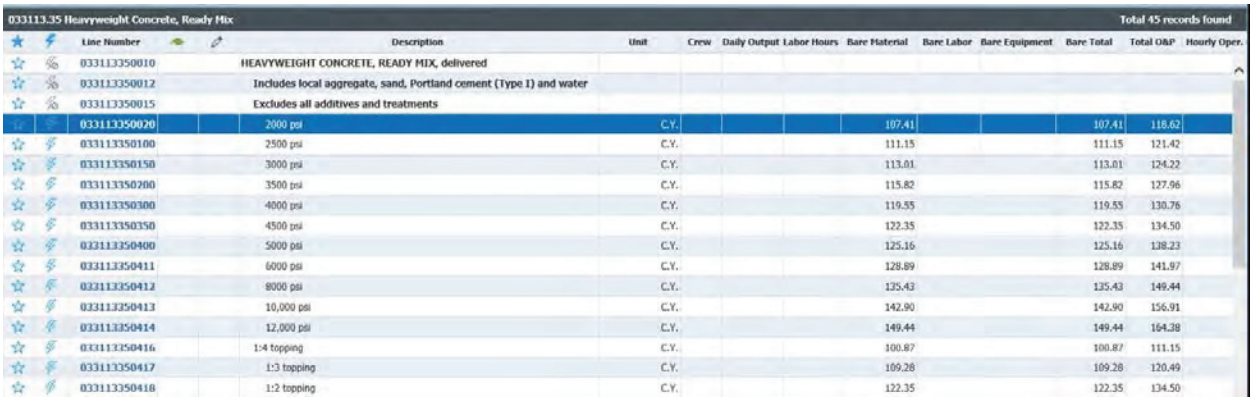
1. Soil costs in original quote included off-site soil. Number has been adjusted for on-site soil based on SCS experience.
2. Liner costs in original quote only included placement of liner, not material. Number has been adjusted to include material based on SCS experience.

Asphalt

Search Results — Total 147 records

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
321216130010	Plant-mix asphalt paving, for highways and large paved areas, no hauling included			0.00						
321216130020	Plant-mix asphalt paving, for highways and large paved areas, no hauling included			0.00						
321216130025	Plant-mix asphalt paving, for highways and large paved areas, no hauling included, Section 31 23 23.20 for hauling costs (MF95 02315 492 0010)			0.00						
321216130080	Plant-mix asphalt paving, for highways and large paved areas, binder course, 1-1/2" thick, no hauling included	S.Y.	B25	7725.00	0.011	5.11	0.38	0.36	5.85	6.68
321216130120	Plant-mix asphalt paving, for highways and large paved areas, binder course, 2" thick, no hauling included	S.Y.	B25	6345.00	0.014	6.80	0.46	0.43	7.69	8.72
321216130130	Plant-mix asphalt paving, for highways and large paved areas, binder course, 2-1/2" thick, no hauling included	S.Y.	B25	5620.00	0.016	8.48	0.52	0.49	9.49	10.75
321216130160	Plant-mix asphalt paving, for highways and large paved areas, binder course, 3" thick, no hauling included	S.Y.	B25	4905.00	0.018	10.22	0.60	0.56	11.38	12.84
321216130170	Plant-mix asphalt paving, for highways and large paved areas, binder course, 3-1/2" thick, no hauling included	S.Y.	B25	4520.00	0.019	11.91	0.65	0.61	13.17	14.86
321216130200	Plant-mix asphalt paving, for highways and large paved areas, binder course, 4" thick, no hauling included	S.Y.	B25	4140.00	0.021	13.59	0.71	0.66	14.96	16.85

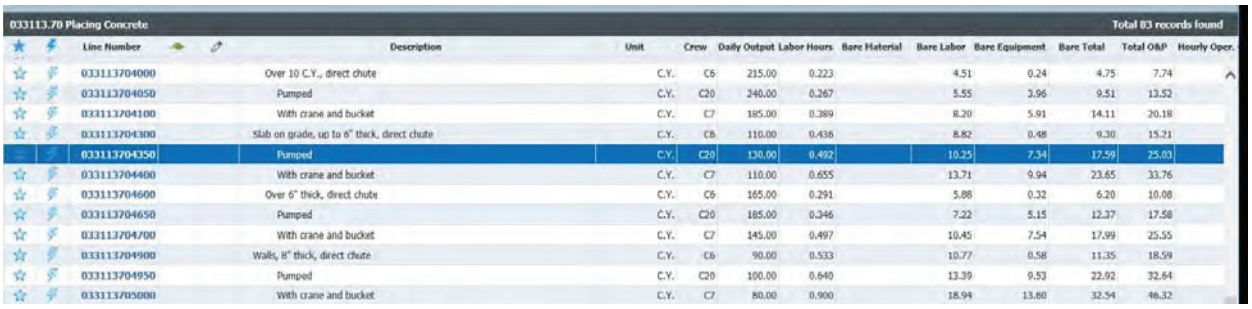
Concrete



033113.35 Heavyweight Concrete, Ready Mix — Total 45 records found

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P	Hourly Oper.
033113350010	HEAVYWEIGHT CONCRETE, READY MIX, delivered										
033113350012	Includes local aggregate, sand, Portland cement (Type I) and water										
033113350015	Excludes all additives and treatments										
033113350020	2000 psi	C.Y.				107.41			107.41	118.62	
033113350100	2500 psi	C.Y.				111.15			111.15	121.42	
033113350150	3000 psi	C.Y.				113.01			113.01	124.22	
033113350200	3500 psi	C.Y.				115.82			115.82	127.96	
033113350300	4000 psi	C.Y.				119.55			119.55	130.76	
033113350350	4500 psi	C.Y.				122.35			122.35	134.50	
033113350400	5000 psi	C.Y.				125.16			125.16	138.23	
033113350411	6000 psi	C.Y.				128.89			128.89	141.97	
033113350412	8000 psi	C.Y.				135.43			135.43	149.44	
033113350413	10,000 psi	C.Y.				142.90			142.90	156.91	
033113350414	12,000 psi	C.Y.				149.44			149.44	164.38	
033113350416	1:4 topping	C.Y.				100.87			100.87	111.15	
033113350417	1:3 topping	C.Y.				109.28			109.28	120.49	
033113350418	1:2 topping	C.Y.				122.35			122.35	134.50	

Concrete Placement



033113.70 Placing Concrete — Total 83 records found

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P	Hourly Oper.
033113704000	Over 10 C.Y., direct chute	C.Y.	C6	215.00	0.223		4.51	0.24	4.75	7.74	
033113704050	Pumped	C.Y.	C20	240.00	0.267		5.55	3.96	9.51	13.52	
033113704100	With crane and bucket	C.Y.	C7	185.00	0.389		8.20	5.91	14.11	20.18	
033113704300	Slab on grade, up to 6" thick, direct chute	C.Y.	C6	110.00	0.436		8.82	0.48	9.30	15.21	
033113704350	Pumped	C.Y.	C20	130.00	0.492		10.25	7.34	17.59	25.03	
033113704400	With crane and bucket	C.Y.	C7	110.00	0.655		13.71	9.94	23.65	33.76	
033113704600	Over 6" thick, direct chute	C.Y.	C6	165.00	0.291		5.88	0.32	6.20	10.08	
033113704650	Pumped	C.Y.	C20	185.00	0.346		7.22	5.15	12.37	17.58	
033113704700	With crane and bucket	C.Y.	C7	145.00	0.497		10.45	7.54	17.99	25.55	
033113704900	Walls, 8" thick, direct chute	C.Y.	C6	90.00	0.533		10.77	0.58	11.35	18.59	
033113704950	Pumped	C.Y.	C20	100.00	0.640		13.39	9.53	22.92	32.64	
033113705000	With crane and bucket	C.Y.	C7	80.00	0.900		18.94	13.60	32.54	46.32	

Concrete Fiber Reinforcement

033113.35 Heavyweight Concrete, Ready Mix — Total 45 records found

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P	Hourly Oper.
033113350561	6000 psi	C.Y.				140.10			140.10	155.04	
033113350562	8000 psi	C.Y.				150.37			150.37	165.32	
033113350563	10,000 psi	C.Y.				160.65			160.65	176.53	
033113350564	12,000 psi	C.Y.				170.92			170.92	187.73	
033113351300	For winter concrete (hot water), add	C.Y.				5.00			5.00	5.51	
033113351410	For mid-range water reducer, add	C.Y.				3.35			3.35	3.69	
033113351420	For high-range water reducer/superplasticizer, add	C.Y.				5.88			5.88	6.44	
033113351430	For retarder, add	C.Y.				3.02			3.02	3.32	
033113351440	For non-Chloride accelerator, add	C.Y.				5.98			5.98	6.58	
033113351450	For Chloride accelerator, per 1%, add	C.Y.				3.61			3.61	3.97	
033113351460	For fiber reinforcing, synthetic (1 lb./C.Y.), add	C.Y.				7.47			7.47	8.22	
033113351500	For Saturday delivery, add	C.Y.				7.94			7.94	8.73	
033113351510	For truck holding/waiting time past 1st hour per load, add	Hr.				98.07			98.07	108.34	
033113351520	For short load (less than 4 C.Y.), add per load	Ea.				80.32			80.32	88.26	
033113354000	**Flowable fill: ash, cement, aggregate, water**										
033113354100	40 - 80 psi	C.Y.				75.19			75.19	83.13	
033113354150	**Structural: ash, cement, aggregate, water & sand**										
033113354200	50 psi	C.Y.				75.19			75.19	83.13	
033113354250	140 psi	C.Y.				76.12			76.12	83.59	
033113354300	500 psi	C.Y.				78.46			78.46	86.40	
033113354350	1000 psi	C.Y.				81.26			81.26	89.66	

Fertilizing

Search Results — Total 71 records

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
320190130010	**Fertilizing**			0.00						
320190130100	Fertilizing, dry granular, 4 lb./M.S.F., hand spread	M.S.F.	1 Clab	24.00	0.333	2.22	8.74		10.96	16.94
320190130110	Fertilizing, dry granular, 4 lb./M.S.F., push rotary	M.S.F.	1 Clab	140.00	0.057	2.22	1.50		3.72	4.92
320190130120	Fertilizing, dry granular, 4# lb./M.S.F., tractor towed spreader, 8' spread	M.S.F.	B66	500.00	0.016	2.22	0.55	0.50	3.27	3.89
320190130130	Fertilizing, dry granular, 4 lb./M.S.F., tractor towed spreader, 12' spread	M.S.F.	B66	800.00	0.010	2.22	0.34	0.32	2.88	3.35
320190130140	Fertilizing, dry granular, 4 lb./M.S.F., truck whirlwind spreader	M.S.F.	B66	1200.00	0.007	2.22	0.23	0.21	2.66	3.04
320190130180	Fertilizing, hydro spread, water soluble, 1.5 lb./MSF, with small power mulcher	M.S.F.	B64	600.00	0.027	2.69	0.75	0.56	4.00	4.81
320190130190	Fertilizing, add for weed control	M.S.F.		0.00		0.29			0.29	0.32

Fine Grading

Search Results

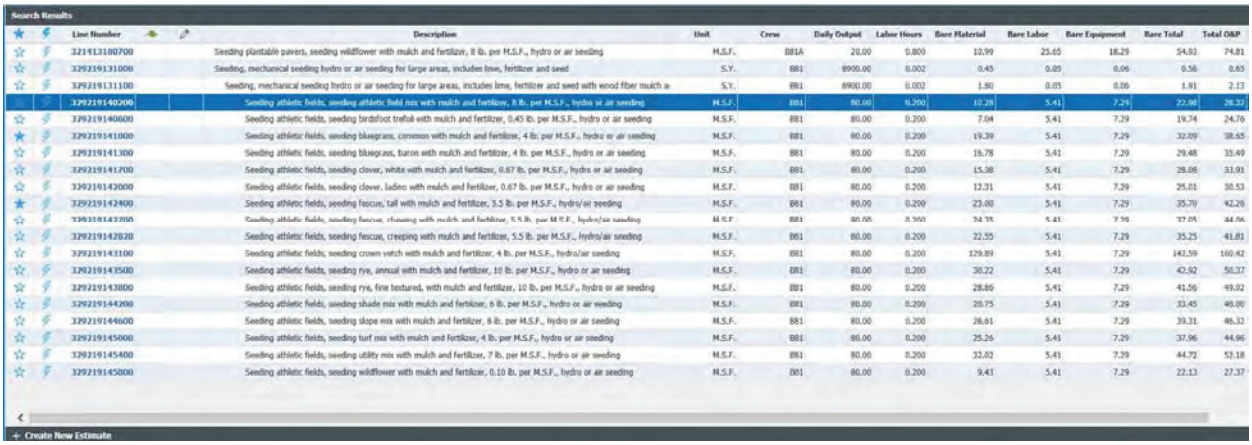
Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
312216000000	**Fine grading**			0.00						
312216100010	**Fine grading, finish grading**			0.00						
312216100011	Fine grading, finish grading granular subbase for highway paving, +/- 1"	S.Y.	B32C	8000.00	0.006		0.19	0.28	0.47	0.62
312216100012	Fine grading, finish grading, small area, to be paved with grader	S.Y.	B11L	400.00	0.040		1.23	1.64	2.87	3.83
312216100100	Fine grading, for roadway, base or leveling course, large area, 6,000 S.Y. or more	S.Y.	B11L	2000.00	0.008		0.25	0.33	0.58	0.77
312216100200	Fine grading, grade subgrade for base course, roadways	S.Y.	B11L	3500.00	0.005		0.14	0.18	0.32	0.43
312216101020	Fine grading, loam or topsoil fine grade for large area, 15,000 S.Y. or more	S.Y.	B32C	5000.00	0.010		0.30	0.44	0.74	0.98
312216101050	Fine grading, fine grade for small irregular areas, to 15,000 S.Y.	S.Y.	B32C	2000.00	0.024		0.74	1.09	1.83	2.43
312216101100	Fine grading, fine grade for slab on grade, machine	S.Y.	B11L	1040.00	0.015		0.47	0.63	1.10	1.47
312216101150	Fine grading, fine grade for slab on grade, hand grading	S.Y.	B18	700.00	0.034		0.91	0.06	0.97	1.58
312216101200	Fine grading, fine grade granular base for sidewalks and bikeways	S.Y.	B62	1200.00	0.020		0.58	0.15	0.73	1.12
312216102550	Fine grading, select gravel, hand grading	C.S.F.	2 Clab	60.00	0.267		6.95		6.95	11.59

Gabions

Search Results

Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
313613100010	**Gabion boxes**			0.00						
313613100400	Gabion boxes, galvanized steel mesh mats or boxes, stone filled, 6" deep	S.Y.	B13	200.00	0.240	27.84	6.89	3.09	37.82	45.63
313613100500	Gabion boxes, galvanized steel mesh mats or boxes, stone filled, 9" deep	S.Y.	B13	163.00	0.294	34.43	8.47	3.79	46.69	56.30
313613100600	Gabion boxes, galvanized steel mesh mats or boxes, stone filled, 12" deep	S.Y.	B13	153.00	0.314	46.15	9.01	4.04	59.20	70.71
313613100700	Gabion boxes, galvanized steel mesh mats or boxes, stone filled, 18" deep	S.Y.	B13	102.00	0.471	65.19	13.54	6.07	84.80	101.09
313613100800	Gabion boxes, galvanized steel mesh mats or boxes, stone filled, 36" deep	S.Y.	B13	60.00	0.800	110.61	23.10	10.31	144.02	170.96

Seeding

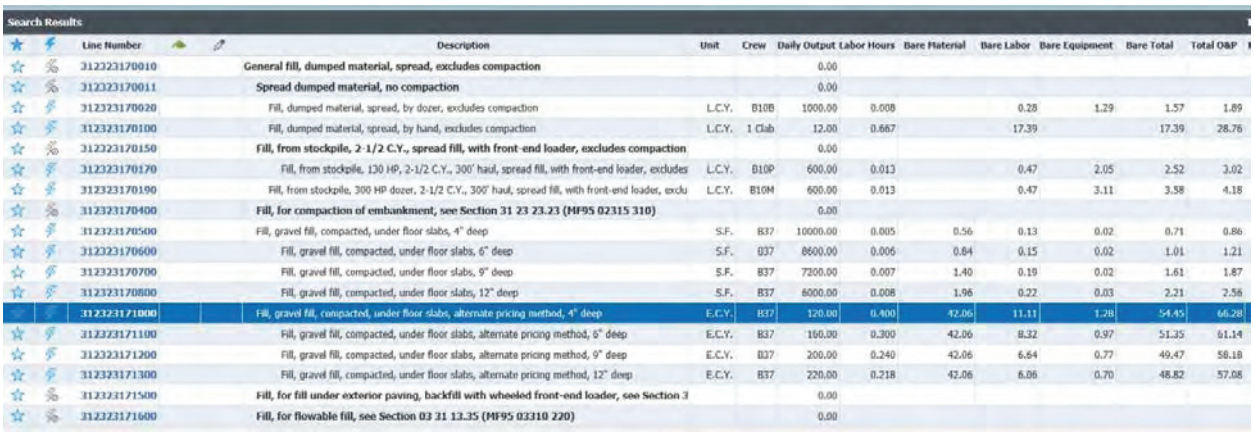


Search Results

	Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
☆	321413100700	Seeding plantable pavers, seeding wildflower with mulch and fertilizer, 8 lb. per M.S.F., hydro or air seeding	M.S.F.	B81A	20.00	0.800	10.99	25.65	18.29	54.93	74.81
☆	329219131000	Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed	S.Y.	B81	8900.00	0.002	0.45	0.05	0.06	0.56	0.65
☆	329219131100	Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed with wood fiber mulch a	S.Y.	B81	8900.00	0.002	1.80	0.05	0.06	1.91	2.13
☆	329219140200	Seeding athletic fields, seeding athletic field mix with mulch and fertilizer, 8 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	10.28	5.41	7.29	22.98	28.32
☆	329219140600	Seeding athletic fields, seeding birdsfoot trefoil with mulch and fertilizer, 0.45 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	7.04	5.41	7.29	19.74	24.76
☆	329219141000	Seeding athletic fields, seeding bluegrass, common with mulch and fertilizer, 4 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	19.39	5.41	7.29	32.09	38.65
☆	329219141300	Seeding athletic fields, seeding bluegrass, baron with mulch and fertilizer, 4 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	16.78	5.41	7.29	29.48	35.49
☆	329219141700	Seeding athletic fields, seeding clover, white with mulch and fertilizer, 0.67 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	15.38	5.41	7.29	28.08	33.91
☆	329219142000	Seeding athletic fields, seeding clover, ladino with mulch and fertilizer, 0.67 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	12.31	5.41	7.29	25.01	30.53
★	329219142400	Seeding athletic fields, seeding fescue, tall with mulch and fertilizer, 5.5 lb. per M.S.F., hydro/air seeding	M.S.F.	B81	80.00	0.200	23.00	5.41	7.29	35.70	42.26
☆	329219143700	Seeding athletic fields, seeding fescue, chewing with mulch and fertilizer, 5.5 lb. per M.S.F., hydro/air seeding	M.S.F.	B81	80.00	0.200	34.55	5.41	7.29	47.25	55.06
☆	329219142820	Seeding athletic fields, seeding fescue, creeping with mulch and fertilizer, 5.5 lb. per M.S.F., hydro/air seeding	M.S.F.	B81	80.00	0.200	22.55	5.41	7.29	35.25	41.81
☆	329219143100	Seeding athletic fields, seeding crown vetch with mulch and fertilizer, 4 lb. per M.S.F., hydro/air seeding	M.S.F.	B81	80.00	0.200	129.89	5.41	7.29	142.59	160.42
☆	329219143500	Seeding athletic fields, seeding rye, annual with mulch and fertilizer, 10 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	30.22	5.41	7.29	42.92	50.37
☆	329219143800	Seeding athletic fields, seeding rye, fine textured, with mulch and fertilizer, 10 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	28.86	5.41	7.29	41.56	49.02
☆	329219144200	Seeding athletic fields, seeding shade mix with mulch and fertilizer, 6 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	20.75	5.41	7.29	33.45	40.00
☆	329219144600	Seeding athletic fields, seeding slope mix with mulch and fertilizer, 6 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	26.61	5.41	7.29	39.31	46.32
☆	329219145000	Seeding athletic fields, seeding turf mix with mulch and fertilizer, 4 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	25.26	5.41	7.29	37.96	44.96
☆	329219145400	Seeding athletic fields, seeding utility mix with mulch and fertilizer, 7 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	32.02	5.41	7.29	44.72	53.18
☆	329219145800	Seeding athletic fields, seeding wildflower with mulch and fertilizer, 0.10 lb. per M.S.F., hydro or air seeding	M.S.F.	B81	80.00	0.200	9.41	5.41	7.29	22.13	27.37

+ Create New Estimate

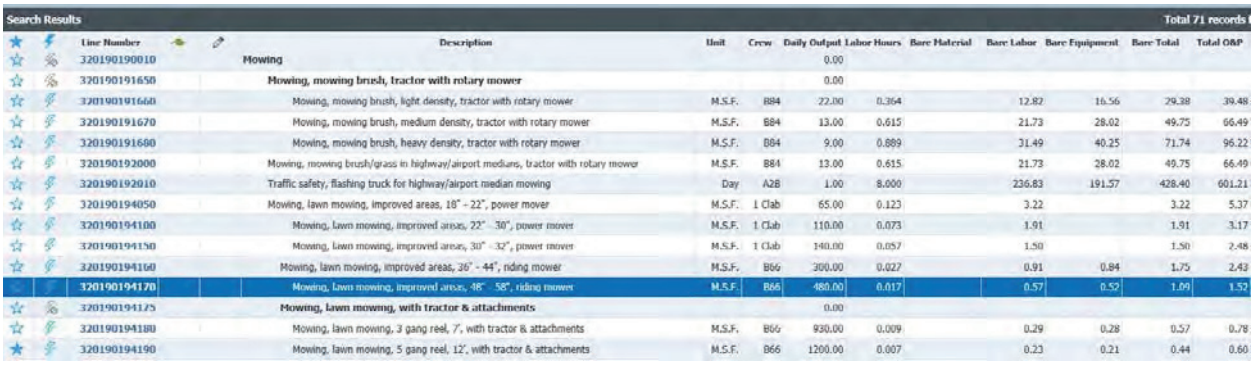
Gravel Fill



Search Results

	Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
☆	312323170010	**General fill, dumped material, spread, excludes compaction**			0.00						
☆	312323170011	**Spread dumped material, no compaction**			0.00						
☆	312323170020	Fill, dumped material, spread, by dozer, excludes compaction	L.C.Y.	B10B	1000.00	0.008		0.28	1.29	1.57	1.89
☆	312323170100	Fill, dumped material, spread, by hand, excludes compaction	L.C.Y.	1 Clab	12.00	0.667		17.39		17.39	28.76
☆	312323170150	**Fill, from stockpile, 2-1/2 C.Y., spread fill, with front-end loader, excludes compaction**			0.00						
☆	312323170170	Fill, from stockpile, 130 HP, 2-1/2 C.Y., 300' haul, spread fill, with front-end loader, excludes	L.C.Y.	B10P	600.00	0.013		0.47	2.05	2.52	3.02
☆	312323170190	Fill, from stockpile, 300 HP dozer, 2-1/2 C.Y., 300' haul, spread fill, with front-end loader, exclu	L.C.Y.	B10M	600.00	0.013		0.47	3.11	3.58	4.18
☆	312323170400	**Fill, for compaction of embankment, see Section 31 23 23.23 (MF95 02315 310)**			0.00						
☆	312323170500	Fill, gravel fill, compacted, under floor slabs, 4" deep	S.F.	B37	10000.00	0.005	0.56	0.13	0.02	0.71	0.86
☆	312323170600	Fill, gravel fill, compacted, under floor slabs, 6" deep	S.F.	B37	8600.00	0.006	0.84	0.15	0.02	1.01	1.21
☆	312323170700	Fill, gravel fill, compacted, under floor slabs, 9" deep	S.F.	B37	7200.00	0.007	1.40	0.19	0.02	1.61	1.87
☆	312323170800	Fill, gravel fill, compacted, under floor slabs, 12" deep	S.F.	B37	6000.00	0.008	1.96	0.22	0.03	2.21	2.56
☆	312323171000	Fill, gravel fill, compacted, under floor slabs, alternate pricing method, 4" deep	E.C.Y.	B37	120.00	0.400	42.06	11.11	1.28	54.45	66.28
☆	312323171100	Fill, gravel fill, compacted, under floor slabs, alternate pricing method, 6" deep	E.C.Y.	B37	160.00	0.300	42.06	8.32	0.97	51.35	61.14
☆	312323171200	Fill, gravel fill, compacted, under floor slabs, alternate pricing method, 9" deep	E.C.Y.	B37	200.00	0.240	42.06	6.64	0.77	49.47	58.18
☆	312323171300	Fill, gravel fill, compacted, under floor slabs, alternate pricing method, 12" deep	E.C.Y.	B37	220.00	0.218	42.06	6.06	0.70	48.82	57.08
☆	312323171500	**Fill, for fill under exterior paving, backfill with wheeled front-end loader, see Section 3**			0.00						
☆	312323171600	**Fill, for flowable fill, see Section 03 31 13.35 (MF95 03310 220)**			0.00						

Mowing



Search Results — Total 71 records

	Line Number	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Bare Total	Total O&P
☆	320190190010	**Mowing**			0.00						
☆	320190191650	**Mowing, mowing brush, tractor with rotary mower**			0.00						
☆	320190191660	Mowing, mowing brush, light density, tractor with rotary mower	M.S.F.	B84	22.00	0.364		12.82	16.56	29.38	39.48
☆	320190191670	Mowing, mowing brush, medium density, tractor with rotary mower	M.S.F.	B84	13.00	0.615		21.73	28.02	49.75	66.49
☆	320190191680	Mowing, mowing brush, heavy density, tractor with rotary mower	M.S.F.	B84	9.00	0.889		31.49	40.25	71.74	96.22
☆	320190192000	Mowing, mowing brush/grass in highway/airport medians, tractor with rotary mower	M.S.F.	B84	13.00	0.615		21.73	28.02	49.75	66.49
☆	320190192010	Traffic safety, flashing truck for highway/airport median mowing	Day	A28	1.00	8.000		236.83	191.57	428.40	601.21
☆	320190194050	Mowing, lawn mowing, improved areas, 18" - 22", power mower	M.S.F.	1 Clab	65.00	0.123		3.22		3.22	5.37
☆	320190194100	Mowing, lawn mowing, improved areas, 22" - 30", power mower	M.S.F.	1 Clab	110.00	0.073		1.91		1.91	3.17
☆	320190194150	Mowing, lawn mowing, improved areas, 30" - 32", power mower	M.S.F.	1 Clab	140.00	0.057		1.50		1.50	2.48
☆	320190194160	Mowing, lawn mowing, improved areas, 36" - 44", riding mower	M.S.F.	B66	300.00	0.027		0.91	0.84	1.75	2.43
☆	320190194170	Mowing, lawn mowing, improved areas, 48" - 58", riding mower	M.S.F.	B66	480.00	0.017		0.57	0.52	1.09	1.52
☆	320190194175	**Mowing, lawn mowing, with tractor & attachments**			0.00						
☆	320190194180	Mowing, lawn mowing, 3 gang reel, 7', with tractor & attachments	M.S.F.	B66	930.00	0.009		0.29	0.28	0.57	0.78
★	320190194190	Mowing, lawn mowing, 5 gang reel, 12', with tractor & attachments	M.S.F.	B66	1200.00	0.007		0.23	0.21	0.44	0.60

BID SCHEDULE – Y16-185-EB

BASE YEAR

The Contractor shall be responsible for performing all work and services as outlined in Part H-Scope of Work of this contract. The Unit prices herein include, but are not limited to all labor, parts, services, materials, equipment, maintenance of traffic, permit fees, taxes, tests, mobilization/demobilization, insurance, bonds, incidentals and other miscellaneous cost, overhead and profit, that are necessary to successfully complete all work herein. This shall include the completion of the Inspection Report Form for each stormwater pond that is serviced under any line item in this schedule. Services under line items 010, 011 and 012 will be on an as needed basis and must have been ordered by the County. Services under line items 010, 011 and 012 shall not be used to supplement or augment labor and materials costs of any other line item in this contract as these services are intended for emergencies and to perform additional work not explicitly covered in line items 001 through 009.

BASE YEAR / STORMWATER POND MAINTENANCE

ITEM NO	DESCRIPTION	UNIT	ESTIMATED ANNUAL QUANTITY	UNIT PRICE	TOTAL PRICE
001	Excavate and dispose of sediment, debris and vegetation.	CY	7,000	$4.25	$29,750.00
002	Jetting and cleaning of stormwater pond lines/pipes	LF	5,000	$2.25	$11,250.00
003	Disposal of all cleared/excavated material. Requires landfill tickets for reimbursement	TN	5,000	$29.00	$145,000.00
004	TCLP Testing	EA	5	$100.00	$500.00
005	Furnish and install sod as required	SY	15,000	$2.40	$36,000.00
006	Furnish and install seed and mulch as required	SY	250	$0.25	$62.50
007	Furnish and install erosion control (fabric formed riprap, FDOT Section 530)	SY	250	$6.36	$1,590.00
008	Furnish and install fill dirt (Prepared top soil material, FDOT section 987)	CY	500	$9.11	$4,555.00

From: Ralph Calistri
To: Devitt, Caroline
Subject: Re: SCLF Jet Cleaning and Video Inspection Quote
Date: Tuesday, October 9, 2018 3:52:28 PM

Hi Caroline,

The time it took to jetclean the entire LCS system, including the 2 headers, was ~60 hours at a contract rate of $244 / hour, totaling ~$14,640.00.

Yes, the video-inspection work is also still billable at $244.00 / hour for Hillsborough County.

Please let me know if you need anything else?

Thank you.

Ralph Calistri - Florida Jetclean - 800-226-8013

On Tuesday, October 9, 2018, 11:50:47 AM EDT, Devitt, Caroline <CDevitt@scsengineers.com> wrote:

Hi Ralph,

I'm working on the financial assurance for the Hillsborough Southeast Landfill and one of the items is jet cleaning and video inspection.

I know you did a jet cleaning of the entire leachate collection system at the beginning of the year and then the 2 new headers in May.

Can you send me the costs for those 2 jobs?

And for video inspection, we previously used a rate of $250/hour. Is that still accurate?

Thank you

Caroline Devitt, E.I.T.

Staff Professional

SCS Engineers

3922 Coconut Palm Drive, Suite 102

Tampa, Florida 33619

813-804-6713 (W)

PINE

INVOICE

Toll-free: (877) 259-7463
www.pine-environmental.com
Office: FL - Tampa (U45)
(813) 620-1001

Invoice Date 09/13/18
Due Date 10/12/18

Invoice # US1-180078070

Cust # 15430009
Contract A382968

Bill To
SCS Engineers
3922 Coconut Palm Drive
Suite 102
TAMPA, FL - 33619
United States

Ship To
PINE
3902 CORPOREX PARK DR
SUITE 450
TAMPA, FL - 33619
United States
Attn:STEPHANIE LIPTAK
Phone:

Ordered By
STEPHANIE LIPTAK

Currency
USD US Dollar

PO #
09205104.26

Project #

Terms
Net 30 Days

Item # / Charge	Qty	Model Description / Rental Period	Asset ID # / Price	Total
51156		Landfill Meter- GEM2000	4481	
	2.00	09/06/18 - 09/07/18	103.70/ Day	207.40

Sub Total	207.40
Sales Tax	14.51
Invoice total	221.91

RECEIVED
SEP 13 2018

Project # 09205104.26
G/L #
Invoice Approved
Accounting Use Only
Voucher Approved
Date Vouchered

Please Remit Payment To:

Pine Lockbox
P.O. Box 12488
Newark, NJ 07101-3588

This invoice has been emailed

Quote

055423

October 09, 2018
Quote valid for 30 days

3902 Corporex Park Drive
Tampa, FL 33619
Phone: (813) 620-1001

Quoted For

Caroline Devitt
SCS Engineers
3922 Coconut Palm Drive
Tampa, FL 33619

Phone: 813-621-0080
Email: cdevitt@SCSengineers.com

Quoted By

Lynn Reedy
Pine Environmental Services LLC

Phone: (813) 620-1001
Email: lreedy@pine-environmental.com

Rental Rates

Item #	Description	Quantity	Per Unit Rental Rates Daily	Weekly	4 Week
52090	FID-Photovac MicroFID Note: **Cal kit includes at N/C**	1	$80.75	$230.35	$700.40

Comments

Plus shipping and taxes
Please refer to quote to assure proper billing

Visit us on the web - www.pine-environmental.com

Quote excludes applicable taxes & freight

I accept terms and conditions of this quotation.

Signature

Printed Name

Payment Terms:
Payment due net 30 days for orders shipped in the United States

Visa, Mastercard, American Express and Discover payments are accepted.

Must arrive by

Month Day Year

☐ *Check here if partial shipments are acceptable*

SCS Fee Schedule
Third Quarter FY 2018

Personnel	Rate ($)
Principal/Office Director	193.31
Project Director	183.83
Senior Project Manager	143.91
Project Manager	131.30
Senior Project Professional	120.79
Project Professional	92.79
Staff Professional	73.74
Senior Technician	71.44
Designer	89.27
Senior Superintendent	99.78
Associate Staff Professional	69.85
Laborer	51.45
Sr. Office Service Manager	73.54
Secretarial/Clerical	63.03

PART 5

MATERIALS QUANTITY REFERENCE

Backfill Volume Calculations

From: Luis Rodriguez

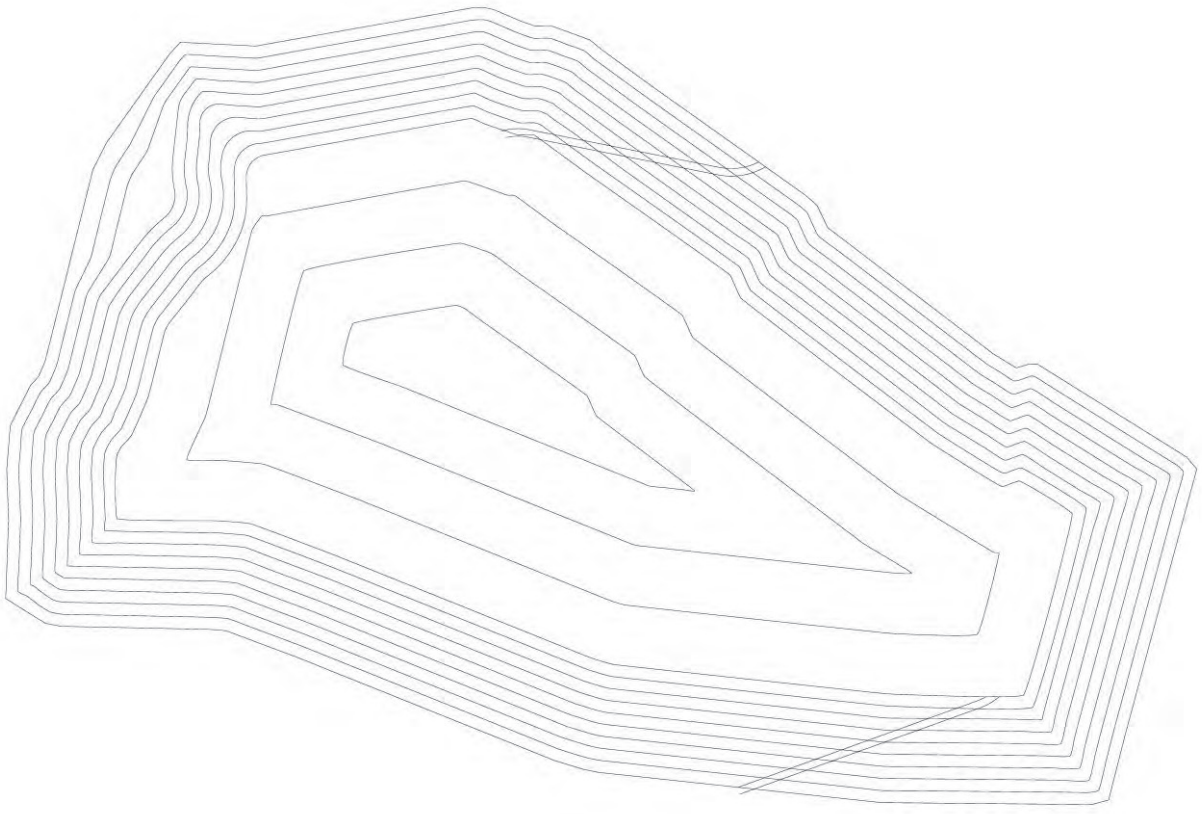
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Phases 1-6 closure cap area.doc

Closure Cap Phases 1-6

Hillsborough County Southeast Landfill phases 1-6



3D surface area: 7249968.17 Sq. ft.
= 166.44 acres

Calculations were performed by Luis Rodriguez
Tuesday, March 19, 201

Backfill Volume Calculations

From: Luis Rodriguez

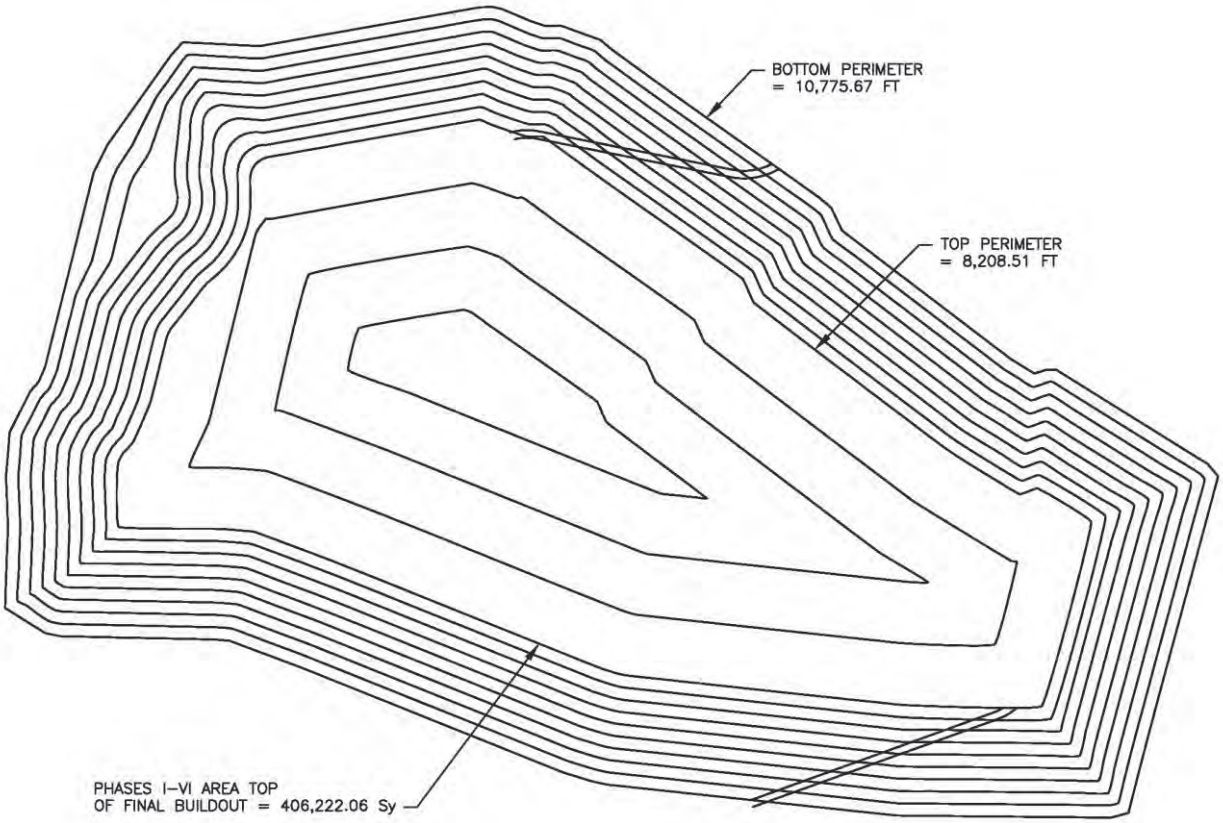
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Phases 1-6 Final Buildout.doc

Final Buildout Phases 1-6

Hillsborough County Southeast Landfill phases 1-6



Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013

Backfill Volume Calculations

From: Luis Rodriguez

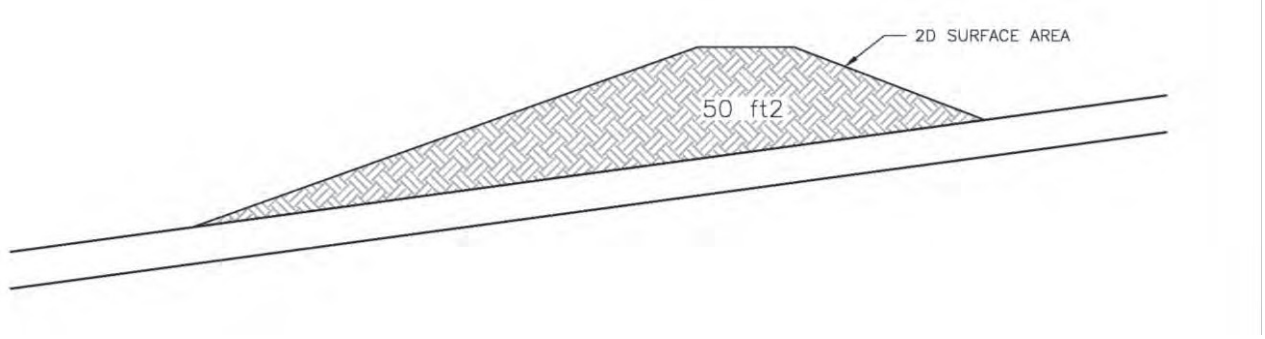
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Site A Sections 7,8 and 9 & Phases 1-6 Typical Sideslope Stormwater Swale.doc

Typical Sideslope Stormwater Swale Site A Sections 7, 8 and 9 & Phases 1- 6

Hillsborough County Southeast Landfill



See dwg 20 Phases I-VI Operating Sequence Drawings
dwg 10 Sections 7,8 and 9 Operating Sequence Drawings.

Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013

Backfill Volume Calculations

From: Luis Rodriguez

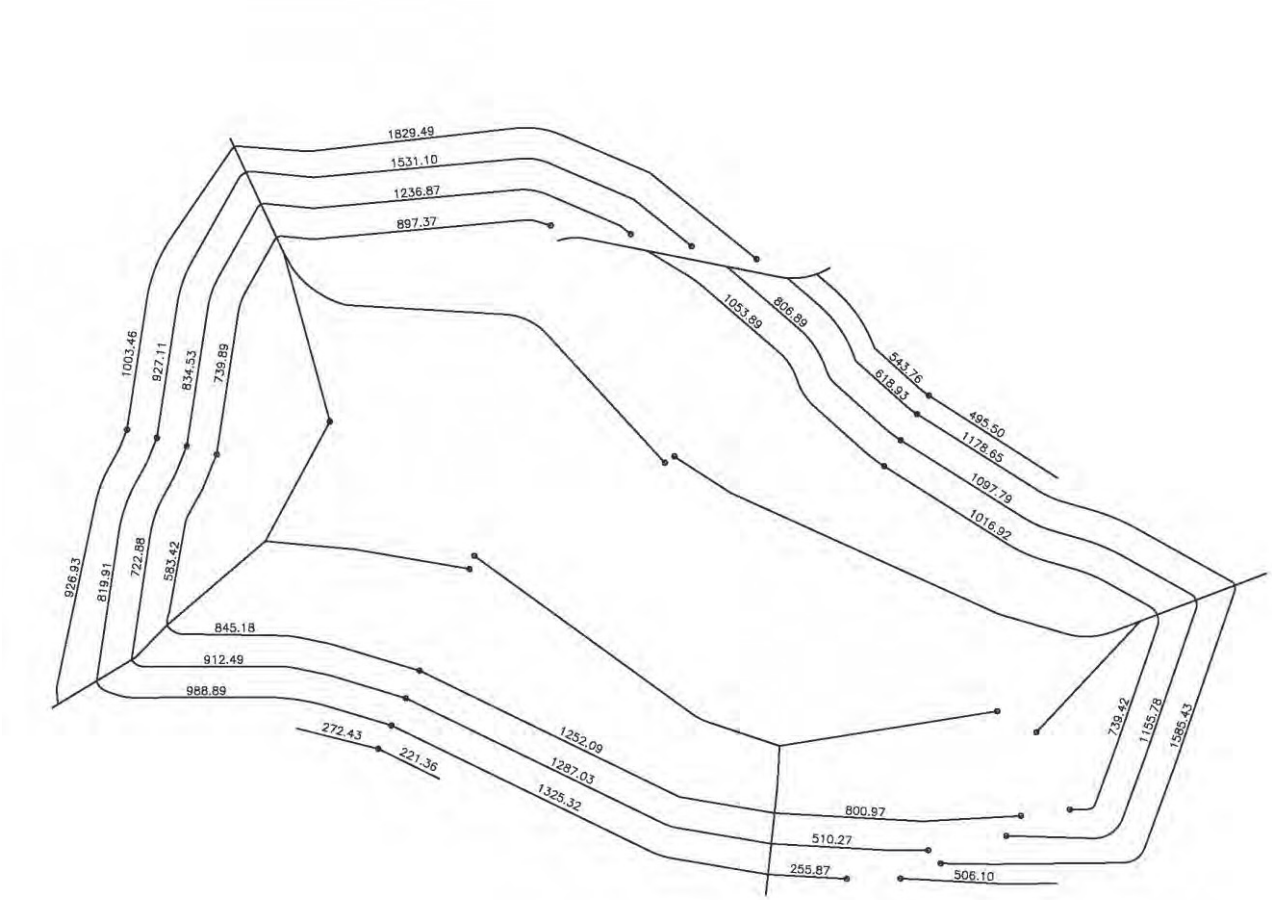
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Phases 1-6 terrace swales lengths.doc

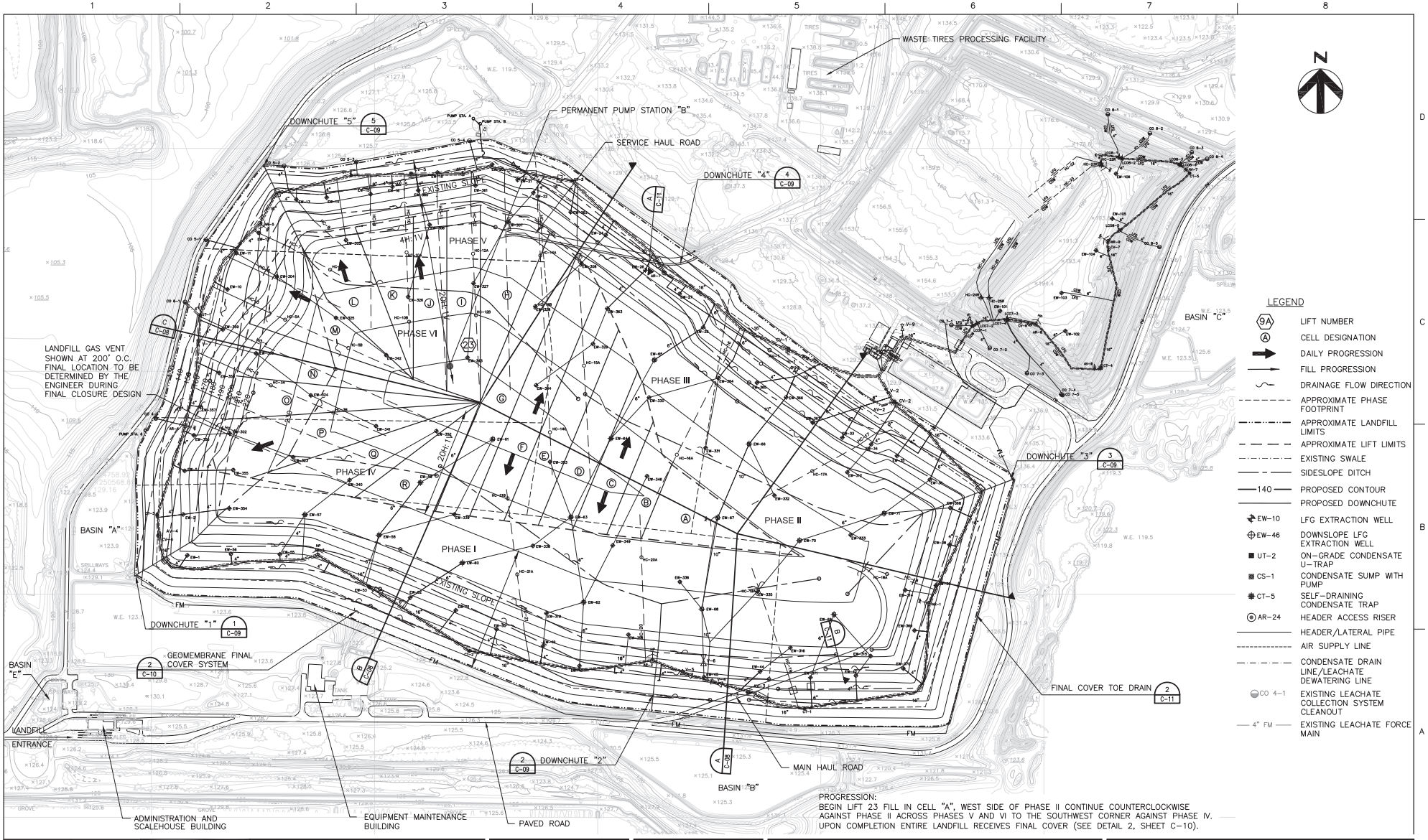
Terrace swale lengths Phases 1-6

Hillsborough County Southeast Landfill phases 1-6



Total Length = 31,523.92

Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013



PROGRESSION:
BEGIN LIFT 23 FILL IN CELL "A", WEST SIDE OF PHASE II CONTINUE COUNTERCLOCKWISE AGAINST PHASE II ACROSS PHASES V AND VI TO THE SOUTHWEST CORNER AGAINST PHASE IV. UPON COMPLETION ENTIRE LANDFILL RECEIVES FINAL COVER (SEE DETAIL 2, SHEET C-10).

Hillsborough County Florida

HDR

HDR Engineering, Inc.
5426 Bay Center Drive
Suite 400
Tampa, FL 33609-3444
HDR CA# 4213

ISSUE	DATE	DESCRIPTION
C	05/2013	REVISED PROPOSED CONTOURS IN SINKHOLE AREA
B	02/2012	FDEP RAI #1
A	12/2011	FDEP SUBMITTAL

PROJECT MANAGER	R. SIEMERING
REVIEWED BY	T. YANOSCHAK
CIVIL DESIGN BY	R. CURTIS
DRAWN BY	L. RODRIGUEZ
PROJECT NUMBER	0096-193806-009

ROBERT B. CURTIS, P.E.
CERTIFICATE NO. 73758

PHASES I-VI OPERATING SEQUENCE
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

PHASES I-VI OPERATING SEQUENCE
PHASES V AND VI - LIFT 23 (FINAL LIFT)

0 1" 2"

FILENAME	00C-08.DWG
SCALE	1"=200'
DWG No.	14

From: Luis Rodriguez

Sent: Tuesday, March 19, 2013

To: Robert Curtis

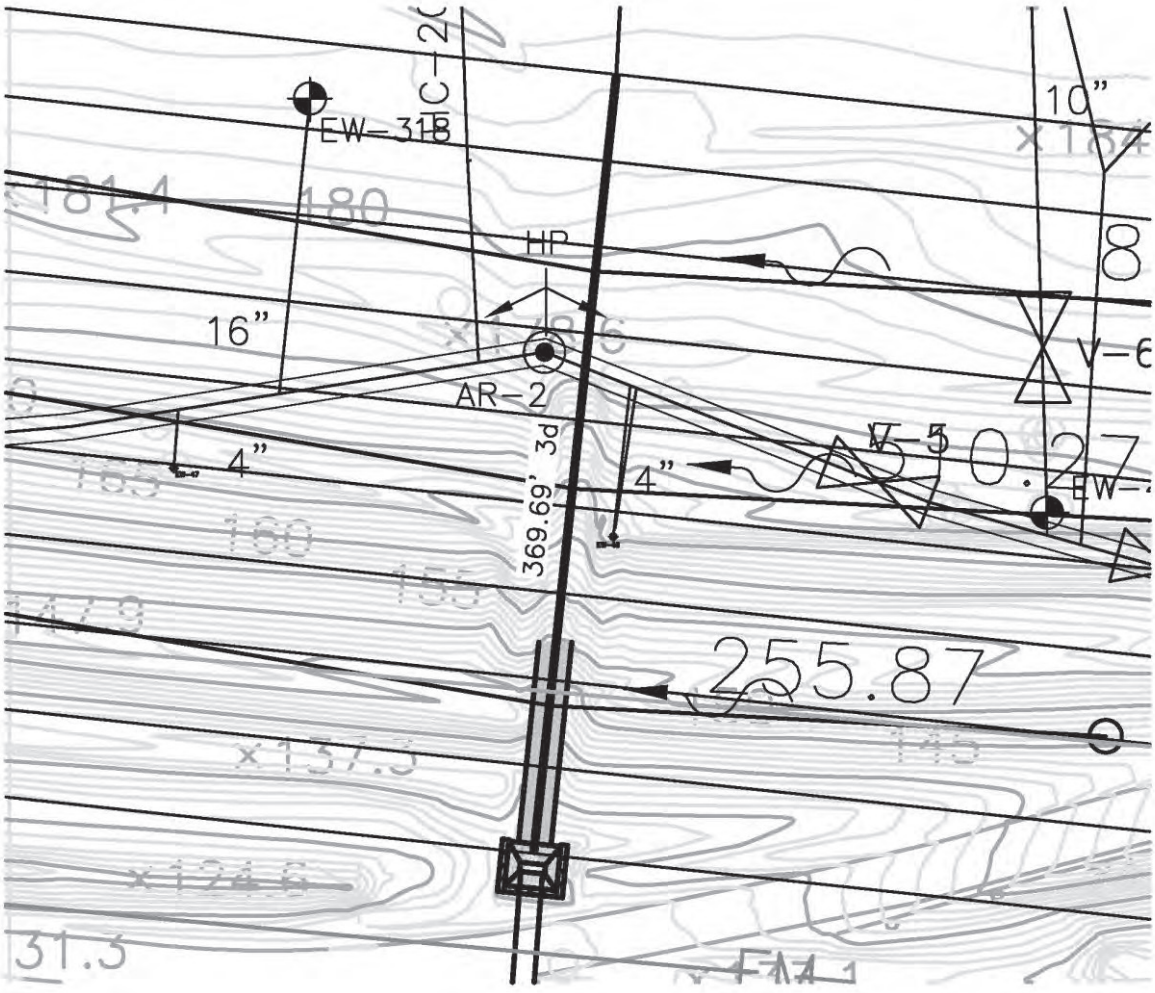
Subject: Phases 1-6 downchute lengths.doc

Downchute Lengths Phases 1-6

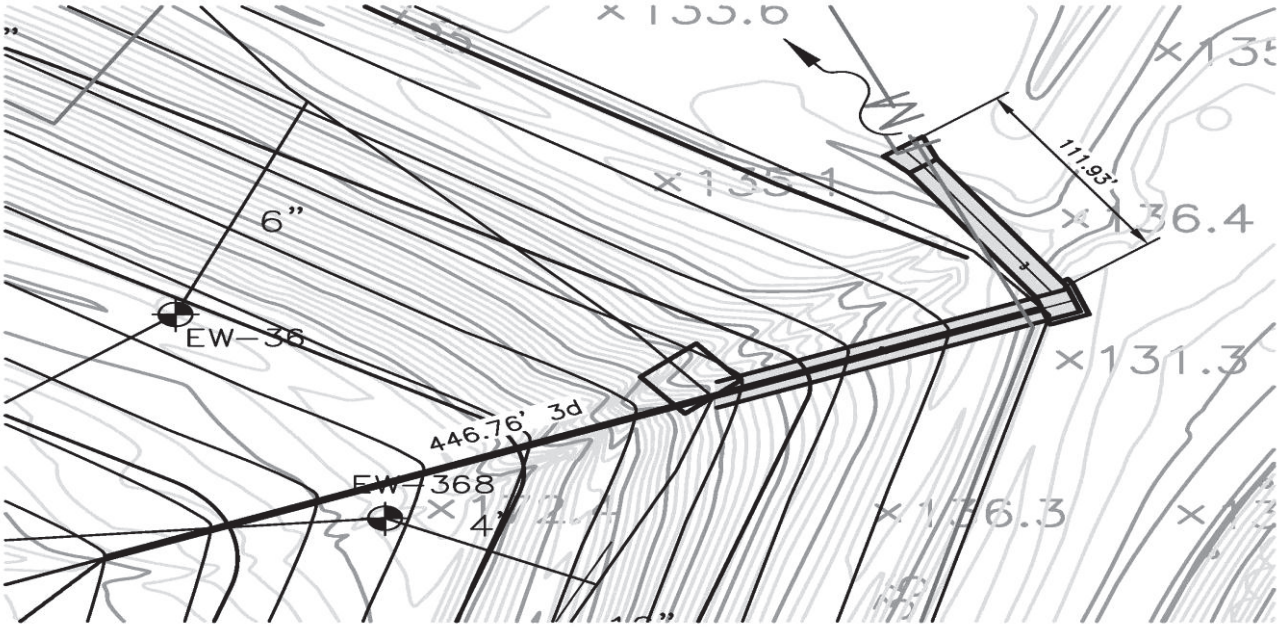
Hillsborough County Southeast Landfill phases 1-6

Downchute 1

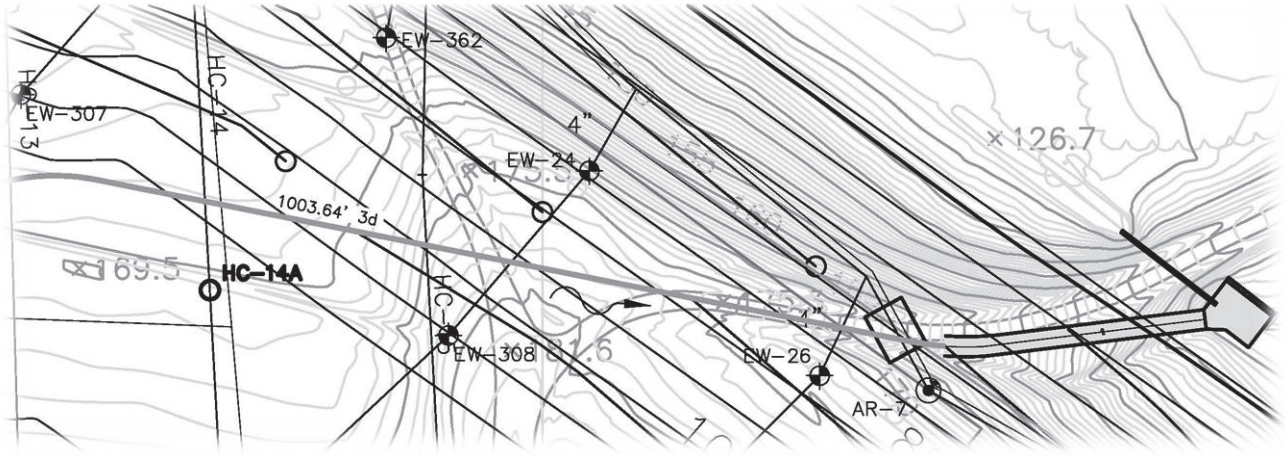
Downchute 2



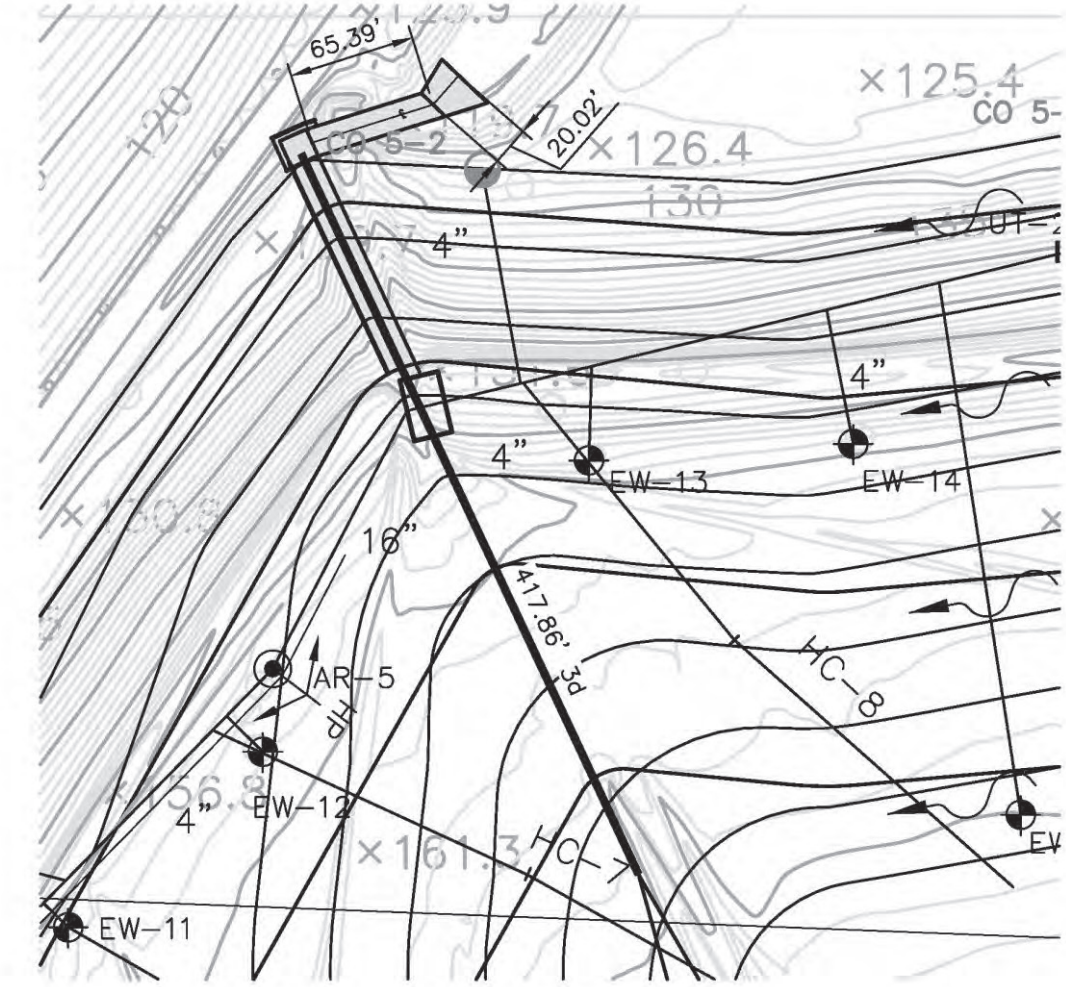
Downchute 3



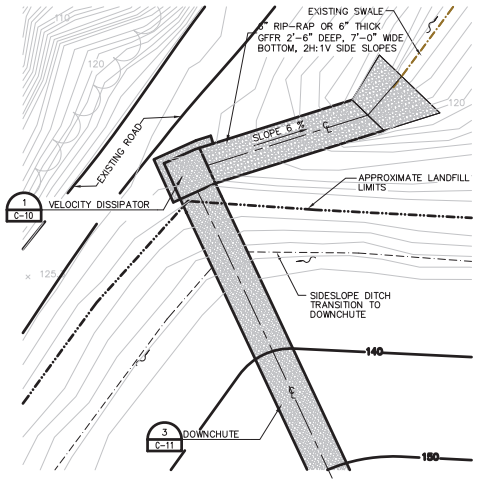
Downchute 4



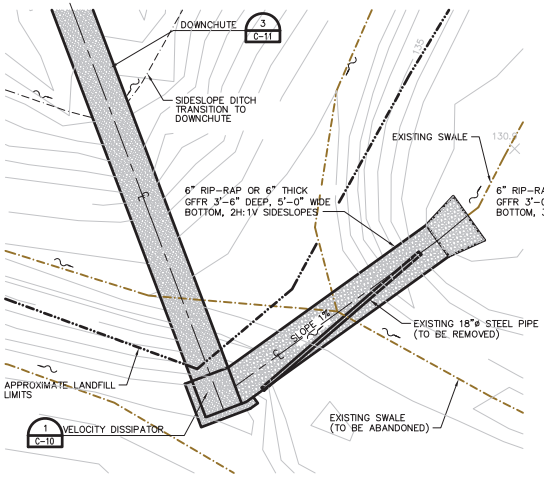
Downchute 5



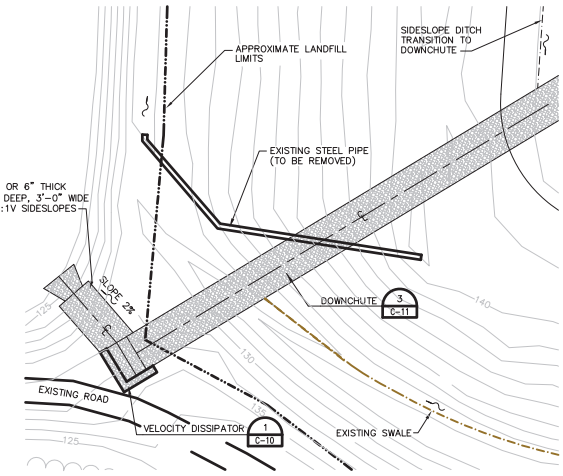
Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013



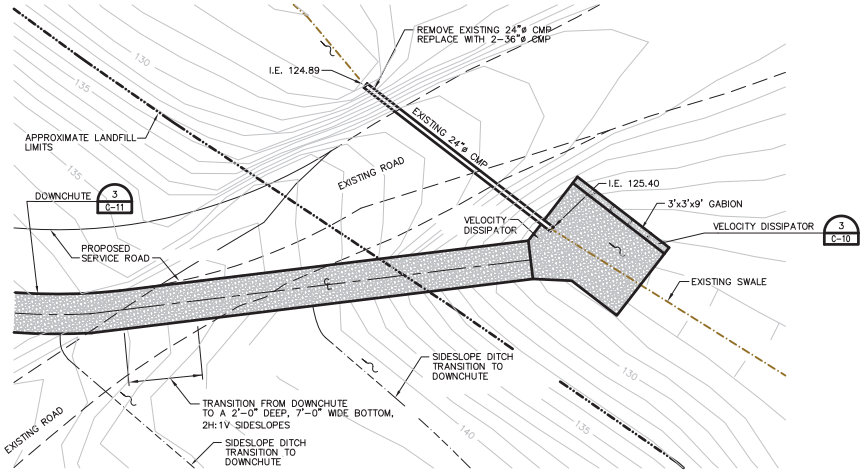
DOWNCHUTE "5" – PLAN DETAIL 5 C-07



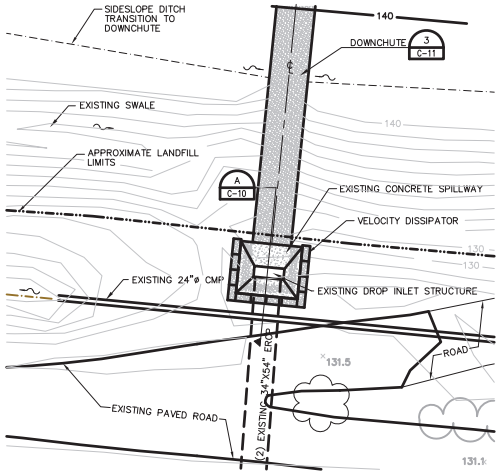
DOWNCHUTE "3" – PLAN DETAIL 3 C-07



DOWNCHUTE "1" – PLAN DETAIL 1 C-07



DOWNCHUTE "4" – PLAN DETAIL 4 C-07



DOWNCHUTE "2" – PLAN DETAIL 2 C-07

Hillsborough County Florida

HDR

HDR Engineering, Inc.
5426 Bay Center Drive
Suite 400
Tampa, FL 33609-3444
HDR CA# 4213

ISSUE	DATE	DESCRIPTION
C	05/2013	REVISED PROPOSED CONTOURS IN SINKHOLE AREA
B	02/2012	FDEP RAI #1
A	12/2011	FDEP SUBMITTAL

PROJECT MANAGER	R. SIEMERING
REVIEWED BY	T. YANOSCHAK
CIVIL DESIGN BY	R. CURTIS
DRAWN BY	L. RODRIGUEZ
PROJECT NUMBER	0096-193806-009

ROBERT B. CURTIS, P.E.
CERTIFICATE NO. 73758

PHASES I-VI OPERATING SEQUENCE
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

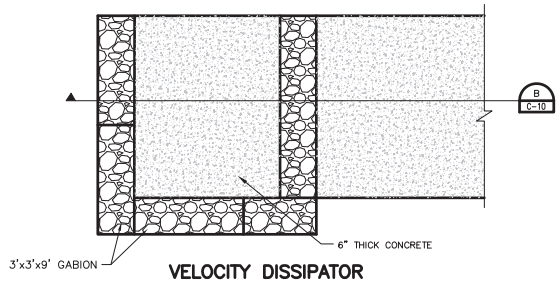
PHASES I-VI OPERATING SEQUENCE

DETAILS 1

0 1" 2"

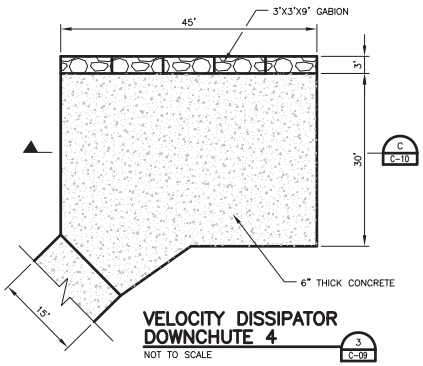
FILENAME	00C-10.DWG
SCALE	NOT TO SCALE

DWG No. 18 A



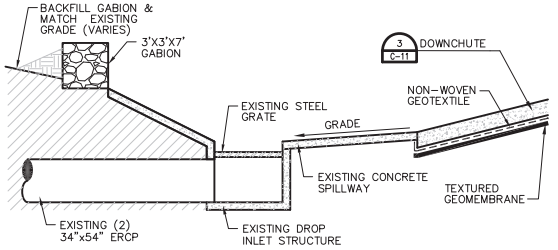
VELOCITY DISSIPATOR DOWNCHUTES 1, 3 & 5

NOT TO SCALE 1 C-09



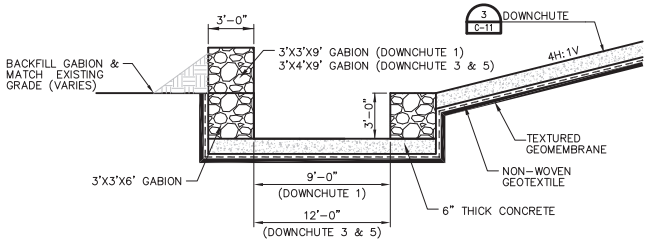
VELOCITY DISSIPATOR DOWNCHUTE 4

NOT TO SCALE 3 C-09



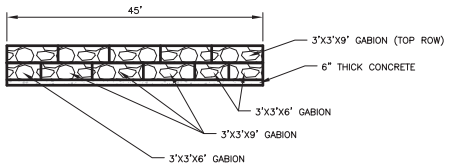
VELOCITY DISSIPATOR SECTION

NOT TO SCALE A C-09



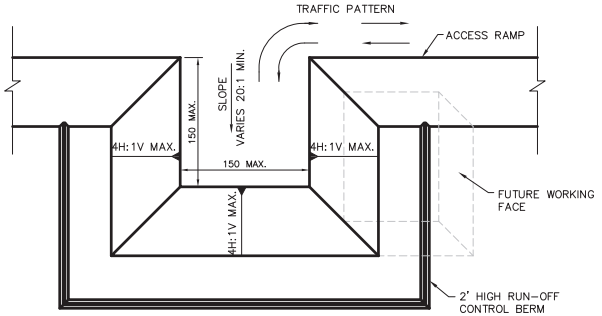
SECTION

NOT TO SCALE B C-10



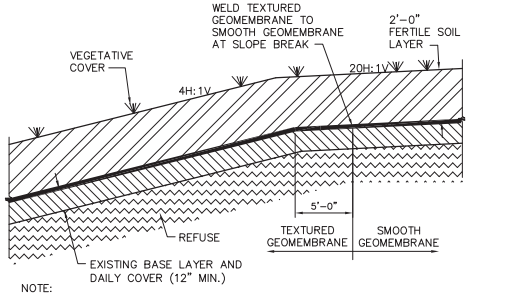
SECTION

NOT TO SCALE C C-10



TYPICAL WORKING FACE CELL PLAN

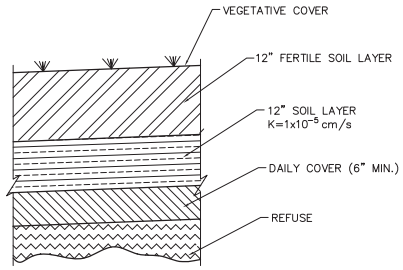
NOT TO SCALE



NOTE:
TEXTURED GEOMEMBRANE TO BE INSTALLED ON SLOPES EXCEEDING 20H:1V AND SMOOTH GEOMEMBRANE TO BE INSTALLED ON SLOPES LESS THAN OR EQUAL TO 20H:1V

TYPICAL GEOMEMBRANE FINAL COVER SYSTEM DETAIL

NOT TO SCALE 2 C-07 C-11



TYPICAL TEMPORARY FINAL COVER DETAIL

NOT TO SCALE 4 C-03 C-04 C-05

Hillsborough County Florida

HDR

HDR Engineering, Inc.
5426 Bay Center Drive
Suite 400
Tampa, FL 33609-3444
HDR CA# 4213

ISSUE	DATE	DESCRIPTION
C	05/2013	REVISED PROPOSED CONTOURS IN SINKHOLE AREA
B	02/2012	FDEP RAI #1
A	12/2011	FDEP SUBMITTAL

PROJECT MANAGER	R. SIEMERING
REVIEWED BY	T. YANOSCHAK
CIVIL DESIGN BY	R. CURTIS
DRAWN BY	L. RODRIGUEZ
PROJECT NUMBER	0096-193806-009

ROBERT B. CURTIS, P.E.
CERTIFICATE NO. 73758

PHASES I-VI OPERATING SEQUENCE
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

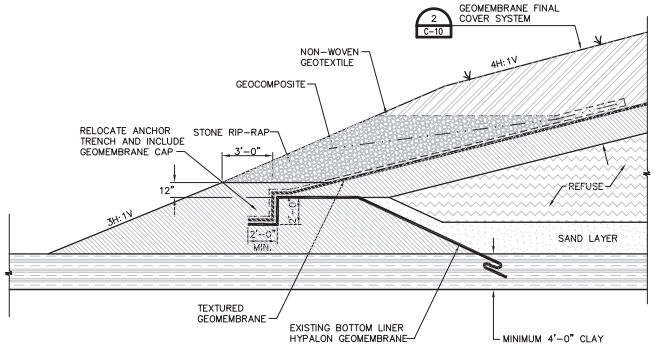
PHASES I-VI OPERATING SEQUENCE

DETAILS 2

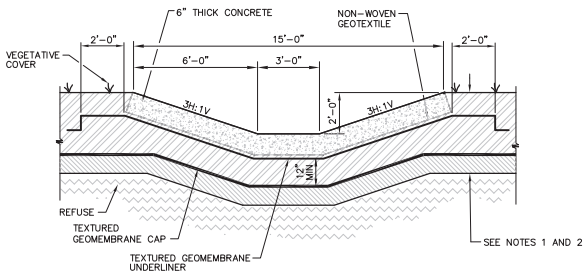
0 1" 2"

FILENAME	00C-11.DWG
SCALE	AS SHOWN

DWG No. 19 A

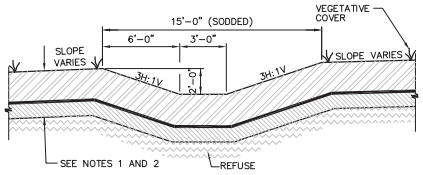


FINAL COVER TOE DRAIN DETAIL
NOT TO SCALE — 2 / C-07



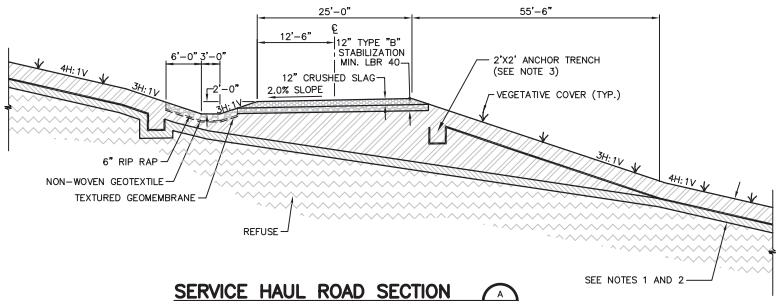
TYPICAL DOWNCHUTE DETAIL
NOT TO SCALE — 3 / C-09

NOTES:
1. GEOMEMBRANE FINAL COVER SYSTEM SHOWN.
2. TYPICAL DOWNCHUTE TO INCLUDE EITHER A TEMPORARY FINAL COVER OR GEOMEMBRANE FINAL COVER SYSTEM. REFER TO SHEETS C-03 TO C-07 FOR APPLICABLE COVER SYSTEM.



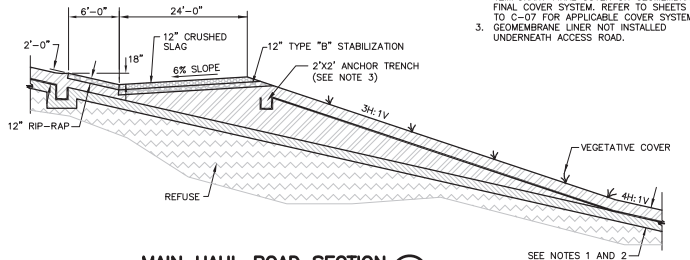
TOP SLOPE DITCH DETAIL
NOT TO SCALE — 4 / C-03

NOTES:
1. GEOMEMBRANE FINAL COVER SYSTEM SHOWN.
2. TOP SLOPE DITCH TO INCLUDE EITHER A TEMPORARY FINAL COVER OR GEOMEMBRANE FINAL COVER SYSTEM. REFER TO SHEETS C-03 TO C-07 FOR APPLICABLE COVER SYSTEM.



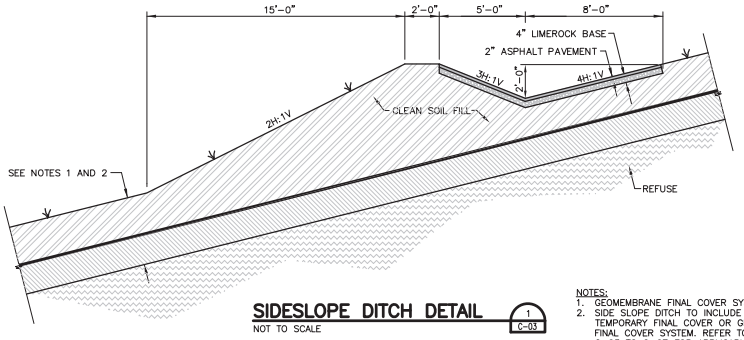
SERVICE HAUL ROAD SECTION
NOT TO SCALE — A / C-07

NOTES:
1. GEOMEMBRANE FINAL COVER SYSTEM SHOWN.
2. SERVICE HAUL ROAD TO INCLUDE EITHER A TEMPORARY FINAL COVER OR GEOMEMBRANE FINAL COVER SYSTEM. REFER TO SHEETS C-03 TO C-07 FOR APPLICABLE COVER SYSTEM.
3. GEOMEMBRANE LINER NOT INSTALLED UNDERNEATH ACCESS ROAD.



MAIN HAUL ROAD SECTION
NOT TO SCALE — B / C-07

NOTES:
1. GEOMEMBRANE FINAL COVER SYSTEM SHOWN.
2. MAIN HAUL ROAD TO INCLUDE EITHER A TEMPORARY FINAL COVER OR GEOMEMBRANE FINAL COVER SYSTEM. REFER TO SHEETS C-03 TO C-07 FOR APPLICABLE COVER SYSTEM.
3. GEOMEMBRANE LINER NOT INSTALLED UNDERNEATH ACCESS ROAD.



SIDESLOPE DITCH DETAIL
NOT TO SCALE — 1 / C-03

NOTES:
1. GEOMEMBRANE FINAL COVER SYSTEM SHOWN.
2. SIDE SLOPE DITCH TO INCLUDE EITHER A TEMPORARY FINAL COVER OR GEOMEMBRANE FINAL COVER SYSTEM. REFER TO SHEETS C-03 TO C-07 FOR APPLICABLE COVER SYSTEM.

Hillsborough County Florida

HDR

HDR Engineering, Inc.
5426 Bay Center Drive
Suite 400
Tampa, FL 33609-3444
HDR CA# 4213

ISSUE	DATE	DESCRIPTION
C	05/2013	REVISED PROPOSED CONTOURS IN SINKHOLE AREA
B	02/2012	FDEP RAI #1
A	12/2011	FDEP SUBMITTAL

PROJECT MANAGER	R. SIEMERING
REVIEWED BY	T. YANOSCHAK
CIVIL DESIGN BY	R. CURTIS
DRAWN BY	L. RODRIGUEZ
PROJECT NUMBER	0096-193806-009

ROBERT B. CURTIS, P.E.
CERTIFICATE NO. 73758

PHASES I-VI OPERATING SEQUENCE
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

PHASES I-VI OPERATING SEQUENCE

DETAILS 3

0 1" 2"

FILENAME	00C-12.DWG
SCALE	AS SHOWN

DWG No. 20 A

F:\PROJECT\Hillsborough\09215600.00\Task 2100 – Leachate Management\10.00_Jet Cleaning 2018\CAD\Figure 1 mod NOV 2018.dwg Oct 31, 2018 – 9:44am Layout Name: 1 By: 4288kls

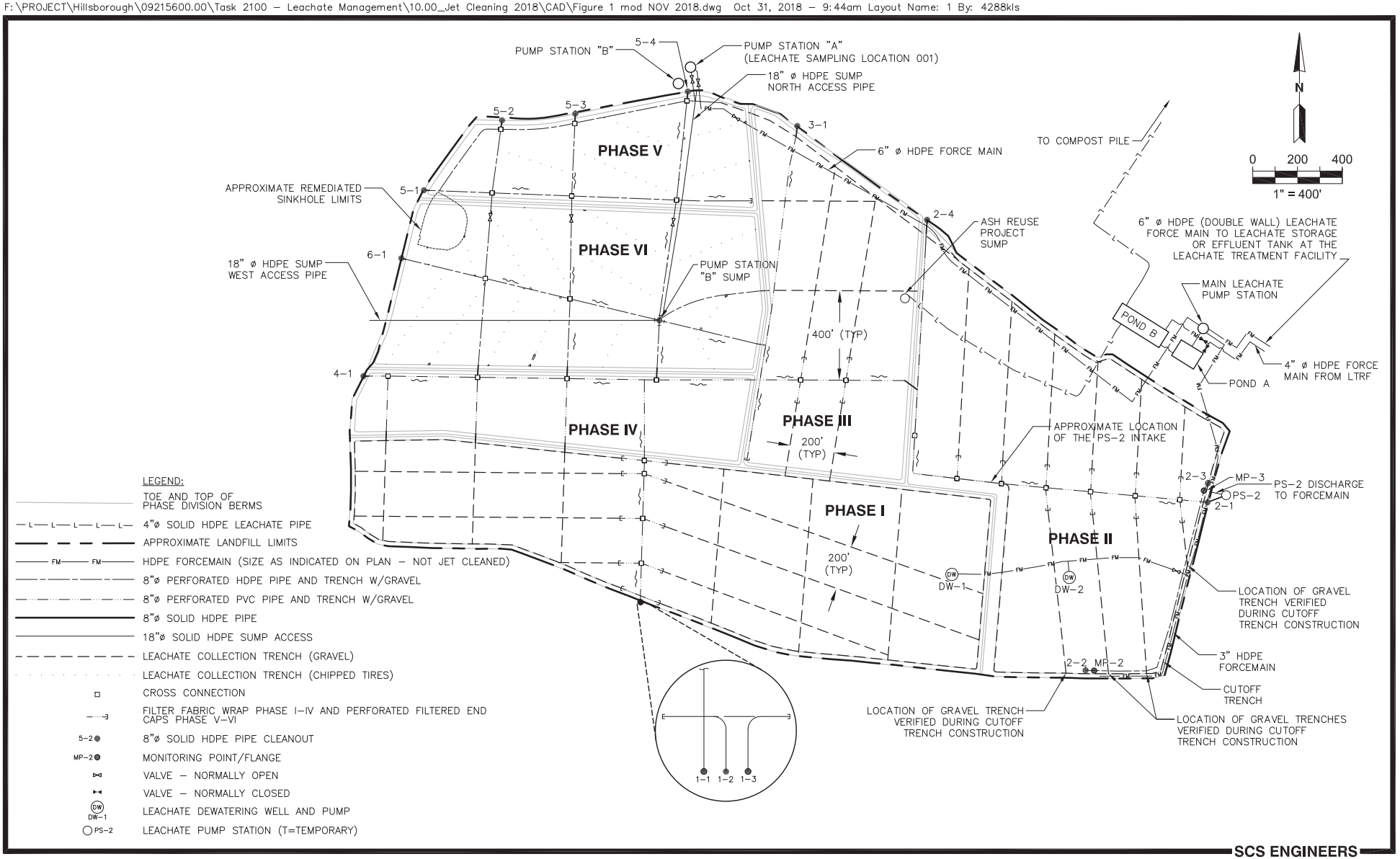


FIGURE 1. PHASES I–VI LEACHATE COLLECTION AND REMOVAL SYSTEM
HILLSBOROUGH COUNTY
NOVEMBER 2018

Backfill Volume Calculations

From: Luis Rodriguez

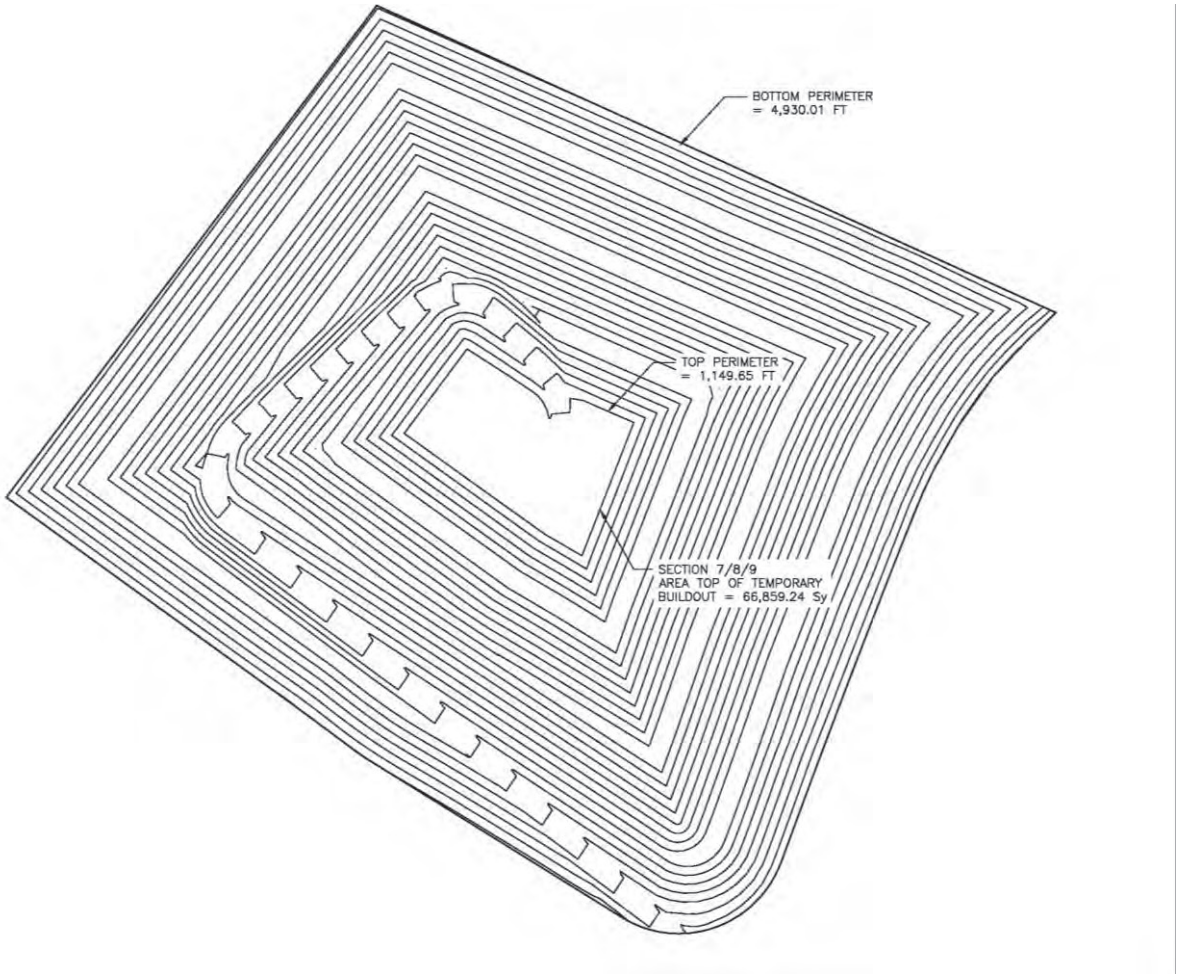
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Site A Sections 7,8 and 9 Temporary Buildout.doc

Temporary Buildout Site A Sections 7, 8 and 9

Hillsborough County Southeast Landfill



Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013

Backfill Volume Calculations

From: Luis Rodriguez

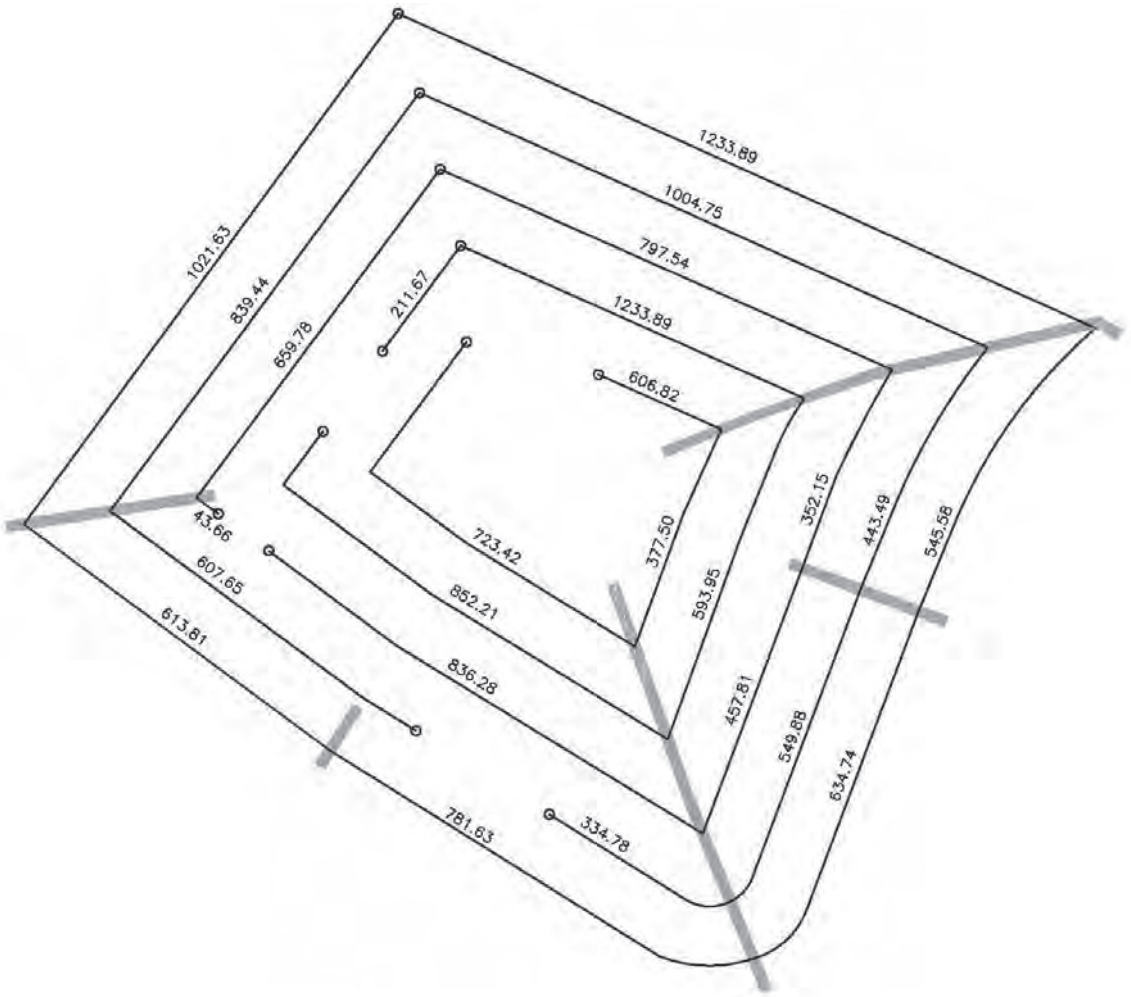
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Site A Sections 7,8 and 9 terrace swales lengths.doc

Terrace swale lengths Site A Sections 7, 8 and 9

Hillsborough County Southeast Landfill



Total Lengths = 16,357.95

Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013

Backfill Volume Calculations

From: Luis Rodriguez

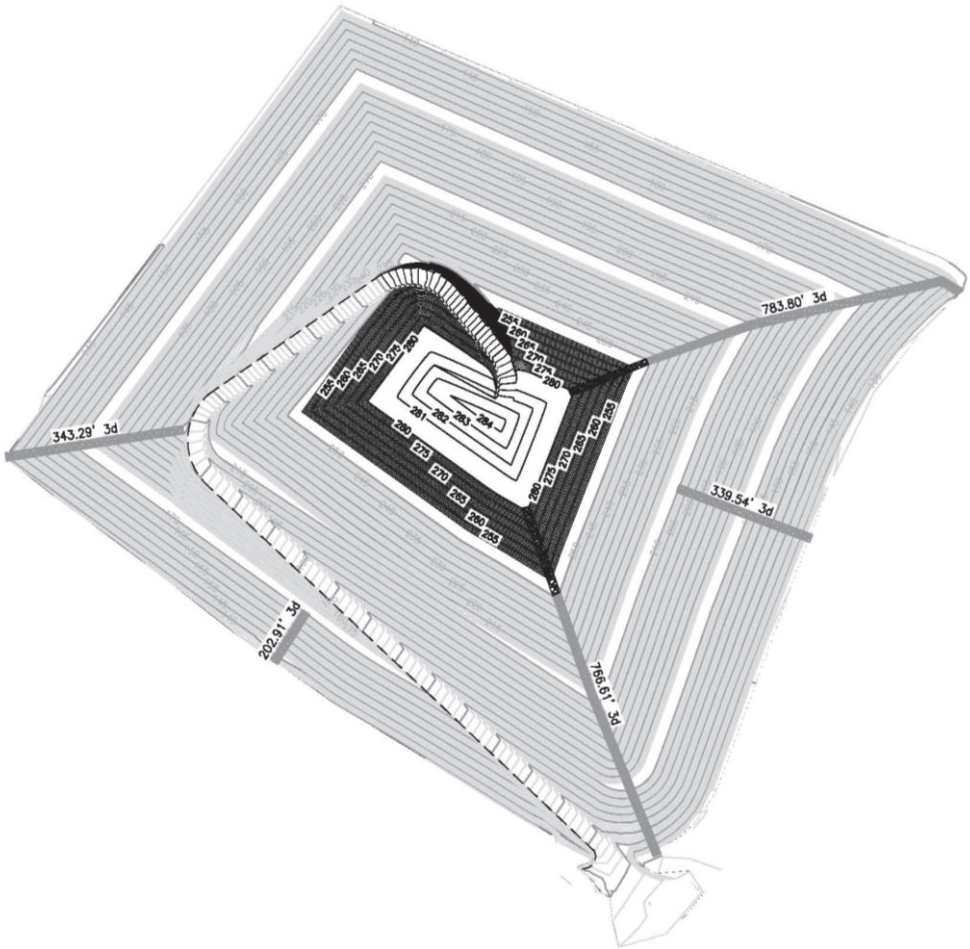
Sent: Tuesday, March 19, 2013

To: Robert Curtis

Subject: Site A Sections 7,8 and 9 downchute lengths.doc

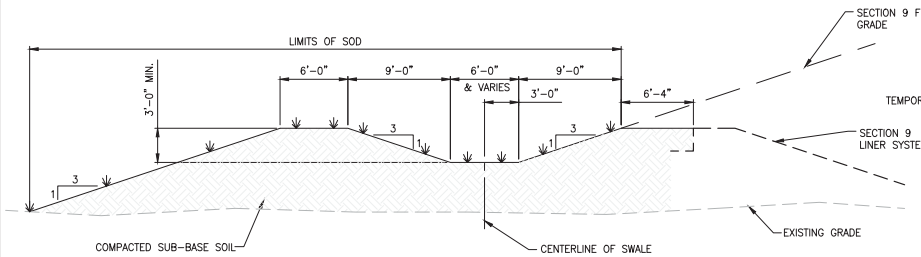
Downchute Lengths Site A Sections 7, 8 and 9

Hillsborough County Southeast Landfill

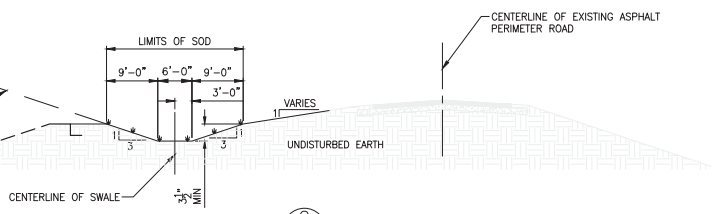


Total Downchute Lengths Sections 7,8 and 9 = 2,436.15 LF

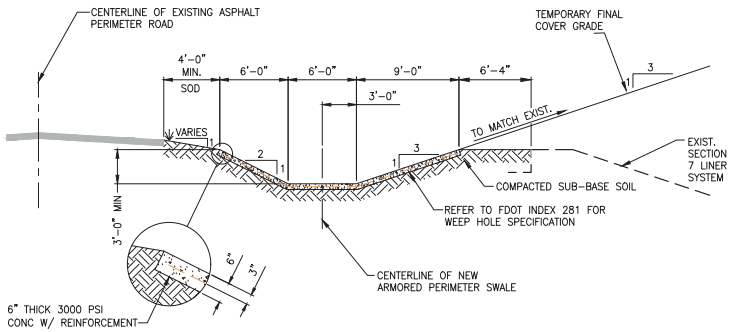
Calculations were performed by Luis Rodriguez
Tuesday, March 19, 2013



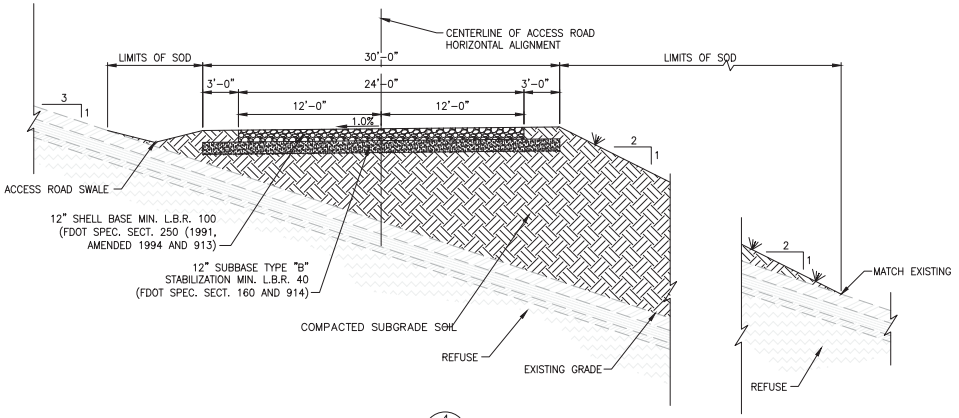
PERIMETER STORMWATER CHANNEL DETAIL 1 (4|10)
NOT TO SCALE



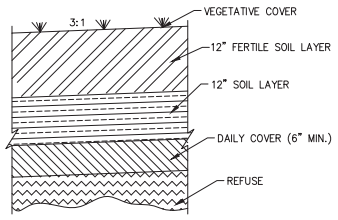
PERIMETER SWALE "A" DETAIL 2 (4|10)
NOT TO SCALE



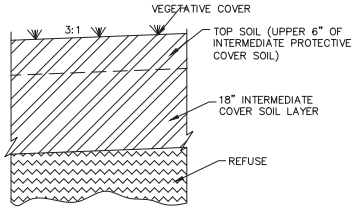
ARMORED PERIMETER SWALE "B" DETAIL 3 (4|10)
NOT TO SCALE



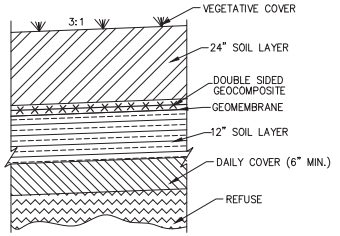
ACCESS ROAD DETAIL 4 (4,6,7|10)
NOT TO SCALE



TEMPORARY FINAL COVER DETAIL 5 (7,11|10)
NOT TO SCALE



INTERMEDIATE COVER DETAIL 6 (7,11|10)
NOT TO SCALE



FINAL COVER DETAIL 7 (10)
NOT TO SCALE

NOT TO SCALE

REV	DATE	DESCRIPTION	CHK. BY:

ROBERT B. CARTIS LICENSE NO. 73258

SHEET TITLE: OPERATING SEQUENCE DETAILS - 1

PROJECT TITLE: CAPACITY EXPANSION AREA SECTIONS 7, 8 AND 9 OPERATING SEQUENCE

CLIENT: HILLSBOROUGH COUNTY PUBLIC WORKS DEPARTMENT SOLID WASTE MANAGEMENT DIVISION TAMPA, FL 33619

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
3920 CYPRESS GARDENS ROAD, SUITE 102, TAMPA, FL 33619
PH (813) 621-0080 FAX NO. (813) 882-8757
FLORIDA CERTIFICATE OF AUTHORIZATION NO. 00004892

PROJ. NO. 01Z5600.05
DSN. BY: RBC
DWN. BY: KKC
CHK. BY: BJC
S/A P/M BY: AJS
APP. BY: RBC

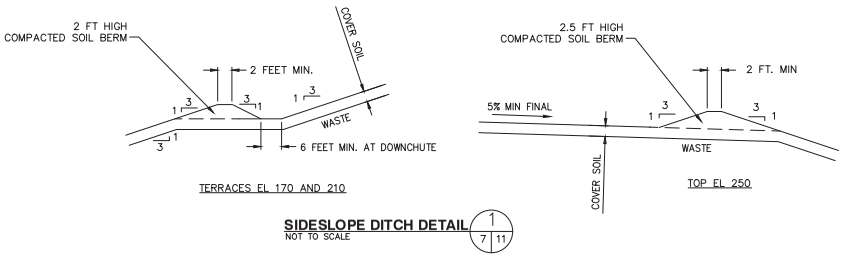
CADD FILE:
SHEET 10--OPERATING SEQUENCE DETAIL

DATE: SEPTEMBER 2018

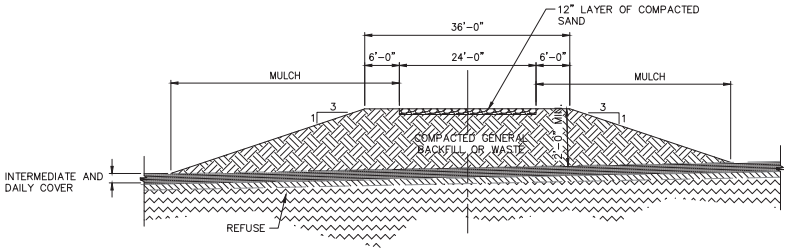
SCALE: AS SHOWN

DRAWING NO. 10
SHEET 10 of 11

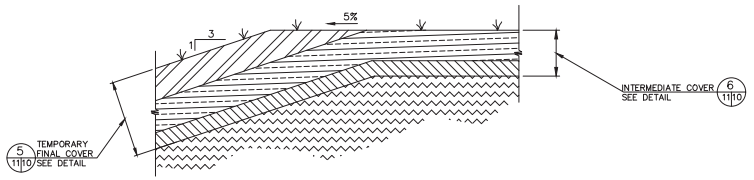
F:\PROJECT\Hillsborough_SE Landfill\Active Landfill\Capacity Expansion Area\DRAWINGS\SCS\Sheet 10-Operating Sequence Detail.dwg Sep 05, 2018 - 6:34pm Layout Name: Layout1 By: 4382kkc



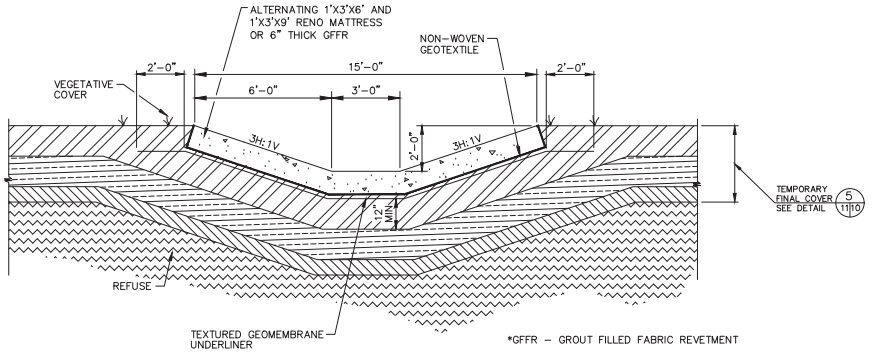
SIDESLOPE DITCH DETAIL 1 (7 | 11)
NOT TO SCALE



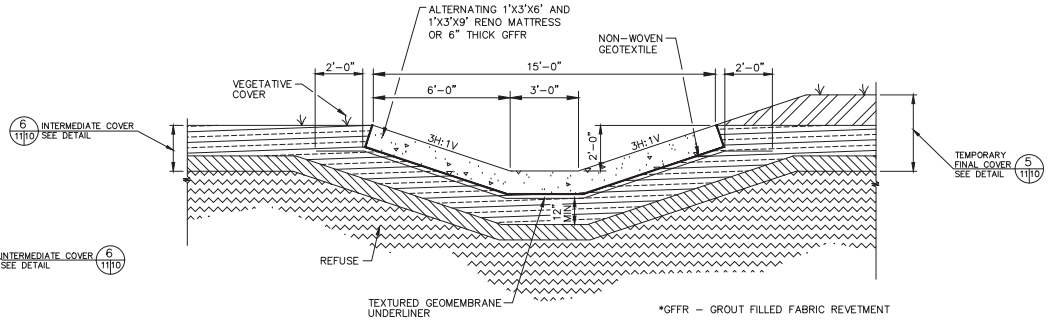
TEMPORARY ACCESS ROAD DETAIL 3 (5,6 | 11)
NOT TO SCALE



TRANSITION TEMPORARY FINAL COVER TO INTERMEDIATE COVER ON TOP SLOPE DETAIL 5 (7 | 11)
NOT TO SCALE



DOWNCHUTE DETAIL 2 (7 | 11)
NOT TO SCALE



TRANSITION TEMPORARY FINAL COVER TO INTERMEDIATE COVER ON SIDESLOPE DETAIL 4 (7 | 11)
NOT TO SCALE

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REV	DATE	DESCRIPTION	CHK. BY

SHEET TITLE: OPERATING SEQUENCE DETAILS - 2

PROJECT TITLE: CAPACITY EXPANSION AREA SECTIONS 7, 8 AND 9 OPERATING SEQUENCE

CLIENT: HILLSBOROUGH COUNTY PUBLIC WORKS DEPARTMENT SOLID WASTE MANAGEMENT DIVISION TAMPA, FL 33619

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
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PROJ. NO.	DWN. BY: KKC	D/A REVIEW BY: KLS
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DATE: SEPTEMBER 2018		

CADD FILE: SHEET 11-OPERATING SEQUENCE DETAIL

SCALE: AS SHOWN

DRAWING NO. 11

SHEET 11 of 11

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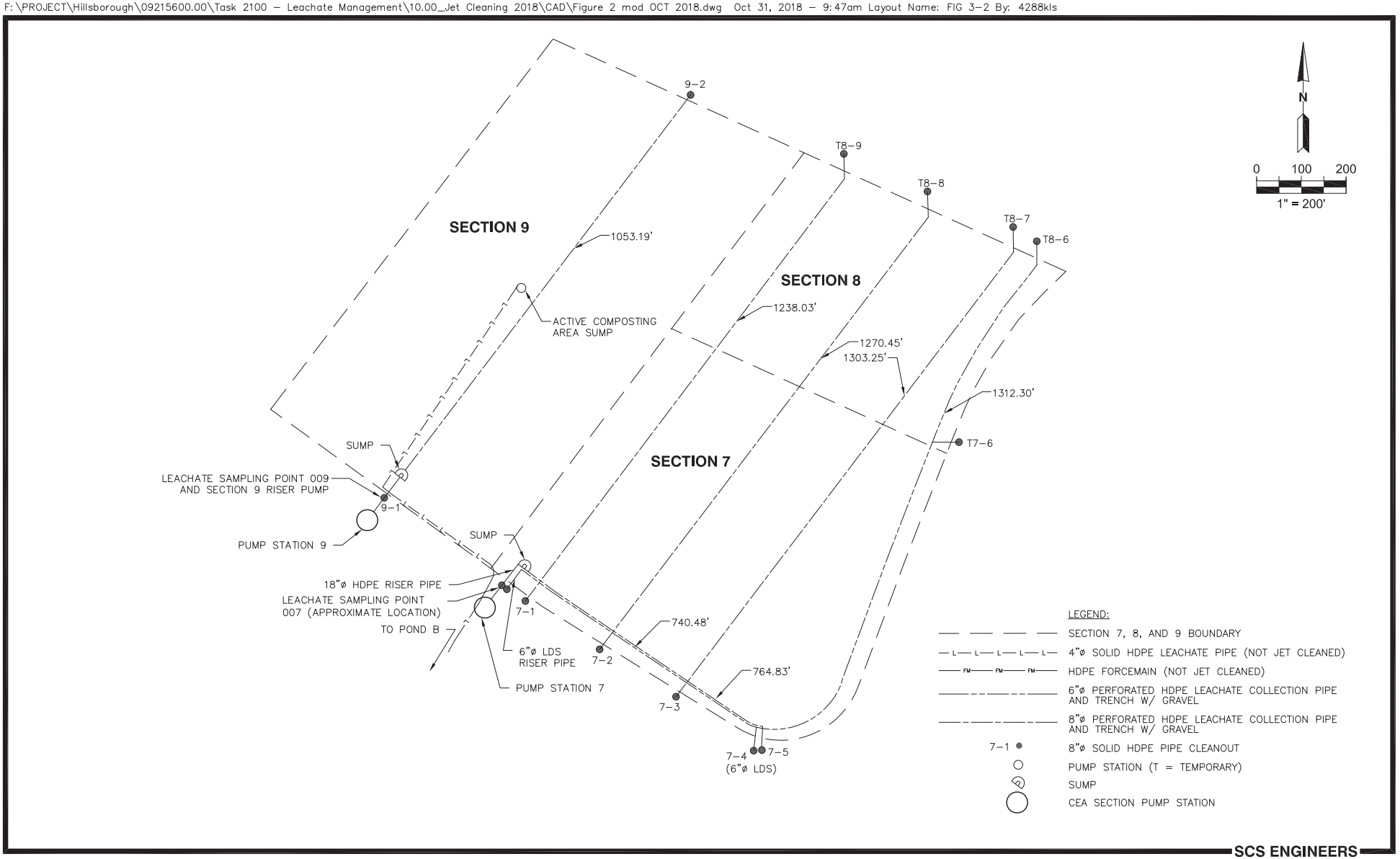

FIGURE 2. CAPACITY EXPANSION AREA (SECTIONS 7, 8, AND 9) – LEACHATE COLLECTION AND REMOVAL SYSTEM
HILLSBOROUGH COUNTY
NOVEMBER 2018

PART 6

USLE CALCULATIONS

Hillsborough County Southeast County Landfill
May 2013

Soil Erosion using the Universal Soil Loss Equation (USLE)

The Universal Soil Loss Equation A (tons/AC/year) = R * K * LS * C * P

Name	Value	Reference*
Rainfall Factor		
R =	425	Figure 1 of USDA "Predicting Rainfall Loss Handbook"
Soil Erodibility Factor		
K =	0.08	Figure 3 of USDA "Predicting Rainfall Loss Handbook"; assuming 10% silt and very fine sand (.15 to .075 mm), 90% sand (0.1 to 2 mm), 2% organic matter, fine granular structure, and moderate permeability
Topographic Factor		
LS =	11.57	Table 3 USDA "Predicting Rainfall Loss Handbook"; 150 ft slope, 33% slope
Cover and Management Factor		
C =	0.042	Assuming 60% of the ground is covered by vegetation.
Support Practice Factor		
P =	1	support practice factor (ranges 0 to 1), assumed worst case, up & down slope practice

Assumptions:

density	95	lb/ft^3	dry density for silty sand
acreage	162.4	acres	Phases I to VI
acreage	34.5	acres	Sections 7 to 9

e of Soil Loss

	C	A (tons/AC/year)	tons/ year	CF/ year	CY/ year
Phases I to VI	0.042	16.52	2,683	56,488	2,092
Sections 7 to 9	0.042	16.52	570	12,000	444

reference United States Department of Agriculture. "Predicting Rainfall Erosion Losses." Agriculture Handbook No. 537, December 1978.

AH537/12/78

PREDICTING RAINFALL EROSION LOSSES

A GUIDE TO CONSERVATION PLANNING

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURE HANDBOOK NUMBER 537

PREPARED BY SCIENCE AND EDUCATION ADMINISTRATION

site as the product of six major factors whose most likely values at a particular location can be expressed numerically. Erosion variables reflected by these factors vary considerably about their means from storm to storm, but effects of the random fluctuations tend to average out over extended periods. Because of the unpredictable short-time fluctuations in the levels of influential variables, however, present soil loss equations are substantially less accurate for prediction of specific events than for prediction of longtime averages.

The soil loss equation is

$$A = R K L S C P \qquad (1)$$

where

A is the computed soil loss per unit area, expressed in the units selected for **K** and for the period selected for **R**. In practice, these are usually so selected that they compute **A** in tons per acre per year, but other units can be selected.

R, the rainfall and runoff factor, is the number of rainfall erosion index units, plus a factor for runoff from snowmelt or applied water where such runoff is significant.

K, the soil erodibility factor, is the soil loss rate per erosion index unit for a specified soil as measured on a unit plot, which is defined as a 72.6-ft length of uniform 9-percent slope continuously in clean-tilled fallow.

L, the slope-length factor, is the ratio of soil loss from the field slope length to that from a 72.6-ft length under identical conditions.

S, the slope-steepness factor, is the ratio of soil loss from the field slope gradient to that from a 9-percent slope under otherwise identical conditions.

C, the cover and management factor, is the ratio of soil loss from an area with specified cover and management to that from an identical area in tilled continuous fallow.

P, the support practice factor, is the ratio of soil loss with a support practice like contouring, stripcropping, or terracing to that with straight-row farming up and down the slope.

The soil loss equation and factor evaluation charts were initially developed in terms of the English units commonly used in the United States. The factor definitions are interdependent, and direct conversion of acres, tons, inches, and feet to metric units would not produce the kind of integers that would be desirable for an expression of the equation in that system. Therefore, only the English units are used in the initial presentation of the equation and factor evaluation materials, and their counterparts in metric units are given in the Appendix under **Conversion to Metric System.**

Numerical values for each of the six factors were derived from analyses of the assembled research data and from National Weather Service precipitation records. For most conditions in the United States, the approximate values of the factors for any particular site may be obtained from charts and tables in this handbook. Localities or countries where the rainfall characteristics, soil types, topographic features, or farm practices are substantially beyond the range of present U.S. data will find these charts and tables incomplete and perhaps inaccurate for their conditions. However, they will provide guidelines that can reduce the amount of local research needed to develop comparable charts and tables for their conditions.

The subsection on **Predicting Cropland Soil Losses**, page 40 illustrates how to select factor values from the tables and charts. Readers who have had no experience with the soil loss equation may wish to read that section first. After they have referred to the tables and figures and located the values used in the sample, they may move readily to the intervening detailed discussions of the equation's factors.

The soil loss prediction procedure is more valuable as a guide for selection of practices if the user has a general knowledge of the principles and factor interrelations on which the equation is based. Therefore, the significance of each factor is discussed before presenting the reference table or chart from which local values may be obtained. Limitations of the data available for evaluation of some of the factors are also pointed out.

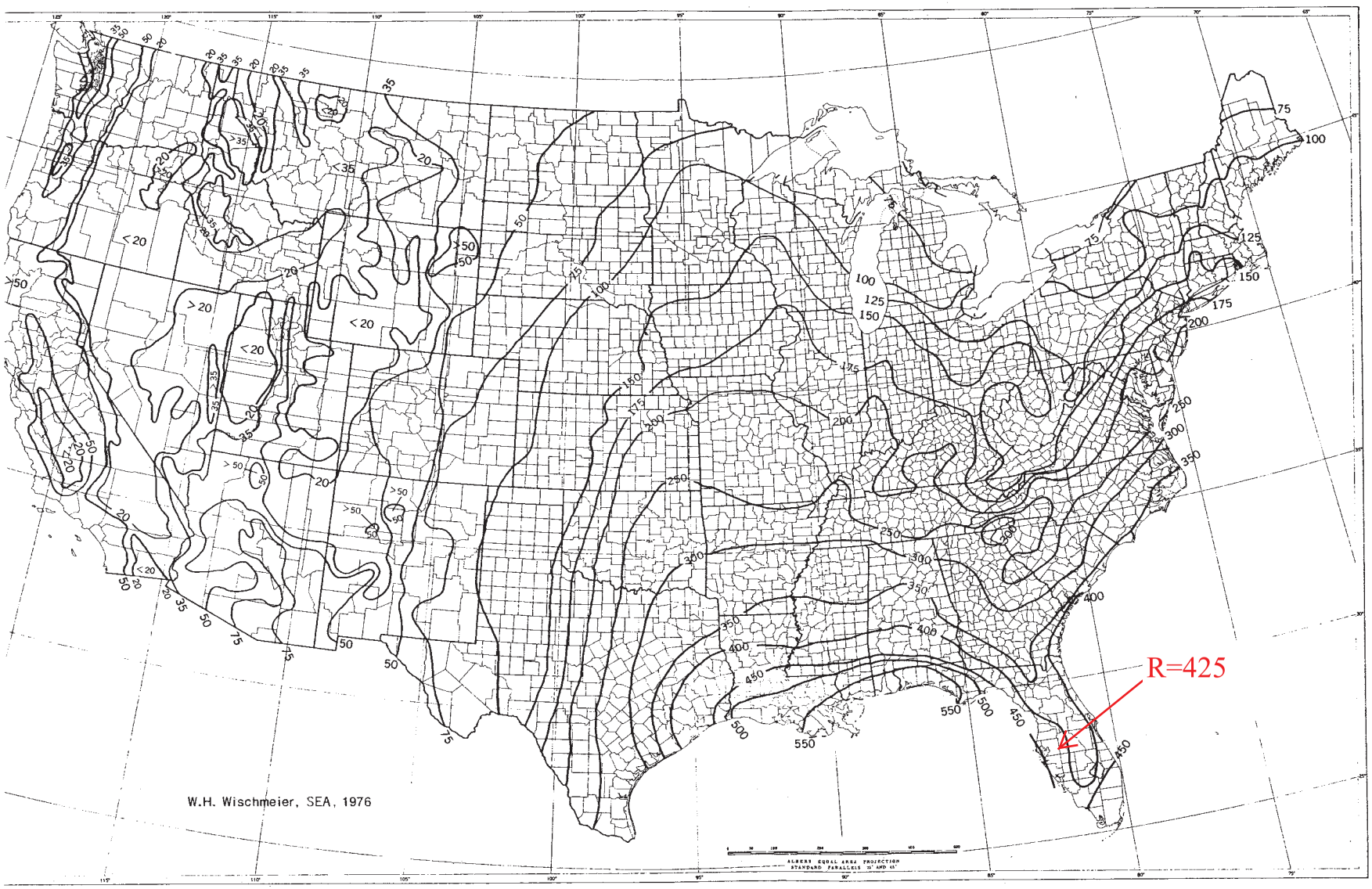

FIGURE 1.—Average annual values of the rainfall erosion index.

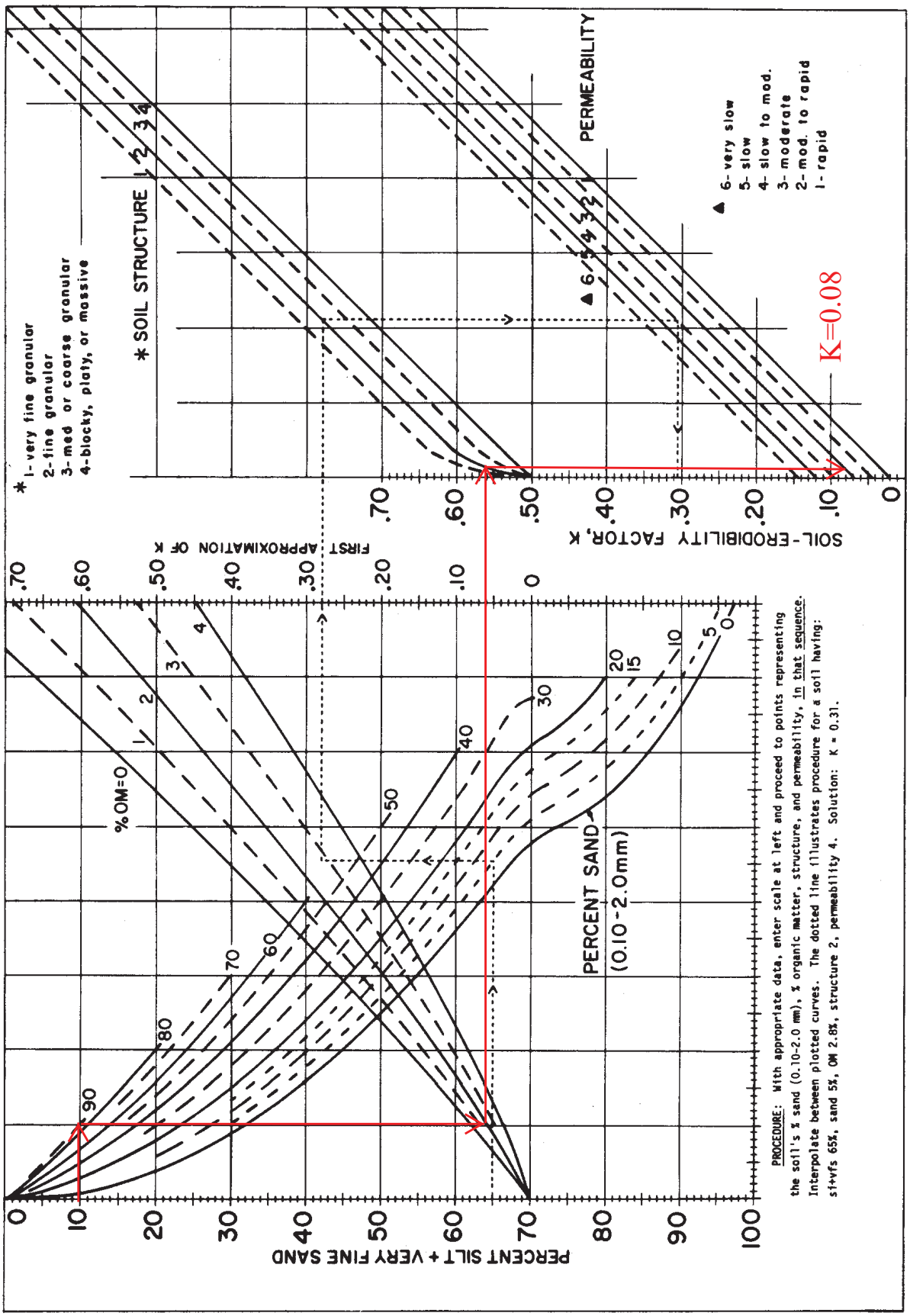

FIGURE 3.—The soil-erodibility nomograph. Where the silt fraction does not exceed 70 percent, the equation is $100\ K = 2.1\ M^{1.14}\ (10^{-4})\ (12 - a) + 3.25\ (b - 2) + 2.5\ (c - 3)$ where M = (percent si + vfs) (100 — percent c), a = percent organic matter, b = structure code, and c = profile permeability class.

TOPOGRAPHIC FACTOR (LS)

Both the length and the steepness of the land slope substantially affect the rate of soil erosion by water. The two effects have been evaluated separately in research and are represented in the soil loss equation by **L** and **S**, respectively. In field applications, however, considering the two as a single topographic factor, **LS**, is more convenient.

Slope-Effect Chart

LS is the expected ratio of soil loss per unit area from a field slope to that from a 72.6-ft length of uniform 9-percent slope under otherwise identical conditions. This ratio for specified combinations of field slope length and uniform gradient may be obtained directly from the slope-effect chart (fig. 4). Enter on the horizontal axis with the field slope length, move vertically to the appropriate percent-slope curve, and read **LS** on the scale at the left. For example, the **LS** factor for a 300-ft length of 10-percent slope is 2.4. Those who prefer a table may use table 3 and interpolate between listed values.

To compute soil loss from slopes that are appreciably convex, concave, or complex, the chart **LS** values need to be adjusted as indicated in the section **LS Values for Irregular Slopes.** Figure 4 and table 3 assume slopes that have essentially uniform gradient. The chart and table were derived by the equation

$$LS = (\lambda/72.6)^m \ (65.41 \ \sin^2 \theta + 4.56 \ \sin \theta + 0.065) \quad (4)$$

where λ = slope length in feet;
θ = angle of slope; and
m = 0.5 if the percent slope is 5 or more, 0.4 on slopes of 3.5 to 4.5 percent, 0.3 on slopes of 1 to 3 percent, and 0.2 on uniform gradients of less than 1 percent.

The basis for this equation is given in the subsection discussing the individual effects of slope length and steepness. However, the relationships expressed by the equation were derived from data obtained on cropland, under natural rainfall, on slopes ranging from 3 to 18 percent in steepness and about 30 to 300 ft in length. How far beyond these ranges in slope characteristics the relationships derived from the data continue to be accurate has not been determined by direct soil loss measurements.

The Palouse Region of the Northwest represents

TABLE 3.—*Values of the topographic factor,* **LS**, *for specific combinations of slope length and steepness*[1]

Percent slope	Slope length (feet)											
	25	50	75	100	150	200	300	400	500	600	800	1,000
0.2	0.060	0.069	0.075	0.080	0.086	0.092	0.099	0.105	0.110	0.114	0.121	0.126
0.5	.073	.083	.090	.096	.104	.110	.119	.126	.132	.137	.145	.152
0.8	.086	.098	.107	.113	.123	.130	.141	.149	.156	.162	.171	.179
2	.133	.163	.185	.201	.227	.248	.280	.305	.326	.344	.376	.402
3	.190	.233	.264	.287	.325	.354	.400	.437	.466	.492	.536	.573
4	.230	.303	.357	.400	.471	.528	.621	.697	.762	.820	.920	1.01
5	.268	.379	.464	.536	.656	.758	.928	1.07	1.20	1.31	1.52	1.69
6	.336	.476	.583	.673	.824	.952	1.17	1.35	1.50	1.65	1.90	2.13
8	.496	.701	.859	.992	1.21	1.41	1.72	1.98	2.22	2.43	2.81	3.14
10	.685	.968	1.19	1.37	1.68	1.94	2.37	2.74	3.06	3.36	3.87	4.33
12	.903	1.28	1.56	1.80	2.21	2.55	3.13	3.61	4.04	4.42	5.11	5.71
14	1.15	1.62	1.99	2.30	2.81	3.25	3.98	4.59	5.13	5.62	6.49	7.26
16	1.42	2.01	2.46	2.84	3.48	4.01	4.92	5.68	6.35	6.95	8.03	8.98
18	1.72	2.43	2.97	3.43	4.21	3.86	5.95	6.87	7.68	8.41	9.71	10.9
20	2.04	2.88	3.52	4.08	5.00	5.77	7.07	8.16	9.12	10.0	11.5	12.9

[1] $LS = (\lambda/72.6)^m \ (65.41 \ \sin^2 \theta + 4.56 \ \sin \theta + 0.065)$ where λ = slope length in feet; **m** = 0.2 for gradients < 1 percent, 0.3 for 1 to 3 percent slopes, 0.4 for 3.5 to 4.5 percent slopes, 0.5 for 5 percent slopes and steeper; and θ = angle of slope. (For other combinations of length and gradient, interpolate between adjacent values or see fig. 4.)

LS

tion and developmental areas can be obtained from table 5 if good judgment is exercised in comparing the surface conditions with those of agricultural conditions specified in lines of the table. Time intervals analogous to cropstage periods will be defined to begin and end with successive construction or management activities that appreciably change the surface conditions. The procedure is then similar to that described for cropland.

Establishing vegetation on the denuded areas as quickly as possible is highly important. A good sod has a **C** value of 0.01 or less (table 5-B), but such a low **C** value can be obtained quickly only by laying sod on the area, at a substantial cost. When grass or small grain is started from seed, the probable soil loss for the period while cover is developing can be computed by the procedure outlined for estimating cropstage-period soil losses. If the seeding is on topsoil, without a mulch, the soil loss ratios given in line 141 of table 5 are appropriate for cropstage **C** values. If the seeding is on a desurfaced area, where residual effects of prior vegetation are no longer significant, the ratios for periods SB, 1 and 2 are 1.0, 0.75 and 0.50, respectively, and line 141 applies for cropstage 3. When the seedbed is protected by a mulch, the pertinent mulch factor from the upper curve of figure 6 or table 9 is applicable until good canopy cover is attained. The combined effects of vegetative mulch and low-growing canopy are given in figure 7. When grass is established in small grain, it can usually be evaluated as established meadow about 2 mo after the grain is cut.

C Values for Pasture, Range, and Idle Land

Factor **C** for a specific combination of cover conditions on these types of land may be obtained from table 10 (*57*). The cover characteristics that must be appraised before consulting this table are defined in the table and its footnotes. Cropstage periods and **EI** monthly distribution data are generally not necessary where perennial vegetation has become established and there is no mechanical disturbance of the soil.

Available soil loss data from undisturbed land were not sufficient to derive table 10 by direct comparison of measured soil loss rates, as was done for development of table 5. However, analyses of the assembled erosion data showed that the research information on values of **C** can be extended to completely different situations by combining subfactors that evaluate three separate and distinct, but interrelated, zones of influence: (a) vegetative cover in direct contact with the soil surface, (b) canopy cover, and (c) residual and tillage effects.

Subfactors for various percentages of surface cover by mulch are given by the upper curve of

TABLE 10.—*Factor* **C** *for permanent pasture, range, and idle land*[1]

Vegetative canopy		Cover that contacts the soil surface						
			Percent ground cover					
Type and height[2]	Percent cover[3]	Type[4]	0	20	40	60	80	95+
No appreciable canopy		G	0.45	0.20	0.10	0.042	0.013	0.003
		W	.45	.24	.15	.091	.043	.011
Tall weeds or short brush with average drop fall height of 20 in	25	G	.36	.17	.09	.038	.013	.003
		W	.36	.20	.13	.083	.041	.011
	50	G	.26	.13	.07	.035	.012	.003
		W	.26	.16	.11	.076	.039	.011
	75	G	.17	.10	.06	.032	.011	.003
		W	.17	.12	.09	.068	.038	.011
Appreciable brush or bushes, with average drop fall height of 6½ ft	25	G	.40	.18	.09	.040	.013	.003
		W	.40	.22	.14	.087	.042	.011
	50	G	.34	.16	.08	.038	.012	.003
		W	.34	.19	.13	.082	.041	.011
	75	G	.28	.14	.08	.036	.012	.003
		W	.28	.17	.12	.078	.040	.011
Trees, but no appreciable low brush. Average drop fall height of 13 ft	25	G	.42	.19	.10	.041	.013	.003
		W	.42	.23	.14	.089	.042	.011
	50	G	.39	.18	.09	.040	.013	.003
		W	.39	.21	.14	.087	.042	.011
	75	G	.36	.17	.09	.039	.012	.003
		W	.36	.20	.13	.084	.041	.011

[1] The listed **C** values assume that the vegetation and mulch are randomly distributed over the entire area.

[2] Canopy height is measured as the average fall height of water drops falling from the canopy to the ground. Canopy effect is inversely proportional to drop fall height and is negligible if fall height exceeds 33 ft.

[3] Portion of total-area surface that would be hidden from view by canopy in a vertical projection (a bird's-eye view).

[4] G: cover at surface is grass, grasslike plants, decaying compacted duff, or litter at least 2 in deep.

W: cover at surface is mostly broadleaf herbaceous plants (as weeds with little lateral-root network near the surface) or undecayed residues or both.

TABLE 12.—*Factor* **C** *for mechanically prepared woodland sites*

Site preparation	Mulch cover[1]	Soil condition[2] and weed cover[3]							
		Excellent		Good		Fair		Poor	
		NC	WC	NC	WC	NC	WC	NC	WC
	Percent								
Disked, raked, or bedded[4]	None	0.52	0.20	0.72	0.27	0.85	0.32	0.94	0.36
	10	.33	.15	.46	.20	.54	.24	.60	.26
	20	.24	.12	.34	.17	.40	.20	.44	.22
	40	.17	.11	.23	.14	.27	.17	.30	.19
	60	.11	.08	.15	.11	.18	.14	.20	.15
	80	.05	.04	.07	.06	.09	.08	.10	.09
Burned[5]	None	.25	.10	.26	.10	.31	.12	.45	.17
	10	.23	.10	.24	.10	.26	.11	.36	.16
	20	.19	.10	.19	.10	.21	.11	.27	.14
	40	.14	.09	.14	.09	.15	.09	.17	.11
	60	.08	.06	.09	.07	.10	.08	.11	.08
	80	.04	.04	.05	.04	.05	.04	.06	.05
Drum chopped[5]	None	.16	.07	.17	.07	.20	.08	.29	.11
	10	.15	.07	.16	.07	.17	.08	.23	.10
	20	.12	.06	.12	.06	.14	.07	.18	.09
	40	.09	.06	.09	.06	.10	.06	.11	.07
	60	.06	.05	.06	.05	.07	.05	.07	.05
	80	.03	.03	.03	.03	.03	.03	.04	.04

[1] Percentage of surface covered by residue in contact with the soil.

[2] *Excellent* soil condition—Highly stable soil aggregates in topsoil with fine tree roots and litter mixed in.

Good—Moderately stable soil aggregates in topsoil or highly stable aggregates in subsoil (topsoil removed during raking), only traces of litter mixed in.

Fair—Highly unstable soil aggregates in topsoil or moderately stable aggregates in subsoil, no litter mixed in.

Poor—No topsoil, highly erodible soil aggregates in subsoil, no litter mixed in.

[3] NC—No live vegetation.

WC—75 percent cover of grass and weeds having an average drop fall height of 20 in. For intermediate percentages of cover, interpolate between columns.

[4] Modify the listed **C** values as follows to account for effects of surface roughness and aging:

First year after treatment: multiply listed **C** values by 0.40 for rough surface (depressions >6 in); by 0.65 for moderately rough; and by 0.90 for smooth (depressions <2 in).

For 1 to 4 years after treatment: multiply listed factors by 0.7.

For 4+ to 8 years: use table 6.

More than 8 years: use table 7.

[5] For first 3 years: use **C** values as listed.

For 3+ to 8 years after treatment: use table 6.

More than 8 years after treatment: use table 7.

meadow, the selected seedbed soil loss ratio is multiplied by a factor from table 5-D. If mulch is applied, a subfactor read from the upper curve of figure 6 is multiplied by the residual subfactor to obtain **C**. When canopy develops, a canopy subfactor from figure 5 is also included.

SUPPORT PRACTICE FACTOR (P)

In general, whenever sloping soil is to be cultivated and exposed to erosive rains, the protection offered by sod or close-growing crops in the system needs to be supported by practices that will slow the runoff water and thus reduce the amount of soil it can carry. The most important of these supporting cropland practices are contour tillage, stripcropping on the contour, and terrace systems. Stabilized waterways for the disposal of excess rainfall are a necessary part of each of these practices.

By definition, factor **P** in the USLE is the ratio of soil loss with a specific support practice to the corresponding loss with up-and-down-slope culture. Improved tillage practices, sod-based rotations, fertility treatments, and greater quantities of crop residues left on the field contribute materially to erosion control and frequently provide the major control in a farmer's field. However, these are considered conservation cropping and management practices, and the benefits derived from them are included in **C**.

Contouring

The practice of tillage and planting on the contour, in general, has been effective in reducing erosion. In limited field studies, the practice provided almost complete protection against erosion from storms of moderate to low intensity, but it provided little or no protection against the occasional severe storms that caused extensive breakovers of the contoured rows. Contouring appears to be the most effective on slopes in the 3- to 8-percent range. As land slope decreases, it approaches equality with contour row slope, and the soil loss ratio approaches 1.0. As slope increases, contour row capacity decreases and the soil loss ratio again approaches 1.0.

PART 7

ON-SITE SOIL CALCULATIONS

ON-SITE SOIL CALCULATIONS

Based on the estimated required on-site soils for closure and long-term care of Phases I-VI and the Capacity Expansion Area (Sections 7, 8, and 9), the total on-site soil volume needed is the following:

Phases I-VI: 726,339 CY

Capacity Expansion Area (Sections 7, 8, and 9): 176,337 CY

Total on-site soil for closure and long-term care: 902, 676

Figure 7-1 shows the buffer area owned by the SWMD. With approximately 420 AC available for use and an estimated 5 feet of excavation, the SWMD has available for use 3,388,000 CY of soil.

420 AC=18,295,200 SF
18,295,200 SF x 5 FT (excavation) = 91,476,000 CF = 3,388,000 CY

Additionally to the buffer area, the SWMD can use remaining soils in the Capacity Expansion Area, Soil Recovery Area (Sand Borrow), and the Future Borrow Area.

Legend

- APPROXIMATE PROPERTY BOUNDARY
- EXPANSION AREA (SECTIONS 7, 8, 9)
- LANDFILL PHASES I-VI
- OTHER AREAS

HILLSBOROUGH SOUTHEAST COUNTY LANDFILL
ON SITE SOILS MAP
HILLSBOROUGH COUNTY, FL

SCS ENGINEERS

Tampa, FL | November 2018

0 750 1,500 Feet

N

Hillsborough County Florida

Document Path: G:\GIS\PROJECTS\Southeast Hillsborough County Landfill\On Site Soils.mxd

Attachment 2

Leachate Collection and Removal System Cleaning and Inspection Report Southeast County Landfill Lithia, Florida

Hillsborough County
Transportation & Utilities Services
Solid Waste Management Division
332 N. Falkenburg Road
Tampa, Florida 33619

SCS ENGINEERS

09215600.07 | November 7, 2018

3922 Coconut Palm Drive, Suite 102
Tampa, Florida 33619
813-621-0080

Leachate Collection and Removal System Cleaning and Inspection Report November 2018

Southeast County Landfill Lithia, Florida

Submitted to:

Hillsborough County
Transportation and Utilities Services
Solid Waste Management Division
332 North Falkenburg Road
Tampa, Florida 33619

Prepared by:

SCS ENGINEERS
3922 Coconut Palm Drive, Suite 102
Tampa Florida 33619
(813)-621-0080

November 7, 2018
File No. 09215600.07

Kollan L. Spradlin, P.E.
No. 82852

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Appendices

1.0 INTRODUCTION

As requested by the Hillsborough County Transportation & Utilities Services, Solid Waste Management Division (SWMD), SCS Engineers (SCS) has prepared this report for the high pressure cleaning and evaluation activities of the Leachate Collection and Removal System (LCRS) conducted at the Southeast County Landfill (SCLF), specifically Phases I-VI and the Capacity Expansion Area, Section 7,8, and 9. This report fulfills requirements of Specific Conditions C.12.c. of the Operating Permit No. 35435-022-SO/01. The following is a summary of the work completed and findings of the inspection. The previous high-pressure cleaning and evaluation report was submitted in June 2013 and approved in November 2013.

2.0 NEWLY INSTALLED LCRS CLEANOUTS

Since the previous LCRS cleaning, additional cleanouts have been installed to access the header pipes in Phases I, II, and III. SWMD believes that it has located and constructed access cleanouts for all headers that terminate near the perimeter berm. According to the as-built construction plans available for review, no additional header pipes are believed to exist. The following sections describe the cleanouts installed in Phases I, II, and III since the previous LCRS cleaning and inspection report.

2.1 PHASE 1

Exploratory trenching activities were conducted in February 2017 to uncover the Phase I header pipe. Upon discovery, three access cleanouts were installed in Phase I in March 2017. All three cleanouts were jet cleaned in March 2017.

2.1.1 CO 1-1

The main header in Phase I is an 8-inch polyvinyl chloride (PVC) pipe running from the south side of Phase I northerly to Phase IV. The main header pipe cleanout consists of an 8-inch high-density polyethylene (HDPE) pipe connected to the original 8-inch PVC header and is referred to as CO 1-1.

2.1.2 CO 1-2 and CO 1-3

During construction of the Phase I cleanout, perforated HDPE pipe was extended east and west of the header along the perimeter and perpendicular to the main Phase I header. These pipes are each less than 100-feet in length. Two wye fittings, cross fitting connections, and riser pipes were installed to allow cleanout of these pipes. The HDPE access cleanouts are referred to as CO 1-2 and CO 1-3. CO 1-2 provides westerly access to the trench pipe and CO 1-3 provides easterly access to the pipe.

2.2 PHASE II

An approximately 1,100 foot leachate cut-off trench was constructed around the southeastern perimeter of Phase II in June and July 2017. As part of the construction activities, three cleanouts (CO 2-1, CO 2-2, and CO 2-3) were installed within Phase II.

2.2.1 CO 2-1

In July 2017, trenching activities uncovered the eastern Phase II LCRS header pipe. This 8-inch PVC header runs from the eastern side of Phase II westerly to Phase III. Following discovery of the header, an 8-inch HDPE cleanout was installed to access the main LCRS header pipe and is referred to as CO 2-1. The HDPE section of the cleanout was connected to an 8-inch HDPE pipe, using a cross fitting, that runs the length of the cut-off trench. Although CO 2-1 was jet cleaned following installation, in August 2017, additional cleaning activities were conducted in December 2017 and January 2018.

2.2.2 CO 2-2 and CO 2-3

In addition to CO 2-1, cleanouts were installed on each end of the Phase II cut-off trench pipe to allow cleaning and inspection of the cut-off trench pipe. The cleanout located on the southern end of the cut-off trench pipe is referred to as CO 2-2 while the cleanout located on the northern end of the cut-off trench pipe is referred to as CO 2-3. Although CO 2-2, and CO 2-3 were jet cleaned following installation, additional cleaning activities were conducted in December 2017 and January 2018.

2.2.3 CO 2-4

In May 2018, trenching activities in the northern part of Phase II uncovered the northern Phase II LCRS access pipe. This 8-inch PVC access pipe runs along the eastern toe of the Phase II/III division berm. Upon uncovering this access pipe, an 8-inch HDPE pipe was extended to the northern side of the Phase II area to allow for jet cleaning and access to the main Phase II header. This extension of the access pipe is designated as the CO 2-4 cleanout. According to available as-built drawings, the CO 2-4 header connects to the main Phase II header that conveys leachate from the eastern part of the SCLF westward into Phase III/IV, and finally into PS-B. CO 2-4 was jet cleaned following construction in May 2018.

2.3 PHASE III

2.3.1 CO 3-1

In May 2018, trenching activities in the northern part of Phase III uncovered a Phase III LCRS access pipe that runs along the eastern toe of the Phase III/V and Phase III/VI division berm. This pipe allows for access to the Phase III header as well as a supplemental collection trench leading from the Phase III area directly to PS-B. Following discovery of the buried 8-inch PVC header, an 8-inch HDPE access cleanout was installed. The Phase III LCRS header cleanout is referred to as CO 3-1. CO 3-1 jet was cleaned following construction in May 2018.

3.0 HIGH PRESSURE CLEANING

3.1 DESCRIPTION OF WORK

The LCRS piping at the SCLF is required to be “water pressure cleaned or inspected by video recording” every five years, per Florida Department of Environmental Protection (FDEP) Solid Waste Management Rule 62-701.500(8)(h). Per the rule, in the event cleaning of the entire length of a LCRS pipe was not successfully completed, that section would be video inspected to determine the location and possible cause of blockage.

The SWMD contracted with Florida Jetclean (FJC) of Odessa, Florida to perform the jet cleaning and inspection. FJC began jet cleaning work on the existing header access cleanouts on December 19, 2017, and completed work on January 12, 2018. FJC performed jet cleaning at the newly installed access locations in May 2018. A representative of SCS observed cleaning and additional testing of the LCRS piping. The water pressure cleaning inspection included LCRS piping in Phases I through VI and the Capacity Expansion Area (Sections 7, 8, and 9). FJC cleaned the accessible LCRS headers at SCLF on multiple dates throughout 2017 and 2018. A collection of the FJC reports containing the maximum achievable lengths is presented in chronological order is included in **Appendix 1**. A list of the pipes high pressure cleaned and the associated maximum achievable length is shown in **Table 1**. The locations are shown in **Figure 1** and **Figure 2.**

Table 1 LCRS Pipes High Pressure Cleaned

Location	Access Point	Approx. Length	Pipe Type
Phase I	Cleanout 1-1	985 feet	8" PVC Header
Phase I	Cleanout 1-2	91 feet	8" HDPE Pipe
Phase I	Cleanout 1-3	97 feet	8" HDPE Pipe
Phase II	Cleanout 2-1	1,107 feet	8" PVC Header
Phase II	Cleanout 2-3	1,200 feet	8" HDPE Pipe
Phase II	Cleanout 2-4	1,000 feet	8" PVC Header
Phase III	Cleanout 3-1	1,000 feet	8" PVC Header
Phase IV	Cleanout 4-1	1,965 feet	8" PVC Header
Phase V	Cleanout 5-1	1,450 feet	8" HDPE Header
Phase V	Cleanout 5-2	1,125 feet	8" HDPE Header
Phase V	Cleanout 5-3	1,200 feet	8" HDPE Header
Phase V	Cleanout 5-4	1,020 feet	8" HDPE Header
Phase V	North Sump Access	1,030 feet	18" HDPE Pipe
Phase VI	Cleanout 6-1	1,180 feet	8" HDPE Header
Phase VI	West Sump Access	1,200 feet	18" HDPE Pipe
Section 7-8	7-1 to T8-9	1,171 feet	8" HDPE Header
Section 7-8	7-2 to T8-8	1,216 feet	8" HDPE Header
Section 7-8	7-3 to T8-7	1,243 feet	8" HDPE Header
Section 7-8	7-4 to Riser	651 feet	6" HDPE LDS
Section 7-8	7-5 to Sump	658 feet	8" HDPE Header
Section 7-8	T8-6 to 7-5	1,244 feet	8" – 6" HDPE Header
Section 7-8	18" Sump Access	52 feet	18" HDPE
Section 7-8	6" Riser Access	52 feet	6" HDPE
Section 9	9-1 to 9-2	1,118 feet	8" HDPE

4.0 TRACER DYE TESTING

A tracer dye test was conducted to further evaluate the function of the Phase I and Phase II LCRS. Summaries of the Phase I and Phase II tracer dye tests is discussed in Section 4.1 and Section 4.2.

4.1 PHASE I TRACER DYE TEST

On January 31, 2018, SWMD personnel conducted a tracer dye test in the main header of the Phase I LCRS. A fluorescent dye was mixed with water and pumped into the Phase I header through the CO

1-1 intake pipe. Liquid samples were collected at Pump Station A (PS-A), which received discharge from PS-B. An auto-sampler device was used to collect samples at half-hour intervals following the injection of the dye and water mixture. Dye was only injected into the Phase I header and not in any other locations in order to show the dye was coming from the Phase I disposal area.

The dye was visually observed in the sample collected approximately one (1) hour and 45 minutes after the initial dye was injected. Samples from one hour and 15 minutes, one hour and 45 minutes, and two hours and 15 minutes after the initial injection were sent to Environmental Conservation Laboratories in Orlando, Florida for fluorescence analysis under optimal dye observation wavelength.

The laboratory report indicated that the sample collected one hour and 45 minutes following the initial injection of dye contained measurable concentrations of the tracer dye. The study indicates that the Phase I and Phase IV LCRS header pipes convey leachate to the PS-B sump. A memorandum describing the field activities with conclusions and the laboratory report is included as **Appendix 2.**

4.2 PHASE II TRACER DYE TEST

On January 9, 2018, SWMD personnel conducted a dye tracer test in the eastern header of the Phase II LCRS. A fluorescent dye was mixed with water and pumped into the Phase II LCRS through the Pump Station-2 intake pipe at CO 2-1. Samples were collected at PS-A each hour after the injection of the dye and water mixture. The dye was visually observed in the sample collected approximately four (4) hours after the initial dye was injected. Samples from two, three, and four hours after the initial injection were sent to Environmental Conservation Laboratories in Orlando, Florida for fluorescence analysis under optimal dye observation wavelength.

The laboratory report indicated that the sample collected four hours following the initial injection of dye contained measurable concentrations of the tracer dye. The study indicates that the Phase II and Phase III LCRS header pipes convey leachate to the PS-B sump. A memorandum describing the field activities with conclusions and the laboratory report is included as **Appendix 3**.

5.0 FINDINGS

Based on SCS' on-site observation and review of the reports received from FJC, it is our opinion that FJC was able to water pressure clean known LCRS headers. Therefore, no video inspection was deemed necessary.

Following water pressure cleaning of the piping, additional testing of the overall performance of the LCRS in Phases I and II was evaluated using tracer dye testing. These tests show that because the dye was observed in the PS-A wet well within hours of injection, the Phase I and Phase II headers are operational and convey leachate to PS-B for removal.

6.0 CONCLUSION

In conclusion, based on review of the water pressure cleaning and video inspections of the Phases I-VI and Capacity Expansion Area (Sections 7, 8, and 9) LCRS, SCS concurs with the evaluation by FJC that the LCRS piping at the SCLF appears to be conveying leachate to the PS-B sump. The next water pressure cleaning and inspection report of the SCLF LCRS will be completed in November 2023. The cleaning and inspection report will be included with the Operation Permit renewal to be submitted to the FDEP prior to June 2023.

Figures

F:\PROJECT\Hillsborough\09215600.00\Task 2100 – Leachate Management\10.00_Jet Cleaning 2018\CAD\Figure 1 mod NOV 2018.dwg Oct 31, 2018 – 9:44am Layout Name: 1 By: 4288kls

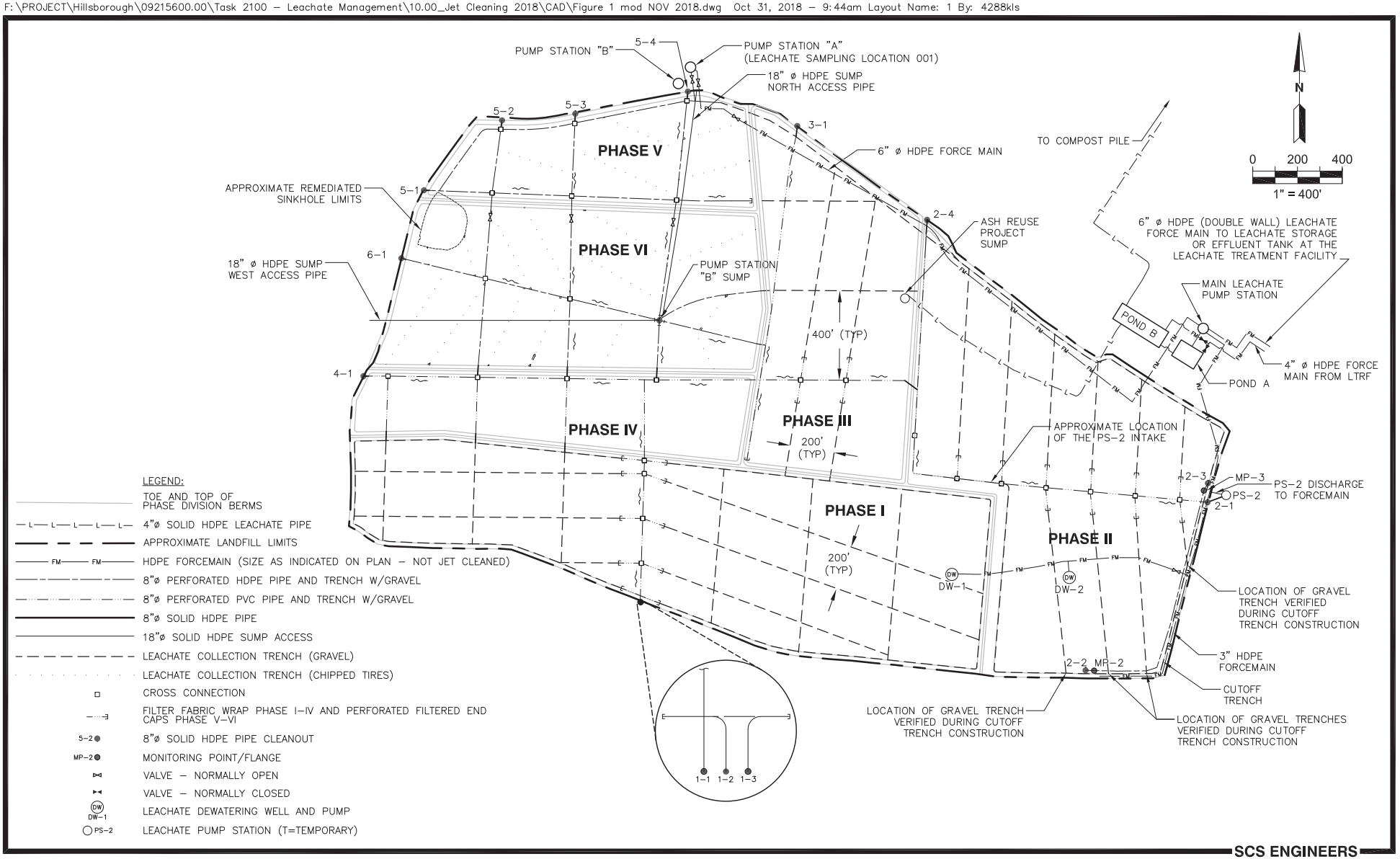
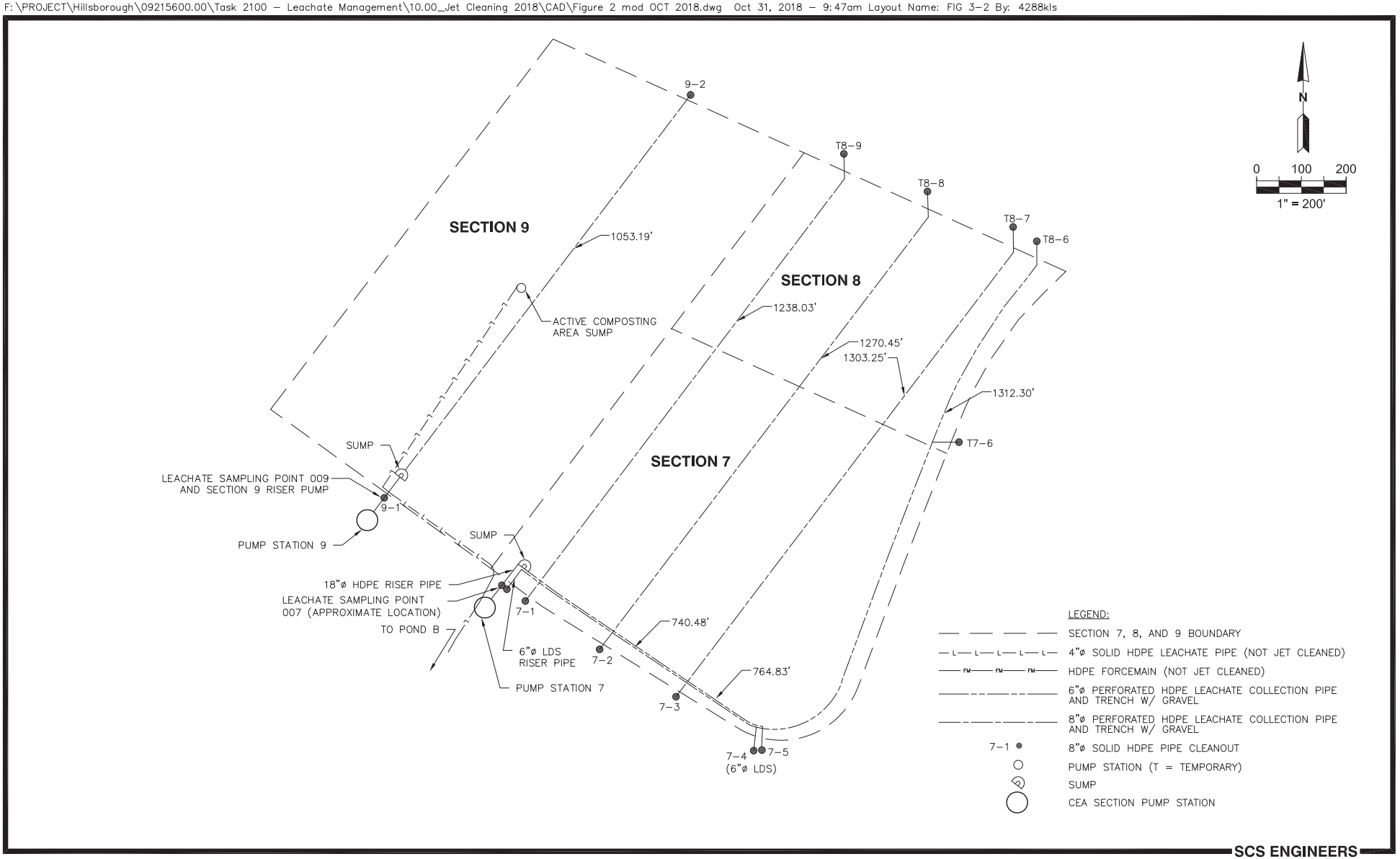


FIGURE 1. PHASES I–VI LEACHATE COLLECTION AND REMOVAL SYSTEM
HILLSBOROUGH COUNTY
NOVEMBER 2018

F:\PROJECT\Hillsborough\09215600.00\Task 2100 – Leachate Management\10.00_Jet Cleaning 2018\CAD\Figure 2 mod OCT 2018.dwg Oct 31, 2018 – 9:47am Layout Name: FIG 3–2 By: 4288kls



SCS ENGINEERS

FIGURE 2. CAPACITY EXPANSION AREA (SECTIONS 7, 8, AND 9) – LEACHATE COLLECTION AND REMOVAL SYSTEM
HILLSBOROUGH COUNTY
NOVEMBER 2018

Appendix 1

2017 and 2018 Florida Jetclean Reports

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

7538 DUNBRIDGE DRIVE
ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

Hillsborough County Solid Waste
Southeast Landfill
Phase 1 Header
2017 Pipe Jetcleaning

Work Performed
March 2017

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

7538 DUNBRIDGE DRIVE
ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 3/23/2017
TO : Larry Ruiz – Hillsborough County Solid Waste Management - SELF
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Southeast Landfill - Phase 1 Header - Jetcleaning Project

Florida Jetclean completed the high-pressure water-jetting of the Phase 1 Header - Access 1, 2 & 3, leachate collection piping on 3/9/2017.

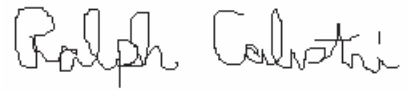
As the below jetting log indicates, the Phase 1 Header piping was jetcleaned as far as possible from the available access locations utilizing high-pressure water-jetting nozzle.

SOUTHEAST LANDFILL – PHASE 1 HEADER
LEACHATE COLLECTION SYSTEM JETTING LOG
JETTING PERFORMED BY FLORIDA JETCLEAN
MARCH 2017

LOCATION	ACHIEVED DISTANCE (ft)	COMMENTS
P1 Header - Access 1	913'	End of pipe reached.
P1 Header - Access 1	91'	End of pipe reached.
P1 Header - Access 1	97'	End of pipe reached.

Please call us with questions or concerns.

Regards,



Ralph Calistri - Florida Jetclean - 800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

Hillsborough County Solid Waste
Southeast Landfill
2017 Phase I LCS Pipe Jetcleaning

Work Performed
June 2017

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 7/13/2017
TO : Larry Ruiz – Hillsborough County Solid Waste Management - SELF
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Southeast Landfill - Phase I - Leachate Pipe Jetcleaning Project

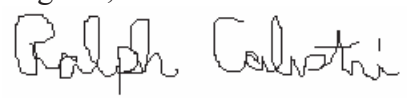
Florida Jetclean completed the high-pressure water-jetting of the Phase I leachate collection pipe at the Hillsborough County Southeast Landfill on 6/28/2017. The below jetting log documents the pipe that was addressed, and the distance that was achieved with the high-pressure water-jetting nozzle in that pipe.

SOUTHEAST LANDFILL
LEACHATE COLLECTION SYSTEM JETTING LOG
JETTING PERFORMED BY FLORIDA JETCLEAN
JUNE 2017

LOCATION	ACHIEVED DISTANCE (ft)	COMMENTS
Phase I CO	985'	Maximum Distance Achievable

Please call us with questions or concerns.

Regards,



Ralph Calistri - Florida Jetclean - 800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

Hillsborough County Solid Waste
Southeast Landfill
2017 CO 2-1 LCS Pipe Jetcleaning

Work Performed
August 2017

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 8/8/2017
TO : Larry Ruiz – Hillsborough County Solid Waste Management - SELF
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Southeast Landfill - CO 2-1 - Leachate Pipe Jetcleaning Project

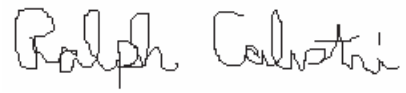
Florida Jetclean completed the high-pressure water-jetting of the CO 2-1 leachate collection pipe at the Hillsborough County Southeast Landfill on 8/3/2017. The below jetting log documents the pipe that was addressed, and the distance that was achieved with the high-pressure water-jetting nozzle in that pipe.

SOUTHEAST LANDFILL
LEACHATE COLLECTION SYSTEM JETTING LOG
JETTING PERFORMED BY FLORIDA JETCLEAN
AUGUST 2017

LOCATION	ACHIEVED DISTANCE (ft)	COMMENTS
CO 2-1	1,107'	Jet Nozzle Stops

Please call us with questions or concerns.

Regards,



Ralph Calistri - Florida Jetclean - 800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

7538 DUNBRIDGE DRIVE
ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

Hillsborough County Solid Waste
Southeast Landfill
Phase I-VI, Section 7-9
Leachate Collection Pipe Maintenance

Work Performed
December 2017 - January 2018

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 1/12/2018
TO : Bob Curtis – SCS Engineers
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Hillsborough County Southeast Landfill – Existing LCS Maintenance

Florida Jetclean was mobilized to the Hillsborough County Southeast County Landfill to conduct high-pressure water-jetting and explosion-proof video-inspection services on the Phase I-VI and Sections 7-9 leachate collection system piping from 12/19/2017 through 1/12/2018. Included in this package is the written report, jetcleaning log, video inspection logs, and the video inspection videos on flash drive for further reference.

High-Pressure Water-Jetting:

The below leachate collection pipe segments were high-pressure jetcleaned their full lengths with achieved distances and notes documented in the jetcleaning log.

LOCATION	DISTANCE ACHIEVED	PIPE TYPE & COMMENTS
Phase I - Cleanout 1-1	666'	8" PVC Header
Phase II - Cleanout 2-1	823'	8” HDPE Header
Phase II - Cleanout 2-2 / 2-3	1,200'	8” HDPE Pipe
Phase IV - Cleanout 4-1	1,965'	8" PVC Header
Phase V - Cleanout 5-1	1,450'	8" PVC Header
Phase V - Cleanout 5-2	1,125'	8" PVC Header
Phase V - Cleanout 5-3	1,200'	8" PVC Header
Phase V - Cleanout 5-4	1,020'	8" PVC Header
Phase V - North Sump Access	1,030'	18” HDPE Pipe
Phase VI - Cleanout 6-1	1,180'	8" PVC Header
Phase VI - West Sump Access	1,200'	18” HDPE Pipe
Section 7-8 - 7-1 to T8-9	1,171'	8" PVC Header
Section 7-8 - 7-2 to T8-8	1,216'	8" PVC Header
Section 7-8 - 7-3 to T8-7	1,243'	8" PVC Header
Section 7-8 - 7-4 to Riser	651'	6" HDPE LDS
Section 7-8 - 7-5 to Sump	658'	8" PVC Header
Section 7-8 - T8-6 to 7-5	1,244'	8" - 6" PVC Header
Section 7-8 - 18" Sump Access	52'	18” HDPE Pipe
Section 7-8 - 6" Riser Access	52'	6" HDPE
Section 9 - 9-1 to 9-2	1,118'	8” HDPE Pipe

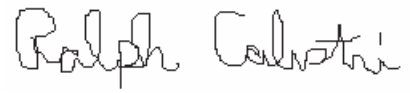
Explosion-proof Video-inspection:

After the high-pressure water-jetting was completed, the below pipe was video-inspected as far as possible utilizing certified explosion-proof video-inspection equipment. The inspection footage on flash drive are included in this package for further review.

LOCATION	DISTANCE ACHIEVED	COMMENTS / RESULT
Phase II – CO 2-1	90.0’	Sand / debris prevents further camera advancement. Recommend additional cleaning and vacuum removal.

Please let us know if you have any questions on the report.

Regards,



Ralph Calistri - Florida Jetclean - 800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
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T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

Hillsborough County Solid Waste
Southeast Landfill
2018 Phase II & III Header Jetcleaning

Work Performed
May 2018

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
WWW.FLORIDAJETCLEAN.COM

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ODESSA, FL 33556
T: 800-226-8013 / F: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 5/29/2018
TO : Larry Ruiz – Hillsborough County SELF, Kollan Spradlin - SCS Engineers
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Southeast Landfill - Phase II & III - Header Pipe Jetcleaning Project

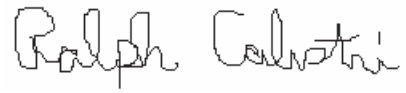
Florida Jetclean was mobilized to the Hillsborough County Southeast Landfill in May 2018 to complete the requested high-pressure water-jetting of the Phase II & Phase III leachate collection header piping. The below jetting log documents the pipes that were addressed, and the distance that was achieved with the high-pressure water-jetting nozzle in each pipe.

SOUTHEAST LANDFILL
LEACHATE COLLECTION SYSTEM JETTING LOG
JETTING PERFORMED BY FLORIDA JETCLEAN
MAY 2018

LOCATION	ACHIEVED DISTANCE (ft)	COMMENTS
CO 2-4 Phase II Header	1,000'	Maximum Distance Achievable
CO 3-1 Phase III Header	1,000'	Maximum Distance Achievable

Please call us with questions or concerns.

Regards,



Ralph Calistri - Florida Jetclean - 800-226-8013

Appendix 2

Phase I Tracer Dye Test Memorandum

Environmental Consultants
and Contractors

3922 Coconut Palm Drive
Suite 102
Tampa, FL 33619

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

SCS ENGINEERS

February 12, 2018
File No. 09215600.05

MEMORANDUM

TO: Mr. Larry Ruiz, S.C.

FROM: Mr. Ken Guilbeault, P.G. KG
Mr. Kollan Spradlin, P.E. KLS

SUBJECT: Phase I Leachate Collection and Recovery System Tracer Dye Test
Southeast County Landfill

CC: Mr. Joe O'Neill, P.E.
File

As requested by the Hillsborough County Public Works Department, Solid Waste Management Division (SWMD), SCS Engineers (SCS) has prepared this memorandum of the observations made during the recent Phase I Leachate Collection and Recovery System (LCRS) tracer dye test at the Southeast County Landfill (SCLF). The tracer dye test was conducted on January 31, 2018. Observations and results of the test are provided below:

BACKGROUND

The SWMD and SCS continue to evaluate the functionality of the SCLF LCRS. This investigation involves flow from areas of Phase I. Leachate collected in Phase I flows by gravity through a header that runs northerly from Phase I, through Phase IV, and into Phase VI. A sump (PS-B) in Phase VI collects the leachate and it is pumped to a wet well (PS-A) on the north side of Phase V. Leachate is pumped from PS-A to the Main Leachate Pump Station (MLPS). From the MLPS, leachate is pumped to the on-site leachate treatment and reclamation facility for treatment and trucking to an off-site wastewater treatment plant. The LCRS is shown on **Figure 1**.

Until recently, inspection of the header pipes in Phases I and II was not practical since there were no cleanouts. The typical design and solid waste rules and regulations at the time Phases I, II, and III were constructed did not require cleanouts. In March 2017, the SWMD excavated along the southern side of the SCLF and located the Phase I header pipe, an 8-inch diameter perforated PVC pipe. At that time, a cleanout riser pipe (CO 1-1) was installed to provide future access to the main LCRS header pipe from the southern side of Phase I.

Subsequent cleaning and inspection of the Phase I header was completed in June 2017 and December 2017. The Phase I header pipe was jet cleaned approximately 985 feet, running south

to north from CO 1-1 in June 2017. Based on the plans of the LCRS, this is the installed length. This indicates that the pipe is not obstructed and leachate along this section is flowing freely.

In order to further assess the Phase I and IV header pipes for the presence of obstructions or restrictions, the SWMD conducted the following tracer dye test. If the header pipe is functioning as designed, a tracer dye inserted at CO 1-1 should be detected at PS-A. An absence of tracer dye in the leachate pumped from PS-B could indicate a liquid conveyance issue within the Phase I or Phase IV LCRS. **Figure 1** provides a plan view of the SCLF LCRS.

FIELD OBSERVATIONS

An SCS representative was on site January 31, 2018, to observe and document the process and the results of the tracer dye test. The photograph log, included as **Attachment 1,** documents the field activities and includes pictures of the auto-sampler and visual documentation of the laboratory results.

Sample Collection Methodology

SWMD personnel set up an auto-sampler device at PS-A to collect leachate samples from the PS-A wet well (**Photograph 1**). The auto sampler was programmed to collect one 500-milliliter sample at the top of each half hour beginning at 10:30 a.m. An initial sample was collected at 10:30 a.m. prior to injecting the fluorescent dye at CO 1-1 (**Photograph 2**). The 10:30 sample was used as a background sample for absorption comparison.

Tracer Dye Injection

SWMD personnel added one gallon of the Bright Dyes Yellow/Green fluorescent dye manufactured by Kingscote Chemicals to a portable water tank containing 1,000 gallons of non-potable water (**Photograph 3**). At 10:45 a.m., the water and dye mixture (dye mixture) was pumped into the header access point. The dye mixture was delivered through a ¾-inch hose inserted approximately 30 feet into a 4-inch HDPE pipe that extended 300 feet into CO 1-1 (**Photograph 4**). SWMD originally intended to use a portable pump connected to the 4-inch HDPE pipe to inject the dye mixture at 10:30 a.m., but technical difficulties with the portable pump required that a smaller pump be utilized to deliver the dye mixture. The 1,000 gallons of dye mixture was pumped into CO 1-1 from 10:45 a.m. to 12:25 p.m. From 12:30 p.m. to 12:48 p.m., the larger portable pump was used to inject an additional 2,000 gallons of non-potable water into the 4-inch HDPE pipe following resolution of the technical difficulties (**Photograph 5**).

Observations and Samples

Visual observations were made at PS-A for the duration of the test. The on-site SCS field representative noted the start and stop times of the PS-B pump cycle. Following each cycle, the on-site SCS field representative observed the color of the liquid within the PS-A wet well. Fluorescent dye was not observed in the first four samples collected (10:30 a.m., 11:00 a.m.,

11:30 a.m., or 12:00 p.m.). The first visual observation of dye within the PS-A wet well was at 12:25 p.m., immediately following a pump cycle and five minutes prior to the 12:30 p.m. sample (**Photograph 6**). The dye was visually observed in the sample collected from PS-A at 12:30 p.m.; one hour and 45 minutes after the initial dye was pumped into CO 1-1.

SWMD personnel and the on-site SCS representative collected representative sub-samples from the auto-sampler at 10:30 a.m., 12:00 p.m., 12:30 p.m., and 1:00 p.m. for laboratory analysis. The samples were transported to Environmental Conservation Laboratories (ENCO) in Orlando, Florida for light absorbance analysis by spectrophotometer under the optimal observation wavelength as published by the tracer dye manufacturer.

The liquid sample collected from the PS-A wet well at 10:30 a.m. was utilized as the control sample due to the fact that was collected from the sampling location prior to the injection of the dye mixture (**Photograph 7**). The auto-sampler device was allowed to continue operation through 1:00 p.m. for a total of six samples. The samples collected at 12:30 p.m. and 1:00 p.m. appeared to have observable dye in the liquid (**Photograph 8 and Photograph 9**). Visual observations were noted and photographs of the samples were taken, but no additional sub-samples were collected for laboratory analysis (**Photograph 10 and Photograph 11**).

LABORATORY RESULTS

The laboratory analysis of the four liquid samples provided as **Attachment 2** indicates that the samples collected prior to 12:30 p.m. did not contain enough of the fluorescent tracer dye to be considered a positive result. Laboratory analysis confirms the visual observation of the presence of dye at the 12:30 p.m. sample. **Table 1** summarizes the raw absorbance at 490nm as measured in absorbance units. The analytical laboratory report and chain of custody are provided as **Attachment 2**. Additional photographs of the samples at the laboratory are included in the laboratory report.

Table 1. Summary of Sample Raw Absorbance Data

Sample Identification	Raw Absorbance at 490nm (Absorbance Units)
1-1 Sample 1 (BG)	0.349
1-1 Sample 2 (12:00 pm)	0.363
1-1 Sample 3 (12:30 pm)	1.164
1-1 Sample 4 (1:00 pm)	2.319

CONCLUSION

The field test and the laboratory results indicate that the tested sections of Phase I and Phase IV LCRS headers appear to be functional and are able to convey liquid from Phase I and Phase IV to PS-B. The leachate is subsequently pumped to PS-A where the dye was observed and verified by laboratory testing approximately one hour and 45 minutes after the initial dye was injected.

Figure 1

F:\PROJECT\Hillsborough\09215600.05 – Active LF\Phase I\1100 – General\3.0 LMP Revisions\CAD\Figure 3.1 171211.dwg Jan 05, 2018 – 9:42am Layout Name: 3–1 By: 4382kkc

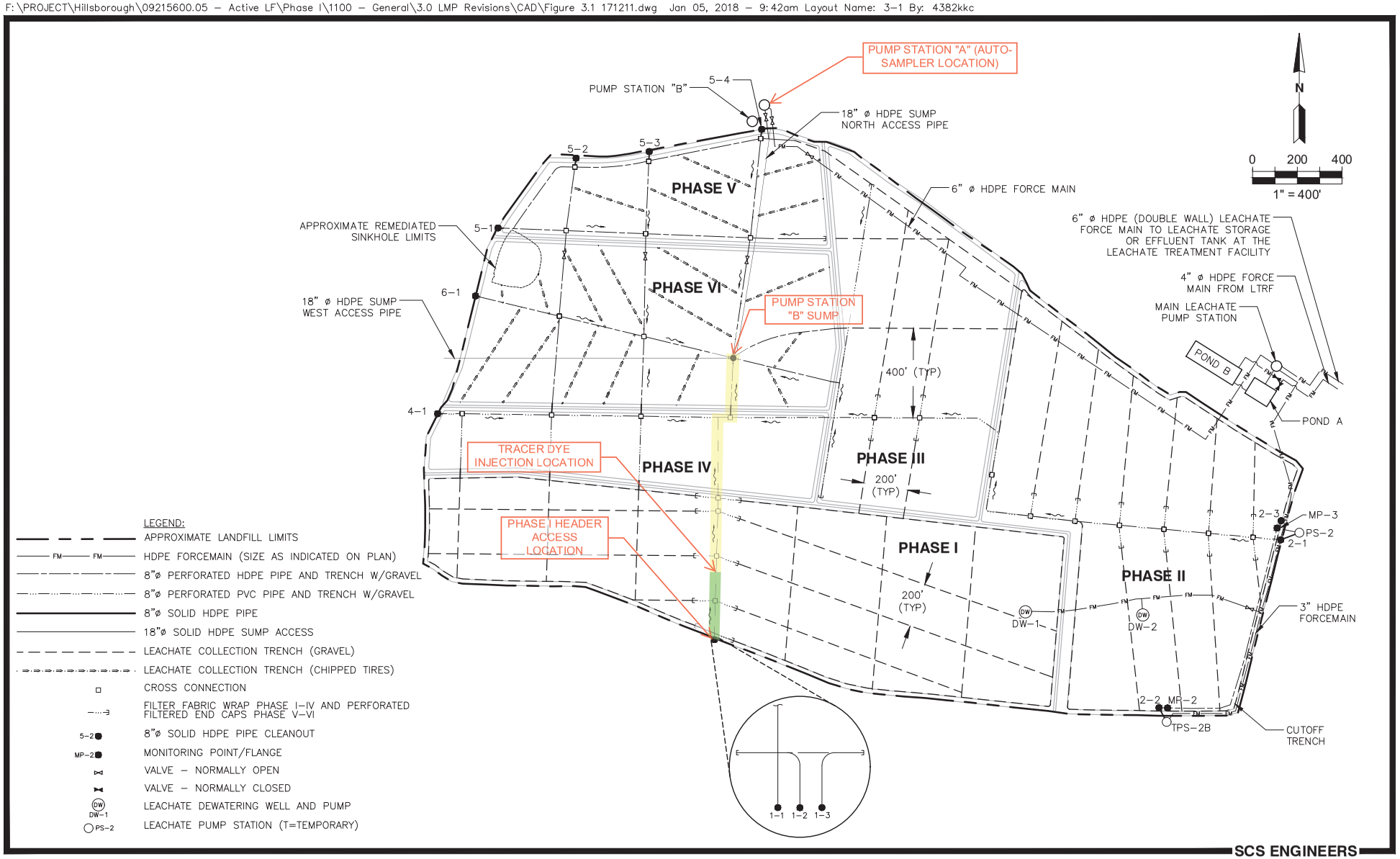


FIGURE 1 – PHASES I–VI LEACHATE COLLECTION SYSTEM
HILLSBOROUGH COUNTY
FEBRUARY 2018

Attachment 1
Photograph Log

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 1. Auto-Sampler Setup on Pump Station A (PS-A)

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 2. Phase I Header Access Point (CO 1-1)

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 3. 1,000 Gallon Portable Tank Used to Mix Water and Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 4. ¾" Hose from the Tank Trailer Pump Delivering the Dye Mixture into CO 1-1

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 5. Portable Pump Used to Inject 2,000 Gallons of Water

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 6. First Observation of Dye in the PS-A Wet Well at 12:25 p.m.

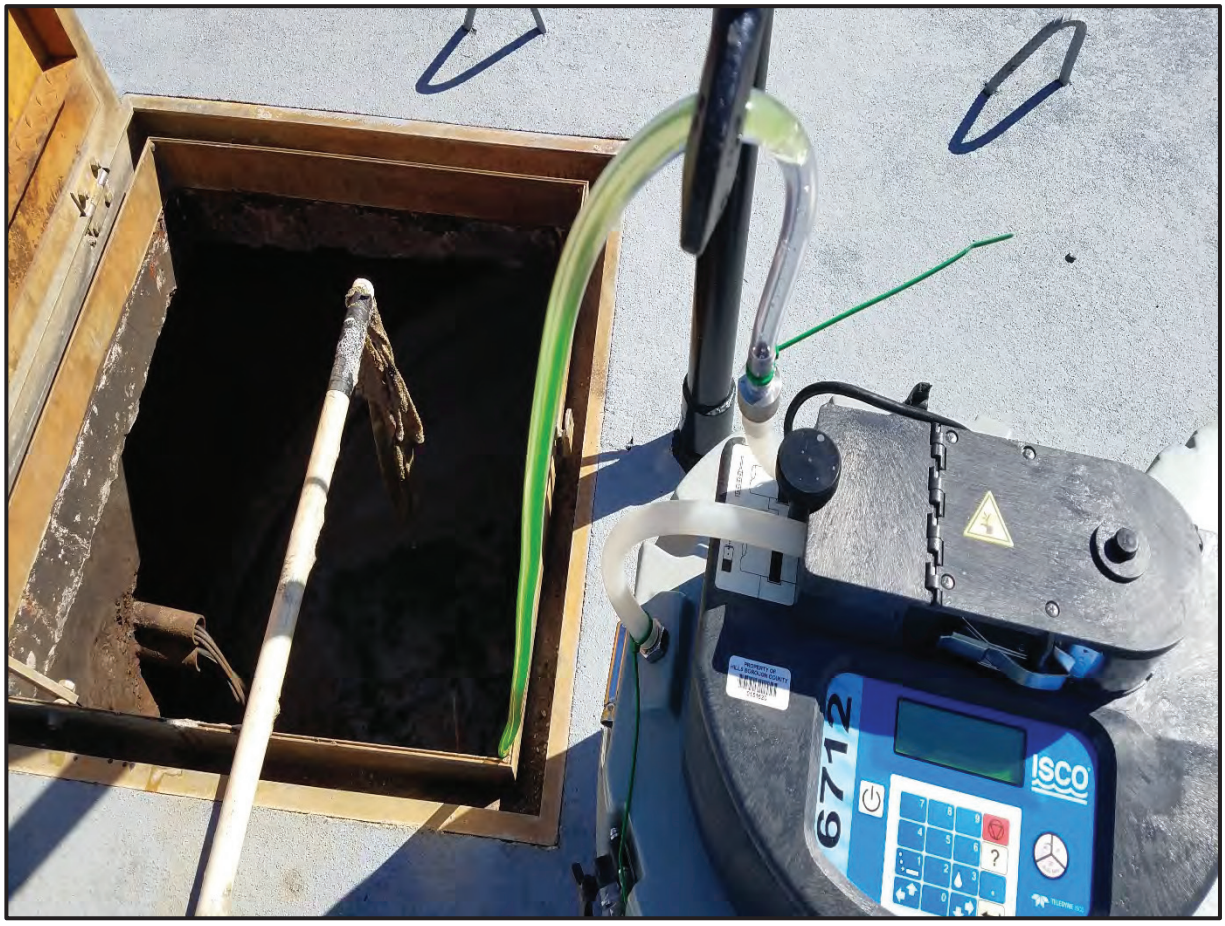
SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 7. 10:30 a.m. Check on Auto-Sampler at PS-A – Used as a Background Sample

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: 09215600.05
Date: 01/31/2018



Photograph 8. 12:30 p.m. Check on Auto-Sampler at PS-A – Observable Fluorescent Dye

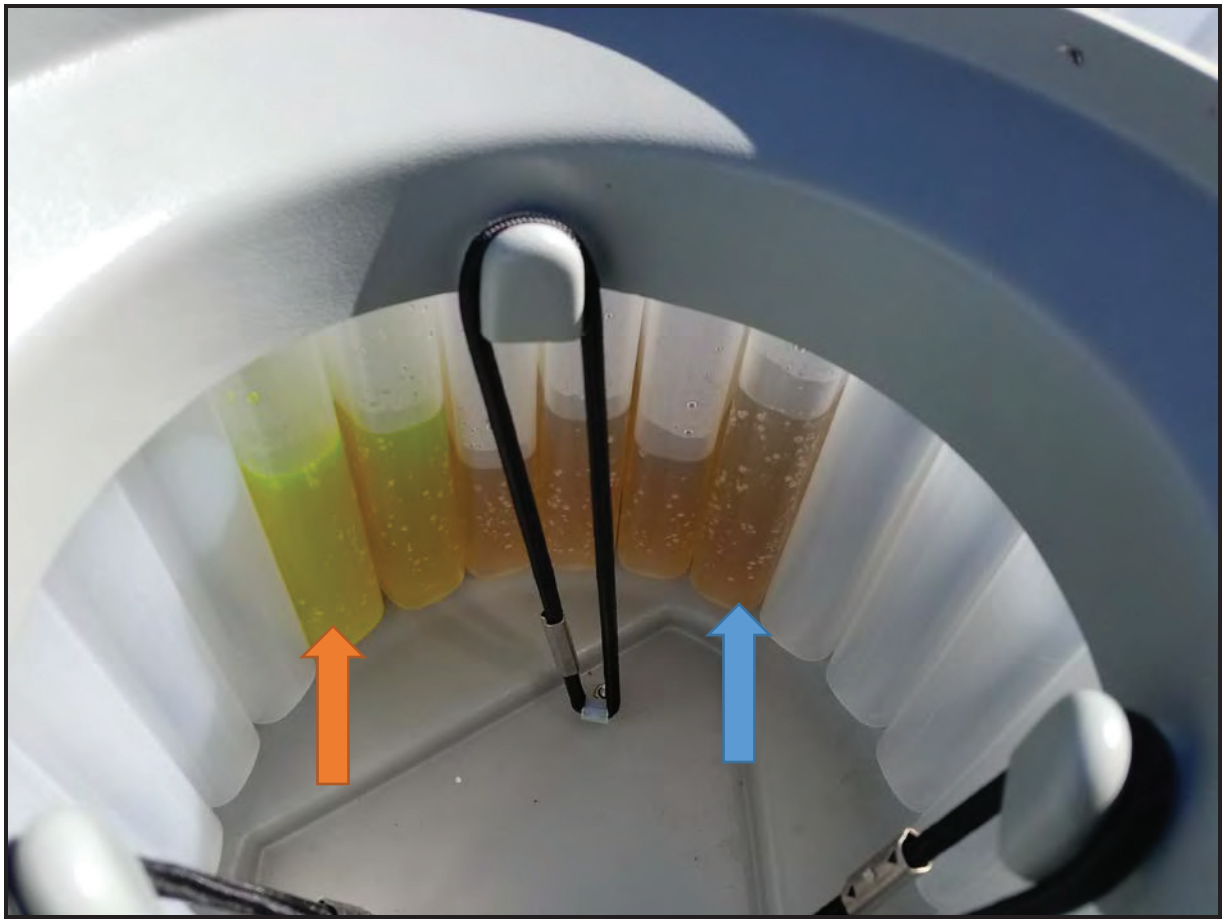
SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 9. 1:00 p.m. Check on Auto-Sampler at PS-A – Observable Fluorescent Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018



Photograph 10. Samples from 10:30 a.m., 11:00 a.m., 11:30 a.m., 12:00 p.m., 12:30 p.m., and 1:00 p.m. The Samples Were Collected Counter-Clockwise. The Blue Arrow Points at the 10:30 Sample and the Orange Arrow Points to the 1:00 p.m. Sample

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase I LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/31/2018

Photograph 11. 1-1 Sample 1 (10:30 a.m.), 1-1 Sample 2 (12:00 p.m.), 1-1 Sample 3 (12:30 p.m.), and 1-1 Sample 4 (1:00 p.m.) Prior to Submission to ENCO

Attachment 2
Laboratory Report

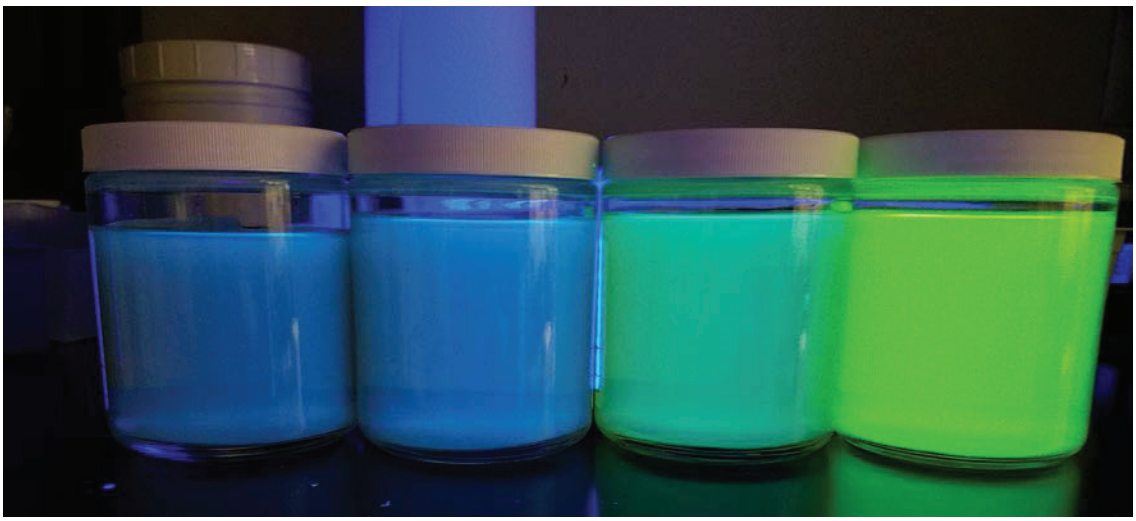
Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 111,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511
www.encolabs.com

February 1, 2018

On February 1, 2018 four samples were received by the laboratory. Container identification matched the provided chain of custody (attached). Sample ID's were as follows: "1-1 Sample 1 (BG)", "1-1 Sample 2", "1-1 Sample 3", "1-1 Sample 4". The intent was to identify the presence of a water tracking dye (Bright Dyes yellow/Green) in each sample. According to the technical bulletin obtained from the manufacturer this can be done visually under UV light and also with the aid of spectrophotometer at wavelength 490nm or 520nm where maximum absorbance occurs. The results obtained are summarized below:

UV Light Detection:

In the image below samples are identified from left to right as "1-1 Sample 1 (BG)", "1-1 Sample 2", "1-1 Sample 3", "1-1 Sample 4". Visual inspection under UV light reveals bright green/yellow luminescence in sample "1-1 Sample 3" and "1-1 Sample 4" while no luminescence was observed in other samples.



Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 111,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511
www.encolabs.com

Absorbance Measurements:

A Hach DR2010 spectrophotometer was utilized to assess light absorbance in each sample at 490nm. The instrument baseline was established with de-ionized water. The absorbance of each sample was assessed immediately thereafter and summarized in the table below.

Sample	Abs_{490}
1-1 Sample 1 (BG)	.349
1-1 Sample 2	.363
1-1 Sample 3	1.164
1-1 Sample 4	2.319

Sample "1-1 Sample 3" and "1-1 Sample 4" exhibited luminescence under UV light. This was confirmed by Visible light spectrophotometer at wavelength 490. Provided sample "1-1 Sample 1 (BG)" is a dye-free sample control then absorbance for sample "1-1 Sample 2" does not suggest the presence of dye.

If any additional information is required please feel free to contact me.

Sincerely,

Matthew Foti, Ph.D.
Operations Director

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

www.encolabs.com

Client Name: SCS Engineers	Project Number: 09215600.05 T1100
Address: 3922 Coconut Palm Dr., Suite 102	Project Name/Desc: SCLF Phase I Dye test
City/ST/Zip: Tampa, FL 33619	PO # / Billing Info: 09215600.05 T1100
Tel: (813) 621-0080 Fax:	Reporting Contact: Darryl Paul & Kollan Spradlin
Sampler(s) Name, Affiliation (Print): Kollan Spradlin, SCS Engineers	Billing Contact: Accounts Payable
Sampler(s) Signature: Kollan Spradlin	Site Location / Time Zone: SCLF

Requested Analyses

Raw Absorbance @ 490 nm

A490

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

___ Standard

___ Expedited

Due ___/___/___

Lab Workorder

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)	Raw Absorbance @ 490 nm	A490	Sample Comments
	1-1 Sample 1 (BG)	1/31/18	10:30	G	WW	1	X		.349	490 nm
	1-1 Sample 2	1/31/18	12:00	G	WW	1	X		.363	490 nm
	1-1 Sample 3	1/31/18	12:30	G	WW	1	X		1.164	490 nm
	1-1 Sample 4	1/31/18	13:00	G	WW	1	X		2.319	490 nm
						4	<-- Total # of Containers			

Sample Kit Prepared By: J Hayden	Date/Time: 1-27-18 0600	Relinquished By: J Hayden	Date/Time: 1-27-18 0600	Received By: Kollan Spradlin	Date/Time: 1/30/18 6:30pm
Comments/Special Reporting Requirements		Relinquished By: Kollan Spradlin	Date/Time: 1/31/18 1523	Received By: Joseph Hayden	Date/Time: 1/31/18 1523
		Relinquished By: Joseph Hayden	Date/Time: 1/31/18 2130	Received By:	Date/Time: 2/1/18 1030
		Cooler #'s & Temps on Receipt		Condition Upon Receipt: ___ Acceptable ___ Unacceptable	

Matrix : **GW**-Groundwater **SO**-Soil **DW**-Drinking Water **SE**-Sediment **SW**-Surface Water **WW**-Wastewater **A**-Air **O**-Other (detail in comments)

Preservation: **I**-Ice **H**-HCl **N**-HNO3 **S**-H2SO4 **NO**-NaOH **O**-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Appendix 3

Phase II Tracer Dye Test Memorandum

Environmental Consultants
and Contractors

3922 Coconut Palm Drive
Suite 102
Tampa, FL 33619

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

SCS ENGINEERS

January 15, 2018
File No. 09215600.05

MEMORANDUM

TO: Mr. Larry Ruiz, SC

FROM: Mr. Ken Guilbeault, P.G.
Mr. Kollan Spradlin, P.E.

SUBJECT: Phase II Leachate Collection and Recovery System Tracer Dye Test
Southeast County Landfill

CC: Mr. Joe O'Neill, P.E.
File

As requested by the Hillsborough County Public Works Department, Solid Waste Management Division (SWMD), SCS Engineers (SCS) has prepared this memorandum of the observations made during the recent Phase II Leachate Collection and Recovery System (LCRS) tracer dye test at the Southeast County Landfill (SCLF). The tracer dye test was conducted from January 9, 2018 through January 10, 2018. Observations and results of the test are provided below:

GOAL: The tracer dye test was conducted to verify and demonstrate connectivity and continuity of the Phase II disposal area leachate collection lines with the Phase III collections lines and ultimately connection with PS-B.

BACKGROUND

The SWMD and SCS continue to investigate possible causes of elevated liquid levels in Phase II of the SCLF as part of on-going corrective actions. Leachate collected in Phase II flows by gravity through a header that runs westerly from Phase II, through Phase III, and into Phase IV. A sump (PS-B) in Phase IV pumps the leachate to a wet well (PS-A) on the north side of Phase V. Leachate is pumped from PS-A to the Main Leachate Pump Station (MLPS). From the MLPS, leachate is pumped to the on-site leachate treatment and reclamation facility for treatment and trucking to an off-site wastewater treatment plant. The LCRS is shown on **Figure 1**.

Until recently, inspection of the header pipes in Phases I and II was not practical since there were no cleanouts. The typical design and solid waste rules and regulations at the time Phases I, II, and III were constructed did not require cleanouts. In July 2017, the SWMD excavated along the east side of the SCLF and located the Phase II header pipe, an 8-inch diameter perforated PVC pipe. At that time, a cleanout riser pipe (CO 2-1) was installed to provide future access to the LCRS from the east side of Phase II. Subsequent cleaning and inspection of the Phase II header was completed in July 2017 and again in December 2017. The Phase II header pipe was jet cleaned approximately 1,100 feet, running

east to west from CO 2-1 in July 2017. This indicates that the pipe is not obstructed and leachate along this section is flowing freely.

In order to further assess and to conclusively demonstrate the Phase II and Phase III header collection pipes are open and conveying leachate to PS-B, the SWMD conducted the following tracer dye test. If the header pipe is functioning as designed, a tracer dye inserted at CO 2-1 should ultimately be detected at PS-A. An absence of tracer dye could indicate a liquid conveyance issue within the Phase II or Phase III LCRS. **Figure 1** provides a plan view of the SCLF LCRS.

FIELD OBSERVATIONS

An SCS representative was on site January 9, 2018 to observe and document the process and the results of the tracer dye test. The photograph log, included as **Attachment 1,** documents the field activities and includes pictures of the auto-sampler and visual documentation of the laboratory results.

Sample Collection Methodology

SWMD personnel setup an auto-sampler device at PS-A to collect leachate samples from the PS-A wet well (**Photograph 1**). The auto sampler was programmed to collect one 500 ml sample at the top of each hour beginning at 11:00 a.m. An initial sample was collected at 11:00 a.m. when the fluorescent dye was first injected into the PS-2 intake pipe at CO 2-1 (**Photograph 2**).

Initial Tracer Dye Injections

SWMD personnel added one gallon of the Bright Dyes Yellow/Green fluorescent dye manufactured by Kingscote Chemicals to a portable water tank containing 1,000 gallons of non-potable water (**Photograph 3 and Photograph 4**). At 11:00 a.m., the water and dye mixture (dye mixture) was pumped into the header access point through the PS-2 intake pipe. By using the PS-2 intake pipe to inject the mixture approximately 800 feet into the header pipe from CO 2-1, the SWMD was able to insert the dye directly into the area of concern and bypass the Phase II cut-off trench. From 12:00 p.m. to 12:15 p.m., an additional 1,000 gallons of dye mixture was pumped into the PS-2 intake pipe.

Additional Tracer Dye Injection

Additional fluorescent dye was injected at PS-2 in order to increase the amount of dye mixture within the Phase II LCRS. At 2:15 p.m., approximately one-half of a Bright Dyes Yellow/Green Dye “Donut” manufactured by Kingscote Chemicals was added to approximately 6,000 gallons of non-potable water and pumped into the PS-2 intake pipe (**Photograph 5 and Photograph 6**).

Observations and Samples

Visual observations were made at the sampler every hour following the initial injection of the dye mixture for indications that the dye had reached PS-A. Fluorescent dye was not observed in the first four samples collected (11:00 a.m., 12:00 p.m., 1:00 p.m., or 2:00 p.m.). The dye was visually observed in the sample collected from PS-A at approximately 3:00 p.m., four hours after the initial dye was pumped into the PS-2 intake pipe.

SWMD personnel collected representative sub-samples from the auto-sampler at 1:00 p.m., 2:00 p.m., and 3:00 p.m. for laboratory analysis (**Photograph 7, Photograph 8, Photograph 9, and Photograph 10**). Additionally, SWMD collected a sample from Monitoring Point 2-2 (MP 2-2) for laboratory analysis. The samples were transported to Environmental Conservation Laboratories (ENCO) in Orlando, Florida for light absorbance analysis by spectrophotometer under the optimal observation wavelength as published by the tracer dye manufacturer.

The liquid sample collected from MP 2-2 was utilized as the control sample as it did not contain observable dye and the sampling location is located up gradient of the injection point (**Photograph 11**). If the Phase II collection system was not flowing, then the dye would backed up and moved outward toward the cut-off trench and MP 2-2. No dye was detected at MP 2-2.

The auto-sampler device was allowed to continue operation through 10:00 a.m. on January 11, 2018 for a total of 48 samples. Visual observations were noted and photographs of the samples were taken, but no additional sub-samples were collected for laboratory analysis (**Photograph 12 and Photograph 13**).

LABORATORY RESULTS

The laboratory analysis of the four liquid samples provided as **Attachment 2** indicates that the samples collected prior to 3:00 p.m. did not contain enough of the fluorescent tracer dye to be considered a positive result (**Photograph 14**). **Table 1** summarizes the raw absorbance at 490nm as measured in absorbance units. The analytical laboratory report is provided as **Attachment 2**.

Table 1. Summary of Sample Raw Absorbance Data

Sample Identification	Raw Absorbance at 490nm (Absorbance Units)
MD (MP 2-2 Control)	0.383
1 (1:00 p.m.)	0.330
2 (2:00 p.m.)	0.311
3 (3:00 p.m.)	1.820

CONCLUSION

- The field observations and the laboratory results indicate that the Phase II and Phase III LCRS headers appear to be functional and are able to convey liquid from Phase II and Phase III to PS-B.
- The conclusion is based upon definitive visual observation of the color change in the samples as well as confirmable laboratory testing of the samples collected from PS-A.
- The leachate is subsequently pumped to PS-A where the dye was observed and verified by laboratory testing approximately four hours after the initial dye was injected.

RECOMMENDATIONS

SCS recommends additional tracer dye testing in Phase I to assess the liquid conveyance capability of the Phase I LCRS. Although cleaning and inspections of the Phase I header in July 2017 showed no obstructions or blockages, a tracer dye test will confirm if the Phase I and IV header is functioning properly. Sufficient time to purge PS-B and PS-A of residual tracer dye is required prior to commencing the Phase I tracer dye test. The Phase I tracer dye test can follow a similar procedure as the Phase II tracer dye test, with the dye mixture injected into cleanout CO 1-1.

Figure 1

F:\PROJECT\Hillsborough\09215600.05 – Active LF\Phase I\1100 – General\3.0 LMP Revisions\CAD\Figure 3.1 171211.dwg Jan 05, 2018 – 9:42am Layout Name: 3–1 By: 4382kkc

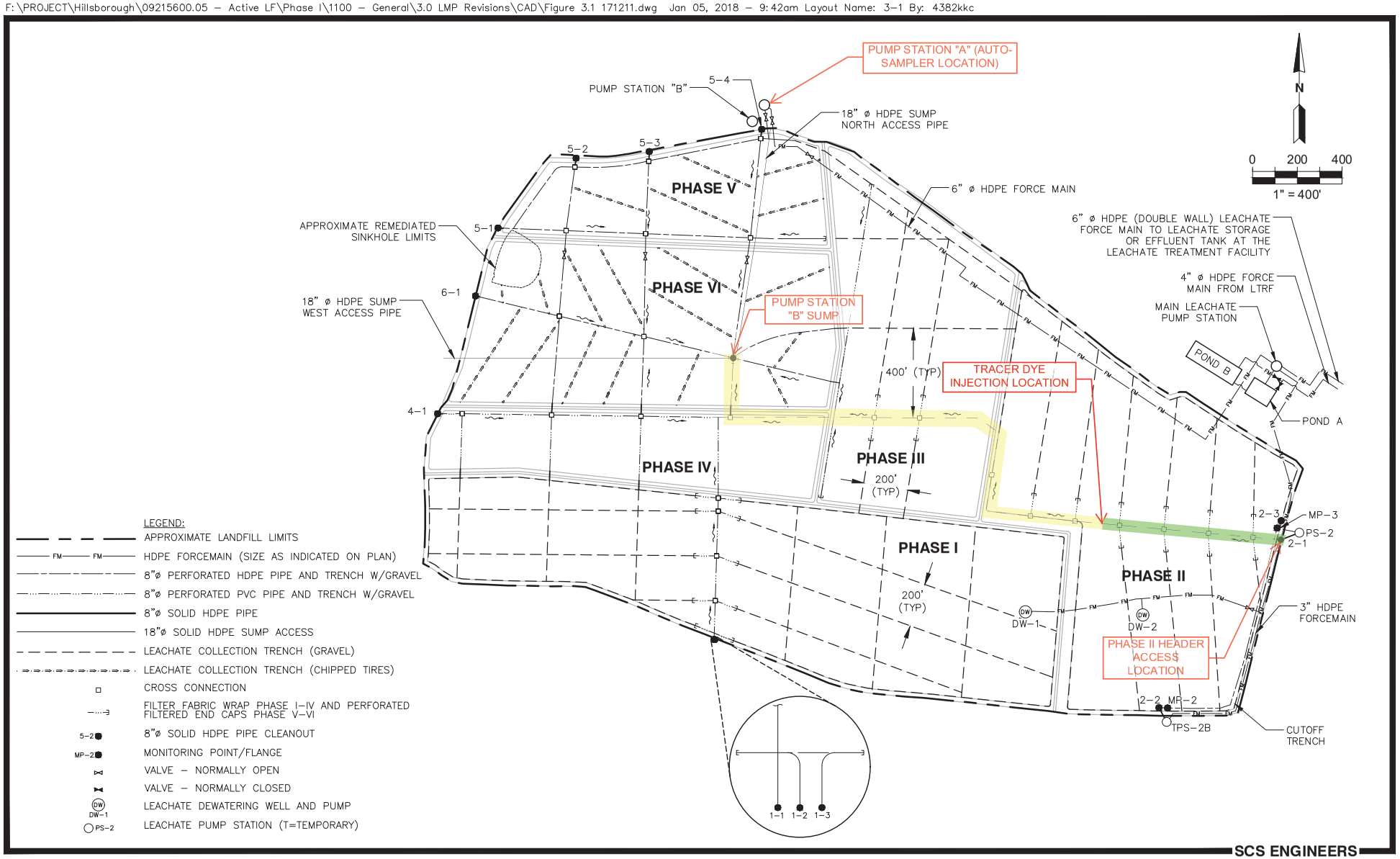


FIGURE 1 – PHASES I–VI LEACHATE COLLECTION SYSTEM
HILLSBOROUGH COUNTY
JANUARY 2018

Attachment 1
Photograph Log

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 1. Auto-Sampler Setup on Pump Station A (PS-A)

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: 09215600.05
Date: 01/09/2018

Photograph 2. Phase II Header Access Point (CO 2-1)

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 3. 1,000 Gallon Portable Tank Used to Mix Water and Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: 09215600.05
Date: 01/09/2018

Photograph 4. Kingscote Chemicals Bright Dyes Yellow/Green Fluorescent Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 5. Tank Truck Used to Pump 6,000 Gallons of Water with Tracer Dye "Donut" into the Phase II Header Access Point

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 6. Kingscote Chemicals Bright Dyes Yellow/Green Fluorescent Dye "Donuts"

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 7. 1:00 p.m. Check on Auto-Sampler at PS-A - No Observable Fluorescent Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 8. 2:00 p.m. Check on Auto-Sampler at PS-A – No Observable Fluorescent Dye

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 9. 3:00 p.m. Check on Auto-Sampler at PS-A –Fluorescent Dye Present

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 10. SWMD Collects Sample 1 (1:00 p.m.), 2 (2:00 p.m.), and 3 (3:00 p.m.) from the Auto-Sampler for Laboratory Analysis

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/09/2018

Photograph 11. SWMD Collects a Control Sample from MP 2-2 (Sample ID "MD")

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/10/2018

Photograph 12. Auto-Sampler Device Samples for the First 24 Hours (01/09/2018 - 01/10/2018). Arrow Indicates the 01/09/2018 12:00 p.m. Sample (Second Sample) and Advances Counter-Clockwise at One Sample per Hour. The 11:00 a.m. Sample (First Sample) is Directly to the Right of the Arrow.

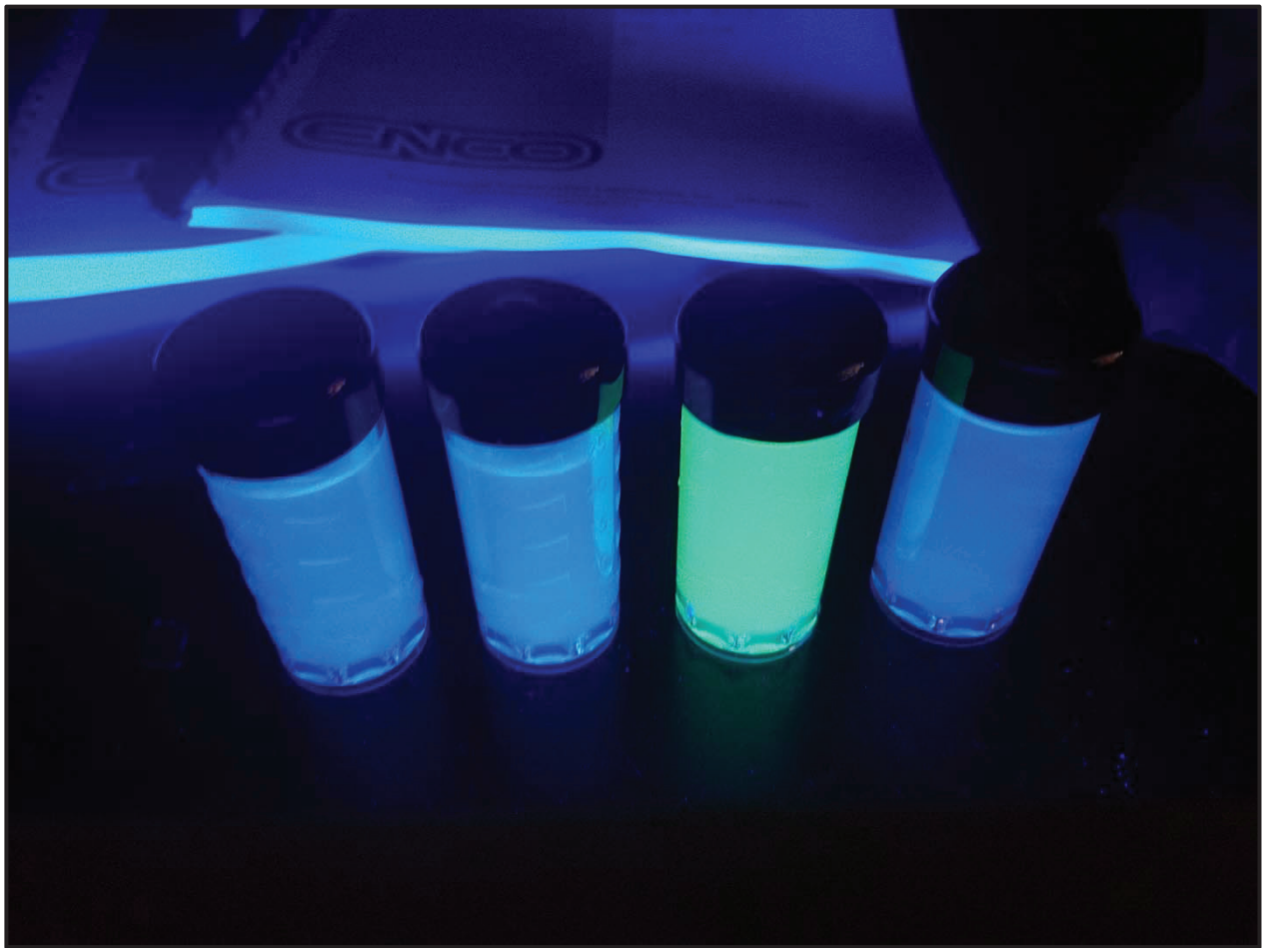
SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test **Project Number:** **09215600.05**
Owner: Hillsborough County **Date:** 01/11/2018

Photograph 13. Auto-Sampler Device Samples for 24-48 Hours (01/10/2018 – 01/11/2018). Arrow Indicates the 01/10/2018 11:00 a.m. Sample and Advances Counter-Clockwise at One Sample Per Hour.

SCS ENGINEERS PHOTO LOG

Project: SCLF Phase II LCRS Tracer Dye Test
Owner: Hillsborough County
Project Number: **09215600.05**
Date: 01/11/2018



Photograph 14. Samples Listed Left to Right – 1 (1:00 p.m.), 2 (2:00 p.m.), 3 (3:00 p.m.), and MD (MP 2-2 Control) as Analyzed

Attachment 2
Laboratory Report

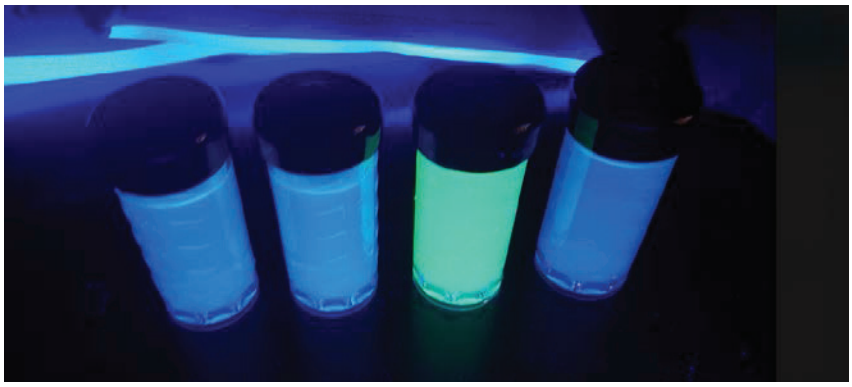
Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 111,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511
www.encolabs.com

January 12, 2018

On January 11, 2018 four samples were received by the laboratory. Container identification matched the provided chain of custody (attached). Sample ID's were as follows: "1", "2", "3", "MD". The intent was to identify the presence of a water tracking dye (Bright Dyes yellow/Green) in each sample. According to the technical bulletin obtained from the manufacturer this can be done visually under UV light and also with the aid of spectrophotometer at wavelength 490nm or 520nm where maximum absorbance occurs. The results obtained are summarized below:

UV Light Detection:

In the image below samples are identified from left to right as "1", "2", "3", "MD". Visual inspection un UV light reveals bright green/yellow luminescence in sample "3" while no luminescence was observed in other samples.



Absorbance Measurements:

A Hach DR2010 spectrophotometer was utilized to assess light absorbance in each sample at 490nm. The instrument baseline was established with de-ionized water. The absorbance of each sample was assessed immediately thereafter and summarized in the table below.

Sample	Abs_{490}
1	.330
2	.311
3	1.82
MD	.383

Sample "MD" was identified by the client as a 'dye-free' control sample. This sample exhibited an absorbance greater than samples "1" and "2" suggesting no dye could be detected in those samples. Sample "3" however demonstrated very high absorbance confirming the visual UV result and the presence of yellow/green dye.

If any additional information is required please feel free to contact me.

Sincerely,

Matthew Foti, Ph.D.
Operations Director

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

www.encolabs.com

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

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(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

Client Name: SCS	Project Number:
Address: 3922 Coconut Palm Dr, Suite 102	Project Name/Desc: SE Landfill
City/ST/Zip: Tampa, FL 33619	PO # / Billing Info:
Tel: 813-955-4906 Fax:	Reporting Contact: Ksprad lin@scsengineers.com Kollan Spradlin
Sampler(s) Name, Affiliation (Print): ~~D~~ Hillsborough County	Billing Contact:
Sampler(s) Signature:	Site Location / Time Zone:

Requested Analyses

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

X Standard

___ Expedited

Due ___/___/___

Lab Workorder

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)	Sample Comments
							4490	
	1	1-09-18	1300	G	GW	1	.330	
	2	↓	1400	G	GW	1	.311	
	3		1500	G	GW	1	1.82	
	MD	↓	1615	G	GW	1	.383	
							<-- Total # of Containers	

Sample Kit Prepared By	Date/Time	Relinquished By: Darryl Paul	Date/Time: 01018 1030	Received By: Joanne Heyden	Date/Time: 1/10/18 1030
Comments/Special Reporting Requirements: MD is control sample. See Matt for instructions on analysis		Relinquished By: Joanne Heyden	Date/Time: 1/10/18 2130	Received By: Dale M. Daniels	Date/Time: 1-11-18 0800
		Relinquished By	Date/Time	Received By	Date/Time

Cooler #'s & Temps on Receipt: C255 18.6°C

Condition Upon Receipt: ___ Acceptable ___ Unacceptable

Matrix : **GW**-Groundwater **SO**-Soil **DW**-Drinking Water **SE**-Sediment **SW**-Surface Water **WW**-Wastewater A-Air **O**-Other (detail in comments)

Preservation: **I**-Ice **H**-HCl **N**-HNO3 **S**-H2SO4 **NO**-NaOH **O**-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist