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December 12, 2012

Mr. F. Thomas Lubozynski, P.E.
Waste Program Administrator
Florida Department of Environmental Protection ("Department")
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767

Subject: **FDEP Application for Extended Period Renewal of Operations Permit for a Solid Waste Disposal Facility- FDEP Permit No. SO64-0078767-023 Tomoka Farms Road Landfill (TFRLF) North Cell Class I Disposal Area Volusia County Solid Waste Division**

Dear Mr. Lubozynski:

On behalf of the Volusia County Solid Waste Division, we are submitting four (4) copies of an FDEP Application, engineering report and supporting documents to renew the FDEP Solid Waste Facility Operations Permit for the North Cell Class I disposal area in TFRLF. We request the permit duration to be twenty (20) years of operations for the approximate 90.9-acre contiguous North Cell Class I solid waste disposal area.

The North Cell Class I solid waste disposal area is comprised of the original North Cell covering 43.2 acres, the 26-acre Phase I expansion, and the 21.7-acre Phase II expansion. Currently, the original cell and the Phase I expansion are in operation, and Phase II expansion is under construction. The construction of Phase-II expansion is anticipated to be completed by 2015. This long-term Operations Permit application is prepared to cover the existing and future solid waste disposal operations for the entire North Cell predicated on acceptance of certification of completion of construction for the Phase II by FDEP. It is requested that the fill operations of the Phase II expansion area be included in the long-term Operations Permit for the North Cell Class I solid waste disposal area.

The Department has recently renewed the sequential closure permit for the North Cell covering three (3) phases of closing construction as final permitted elevations are achieved. It is requested that the general and specific conditions of the North Cell closing construction permit be consolidated into the long-term Operations Permit. Based on the results of the October 22, 2012 pre-application discussions, the County will notify the Department prior to construction of a sequential closing and will submit the certification of completion of construction after each construction event.

In addition, based on the result of our discussion at the pre-application meeting, we are submitting the North Cell landfill gas master plan for future expansion and improvements of the LFG management and control system. We request that the LFG master plan be integrated into the long-term Operations Permit. The County will notify the Department prior to construction of each landfill gas collection system expansion and will submit the certification of completion of construction after each construction event.

Volusia County Check No. 638837, dated December 7, 2012 for the amount of $10,000 is submitted as application fee for the initial five (5) year period. Notice of Application will be published in a local newspaper of general circulation, upon receipt of notification from FDEP to publish the Notice of Application.

If you have any questions, please advice.

Sincerely,

NEEL-SCHAFFER, INC.

Mehran (Ron) S. Beladi, PE
Vice-President
Sr. Engineer Manager

Copy:

Mr. Richard Tedder, P.E., FDEP, Solid Waste Program Administrator, Tallahassee
Mr. Lenny Marion, Director, Volusia County Solid Waste Division (SWD)
Mr. Junos Reed, P.E., Operations Manager, Volusia County SWD
Ms. Jenifer Stirk, Permit Compliance, Volusia County SWD

Volusia County
FLORIDA

CATEGORY	VENDOR	CHECK DATE	CHECK NO:
SW	92091600030	12/07/2012	000000000638837

PAYMENT DOCUMENT	REFERENCE DOCUMENT	INVOICE NBR	CHECK DESCRIPTION	ACCOUNT NUMBER	AMOUNT
GAX 760 D-118258		12042012	Operations Permit Renew NCell@ Tomoka Farms Rd. Landfill. FDEP62-701.315(2) & #5064-9078767-023	450 760 5000 3104	10,000.00

GRAND TOTAL $10,000.00

STATE SALES TAX CERTIFICATION OF EXEMPTION NO. 85-8012622393C-9

Volusia County
FLORIDA
DeLand, Florida

Bank of America, N.A.
Daytona Beach, Florida 32114

CHARGEABLE TO: ACCOUNTS PAYABLE ACCOUNT

ACCOUNTS PAYABLE
ACCOUNT

Not Valid After 90 Days

Date	Number
12-07-2012	638837

AMOUNT
$******10,000.00

Ten Thousand And 00/100 Dollars

VENDOR NUMBER 92091600030

PAY TO THE ORDER OF: FLORIDA DEPT OF ENVIRONMENTAL PROTECTION
3319 MAGUIRE BLVD. SUITE 232
ORLANDO, FL 32803-3767

Charlene Weaver

⑈638837⑈ ⑆063100277⑆ 0055027186 62⑈ ⑈0001000000⑈

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Florida Department of Environmental Protection

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

DEP Form #: 62-701.900(1), F.A.C.

Form Title: Application to Construct, Operate, Modify, or Close a Solid Waste Management Facility

Effective Date: January 6, 2010

Incorporated in Rule: 62-701.330(3), F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION TO CONSTRUCT, OPERATE, MODIFY, OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

APPLICATION INSTRUCTIONS AND FORMS

Northwest District
160 Governmental 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 Pkwy
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 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

INSTRUCTIONS TO APPLY FOR A SOLID WASTE MANAGEMENT FACILITY PERMIT

I. General

Solid Waste Management Facilities shall be permitted pursuant to Section 403.707, Florida Statutes,(FS) and in accordance with Florida Administrative Code (FAC) Chapter 62-701. A minimum of four copies of the application shall be submitted to the Department's District Office having jurisdiction over the facility. The appropriate fee in accordance with Rule 62-701.315, FAC, shall be submitted with the application by check made payable to the Department of Environmental Protection (DEP).

Complete appropriate sections for the type of facility for which application is made. Entries shall be typed or printed in ink. All blanks shall be filled in or marked "not applicable" or "no substantial change". Information provided in support of the application shall be marked "submitted" and the location of this information in the application package indicated. The application shall include all information, drawings, and reports necessary to evaluate the facility. Information required to complete the application is listed on the attached pages of this form.

II. Application Parts Required for Construction and Operation Permits

A. Landfills and Ash Monofills - Submit Parts A through S
B. Asbestos Monofills - Submit Parts A,B,C,D,E,F,I,K,M, O through S
C. Industrial Solid Waste Disposal Facilities - Submit Parts A through S

NOTE: Portions of some Parts may not be applicable.

NOTE: For facilities that have been satisfactorily constructed in accordance with their construction permit, the information required for A, B and C type facilities does not have to be resubmitted for an operation permit if the information has not substantially changed during the construction period. The appropriate portion of the form should be marked "no substantial change".

III. Application Parts Required for Closure Permits

A. Landfills and Ash Monofills - Submit Parts A,B,L, N through S
B. Asbestos Monofills - Submit Parts A,B,M, O through S
C. Industrial Solid Waste Disposal Facilities - Submit Parts A,B, L through S

NOTE: Portions of some Parts may not be applicable.

IV. Permit Renewals

The above information shall be submitted at time of permit renewal in support of the new permit. However, facility information that was submitted to the Department to support the expiring permit, and which is still valid, does not need to be re-submitted for permit renewal. Portions of the application not re-submitted shall be marked "no substantial change" on the application form.

V. Application Codes

S	-	Submitted
LOCATION	-	Physical location of information in application
N/A	-	Not Applicable
N/C	-	No Substantial Change

VI. LISTING OF APPLICATION PARTS

PART A: GENERAL INFORMATION

PART B: DISPOSAL FACILITY GENERAL INFORMATION

PART C: PROHIBITIONS

PART D: SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL

PART E: LANDFILL PERMIT REQUIREMENTS

PART F: GENERAL CRITERIA FOR LANDFILLS

PART G: LANDFILL CONSTRUCTION REQUIREMENTS

PART H: HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS

PART I: GEOTECHNICAL INVESTIGATION REQUIREMENTS

PART J: VERTICAL EXPANSION OF LANDFILLS

PART K: LANDFILL OPERATION REQUIREMENTS

PART L: WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS

PART M: SPECIAL WASTE HANDLING REQUIREMENTS

PART N: GAS MANAGEMENT SYSTEM REQUIREMENTS

PART O: LANDFILL CLOSURE REQUIREMENTS

PART P: OTHER CLOSURE PROCEDURES

PART Q: LONG-TERM CARE

PART R: FINANCIAL ASSURANCE

PART S: CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
APPLICATION FOR A PERMIT TO CONSTRUCT, OPERATE, MODIFY OR CLOSE
A SOLID WASTE MANAGEMENT FACILITY

Please Type or Print

PART A. GENERAL INFORMATION

1. Type of disposal facility (check all that apply):

☑ Class I Landfill
☐ Class III Landfill
☐ Industrial Solid Waste
☐ Other Describe:
☐ Ash Monofill
☐ Asbestos Monofill

NOTE: Waste Processing Facilities should apply on Form 62-701.900(4), FAC;
Land Clearing Disposal Facilities should notify on Form 62-701.900(3), FAC;
Compost Facilities should apply on Form 62-701.900(10), FAC; and
C&D Disposal Facilities should apply on Form 62-701.900(6), FAC

2. Type of application:

☐ Construction
☑ Operation
☐ Construction/Operation
☐ Closure
☐ Long-term Care Only

3. Classification of application:

☐ New
☑ Renewal
☐ Substantial Modification
☐ Intermediate Modification
☐ Minor Modification

4. Facility name: Tomoka Farms Road Landfill-North Cell Class I Solid Waste Disposal Area

5. DEP ID number: 27540 County: Volusia

6. Facility location (main entrance):
1990 Tomoka Farms Road, Port Orange, Florida, 32128
Located on C.R. 415 (Tomoka Farms Road) approximately 3 miles south of U.S. 92.

7. Location coordinates:

Section: 09 Township: 16S Range: 32E

Latitude: 29° 7' 42.27" Longitude: 81° 4' 54.49"

Datum: NAD83/90(E),NGVD29 Coordinate Method: ARCINFO

Collected by: Joseph Zapert, P.L.S. Company/Affiliation: Sliger & Associates, Inc.

8. Applicant name (operating authority): Volusia County Solid Waste Division

Mailing address: 3151 East New York Avenue (S.R. 44) Deland Florida 32724
Street or P.O. Box City State Zip

Contact person: Mr. Leonard Marion Telephone: (386) 943-7889

Title: Director of Solid Waste Services

lmarion@volusia.org
E-Mail address (if available)

9. Authorized agent/Consultant: Neel-Schaffer, Inc.

Mailing address: 2301 Lucien way, Suite 300 Maitland Florida 32751
Street or P.O. Box City State Zip

Contact person: Mehran (Ron) S. Beladi Telephone: (407) 647-6623

Title: Sr. Engineer Manager

ron.beladi@neel-schaffer.com
E-Mail address (if available)

10. Landowner (if different than applicant): Not Applicable

Mailing address: Not Applicable
Street or P.O. Box City State Zip

Contact person: Not Applicable Telephone: ( ) Not Applicable

E-Mail address (if available)

11. Cities, towns and areas to be served:
Incorporated and unincorporated areas of Volusia County (including City of Deltona beginning in FY 2013). Class I solid waste originating in Flagler County is also accepted.

12. Population to be served:

Current: 597,000 Five-Year Projection: 647,800

13. Date site will be ready to be inspected for completion: Phase II at construction completion

14. Expected life of the facility: 20 years

15. Estimated costs:

Total Construction: $ 8,400,000 Closing Costs: $ 9,550,000

16. Anticipated construction starting and completion dates:

From: October 2014(Phase II-Areas 3&4, 21.7Acres) To: October 2015

17. Expected volume or weight of waste to be received:

_____ yds^3/day 1,100 tons/day _____ gallons/day

PART B. DISPOSAL FACILITY GENERAL INFORMATION

1. Provide brief description of disposal facility design and operations planned under this application:
The purpose of application is to request renewal of the current operations permit (Permit No. SO64-0078767-023) for North Cell Class I disposal area at Tomoka Farms Road Landfill (TFRLF), and to obtain a 20-year FDEP Solid Waste Operations Permit for continued operation of the original North Cell area (43.2 acres), Phase I expansion area (26 acres), and future operations of Phase II expansion area (21.7 acres) resulting in a contiguous North Cell Class I disposal area covering 90.9 acres. In addition, it is requested the general and specific conditions of the North Cell Sequential Closure Permit (SF64-0078767-027 & 028) be consolidated into this long-term Operations Permit in order to allow the County to construct the final cover system as permitted sequentially through final closure on areas where the final permitted elevations have been achieved. It is also requested this long-term Operations Permit integrate the North Cell Landfill Gas(LFG) Master Plan, submitted as part of this application, to enable the County to construct the LFG system expansions for the North Cell Class I disposal area as needed during the life of the Operations Permit in compliance with the TFRLF Air Operation Permit (Title-V permit) to control surface emissions and odor. The fill sequence plan for the entire North Cell disposal area submitted to FDEP in 2009 is resubmitted with this application without change as a reference to be incorporated into this long-term Operations Permit.

2. Facility site supervisor: Mr. Junos Reed, P.E.

Title: Operations Manager Telephone: (386) 947-2952

jreed@volusia.org
E-Mail address (if available)

3. Disposal area: Total 90.9 acres; Used 69.2 acres; Available 21.7 acres.

4. Weighing scales used: ☑ Yes ☐ No

5. Security to prevent unauthorized use: ☑ Yes ☐ No

6. Charge for waste received: _____ $/yds^3 34 $/ton

7. Surrounding land use, zoning:

☐ Residential ☑ Industrial
☑ Agricultural ☐ None
☐ Commercial ☐ Other Describe:

8. Types of waste received:

☑ Household ☐ C & D debris
☑ Commercial ☑ Shredded/cut tires
☐ Incinerator/WTE ash ☐ Yard trash
☐ Treated biomedical ☐ Septic tank
☑ Water treatment sludge ☑ Industrial

S	LOCATION	N/A	N/C	PART D CONTINUED
☑	Section 2.3.	☐	☐	2. Engineering and/or professional certification (signature, date and seal) provided on the applications and all engineering plans, reports and supporting information for the application; (62-701.320(6),FAC)
☑	Section 2.4.	☐	☐	3. A letter of transmittal to the Department; (62-701.320(7)(a),FAC)
☑	Section 2.5 & Application Form	☐	☐	4. A completed application form dated and signed by the applicant; (62-701.320(7)(b),FAC)
☑	Section 2.6	☐	☐	5. Permit fee specified in Rule 62-701.315, FAC in check or money order, payable to the Department; (62-701.320(7)(c),FAC)
☑	Section 2.7 and Application Report	☐	☐	6. An engineering report addressing the requirements of this rule and with the following format: a cover sheet, text printed on 8 1/2 inch by 11 inch consecutively numbered pages, a table of contents or index, the body of the report and all appendices including an operation plan, contingency plan, illustrative charts and graphs, records or logs of tests and investigations, engineering calculations; (62-701.320(7)(d),FAC)
☑	Section 2.8 & Attach C. (Closure Plan by reference)	☐	☐	7.Operation Plan and Closure Plan; (62-701.320(7)(e)1,FAC)
☑	Section 2.9 & Attach C.	☐	☐	8. Contingency Plan; (62-701.320(7)(e)2,FAC)
☑	Section 2.10, Attachment B & Attach. C (Ops. Plan)	☐	☐	9. Plans or drawings for the solid waste management facilities in appropriate format (including sheet size restrictions, cover sheet, legends, north arrow, horizontal and vertical scales, elevations referenced to NGVD 1929) showing; (62-701.320(7)(f),FAC)
☑	Attachment B	☐	☐	a. A regional map or plan with the project location in relation to major roadways and population centers;
☑	Attachment B	☐	☐	b. A vicinity map or aerial photograph no more than 1 year old showing the facility site and relevant surface features located within 1000 feet of the facility;
☑	Attachment B property Boundary Information	☐	☐	c. A site plan showing all property boundaries certified by a Florida Licensed Professional Surveyor and Mapper; and
☑	Application Report and Attachments	☐	☐	d. Other necessary details to support the engineering report, including referencing elevations to a consistent, nationally recognized datum and identifying the method used for collecting latitude and longitude data.

S	LOCATION	N/A	N/C	PART G CONTINUED
☐	_____	☑	☐	(3) Manufacturing and fabrication specifications including geomembrane raw material and roll QA, fabrication personnel qualifications, seaming equipment and procedures, overlaps, trial seams, destructive and nondestructive seam testing, seam testing location, frequency, procedure, sample size and geomembrane repairs;
☐	_____	☑	☐	(4) Geomembrane installation specifications including earthwork, conformance testing, geomembrane placement, installation personnel qualifications, field seaming and testing, overlapping and repairs, materials in contact with geomembrane and procedures for lining system acceptance;
☐	_____	☑	☐	(5) Geotextile and geogrid specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;
☐	_____	☑	☐	(6) Geonet and geocomposite specifications including handling and placement, conformance testing, stacking and joining, repair, and placement of soil materials and any overlying materials;
☐	_____	☑	☐	(7) Geosynthetic clay liner specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil material and any overlying materials;
	Section 4.7			
☐	_____	☑	☐	f. Standards for soil liner components (62-710.400(3)(f),FAC):
☐	_____	☑	☐	(1) Description of construction procedures including overexcavation and backfilling to preclude structural inconsistencies and procedures for placing and compacting soil component in layers;
☐	_____	☑	☐	(2) Demonstration of compatibility of the soil component with actual or simulated leachate in accordance with EPA Test Method 9100 or an equivalent test method;
☐	_____	☑	☐	(3) Procedures for testing in-situ soils to demonstrate they meet the specifications for soil liners;

S	LOCATION	N/A	N/C	PART G CONTINUED
☐	_____	☑	☐	(4) Specifications for soil component of liner including at a minimum:
☐	_____	☑	☐	(a) Allowable particle size distribution, Atterberg limits, shrinkage limit;
☐	_____	☑	☐	(b) Placement moisture and dry density criteria;
☐	_____	☑	☐	(c) Maximum laboratory-determined saturated hydraulic conductivity using simulated leachate;
☐	_____	☑	☐	(d) Minimum thickness of soil liner;
☐	_____	☑	☐	(e) Lift thickness;
☐	_____	☑	☐	(f) Surface preparation (scarification);
☐	_____	☑	☐	(g) Type and percentage of clay mineral within the soil component;
☐	_____	☑	☐	(5) Procedures for constructing and using a field test section to document the desired saturated hydraulic conductivity and thickness can be achieved in the field.
☐	_____	☑	☐	g. If a Class III landfill is to be constructed with a bottom liner system, provide a description of how the minimum requirements for the liner will be achieved.
	Section 4.3			
☐	_____	☑	☐	3. Leachate collection and removal system (LCRS); (62-701.400(4),FAC)
☐	_____	☑	☐	a. The primary and secondary LCRS requirements; (62-701.400(4)(a),FAC)
☐	_____	☑	☐	(1) Constructed of materials chemically resistant to the waste and leachate;
☐	_____	☑	☐	(2) Have sufficient mechanical properties to prevent collapse under pressure;

S	LOCATION	N/A	N/C	PART G CONTINUED
☐	_____	☑	☐	(3) Have granular material or synthetic geotextile to prevent clogging;
☐	_____	☑	☐	(4) Have method for testing and cleaning clogged pipes or contingent designs for rerouting leachate around failed areas;
☐	_____	☑	☐	b. Other LCRS requirements; (62-701.400(4)(b) and (c),FAC)
☐	_____	☑	☐	(1) Bottom 12 inches having hydraulic conductivity ≥ 1×10^{-3} cm/sec;
☐	_____	☑	☐	(2) Total thickness of 24 inches of material chemically resistant to the waste and leachate;
☐	_____	☑	☐	(3) Bottom slope design to accommodate for predicted settlement and still meet minimum slope requirements;
☐	_____	☑	☐	(4) Demonstration that synthetic drainage material, if used, is equivalent or better than granular material in chemical compatibility, flow under load and protection of geomembrane liner.
	Section 4.4			
☐	_____	☑	☐	4. Leachate recirculation; (62-701.400(5),FAC)
☐	_____	☑	☐	a. Describe general procedures for recirculating leachate;
☐	_____	☑	☐	b. Describe procedures for controlling leachate runoff and minimizing mixing of leachate runoff with storm water;
☐	_____	☑	☐	c. Describe procedures for preventing perched water conditions and gas buildup;
☐	_____	☑	☐	d. Describe alternate methods for leachate management when it cannot be recirculated due to weather or runoff conditions, surface seeps, wind-blown spray, or elevated levels of leachate head on the liner;
	Sections 4.9 and 7.4			
☐	_____	☑	☐	e. Describe methods of gas management in accordance with Rule 62-701.530, FAC;

S	LOCATION	N/A	N/C	PART G CONTINUED
	Section 4.4			
☐	_____	☑	☐	f. If leachate irrigation is proposed, describe treatment methods and standards for leachate treatment prior to irrigation over final cover and provide documentation that irrigation does not contribute significantly to leachate generation.
	Section 4.5			
☐	_____	☑	☐	5.Leachate storage tanks and leachate surface impoundments; (62-701.400(6),FAC)
☐	_____	☑	☐	a. Surface impoundment requirements; (62-701.400(6)(b),FAC)
☐	_____	☑	☐	(1) Documentation that the design of the bottom liner will not be adversely impacted by fluctuations of the ground water;
☐	_____	☑	☐	(2) Designed in segments to allow for inspection and repair as needed without interruption of service;
☐	_____	☑	☐	(3) General design requirements;
☐	_____	☑	☐	(a) Double liner system consisting of an upper and lower 60-mil minimum thickness geomembrane;
☐	_____	☑	☐	(b) Leak detection and collection system with hydraulic conductivity ≥ 1 cm/sec;
☐	_____	☑	☐	(c) Lower geomembrane placed on subbase ≥ 6 inches thick with $k \leq 1 \times 10^{-5}$ cm/sec or on an approved geosynthetic clay liner with $k \leq 1 \times 10^{-7}$ cm/sec;
☐	_____	☑	☐	(d) Design calculation to predict potential leakage through the upper liner;
☐	_____	☑	☐	(e) Daily inspection requirements and notification and corrective action requirements if leakage rates exceed that predicted by design calculations;
☐	_____	☑	☐	(4) Description of procedures to prevent uplift, if applicable;
☐	_____	☑	☐	(5) Design calculations to demonstrate minimum two feet of freeboard will be maintained;
☐	_____	☑	☐	(6) Procedures for controlling vectors and off-site odors.

S	LOCATION	N/A	N/C	PART G CONTINUED
	Section 4.5			
☐	_____	☑	☐	b. Above-ground leachate storage tanks; (62-701.400(6)(c),FAC)
☐	_____	☑	☐	(1) Describe tank materials of construction and ensure foundation is sufficient to support tank;
☐	_____	☑	☐	(2) Describe procedures for cathodic protection if needed for the tank;
☐	_____	☑	☐	(3) Describe exterior painting and interior lining of the tank to protect it from the weather and the leachate stored;
☐	_____	☑	☐	(4) Describe secondary containment design to ensure adequate capacity will be provided and compatibility of materials of construction;
☐	_____	☑	☐	(5) Describe design to remove and dispose of stormwater from the secondary containment system;
☐	_____	☑	☐	(6) Describe an overfill prevention system such as level sensors, gauges, alarms and shutoff controls to prevent overfilling;
☐	_____	☑	☐	(7) Inspections, corrective action and reporting requirements;
☐	_____	☑	☐	(a) Overfill prevention system weekly;
☐	_____	☑	☐	(b) Exposed tank exteriors weekly;
☐	_____	☑	☐	(c) Tank interiors when tank is drained or at least every three years;
☐	_____	☑	☐	(d) Procedures for immediate corrective action if failures detected;
☐	_____	☑	☐	(e) Inspection reports available for department review.
	Section 4.5			
☐	_____	☑	☐	c. Underground leachate storage tanks; (62-701.400(6)(d),FAC)

S	LOCATION	N/A	N/C	PART G CONTINUED
☐	_____	☑	☐	(1) Describe materials of construction;
☐	_____	☑	☐	(2) A double-walled tank design system to be used with the following requirements;
☐	_____	☑	☐	(a) Interstitial space monitoring at least weekly;
☐	_____	☑	☐	(b) Corrosion protection provided for primary tank interior and external surface of outer shell;
☐	_____	☑	☐	(c) Interior tank coatings compatible with stored leachate;
☐	_____	☑	☐	(d) Cathodic protection inspected weekly and repaired as needed;
☐	_____	☑	☐	(3) Describe an overfill prevention system such as level sensors, gauges, alarms and shutoff controls to prevent overfilling and provide for weekly inspections;
☐	_____	☑	☐	(4) Inspection reports available for department review.
	Section 7.3			
☑	_____	☐	☐	d.Schedule provided for routine maintenance of LCRS; (62-701.400(6)(e),FAC)
	Section 4.6			
☐	_____	☑	☐	6.Liner systems construction quality assurance (CQA); (62-701.400(7),FAC)
☐	_____	☑	☐	a. Provide CQA Plan including:
☐	_____	☑	☐	(1) Specifications and construction requirements for liner system;
☐	_____	☑	☐	(2) Detailed description of quality control testing procedures and frequencies;
☐	_____	☑	☐	(3) Identification of supervising professional engineer;
☐	_____	☑	☐	(4) Identify responsibility and authority of all appropriate organizations and key personnel involved in the construction project;

S	LOCATION	N/A	N/C	PART G CONTINUED
☐	_____	☑	☐	(5) State qualifications of CQA professional engineer and support personnel;
☐	_____	☑	☐	(6) Description of CQA reporting forms and documents;
☐	_____	☑	☐	b. An independent laboratory experienced in the testing of geosynthetics to perform required testing;
☐	_____	☑	☐	7. Soil Liner CQA (62-701.400(8)FAC)
☐	_____	☑	☐	a. Documentation that an adequate borrow source has been located with test results or description of the field exploration and laboratory testing program to define a suitable borrow source;
☐	_____	☑	☐	b. Description of field test section construction and test methods to be implemented prior to liner installation;
☐	_____	☑	☐	c. Description of field test methods including rejection criteria and corrective measures to insure proper liner installation.
☐	Section 4.8 _____	☑	☐	8. Surface water management systems; (62-701.400(9),FAC)
☐	Section 4.8 _____	☐	☑	a. Provide a copy of a Department permit for stormwater control or documentation that no such permit is required;
☐	_____	☐	☑	b. Design of surface water management system to isolate surface water from waste filled areas and to control stormwater run-off;
☐	_____	☐	☑	c. Details of stormwater control design including retention ponds, detention ponds, and drainage ways;
☐	Section 4.9 _____	☑	☐	9. Gas control systems; (62-701.400(10),FAC)
☐	Section 4.9 _____	☑	☐	a. Provide documentation that if the landfill is receiving degradable wastes, it will have a gas control system complying with the requirements of Rule 62-701.530, FAC;
☐	_____	☐	☑	10. For landfills designed in ground water, provide documentation that the landfill will provide a degree of protection equivalent to landfills designed with bottom liners not in contact with ground water; (62-701.400(11),FAC)

PART H. HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS (62-701.410(1), FAC)

S	LOCATION	N/A	N/C	
	Section 5.0			
☑		☐	☐	1. Submit a hydrogeological investigation and site report including at least the following information:
☐		☐	☑	a. Regional and site specific geology and hydrogeology;
☐		☐	☑	b. Direction and rate of ground water and surface water flow including seasonal variations;
☐		☐	☑	c. Background quality of ground water and surface water;
☐		☐	☑	d. Any on-site hydraulic connections between aquifers;
☐		☐	☑	e. Site stratigraphy and aquifer characteristics for confining layers, semi-confining layers, and all aquifers below the landfill site that may be affected by the landfill;
☐		☐	☑	f. Description of topography, soil types and surface water drainage systems;
	Section 5.0 & Attach. B			
☑		☐	☐	g. Inventory of all public and private water wells within a one-mile radius of the landfill including, where available, well top of casing and bottom elevations, name of owner, age and usage of each well, stratigraphic unit screened, well construction technique and static water level;
	Section 8.0			
☑		☐	☐	h. Identify and locate any existing contaminated areas on the site;
☐		☑	☐	i. Include a map showing the locations of all potable wells within 500 feet of the waste storage and disposal areas;
☐		☑	☐	2. Report signed, sealed and dated by PE and/or PG.

PART I. GEOTECHNICAL INVESTIGATION REQUIREMENTS (62-701.410(2),FAC)

S	LOCATION	N/A	N/C	
	Section 5.0			
☑	_____	☐	☐	1. Submit a geotechnical site investigation report defining the engineering properties of the site including at least the following:
☐	_____	☐	☑	a. Description of subsurface conditions including soil stratigraphy and ground water table conditions;
☐	_____	☐	☑	b. Investigate for the presence of muck, previously filled areas, soft ground, lineaments and sink holes;
☐	_____	☐	☑	c. Estimates of average and maximum high water table across the site;
☐	_____	☐	☑	d. Foundation analysis including:
☐	_____	☐	☑	(1) Foundation bearing capacity analysis;
☐	_____	☐	☑	(2) Total and differential subgrade settlement analysis;
☐	_____	☐	☑	(3) Slope stability analysis;
☐	_____	☐	☑	e. Description of methods used in the investigation and includes soil boring logs, laboratory results, analytical calculations, cross sections, interpretations and conclusions;
☐	_____	☐	☑	f. An evaluation of fault areas, seismic impact zones, and unstable areas as described in 40 CFR 258.13, 40 CFR 258.14 and 40 CFR 258.15.
☐	_____	☐	☑	2. Report signed, sealed and dated by PE and/or PG.

PART J. VERTICAL EXPANSION OF LANDFILLS (62-701.430,FAC)

S	LOCATION	N/A	N/C	
	Section 6.0			
☐	_____	☑	☐	1. Describe how the vertical expansion shall not cause or contribute to leachate leakage from the existing landfill, shall not cause objectionable odors, or adversely affect the closure design of the existing landfill;
☐	_____	☑	☐	2. Describe how the vertical expansion over unlined landfills will meet the requirements of Rule 62-701.400, FAC with the exceptions of Rule 62-701.430(1)(c),FAC;
☐	_____	☑	☐	3. Provide foundation and settlement analysis for the vertical expansion;
☐	_____	☑	☐	4. Provide total settlement calculations demonstrating that the final elevations of the lining system, that gravity drainage, and that no other component of the design will be adversely affected;
☐	_____	☑	☐	5. Minimum stability safety factor of 1.5 for the lining system component interface stability and deep stability;
☐	_____	☑	☐	6. Provide documentation to show the surface water management system will not be adversely affected by the vertical expansion;
☐	_____	☑	☐	7. Provide gas control designs to prevent accumulation of gas under the new liner for the vertical expansion.

PART K. LANDFILL OPERATION REQUIREMENTS (62-701.500,FAC)

S	LOCATION	N/A	N/C	
☑	Section 7.1 & Attachment C (Ops& Contingency Plan)	☐	☐	1. Provide documentation that landfill will have at least one trained operator during operation and at least one trained spotter at each working face; (62-701.500(1),FAC)
☑	Attachment C and Appl. Report Section 7.2	☐	☐	2. Provide a landfill operation plan including procedures for: (62-701.500(2), FAC)
☑	Attach. C Section 2.2	☐	☐	a. Designating responsible operating and maintenance personnel;
☑	Attach. C Section 2.3	☐	☐	b. Emergency preparedness and response, as required in subsection 62-701.320(16), FAC;
☑	Attach. C Section 2.4	☐	☐	c. Controlling types of waste received at the landfill;
☑	Attach. C Section 2.5	☐	☐	d. Weighing incoming waste;
☑	Attach. C Section 2.6	☐	☐	e. Vehicle traffic control and unloading;
☑	Attach. C Section 2.7	☐	☐	f. Method and sequence of filling waste;
☑	Attach. C Section 2.8	☐	☐	g. Waste compaction and application of cover;
☑	Attach. C Section 2.9	☐	☐	h. Operations of gas, leachate, and stormwater controls;
☑	Attach. C Section 2.10	☐	☐	i. Water quality monitoring.
☑	Attach. C Section 2.11	☐	☐	j. Maintaining and cleaning the leachate collection system;
☑	Attach. C Section 3.0	☐	☐	3. Provide a description of the landfill operation record to be used at the landfill; details as to location of where various operational records will be kept (i.e. FDEP permit, engineering drawings, water quality records, etc.) (62-701.500(3),FAC)
☑	Attach. C Section 4	☐	☐	4. Describe the waste records that will be compiled monthly and provided to the Department annually; (62-701.500(4),FAC)
☑	Attach. C Section 5	☐	☐	5. Describe methods of access control; (62-701.500(5),FAC)

S	LOCATION	N/A	N/C	PART K CONTINUED
☑	Attach. C Section 6	☐	☐	6. Describe load checking program to be implemented at the landfill to discourage disposal of unauthorized wastes at the landfill; (62-701.500(6),FAC)
☑	Attach. C Section 7	☐	☐	7. Describe procedures for spreading and compacting waste at the landfill that include: (62-701.500(7),FAC)
☑	Attach. C Section 7.1	☐	☑	a. Waste layer thickness and compaction frequencies;
☑	Attach. C Section 7.2	☐	☐	b. Special considerations for first layer of waste placed above liner and leachate collection system;
☑	Attach. C Section 7.3	☐	☐	c. Slopes of cell working face and side grades above land surface, planned lift depths during operation;
☑	Attach. C Section 7.4	☐	☐	d. Maximum width of working face;
☑	Attach. C Section 7.5	☐	☐	e. Description of type of initial cover to be used at the facility that controls:
☑	Attach. C Section 7.5	☐	☐	(1) Vector breeding/animal attraction
☑	Attach. C Section 7.5	☐	☐	(2) Fires
☑	Attach. C Section 7.5	☐	☐	(3) Odors
☑	Attach. C Section 7.5	☐	☐	(4) Blowing litter
☑	Attach. C Section 7.5	☐	☐	(5) Moisture infiltration
☑	Attach. C Section 7.5	☐	☐	f. Procedures for applying initial cover including minimum cover frequencies;
☑	Attach. C Section 7.6	☐	☐	g. Procedures for applying intermediate cover;
☑	Attach. C Section 7.7	☐	☐	h. Time frames for applying final cover;
☑	Attach. C Section 7.8	☐	☐	i. Procedures for controlling scavenging and salvaging.

S	LOCATION	N/A	N/C	PART K CONTINUED
☑	Attach C Section 11 and Appl. Report Section 7.6	☐	☐	11. Equipment and operation feature requirements; (62-701.500(11),FAC)
☑	Attach C Section 11.1	☐	☐	a. Sufficient equipment for excavating, spreading, compacting and covering waste;
☑	Attach C Section 11.2	☐	☐	b. Reserve equipment or arrangements to obtain additional equipment within 24 hours of breakdown;
☑	Attach C Section 11.3	☐	☐	c. Communications equipment;
☑	Attach C Section 11.4	☐	☐	d. Dust control methods;
☑	Attach C Section 11.5	☐	☐	e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;
☑	Attach C Section 11.6	☐	☐	f. Litter control devices;
☑	Attach C Section 11.7	☐	☐	g. Signs indicating operating authority, traffic flow, hours of operation, disposal restrictions.
☑	Attach C Section 12 and Appl. Report Section 7.7	☐	☐	12. Provide a description of all-weather access road, inside perimeter road and other roads necessary for access which shall be provided at the landfill; (62-701.500(12),FAC)
☑	Attach C Section 13 and Appl. Report section 7.8	☐	☐	13. Additional record keeping and reporting requirements; (62-701.500(13),FAC)
☑	Attach C Section 13.1	☐	☐	a. Records used for developing permit applications and supplemental information maintained for the design period of the landfill;
☑	Attach C Section 13.2	☐	☐	b. Monitoring information, calibration and maintenance records, copies of reports required by permit maintained for at least 10 years;
☑	Attach C Section 13.3	☐	☐	c. Maintain annual estimates of the remaining life of constructed landfills and of other permitted areas not yet constructed and submit this estimate annually to the Department;
☑	Attach C Section 13.4	☐	☐	d. Procedures for archiving and retrieving records which are more than five year old.

PART L. WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS (62-701.510, FAC)

S	LOCATION	N/A	N/C	
☑	SECTION 1.3.10, Section 8.0 & MPIS	☐	☐	1. Water quality and leachate monitoring plan shall be submitted describing the proposed ground water, surface water and leachate monitoring systems and shall meet at least the following requirements;
☐		☐	☑	a. Based on the information obtained in the hydrogeological investigation and signed, dated and sealed by the PG or PE who prepared it; (62-701.510(2)(a),FAC)
☐		☐	☑	b. All sampling and analysis preformed in accordance with Chapter 62-160, FAC; (62-701.510(2)(b),FAC)
☐		☐	☑	c. Ground water monitoring requirements; (62-701.510(3),FAC)
☐		☐	☑	(1) Detection wells located downgradient from and within 50 feet of disposal units;
☐		☐	☑	(2) Downgradient compliance wells as required;
☐		☐	☑	(3) Background wells screened in all aquifers below the landfill that may be affected by the landfill;
☐		☐	☑	(4) Location information for each monitoring well;
☐		☐	☑	(5) Well spacing no greater than 500 feet apart for downgradient wells and no greater than 1500 feet apart for upgradient wells unless site specific conditions justify alternate well spacings;
☐		☐	☑	(6) Well screen locations properly selected;
☐		☐	☑	(7) Monitoring wells constructed to provide representative ground water samples;
☐		☐	☑	(8) Procedures for properly abandoning monitoring wells;
☐		☐	☑	(9) Detailed description of detection sensors if proposed.
☐		☐	☑	d. Surface water monitoring requirements; (62-701.510(4),FAC)

S	LOCATION	N/A	N/C	PART N CONTINUED
☑	Section 10.4	☐	☐	a. Information required in Rules 62-701.320(7) and 62-701.330(3), FAC supplied;
☑	Section 10.4	☑	☐	b. Information required in Rule 62-701.600(4), FAC supplied where relevant and practical;
☑	Section 10.4	☐	☐	c. Estimate of current and expected gas generation rates and description of condensate disposal methods provided;
☑	Section 10.4	☐	☐	d. Description of procedures for condensate sampling, analyzing and data reporting provided;
☑	Section 10.4	☐	☐	e. Closure plan provided describing methods to control gas after recovery facility ceases operation and any other requirements contained in Rule 62-701.400(10), FAC;
☑	Section 10.4	☑	☐	f. Performance bond provided to cover closure costs if not already included in other landfill closure costs.

PART O. LANDFILL FINAL CLOSURE REQUIREMENTS (62-701.600,FAC)

S	LOCATION	N/A	N/C	
☑	Section 11.1	☐	☐	1. Closure permit requirements; (62-701.600(2),FAC)
☐		☑	☐	a. Application submitted to Department at least 90 days prior to final receipt of wastes;
☑	Section 11.1	☐	☑	b. Closure plan shall include the following:
☐		☐	☑	(1) Closure design plan;
☐		☐	☑	(2) Closure operation plan;
☐		☐	☑	(3) Plan for long-term care;
☐		☐	☑	(4) A demonstration that proof of financial responsibility for long-term care will be provided.

S	LOCATION	N/A	N/C	PART O CONTINUED
	Section 11.2			
☑		☐	☐	2. Closure design plan including the following requirements: (62-701.600(3),FAC)
☐		☐	☑	a. Plan sheet showing phases of site closing;
☐		☐	☑	b. Drawings showing existing topography and proposed final grades;
☐		☐	☑	c. Provisions to close units when they reach approved design dimensions;
☐		☐	☑	d. Final elevations before settlement;
☐		☐	☑	e. Side slope design including benches, terraces, down slope drainage ways, energy dissipaters and discussion of expected precipitation effects;
☐		☐	☑	f. Final cover installation plans including:
☐		☐	☑	(1) CQA plan for installing and testing final cover;
☐		☐	☑	(2) Schedule for installing final cover after final receipt of waste;
☐		☐	☑	(3) Description of drought-resistant species to be used in the vegetative cover;
☐		☐	☑	(4) Top gradient design to maximize runoff and minimize erosion;
☐		☐	☑	(5) Provisions for cover material to be used for final cover maintenance.
☐		☐	☑	g. Final cover design requirements:
☐		☐	☑	(1) Protective soil layer design;
☐		☐	☑	(2) Barrier soil layer design;

S	LOCATION	N/A	N/C	PART O CONTINUED
☐	_____	☐	☑	5. Declaration to the public; (62-701.600(7),FAC)
☐	_____	☐	☑	6. Official date of closing; (62-701.600(8),FAC)
☑	Section 11.4 _____	☐	☐	7. Justification for and detailed description of procedures to be followed for temporary closure of the landfill, if desired; (62-701.600(9),FAC)

PART P. OTHER CLOSURE PROCEDURES (62-701.610,FAC)

S	LOCATION	N/A	N/C	
☐	Section 11.5 _____	☐	☑	1. Describe how the requirements for use of closed solid waste disposal areas will be achieved;(62-701.610(1),FAC)
☐	_____	☑	☐	2. Describe how the requirements for relocation of wastes will be achieved; (62-701.610(2), FAC)

PART Q. LONG-TERM CARE (62-701.620,FAC)

S	LOCATION	N/A	N/C	
☑	Section 11.6 _____	☐	☑	1. Maintaining the gas collection and monitoring system; (62-701.620(5), FAC)
☐	_____	☐	☑	2. Stabilization report requirements; (62-701.620(6),FAC)
☐	_____	☐	☑	3. Right of access;(62-701.620(7),FAC)
☐	_____	☐	☑	4. Requirements for replacement of monitoring devices; (62-701.620(8),FAC)
☐	_____	☐	☑	5. Completion of long-term care signed and sealed by professional engineer (62-701.620(9), FAC).

PART R. FINANCIAL ASSURANCE (62-701.630,FAC)

S	LOCATION	N/A	N/C	
☑	Section 1.3.14, Section 12.0 and Attachment F	☐	☐	1. Provide cost estimates for closing, long-term care, and corrective action costs estimated by a PE for a third party performing the work, on a per unit basis, with the source of estimates indicated; (62-701.630(3)&(7), FAC).
☐		☐	☑	2. Describe procedures for providing annual cost adjustments to the Department based on inflation and changes in the closing, long-term care, and corrective action plans; (62-701.630(4)&(8), FAC).
☐		☐	☑	3. Describe funding mechanisms for providing proof of financial assurance and include appropriate financial assurance forms; (62-701.630(5),(6),&(9), FAC).
☐	Section 1.3.14	☐	☐	4. Provide documentation and the appropriate forms for delaying submitting proof of financial assurance for solid waste disposal units that qualify; (62-701.630(2)(c), FAC).

PART S. CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

1. Applicant:

The undersigned applicant or authorized representative of Volusia County Solid Waste Division

_____ is aware that statements made in this form and attached

information are an application for a long-term Operations Permit from the Florida Department of Environmental Protection and certifies that the information in this application is true, correct and complete to the best of his/her knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403, Florida Statutes, and all rules and regulations of the Department. It is understood that the Permit is not transferable, and the Department will be notified prior to the sale or legal transfer of the permitted facility.

Signature of Applicant or Agent	3151 East New York Avenue Mailing Address
Leonard Marion, Director Name and Title (please type)	Deland, Florida 32724 City, State, Zip Code
lmarion@volusia.org E-Mail address (if available)	(386) 943-7889 Telephone Number
	Date: 12-28-12

Attach letter of authorization if agent is not a governmental official, owner, or corporate officer.

2. Professional Engineer registered in Florida (or Public Officer if authorized under Sections 403.707 and 403.7075, Florida Statutes):

This is to certify that the engineering features of this solid waste management facility have been designed/examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, this facility, when properly maintained and operated, will comply with all applicable statutes of the State of Florida and rules of the Department. It is agreed that the undersigned will provide the applicant with a set of instructions of proper maintenance and operation of the facility.

Signature	2301 Lucien Way, Suite 300 Mailing Address
Mehran S. Beladi, P.E., Sr. Engineer Mgr. Name and Title (please type)	Maitland, Florida 32751 City, State, Zip Code
	ron.beladi@neel-schaffer.com E-Mail address (if available)
41819 Florida Registration Number (please affix seal)	(407) 647-6623 Telephone Number
	Date: 12/12/12

MEHRAN S. BELADI
LICENSE
41819
STATE OF FLORIDA
PROFESSIONAL ENGINEER

SECTION 1.0

FAC 62-701 Permit Application Checklist

1.1 Executive Summary

1.1.1 Background and Purpose

Volusia County (the "County") is currently permitted by Florida Department of Environmental Protection ("FDEP", "Department") to operate the North Cell Class I disposal area at the Tomoka Farms Road Landfill (TFRLF) in Port Orange Florida. Current disposal operations are in the original 43.2 acre North Cell, and the 26-acre Phase I (Areas 1& 2) expansion area. The current FDEP Operations Permit (Permit No. SO64-0078767-023) for the Original North Cell and Phase I expansion is due to expire on March 3, 2013.

The County is also in the process of obtaining a renewal of the FDEP construction permit (SC64-0078767-022) for construction of the 21.7 acre Phase II expansion area. The completion of construction of phase II expansion area will result in a contiguous North Cell disposal area covering 90.90 acres.

Over the past years, the original North Cell has been filled to approximate elevation 155 ft NGVD, and the active filling has progressed eastward onto the Phase I expansion. Once the Phase II construction is completed and operational, it will allow access for further disposal operations on top of the original North Cell and the Phase I expansion areas to maximum elevation of approximately 193 feet NGVD.

The County also has obtained an FDEP permit for sequential closure of North Cell as final elevations are achieved (Permit No. SF64-0078767-028).

The purpose of this application is to:

- Renew and extend the current solid waste operations permit for long-term permitting of the entire North Cell Class I disposal area including the original North Cell, and the Phase I and II expansion areas, comprising a total acreage of 90.90 acres. This is predicated on FDEP receiving and accepting the certification of completion of construction of Phase II expansion area.
- Combine the general and specific conditions of the North Cell sequential closure permit with this long-term North Cell Operation Permit in order to permit the County to construct the final cover sequentially on areas of the disposal area where the final elevations have been achieved. The closure sequence information was previously presented to FDEP in the June 2012 Closure Permit renewal application. The closed areas will be designated as "closed" once FDEP has receiving and accepted the certification of completion of construction of the sequential closure area after each construction event.
- Integrate the North Cell landfill gas (LFG) management master plan into the long-term North Cell Operations Permit in order to permit the County to construct the LFG system expansions as needed to control odor. The County will submit to FDEP the certification of completion of construction of LFG system expansions for the North Cell after each construction event.

- Integrate the North Cell filling sequence into the long-term Operations Permit.

Based on the current solid waste projections, fluctuations in population and possible future waste reductions due to state-wide enhanced recycling of the solid waste stream, the North Cell landfill airspace may last between 15 to 20 years. The County is requesting a twenty (20) year operations permit payable in five-year payment increments as provided for in the August 2012 amendments to the Chapter 62-701 Solid Waste Rule.

A pre-application meeting was held in Orlando on October 22, 2012. The applicant met with FDEP Central District and Tallahassee staff to discuss the requirements of this application. The construction permit application to renew the construction permit for Phase II of the North Cell was submitted to FDEP on August 1, 2012. The pending application included improvements to the Phase II leachate collection/detection and pumping systems. The County and FDEP are working to resolve any outstanding issues on the construction permit renewal.

Partial closure of the original west portion of the North Cell is permitted under permit No. SF64-0078767-028, issued May 9, 2012. This closure permit authorizes sequential closing of the North Cell when filling has reached final elevations, in three (3) phases using LLDPE geomembrane and a composite drainage net, with stormwater letdown pipes.

The LFG collection system installed in 2006, and expanded in 2010 and 2012, will also be augmented from time to time using horizontal collectors and vertical wells to control odor, and in compliance with other facility permits.

1.1.2 Existing Information and Reference Documentation

The source information referenced in this application for renewal of the North Cell Phase I Expansion operations permit is contained in the Application for Renewal of Operations Permit Nos. SO64-0078767-015 and 016 dated June 25, 2007, as well as subsequent requests for information. Additional source information is provided in the North Cell Phase II construction application submitted August 1, 2012. These permit applications and additional sources submitted since 2000 are listed below.

Table 1-1
Documents Referenced

Ref. No.	North Cell Permit Number	Permit Description	Permit Issue Date	Permit Expiration Date
1.	SO64-0078767-023	North Cell Operations	June 2, 2008	March 3, 2013
2.	SF64-0078767-028.	North Cell Phase I Closure and South Cell Post-Closure Care Application Date: Dec. 7, 2011 RAI Response No. 1: Jan. 27, 2012	May 9, 2012	March 19, 2017
3.	SF64-0078767-027 (Permit Modification)	North Cell Class I Closure, Intermediate Modification Application Date: 8/25/2010 (Includes August 2009 Fill Sequence Plan, and CQA Plan)	March 6, 2012	January 3, 2016

4.	SC64-0078767-029 (Renewal Application)	Construction Permit For North Cell Phase II Expansion Application Date: 8/1/2012 RAI Response No.1: 9/13/2012 RAI Response No. 2: 11/1/2012	Pending	
5.	SC64-0078767-022 (Renewal Application)	Construction Permit For North Cell Phase II Expansion	Oct. 30,2007	October 5, 2012
6.	SC64-0078767-014 SO64-0078767-015	Construction Permit/Operation Permit Modification, Tomoka Farms Road Landfill, East Cell Expansion, dated April 3, 2002 Certification: December 19, 2005 Record Drawings Phase 1 Construction: November 2005	Oct. 2, 2002	October 1, 2007
7.	64-FLA662356-001-1W8D	Industrial Wastewater Facility Permit, (onsite leachate treatment)	April 15, 2009	April 13, 2014
8.	FLRD5B988-003	NPDES General Permit for the TFRLF site	Jan. 8, 2012	Jan. 7, 2017
9.	48-FL0037877-003 IW7D	NPDES Permit No. 48-FL0037877-003 IW7D-Modification for Conditional Discharge of Contact Wastewater	Oct. 11, 2011	Jan. 3, 2016

Other Related Reference Documents

Ref. No.	Title or Permit No.	Document Description	Prepared by	Date of Preparation
10.	Landfill Gas Collection System Expansion Certification	North Cell Phase I Gas Management System Certification Documents, March 2007, (Gas Wells, Headers, Condensate Sumps and Compressor Station/Flare to serve the North Cell).	SCS Engineers, Inc.	March 2007
	Landfill Gas Collection System Expansion Certification	North Cell Gas Management System Phase II Certification Documents	HDR Engineering, Inc.	May 12, 2010
	Landfill Gas Collection System Expansion Certification	North Cell Gas Management System Phase III Certification Documents	HDR Engineering, Inc.	Sept. 10, 2012

11.	Geotechnical Report	Tomoka Farms Road Landfill, East Cell Expansion Geotechnical Report (Submitted with SC64-0078767-022)	SCS Engineers, Inc.	Nov. 14, 2000
12.	Groundwater Monitoring Plan Modification	Tomoka Farms Road Landfill Groundwater Monitoring Plan Modification, Class I East Cell (Submitted with SC64-0078767-022)	SCS Engineers, Inc.	July 18, 2000
13.	Technical Water Quality Monitoring Report	Tomoka Farms Road Landfill Technical Water Quality Monitoring Report	SCS Engineers, Inc.	April 6, 2012

These permit applications, permits and reports are referenced throughout this application. Attachment A includes the cover pages for the current permits related to the North Cell. The entire permit package was not included.

1.2 Facility Owner and Operator

The Facility is owned by the County Council of Volusia County, and is operated by the County's Public Works Solid Waste Division. The designated responsible person(s) for the TFRLF are as follows:

Mr. Leonard Marion, Director
Volusia County Solid Waste Division
3151 East S.R. 44 (New York Avenue)
Deland, Florida 32724
Phone (386) 943-7889
E-mail: lmarion@volusia.org

Mr. Junos Reed, P.E.
Solid Waste Division Operations Manager
1990 Tomoka Farms Road
Port Orange, Florida
Phone (386) 947-2952
E-mail: jreed@volusia.org

1.3 Checklist (FDEP Form 62-701.900(1))

This application checklist located in front of this Section provides the location and disposition of information listed in the FDEP Solid Waste Management Facility Application Form No. 62-701.900(1). The format of the checklist follows the information sequence of the application form.

1.3.1 PARTS A & B - General Information and Disposal Facility General Information

The required information for this section is included on the application form.

1.3.2 PART C - Prohibitions (62-701.300, FAC)

Certain Part C prohibitions do not apply or are not changed from prior information. Section 2.0 provides a brief summary for these items.

1.3.3 PART D - Solid Waste Management Facility Permit General Requirements (62-701.320, FAC)

Submittal information pertaining to the application (application copies, certification, transmittal letter, permitting fees, Engineering report, Operational drawings, Proof of publication and Airport safety requirements is included in Section 2.0 of this document.

1.3.4 PARTS E & F - Landfill Permit Requirements and General Criteria for Landfills (62-701.330 & 340, FAC)

The required information for Part E and Part F is included in Section 3.0 of this document. Section 3.0 contains a discussion of historical solid waste tonnages, sources and types of solid waste delivered to the TFRLF, solid waste projections and planned construction and closure. The drawings included with this application report include an airport location map, vicinity aerial, site aerial, and a detailed plot plan of North Cell with existing topographic information. See Drawings in Attachment B.

1.3.5 PART G - Landfill Construction Requirements (62-701.400, FAC)

The information for Part G is not applicable to this operations permit renewal application. A separate application for construction of Phase II Areas 3 and 4 has been submitted and is under review. Most items in Part G have been marked as "Not Applicable". Section 4.0 provides a summary of improvements in leachate collection and treatment, as well as changes in LFG management system over the past five years.

1.3.6 PART H - Hydrogeological Investigation Requirements (62-701.410(1), FAC)

No new hydrological Investigation is needed for continued operation of the original North cell and the Phase I/Phase II expansion. Monitoring well requirements for North Cell Phase II (Area 3 and Area 4) were previously established in the April 2002 Hydrogeological Report. Monitoring wells for Area 3 and 4 are already installed and included in the current MPIS. Items for Part H have been marked "No Change, NC "on the permit application. The current water quality monitoring requirements are in the Monitoring Plan Implementation Schedule (MPIS). Under the September 2012 amended Solid Waste Rule, annual leachate testing for this facility is no longer required. The well inventory within one mile of the Facility was verified and well information is provided in Attachment B.

1.3.7 PART I – Geotechnical Investigation Requirements (62-701.410(2), FAC)

There is "No Change, NC" from the prior operations application. The information previously submitted to the Department for Part I to document the Phase II area expansion is included in Referenced documents No. 18 and No. 19 in Section 1.1.2. See Section 5.0.

1.3.8 PART J - Vertical Expansion of Landfills (62-701.430, FAC)

No vertical expansion is proposed in this operations permit renewal application and it is "Not Applicable". The vertical elevation of the top surface of the landfill at final closure is permitted to reach an elevation of 193 feet NGVD per the recent closure permit renewal. See Section 6.0.

1.3.9 PART K - Landfill Operation Requirements (62-701.500, FAC)

The information for Part K is included in Section 7.0. The Operations Plan provided in Attachment C was updated in February 2012 to reflect rule changes effective January 2010. Normal operations and contingency operations are included. Changes to integrate Chapter 62-701 (Solid Waste) Rule changes effective September 2012 are minor and pertain to permit duration and reporting requirements. Updated operator training status list and training program information is provided in Attachment D. Fill sequence is in accordance with the North Cell Class I Cell Fill Sequence Plans submitted August 2009 (Reference No.11). A Fill Sequence schematic is provided in Attachment B.

1.3.10 PART L - Water Quality and Leachate Monitoring Requirements (62-701.510, FAC)

The information for Part L is included in Section 8.0. The Monitoring Plan Implementation Schedule currently in place (March 3, 2012) as modified for the North Cell Closure Permit renewal is proposed to remain in effect for the operation permit period, unless modified. The latest two year Technical Water Quality Monitoring Report was submitted in April 2012(Reference No. 6) and is on file with the Department. Contamination has occurred near the Class III landfill and the unlined Class I South Landfill. The assessment monitoring program status is also discussed in Section 8.0.

Leachate testing is performed under a separate Industrial Waste Permit for the onsite leachate treatment facility.

1.3.11 PART M - Special Waste Handling Requirements (62-701.520, FAC)

Part M has not changed from the previous operations permit applications (2002 and 2006) and is noted as "No Change" on the Permit Application Form. See Section 9.0.

1.3.12 PART N - Gas Management System Requirements (62-701.530, FAC)

The information for the Landfill Gas Management System for the Phase 1 expansion is referenced in Section 10.0. The LFG collection system and flare station for the original North Cell was installed in 2006. In 2008, the County contracted with a private vendor, Fortistar Methane Group, to operate the LFG collection system and purchase the LFG. LFG is

utilized for LFG-powered engines linked to onsite generators that produce electricity for the local power grid.

The County intends to install horizontal gas collection pipes during the filling sequence as an interim gas management system for increasing capture of landfill gases. Plans for phased expansion of the North Cell LFG collection and control system were recently developed to accompany the 2009 Fill Sequence Plan. Future gas wells, headers and condensate removal systems are proposed to be similar to the Phase I permitted system.

The phased LFG master plan drawings are included in Attachment G. Future wells and the LFG transmission system for the North Cell Phase II Expansion area will be constructed after notification to the Department, with construction certification submitted after each construction project.

1.3.13 PART O, P, & Q - Landfill Final Closure Requirements, Closure Procedures, and Long Term Care Requirements (62-701.600, 610 & 620, FAC)

This application is for renewal of operations permit SO64-0078767-023, that covers the original North Cell, the Phase I expansion area, and the future Phase II expansion Area. The information for Part P, Part Q and Part R is referenced in Section 11.0. Since the Phase II expansion area is contiguous to Phase I and cannot be monitored separately, the long- term care period will not begin until the 2026 to 2032 period, after filling in Phase II is completed.

Closure information changed from the June 2007 operations permit renewal application. In 2007 County received a permit modification for an exposed liner closure of the south slope of the original North Cell. In August 2011, the County applied to close the south slope using a standard geomembrane with geocomposite drainage system, Refer to the Application for Closure of North Cell Phase I and Post-Closure Care of South Cell, Tomoka Farms Road Landfill for updated closure and long-term care information (Reference No. 4). Closure Permit SF64-0078767-028, permit was issued May 9, 2012.

1.3.14 PART R - Financial Responsibility Requirements (62-701.630, FAC)

The FY 2012 Financial Responsibility Cost Estimate Report is on file and has been accepted by the Department. Pursuant to the October 22, 2012 pre-application meeting, updated detailed closure and long-term care cost estimates for the North Cell are provided in Attachment F. Currently financial responsibility for the Phase II Class I Landfill Expansion is not required as it has not been constructed or permitted for operation. Construction of Phase II is planned for Years 2014 and 2015. See Section 12.0.

1.3.15 PART S - Certification by Applicant and Engineer or Public Officer

The required information for this section has been included on the final page of the application form.

SECTION 2.0

Part D – Prohibitions (62-701.300, FAC)

2.1 Prohibitions

Volusia County does not seek any exemptions to the prohibitions of 62-701.300. The Volusia County Solid Waste Division has the required approvals from local, state and federal regulatory agencies. Volusia County does not permit burning on the site without written permission from the Division of Forestry and other regulatory agencies. The County has an effective screening program and uses trained spotters and operators at the working face to examine the waste for prohibited materials. "Special wastes "are accepted at the Tomoka Farms Road Landfill in accordance with special waste protocol for each type of waste. Special wastes can include ash residue, sewage treatment sludge (residuals), industrial sludge and water/air treatment sludges. No liquids are accepted at the Class I solid waste unit for disposal. The North Cell Class I solid waste disposal unit has proper setbacks from the property boundary, on-site building structures and other ongoing solid waste facility related activities.

2.2 Permit Applications Copies (62-701.320 (5) (a), FAC)

Four (4) copies of the completed operation permit application report, including all supporting data, are submitted herewith.

2.3 Certification (62-701.320 (6), FAC)

Appropriate professional certifications are provided on all applicable submittals herewith.

2.4 Transmittal Letter (62-701.320 (7) (b), FAC)

The application transmittal letter is included in the front of this permit renewal application document.

2.5 FDEP Form (62-701.900 (1), FAC)

A completed, dated, signed, and sealed application form is included in front of Section 1.0 of this report.

2.6 Permit Application Fee

A check in the amount of Ten Thousand Dollars ($10,000.00) for the initial five years of operation of the twenty-year operations permit renewal period is submitted herewith. A copy of the check is included with this application. The County, in the fifth year of continued operations, will submit additional permit application fees on five-year increments.

2.7 Engineering Report (62-701.320 (7) (d), FAC)

The Engineering Report is contained herewith. The report references existing information where needed and includes information that has changed since the original submittal. This

permit application report is prepared in conformance with FAC 62-701.320(7) (d) required format, content, and appendices.

2.8 Operation Plan and Closure Plan (62-701.320 (7) (e), FAC)

Changes and updates since the November 2008 operations permit modification are noted in Section 7.0. The November 2008 operations plan was revised in February 2012. It is further updated for this application provided as Attachment C. The Closure Sequence Plan last updated for the closure permit application (Reference No. 3) is not proposed to be changed for this application.

2.9 Contingency Plan (62-701.320 (7) (e) 2, FAC)

The contingency plan is updated and provided in Attachment C.

2.10 Drawings for the Solid Waste Management Facilities

Record Drawings for the original North Cell and Phase I Expansion construction are on file with the Department. Drawings depicting the as-built "East Cell" Phase 1 expansion were submitted in December 2005 with the Phase I Construction certification documents. The following Drawings are provided in Attachment B to update the aerial, topography and site plans for the North Cell Class I Disposal Area:

Figure B-1 Airport Location Map Re-submitted from Prior application
Figure B-2 Aerial Vicinity Map
Figure B-3 Site Aerial
Figure B-4 North Cell Topography and Site Plan (April 2012)
Figure B-5 Final Grading Plan
Figure B-6 Monitoring Well Locations
Figure B-7 Gas Probe Locations
Figure B-8 Offsite Well Location Information (October 2012)

2.11 Proof of Property Ownership (62-701.320(7) (g), FAC)

Volusia County currently owns approximately 3400 acres of land in the eastern County designated as the TFRLF. This property has been designated by the County for solid waste management activities, buffer and preservation. Proof of property ownership for the TFRLF property was previously submitted to the Department.

2.12 Recycling Goal Achievement (62-701.320 (7) (h), FAC)

Volusia County has an active solid waste recycling program and promotes solid waste recycling within the County to continually improve the program. The current recycling rate is estimated to be approximately 25 percent of waste generated in Volusia County. A recycling goal of 75 percent of the total waste stream by 2020 has been established by the State of Florida. The County will strive to educate the public and remove more recyclable materials from the Class I waste stream to raise the recycling percentage. Normal source-separated recyclables (glass, paper, cardboard, metal, plastics) are currently collected from residents by recyclable collection vehicles, and delivered to a vendor-operated recycling center at the TFRLF.

2.13 History of FDEP Enforcement Activities (62-701.320 (7) (i), FAC)

A history of enforcement actions taken by the Department since January 1, 2008 is listed below. Department enforcement activities since the prior operation permit renewal are:

- February 2008 Air Consent Order for failure to timely install and operate the Landfill Gas Control System, and failure to identify the non- compliance status on the 2004, 2005, and 2006 Statement of Compliance. Addressed by Installation of North Cell Phase I LFG control system by August 2006. In-kind project proposed to settle administrative fines were the leachate storage and treatment improvements that resulted in an on-site Sequence Batch Reactor (SBR) Leachate treatment Plant and effluent spray field.
- Warning Letter-January 5, 2011, Potential Release of Leachate. A Department inspection in November indicated the potential release of up to 100,000 gallons of leachate may have occurred from the leachate impoundment to an adjacent swale. Issue was resolved with calculations using leachate pond levels, metered leachate quantities transmitted to the impoundments and testing of stormwater. Test results indicated very low levels of leachate constituents in stormwater system. Actual release volume was shown to be much lower than the potential leachate volume.
- Non-Compliance Letter-September 12, 2011 Leachate Seep on south slope of North Cell with seepage into stormwater. Resolved with construction of seep interceptor drain that is connected to the leachate collection system. Construction of interceptor drain completed in late 2011.

2.14 Proof of Publication of Landfill Permit Applications (62-702.320(8), FAC)

The proof of publication in a newspaper of general circulation of notice of applications for a permit to operate a solid waste management facility will be provided to the Department upon receipt of notification from the Department to publish the Notice of Application.

2.15 Airport Safety Requirements (62-701.320 (12), FAC)

The North Cell is located near the north boundary of the Tomoka Farms Landfill Facility. The closest runway is the east-west runway at the Daytona Beach International Airport. The end of this runway is 12,300 feet from the northeast property line of the Tomoka Farms Landfill facility and 13,000 linear feet from the North Cell. The Spruce Creek private airport is approximately five (5) miles to the southeast.

The proposed top elevation of 193 feet NGVD is unchanged from the previous application. No lateral expansion or vertical expansion is proposed under this permit. No notification to government officials, FAA or airports is required.

An Airport Location Map is provided in Attachment B.

2.16 Certified Operators (62-701.320 (13), FAC)

The Tomoka Farms Road Landfill Facility is operated by certified operators who are trained as Manager of Landfill Operations or as spotters. A list of staff and their certifications from the Treeo Center or other approved trainers is provided in Attachment D.

SECTION 3.0

Part E - Landfill Permit Requirements (62-701.330, FAC) and Part F General Criteria for Landfills (62-701.340, FAC)

In the late-1970s, Volusia County planned for solid waste facility expansion and buffer from surrounding properties by purchasing approximately 4500 acres of contiguous property around the existing landfill. The North Cell Class I disposal area is anticipated to provide Class I solid waste disposal capacity to the County for the next 15-20 years. There is significant land area available at the TFRLF for future solid waste disposal areas.

3.1 Regional Map, Vicinity Aerial, Site Aerial and Airport Location Map (62-701.330 (3) (a), FAC)

3.1.1 Regional Map, Vicinity Aerial, Site Aerial and Property Boundaries

A regional map is provided in Attachment B, Figure B-1. This general road map provides an overview of location, major roads and nearby water bodies. The TFRLF boundary is delineated. The regional map is also used as the base map for the airport location map.

Attachment B, Figure B-2 is a year 2012 vicinity aerial that shows the property boundary of the existing landfill with surrounding properties, and depicts the area located within a one-mile radius of the landfill property boundary. Figure B-3 in Attachment B is a detailed April 2012 site aerial photography previously submitted to FDEP as part of the Phase II construction permit renewal application. A review of the September 2012 property appraiser map indicates that the majority of the properties located within one-mile of the TFRLF property are zoned for conservation, agricultural, or commercial use.

Figures B-5 and B-6 depict the onsite monitoring well system and gas probe locations at the TFRLF, respectively. Figure B-7 indicates the relative location of permitted offsite wells.

3.1.2 Airport Location Map and Airport Safety

The location of airports within a five mile radius of the TFRLF is shown on the regional map Attachment B, Figure B-1.

The landfill property boundary is more than 10,000 feet but less than 5 miles (12,300 foot distance) from the Daytona Beach International Airport (DBIA) east-west Runway. The DBIA is the only public use airport within five miles. The Spruce Creek airport located southeast of the landfill property is approximately five (5) miles away and is a private use airport. The DBIA, FAA, and other appropriate officials were notified of the August 2012 construction permit application following the submittal to FDEP.

3.2 Plot Plan and Cross Sections (62-701.330 (3) (b), FAC)

This permit application includes or references documents recently submitted for renewal of the construction permit for Phase II expansion area. This information was also previously

submitted in the original 2002 construction/operations modification permit application. The plans showing the disposal areas, original elevations and proposed elevations were presented on Sheets 5 of 14, 6 of 14 and 8 of 14 of the 2002 submittal. The waste boundaries depicted for Phase II expansion, (areas 3 and 4) have not changed. Cross sections were recently presented in the 2009 Closure permit application (Ref. No. 2), and the 2009 updated fill sequence plans (Ref. No. 3).

The North Cell is approximately 1,000 feet inside the TFRLF property; therefore so security fencing is not located adjacent to this cell. The perimeter of the site is fenced with farm fencing. Landfill expansion is discussed in more detail in Section 3.5.2.

A plot plan showing boring locations was presented in the November 14, 2000 Geotechnical Report prepared for the North Cell expansion on file with the Department.

3.3 Topographical Information and Survey (62-701.330 (3) (c), FAC)

An April ,2012 topographic survey for the North Cell area, with a scale not greater than 200 feet to the inch, is provided in Attachment B Figure B-4. This map shows the existing topography of the previously filled North Cell disposal area, Area 1, the recently activated Area 2 and the proposed location of Area 3 and Area 4. Access roads, and proposed grades required for proper drainage for the original North Cell and Area 1 are shown on Figure B-4. Drawings showing lift and row elevations (Stages) as filling continues, are provided in the 2009 Fill Sequence Drawings (Reference No. 8). Proposed final cross sections for Areas 1-4 are provided on Sheet 4 of 9 of the 2009 Fill Sequence.

Well Information for recorded wells within one mile of the Tomoka Farms Road Landfill is provided in Attachment B.

3.4 A Report Describing the Landfill (62-701.330 (3) (d), FAC)

3.4.1 Current and Projected Population of Area Served and Type and Quantity of Waste Projections

The projections for the generation of Class I waste to be disposed at the Tomoka Farms Road Landfill Facility through the year 2035 are based on existing solid waste volume depletion information for the period of 2006 through 2011 and population projections available from the Office of Economic and Demographic Research (EDR-Florida) and the Volusia County Planning Department. Population projections used in the FY 2012 Financial Responsibility Cost Estimate Report, August 2012 are used for airspace utilization projections in this application. The 2012 population of the Volusia County wasteshed is estimated to be 596,730 people. The population within the Class I wasteshed is projected to grow to 647,798 people in 2017. It is noted that the Class I wasteshed population projection include approximately 100,000 people from Flagler County, who may not participate in the County's solid waste management system in the near future. The wasteshed includes the unincorporated areas within Volusia County and incorporated cities and towns within Volusia County. Typical solid waste is about 60 percent residential and 40 percent commercial in origin with allowable industrial waste occasionally direct hauled and accepted at the Landfill. Wastewater residuals are accepted at the TFRLF and processed by an onsite vendor.

Since 2008, the Class I solid waste from Flagler County has started to be diverted to other disposal facilities. In addition, the City of Deltona, with a population of approximately 85,000+ people, diverted their waste stream to other non-county disposal facilities between the years 2008 through 2012. The City of Deltona started participating in the County's solid waste management system starting in September 2012 and their solid waste is hauled to TFRLF. These factors, and the economic downturn during the same period, may help explain the fluctuation in solid waste volumes in the Volusia County solid waste system since 2008.

Waste tonnage projections for Class I waste are based on a medium population growth scenario used by EDR-Florida. Class I disposal quantity projections were based on the following assumptions:

- Class I solid waste disposal tonnage will increase in direct proportion to population (i.e., the per capita disposal rate will remain constant).
- The base quantity for future Class I solid waste disposal projections is the average annual Class I per capita volumetric disposal rate for FY 2006 through FY 2011. The Class I solid waste disposal rate for the TFRLF increased from 0.87 cubic yards per capita in operational year 2000 to 1.16 cubic yards per capita in FY 2004, then decreased during the next seven years. The five year (2006-2011) average rate used to project future disposal quantities in this analysis was 0.688 cubic yards per capita.
- Apparent waste density is used to convert from volume to tonnage. Apparent density refers to the quantity of waste placed in the landfill in tons, divided by the volume of landfill capacity consumed, not including the amount and volume of cover material. As waste decomposes, the landfill subsides, recovering landfill capacity and increasing apparent waste density as additional waste is placed in the recovered volume. An analysis of historic volume used compared to Class I tonnages disposed results in an apparent density of approximately 1750 pounds/CY in place.
- EDR population estimates are used for Years 2013 through 2030. Tonnage projections are extrapolated at an annual increase of 1.01 percent per year through 2035.

Table 3-1 presents historical Class I solid waste volume utilization for FY 2007 through FY 2011. The waste tonnage projections used for planning the buildout and filling of original North Cell, and Phase I and II expansions (Areas 1-4) are provided in Table 3-1. As is normal for any long-term projection, the further into the future the projection extends the higher the degree of uncertainty.

3.4.2 Anticipated Site Life

Phased Development Plan for Class I Landfill Cells

A development plan for constructing Class I North Cell landfill Areas 1 through 4 was presented in the 2002 permit application. Due to lower than previously projected waste quantities, the construction of Phase II has been delayed. Table 3-3 summarizes the Phase II landfill unit base construction schedule.

Typical Cell Cross Sections

In accordance with previously submitted documents as part of the 2009 Fill Sequence Plan in the closure permit modification application, (Sheet 4 of 9), the cross sections for the Norht Cell Class I landfill developed based on site geometry and the following criteria:

SECTION 4.0

Part G - Landfill Construction Requirements (62-701.400, FAC)

4.1 Phased Construction and Closure of Landfill Units (62-701.400(3), FAC)

The remainder of the North Cell Class I landfill will be constructed as Phase II in accordance with the current permitted plans. The approximate schedule for Phase II construction is presented in Section 3.3 of this permit application report. Closure sequential construction will be performed as side slopes reach permitted elevations, solid waste decomposition takes place and permitted disposal capacity is exhausted. Closure construction is anticipated in three (3) phases as presented in Section 3.4.

4.2 Landfill Liner Requirements (62-701.400 (3), FAC)

4.2.1 General Construction Requirements

Landfill liner requirements are not applicable for this operations permit application. Construction of Phase 2, Areas 3 and 4 was included in the Construction Permit renewal Application dated August 1, 2012 (Ref. No. 2). The checklist items pertaining to construction have been designated as "Not Applicable" on the application form.

4.3 Leachate Collection and Removal System (LCRS) (62-701.400 (4), FAC)

4.3.1 Leachate Handling System

Construction phase portions of the application have been marked "Not Applicable."Phase II, Area 3 and 4 LCRS will be constructed in conformance with the construction permit application (Ref. No. 3). The design of the LCRS for Phase II was improved by strengthening sumps with solid wall HDPE pipe and using solid wall HDPE pipe for the leachate collection pipe and leak detection systems. This design is similar to the LCRS retrofit and improvements in Areas 1 and 2.

4.4 Leachate Treatment and Recirculation (62-701.400 (5), FAC)

No new construction of leachate treatment facilities is proposed. This Section is "Not Applicable". Since the issuance of the 2008 operations permit, the County has constructed an onsite leachate treatment plant and effluent irrigation system. The operation of the treatment facility is controlled by an industrial waste permit (Ref. No. 7). The treatment plant is a batch reactor with an average daily design flow of 45,000 gallons per day. The step aeration plant has anoxic zones, aeration basins and clarifier, and uses supplemental methanol as a carbon source for biological carbon uptake. The plant was placed in operation

There is a minor change to the stormwater management system that was referenced in the July 2008 application. An infill had been proposed between the south slope of the North Cell and the north slope of the South Cell. This infill has been removed through permit modification. Stormwater from the south slope of the North Cell is now conveyed to a stormwater swale at the south toe of the disposal unit. It is routed westward then northwards and released into the north pond adjacent to the North Cell. Reference ERP No.ERP64-020632-002-EM.

The detailed design and calculations of the major stormwater management system were provided with the ERP. Calculations for the closure stormwater system on the North Cell were presented in the Closure Permit renewal Application (Ref. No. 3). Stormwater runoff will be collected on the landfill cover by a series of sideslope swales at 40 foot vertical intervals with downdrain pipes or flumes that drain to stormwater perimeter ditches. The side slope swales and downdrain pipes will have appropriate erosion and sediment control protection.

Discharge from the site is through wetlands to Class III Waters. Discharge is regulated by two National Pollutant Discharge Elimination System Permits. These permits are listed in Table 1-1.

4.9 Gas Control System (62-701.400 (10), FAC)

No Landfill Gas control system construction is proposed under this application. The design and construction of the permanent gas control System is "Not Applicable" for this operations permit renewal application. A proposed LFG Master plan for buildout of the North Cell LFG system is provided in Attachment G.

A landfill gas control system for the original North Cell was installed in 2006. That project included installation of vertical gas wells, headers, condensate sumps, compressors and a new flare station. The LFG collection system was further expanded in 2009 and again in 2012 (Ref. No. 9). As part of the operation of the North Cell, the County will continue to install horizontal collectors, vertical wells, laterals, and collection piping as warranted to control odor and collect LFG for the on-site LFG-to-Energy (LFGTE) facility, in accordance with the LFG management master plan.

The construction of LFG improvements and controls may be performed by the County as a stand-alone project, or as part of sequential closure construction in accordance with the conditions of the North Cell Operation Permit. The County will inform FDEP of an impending LFG improvement and control construction project in accordance with the LFG management master plans submitted with this application. After completion of each construction event, the County will submit record drawings and certification of completion of construction to FDEP.

SECTION 5.0

Parts I – Hydrogeological Investigation (62-701.410, FAC) and Part J- Geotechnical Investigation Requirements (62-701.420, FAC)

The information for Part I and Part J, with the exception of an updated well survey within one mile of the landfill, was previously submitted. See Reference Nos. 17 and 18 in Section 1.1.2.

The well inventory within one mile of the TFRLF has been updated as of October 2012 and is discussed below. Maps of offsite well locations within one mile of the TFRLF are provided in Attachment B. Other items in Part I and Part J of the application form have been marked "No Change."

Updated Well Inventory

The Saint Johns River Water Management District Consumptive Use Permit Data Base (October 2012), and the FDEP Water Data System (October 2012) were checked to locate permitted potable water and irrigation wells within one mile of the Tomoka Farms Road Landfill. Consumptive Use Permits within one mile are listed below:

Table 5-1
Consumptive Uses Permits
Tomoka Farms Road Landfill Facility

Permit No.	Activity Description	General Location	Well, Pond or Ditch
CUP-4353	Fire Protection	North 0.8 miles	Well
CUP-8834	Municipal Public Water Supply, south west well field- (3 wells in close proximity)	North 0.5-0.7 miles	Wellfield
CUP-130947	Dewatering for FDOT Borrow Pond Excavation for I-4	West	Pond
CUP-130416	Dewatering for I-4 Swale Improvements	West	Ditch
CUP-9367	Dewatering Permit- TFRLF Borrow Ponds	Onsite	Multiple Ponds for Borrow or Stormwater Control
HD 64-57-00290	TFRLF Administration Building (Volusia County Health Dept. Permit-Non Potable Use)	Onsite North of Admin Building	Well

Three (3) public water supply wells (southwest well field-Well Nos. 17170, 17171 ad 17172) for the City of Daytona Beach grouped under CUP No. 8834 are located approximately one mile west of the western TFRLF boundary. Additional well map and documentation is included in Attachment B. No other community or non-community public water system wells were known to be located within one mile of the Tomoka Farms Road Landfill Boundary. Recorded wells on the SJRWMD database are shown in Attachment B. Well logs are contained within the individual files at the SJRWMD for each consumptive use well or at the Volusia County Health Department.

Since 2006, the City of Daytona Beach Utilities has provided the potable water to all areas of the TFRLF except the Administration Building, which is supplied by on-site well water. A connection between a Tomoka Farms Road water main and a major water main west of the landfill was installed to loop the City of Daytona Beach water distribution system.

Three (3) public water supply wells (southwest well field-Well Nos. 17170, 17171 ad 17172) for the City of Daytona Beach grouped under CUP No. 8834 are located approximately one mile west of the western TFRLF boundary. Additional well map and documentation is included in Attachment B. No other community or non-community public water system wells were known to be located within one mile of the Tomoka Farms Road Landfill Boundary. Recorded wells on the SJRWMD database are shown in Attachment B. Well logs are contained within the individual files at the SJRWMD for each consumptive use well or at the Volusia County Health Department.

Since 2006, the City of Daytona Beach Utilities has provided the potable water to all areas of the TFRLF except the Administration Building, which is supplied by on-site well water. A connection between a Tomoka Farms Road water main and a major water main west of the landfill was installed to loop the City of Daytona Beach water distribution system.

SECTION 6.0

Part K - Vertical Expansion of Landfills (62-701.430, FAC)

This part is not applicable for this permit application. No vertical expansion is planned. Section 6.0 of the permit application has been marked "Not Applicable." The final elevation has been permitted to be 193 feet NGVD.

SECTION 7.0

Part L - Landfill Operation Requirements (62-701.500, FAC)

7.1 Trained Operators (62-701.500 (1), FAC)

At least one trained spotter will be located at each active working face. One trained operator (MOLO trained) is present onsite during operating hours. The training program is discussed in Attachment C. Current employee training certificates and training program is included in Attachment D.

7.2 Operations and Contingency Plan (62-701.500(2) through 62-701.500(7), FAC)

7.2.1 Update of Operations and Contingency Plan

The updated Operation and Contingency Plan is included in Attachment C.

Significant updates to operations include the fill sequence plan, the transmission and onsite treatment of leachate from the North Cell with onsite disposal of treated effluent, the initiation of filling operations into Area 2 in mid-2012, and physical improvements to the original North Cell and Phase I leachate collection and removal systems.

For this operations permit renewal, the checklist has been marked "No Change" if the operation has not significantly changed from the previously submitted operation plan. The location of pertinent operational information in the Operations and Contingency Plan is noted on the application checklist.

7.2.2 Update of Fill Sequence Plan

An updated fill sequence plan was developed in 2009 to enable the County to fill Phase 1 and Phase II in a methodical order. The fill sequence entitled" Tomoka Farms Road Landfill Class I Cell Fill Sequence Plan, August 2009, was integrated into the closure permit renewal application RAI response submitted to FDEP in November 2011 (Reference No. 3). The fill sequence drawings indicate fifteen stages of filling. A copy is included in Attachment C of this application for reference.

The maximum fill height remains unchanged at 193 feet NGVD. The County proposes to continue with installation of horizontal LFG collectors as part of the operations as warranted to control odor. Horizontal LFG collectors will be connected to the active LFG system for utilization.

7.3 Leachate Collection, Transmission and Treatment Systems (62-701.500(8), FAC)

7.3.1 Leachate Collection and Transmission

Leachate from the initial footprint of the North Cell is collected from four (4) sumps located along the western edge. Sump riser pipes contain leachate pumps that remove leachate collected from over the liner in the original north cell. Each designated sump location also has a leak detection sump that is used to remove any leakage that flows between the HDPE liners of the double composite liner system. Collected leachate is pumped to the new onsite treatment plant for treatment and disposal, or to the north leachate impoundment for temporary storage. The County recently completed repair of Sumps 1 and 4, and currently is in the process of contractor selection to complete the repairs on sumps 2 and 3.

Leachate from Phase I, Area 1 and Area 2 flows south to north emptying into leachate collection sumps and leachate detection sumps at the north end. Sideslope collection and detection riser pipes containing submersible pumps discharge to the leachate collection and leachate detection header pipes, respectively along the north edge of Phase I. There are no pipe penetrations through the primary or secondary liner. Leachate is transmitted through leachate collection and leachate detection headers to the treatment plant or to the south leachate impoundment.

The plans for leachate collection and detection systems for Phase II Area 3 and Area 4 is similar to those currently installed in Phase I. Minor improvements in the design are identified in the North Cell Construction permit renewal (Ref. No. 4) Additional transmission piping will be installed to serve the Phase II expansion area.

No significant change in operation of the leachate collection and transmission system for Phase I and Phase II is anticipated during the next twenty-year operational period.

7.3.2 Leachate Treatment System Description

Leachate treatment is performed onsite at a 45,000 GPD Average daily Flow (ADF) Sequential Batch Reactor (SBR) that includes anoxic tanks, aeration tanks, methanol addition, clarifiers, disinfection, sludge removal and sludge drying beds. The plant is permitted to operate under Industrial Waste Permit No. IW- Permit No. 64-FLA662356-001-1W8D, issued April 15, 2009, which expires on April 14 2014. Leachate is pumped directly to the treatment plant via the leachate transmission system serving the disposal unit, or from storage in the north leachate impoundment. Effluent from the treatment plant is used for on-cell dust control, wash water for the treatment plan equipment, or is stored in the north surface impoundment for spray irrigation. A dedicated onsite 26-acre irrigation site with monitoring wells is used for effluent disposal.

7.3.4 Description of Improvements and Operation of Leachate Collection and Removal Systems

7.3.4.1 Leachate Collection System Retrofit

Over the past three years, the County has completed retrofits to leachate sumps No. 1, 4, 5 and 6. The project included replacement of the vertical risers made of corrugated HDPE

pipe with solid wall HDPE SDR 17 pipe, and replacement of the leachate collection header within twenty feet of the sideslope riser pipes. Sumps 1 and 4 are on the west corners of the original North Cell, sumps 2 and 3 are interior locations on the west edge of the North Cell, and Sumps 5 and 6 serve Area 1 and 2 in Phase I expansion area, respectively.

The repair/replacement has enabled the risers to structurally support the overlying liner protective layer and the weight of the solid waste, and to protect the sump area and pumps. Retrofit of sumps 2 & 3 on the west edge of the North cell is planned over the next 12-month time period using similar solid wall HDPE SDR 17 materials to achieve a durable riser pipe and pump sump, allowing more efficient pump operation, and easier removal and inspection of pumps.

The Phase I expansion Areas 1 and 2 leachate collection piping made of corrugated HDPE were replaced with perforated solid wall pipes to mitigate pipe crushing. This replacement was performed early in the filling of Area 1, when there was minimal waste in place and prior to waste filing in Area 2. The selected solid wall perforated pipe has been able to withstand waste loading for the build-out height of the North Cell. Sumps 7 and 8 located in Phase II expansion area (Area 3 and 4) are designed and permitted to use solid wall HDPE risers and pump sumps to withstand the potential weight of protective cover and the solid waste at build-out height.

7.3.4.2 Prevention of LCS Clogging

Leachate collection pipes are backfilled with imported natural river run gravel with a maximum size of 3/4 inch or less and less than 5 percent passing the 3/8 inch sieve, which, in turn, are wrapped with filtration geotextile to prevent clogging of the leachate collection system by infiltration of fine particles from the waste. In addition, the leachate collection pipes are covered with a layer of composite drainage net (CDN) and 24 inches of drainage sand.

7.3.4.3 Cleaning of Clogged Pipes

The LCRS has cleanout pipes for cleaning the collection system and the leak detection system. Sumps 1, 2, 3 and 4 are accessed from the west end. LCS/LDS pipes are also accessible from the west end. Portions of the collection/detection pipe system for Sumps 1 and 4 are accessible via cleanouts along the north and south edges of the North Cell.

Florida Jetclean Inc. of Clearwater, Florida, an experienced LCS cleaning contractor, has historically serviced the collection and detection piping systems. Typical length of pipes discharging to Sumps 1-4 is about 1,000 feet. The North Cell LCS and LDS pipe length is approximately 1,350 feet.

LCS/LDS inspection for Sump 1 through 4 takes place from the west end of the sumps. LCRS pipes for Phase I expansion (Areas 1 and 2) are inspected from both ends, through Sumps 5 and 6 on one end, and through the length of the collection pipe or detection pipe on the south edge of the North Cell. The Phase II expansion (Areas 3 and 4) LCRS will be inspected at the conclusion of construction.

The LCRS is required to be inspected and cleaned as necessary when the operations permit is renewed. For this permit renewal, inspection was performed on different portions of the

LCRS in June, July, September and October 2012. Inspection reports are provided in Attachment E. The results of the inspection indicate that leachate flow to each of the sumps do not appear to be blocked, but may be impeded by sediment buildup or pipe deformation. In particular, in Sumps 2 and 3 on the west perimeter, the leachate collection pipe and collection pipe risers have damage that must be repaired to enable better pumping and to allow for pump removal and insertion.

The repairs to Sumps 2 and 3, as indicated previously, are scheduled during the next 12-month period. The extent of the repairs was described in detail the Closure Permit Application (Ref. No. 3). The County will notify the Department of start of construction and will submit certification of completion of construction for the repairs.

7.4 North Cell Phase I Gas Management System Description and Operation (62-701.500(9), FAC)

The North Cell Phase I LFG collection and control system became fully operational in March 2007. The system was constructed in substantial conformance with the permitted system (2003 operations permit intermediate modification) and includes vertical gas wells, headers, condensate sumps, compressors and a flare station. The LFG collection system was further expanded in 2009, and again in 2012 (Ref. No. 9.)

The on-site flare system is a backup to the privately operated LFGTE plant at the site that uses LFG to run engines that drive electrical generators. The County utilizes LFG from the North Cell and the South Cell for power generation. A vendor (Fortistar Methane Group) operates four LFG fueled engines that turn two turbines to produce electricity. Electricity is fed into the local power grid.

The back-up flare station has a capacity of up to 5000 SCFM. The LFG collection system is operated under vacuum from dual compressors/blowers. A complete description of the components and operation is contained in the LFG O&M Manuals that are onsite.

In early 2010, the County completed a project to replace the south LFG header in the original north cell, modify horizontal headers and wellheads on the south slope, and reconstruct seven vertical wells with replacement wells. During 2011-2012, the County installed 22 vertical collection wells, as well as, additional upgrades to the existing landfill gas collection system.

The County will continue to install LFG collection and control system expansions and improvements for the North Cell in accordance with the LFG management master plan submitted as Attachment G. Certification of completion of construction will be submitted to FDEP after each construction event.

7.5 Surface Water Management System (62-701.500 (10), FAC)

Runoff from the north, south, east and west edges of the landfill unit is collected in perimeter stormwater ditches, which are sized to convey runoff from the 25-year 24-hour storm event to the north stormwater pond. Maintenance Procedures are provided in the Operations and Contingency Plan (Attachment C, Section 10)

There is a minor change to the stormwater management system that was referenced in the July 2008 application. An infill had been proposed between the south slope of the North Cell and the north slope of the South Cell. This infill has been removed through permit modification. Stormwater from the south slope of the North Cell is now conveyed to a stormwater swale at the south toe of the disposal unit. It is routed westward then northwards and released into the north pond adjacent to the North Cell (Reference ERP No. ERP64-020632-002-EM.)

Stormwater from the north stormwater pond is pumped to onsite wetlands. Pumping of the north stormwater pond also controls the gradient under the landfill liner. Stormwater pumping under the County's Consumptive Use Permit, creates a groundwater gradient towards the north pond. Dewatering under newly installed landfill liners (approximate elevation of 15 NGVD at low point) must be continued until waste in the Cell has reached the required elevation to overcome buoyancy.

The permanent secondary storm water management system for the North Cell consists of swales on terraces located at approximately 40 foot vertical intervals. Storm water inlets, letdown structures and pipes are used to convey storm water to the perimeter ditches which flows into the adjacent North Pond.

7.6 Equipment and Operation Feature Requirements (62-701.500(11), FAC)

The County will provide sufficient equipment for handling solid waste disposal, have arrangements for backup equipment when needed, and provide for dust control, fire protection, litter control and proper signage. Communication equipment will be used to enhance operations and for safety. See Operations and Contingency Plan in Attachment C, Section 11.

7.7 All Weather Access Roads and Other Necessary Onsite Roads (62-701.500(12), FAC)

All weather access roads and temporary access roads are described in Attachment C, Section 12.

7.8 Recordkeeping Requirements (62-701.500(13), FAC)

All required records will be maintained for compliance and inspection purposes. Refer to Operations and Contingency Plan in Attachment C, Section13.

SECTION 8.0

Part M - Water Quality and Leachate Monitoring Requirements (62-701.510, FAC)

8.1 Water Quality and Leachate Monitoring Plan (62-701.510(1) FAC)

The latest Monitoring Plan Implementation System (MPIS) was issued March 23, 2012, and became effective with the closure permit issuance. According to the latest MPIS, there are 54 groundwater wells that are sampled or read for water levels, seven surface water monitoring sites and two leachate monitoring points. No changes to the current water quality monitoring requirements are proposed in this application. Volusia County requests that the annual leachate sampling and analysis requirement in the MPIS be removed since it is no longer required in the September 2012 Solid Waste Rule. Onsite leachate treatment is regulated by the Industrial Waste Permit. Leachate sampling and analysis is performed at the north leachate impoundment (L-2) for leachate treatment process adjustment and on the effluent to determine effluent quality. The operations permit application has been marked "No Change, with the exception of leachate sampling and testing.

At the October 22, 2012 pre-application meeting for this permit application, The Department agreed that the Technical Water Quality Report 2011, submitted on April 6, 2012, was adequate to document water quality trends over the past four years and that no additional water quality summary report was needed for the purposes of this permit application.

8.2 Leachate Sampling Locations (62-701.510(5) FAC)

Leachate is sampled at the north leachate impoundment.

8.3 Assessment Monitoring and Corrective Action (62-701.510(7) FAC)

The County has conducted contamination assessment monitoring for benzene and ammonia nitrogen contamination in the vicinity of the Class III Disposal unit over the past two years. Volusia County Solid Waste Division is currently in post-remediation monitoring in accordance with the Limited Scope Remedial Action Plan (LSRAP) approved on March 19, 2009. Subsequently, on October 29, 2012, the Department provided their comments on two water quality reports that had been submitted within the past 24 months. These reports are:

- Contamination Evaluation Report (CEP), dated April 6, 2011, and
- Tomoka Farms Road Landfill Technical Water Quality Monitoring Report, dated April 6, 2012

The County is preparing a response to the October 29, 2012 RAI for submittal to FDEP under a separate cover.

8.4 Water Quality Report Requirements (62-701.510(9) FAC)

The County submits semiannual and Technical Water Quality Reports as required by the MPIS and the conditions of the current operations permit.

SECTION 9.0

Part N - Special Waste Handling Requirements (62-701.520, FAC)

Special waste handling requirements have not changed since the 2007 operations permit renewal application. The permit application has been marked "No Change."

SECTION 10.0

Part O- Gas Management System Requirements (62-701.530, FAC)

10.1 Landfill Gas Management Systems (62-701.530 (1), FAC)

10.1.1 Original North Cell Landfill Gas System and Phased Expansions

In accordance with the requirements of the FDEP Title-V Air permit for the landfill, the County has implemented a LFG gas collection and control system in the North Cell. The system of vertical wells, laterals and collection main, and a flare station (Phase 1 LFG) was completed in February 2007. Additional vertical wells, horizontal collectors lateral piping and headers (Phase 2 LFG) were installed during 2009 in the east portion of the original cell and in Area 1. That project also included seven well replacements and retrofit of the south header pipe. In 2012, The Phase 3 LFG system expansion was completed which consisted of installation of 22 vertical gas wells and upgrades to the existing landfill gas collection system. These upgrades consisted of adding a new 18 inch diameter header line with four (4) new condensate sumps on the south edge of the North Cell, extension of the north 16-inch diameter header outside of waste, a new condensate sump, looping the north and south headers using sub-headers and adding air and force mains to the system. The construction certification documents for each phase of LFG collection and control system were submitted to FDEP (Ref. No. 10).

The County plans to continue with installation of horizontal LFG collectors as part of the North Cell Operations Permit. Horizontal LFG collectors with wellheads are proposed to be installed at approximately 40 foot vertical intervals and manifolded to perimeter LFG header pipes. Active LFG collection system is intended to comply with the current Title-V permit requirements for surface emissions, and to reduce gas odors. Vertical wells are planned to be installed from time to time on side slopes where final elevations have been achieved as part of sequential closure construction events.

The collected LFG is transmitted to the on-site LFGTE plant. Excess LFG is currently oxidized at the backup flare station permitted under the Title-V operation permit. The County is planning to advertise to contract with a new vendor or renegotiate with the current vendor to increase the capacity of the LFGTE plant consistent with the amount of LFG projected to be generated at the North Cell.

10.1.2 Buildout Landfill Gas Management System

The planning and final construction of the permanent LFG management system for the North Cell will be performed as final permitted elevations are achieved and filling operations for each sequence have been completed. The system will continue to include horizontal collectors installed during filling operations, lateral piping, vertical gas well installation, LFG headers and expansion of the condensate removal system. The condensate

removal system ties into the primary leachate collection system. The LFG management master plan is submitted in Attachment G.

The County will notify the Department of plans for expand the LFG collection system of horizontal collectors and vertical wells as final elevations are achieved and connect to the LFG-To-Energy plant and the flare station. The record drawings and documents for certification of construction completion for each future expansion of the LFG management and control system will be forwarded to FDEP for approval as part of this operation permit for the North Cell.

10.2 Routine Gas Monitoring System (62-701.530(2), FAC)

Landfill gas probes are installed throughout the site to monitor migration of gas. The current monitoring locations include LFG probes G1 through G 5 located south of the Class III Cell, LFG Probe G- 7 located at the backup flare facility control shed and LFG Probe G-8 located at the northwest corner of the original north cell. LFG Probe LFG 6 was located near the equipment maintenance facility and was removed per agreement with the Department to install detection sensors in the maintenance building. Detection sensors were installed at the maintenance building but were later removed due to inconsistent performance. The maintenance building is currently monitored at least quarterly with portable test equipment. Additional LFG monitoring points are the TFRLF administration building and the scalehouse. All monitoring points are sampled quarterly, and the results reported to the Department.

At the October 25, 2012 meeting, the Department requested that four (4) additional LFG monitoring locations be added to the routine gas monitoring system. These additional locations are buildings or sheds used by County or private vendor personnel. Proposed monitoring sites are the GEL Recycling Center due east of the North Cell, the Household Hazardous Waste Facility east of the North Cell, the sludge processing facility west of the South Cell and the Leachate Treatment Facility at the southwest corner of the North Cell. The existing North Cell dewatering ditch separating the GEL Recycling Center and the HHW will be filled after construction of Phase II requiring some of these probes.

Quarterly readings at these proposed locations would be ambient air readings and the County would not be required to install in-ground LFG probes. The County will add these structures to the quarterly LFG monitoring. See Figure B-7 in Attachment B.

10.3 Gas Remediation Plan and Odor Remediation Plan Implementation (62-701.530 (3), FAC)

If the results of monitoring show that the combustible gas concentrations exceed the lower explosive limits, the Volusia County Solid Waste Division will take the necessary steps to ensure that human health is protected and will notify the FDEP. A gas remediation plan will be submitted to the Department within seven days of the detection.

The Volusia County Department Solid Waste Division has implemented a routine odor-monitoring program for the landfill and adjacent buildings to determine the timing and extent of off-site odors and will submit an odor remediation plan to the FDEP, if one should become necessary.

10.4 Landfill Gas Recovery Facilities (62-701.530(5), FAC)

The North Cell Phase I gas system became fully operational in March 2007. The system includes vertical gas wells, headers, condensate sumps, compressors and a flare station.

The Title-V operations permit required a flare system as a backup to the LFG-To-Energy plant. The LFG utilization plant uses LFG to run combustion engines that drive electrical generators. The back-up flare station has a maximum capacity of 5,000 standard cubic feet per minute (SCFM). The collection system is operated under vacuum from dual compressors/blowers. A complete description of the components and operation is contained in the LFG O&M Manuals that are onsite.

Information required in Rules 62-701.330 (3) FAC (general maps and site plan) is provided in Attachment B, which provides a general sequence for the installation of horizontal collectors and vertical wells.

A closure plan for LFG system operation has been submitted in the Intermediate Modification Closure Permit Application (Reference No. 3).

Landfill Gas Generation Rates were provided for the Title V permit and for the North Cell Phase I System Construction Permit Application. See Reference No. 12. Condensate in the LFG header system is drained to the leachate collection system through separate drains leading to condensate sumps that provide a vacuum break. Condensate is not sampled separately. It is sampled with the leachate.

The closure plan was provided with the Intermediate Modification Closure Permit Application (Ref. No. 3) RAI responses. The closure operation plan provides information describing methods to control gas emissions after the recovery facility ceases operations. The captured LFG would be flared. When LFG generation decreases further below hazard levels, the active gas collection system would be operated as a passive vent system.

SECTION 11.0

Part O- Landfill Final Closure Requirements (62-701.600, FAC), Part P Closure Procedures (62-701.610, FAC) and Part Q-Long Term Care Requirements

11.1 Closure Permit General Requirements (62-701.600(2), FAC)

Volusia County will submit a notice to FDEP of the final closure of the North Cell least 90 days before the date when solid waste will no longer be disposed in the North Cell. Closure permit general requirements were discussed in the November 2010 Responses for the Closure Permit Application (Ref. No. 3). The County requests the conditions of the sequential closing permit be incorporated into the North Cell Operations Permit. The application has been marked "No Change."

A detailed Closure Plan that includes the Closure Design Plan, Closure Operation plan and Long-Term Care Plan was submitted with the November 2011 responses. These items have been marked "No Change" on the operations permit application form.

See Section 1.3.14 and Section 12.0 for demonstration of financial responsibility for long-term care.

11.2 Closure Design Plan Requirements (62-701.600(3), FAC)

In November 2010, the County submitted RAI responses for phased closure of the North Cell that included three (3) sequential closing construction phases. Plans submitted with the November 2010 RAI responses (Ref. No. 3) included the design of closure sideslopes, closure top slope, terraces, swales, final cover system layering, cover soils/vegetation and stability calculations. A geomembrane is proposed for the barrier layer. The proposed final veneer for the landfill final cover (from bottom to top) as stated in Closure Permit No.SF64-0078767-028, issued May 9, 2012 is:

- 12- inch leveling layer (minimum thickness) over the graded solid waste
- 40-mil thick LLDPE geomembrane
- Composite Drainage Net (biplanar with geotextile on both sides)
- 24-inch protective cover layer, consisting of 18- inch thick soil layer and six inches of soils capable of supporting vegetative growth
- Sod

The application form for the operations permit renewal has been marked "No Change".

The initial sequential closing construction covers the north, south and west sideslopes of the original North Cell to approximate elevation 145 feet NGVD. The next sequential closing construction will close the Area 1 through Area 4 sideslopes to elevation 145 feet NGVD.

The final sequential closing construction will close the upper sideslopes above elevation 145 and the top deck to elevation 193. Closure phase timing for the North Cell is presented in Section 3.0.

11.3 Closure Operation Plan Requirements (62-701.600(4), FAC)

A report on the steps to close the Landfill unit and post-closure operations (LFG collection, leachate management, maintenance and water quality monitoring) was provided in the November 2010 Responses for the closure permit application. The time schedule for sequential and final closure was presented in Section 3.0 of this application report. The operations permit application has been marked "No Change."

11.4 Certification of Closure Construction (62-701.600(6), FAC)

Required documentation for the closure construction is described in the November 2010 Responses to the closure permit application (Ref. No. 3). This documentation includes a certification report for the physical closure, as-build Drawings, as-build survey and permanent monumentation. The County will prepare and file the Declaration to the Public in the public record. Once, recorded, proof of the Declaration will be filed with the Department. After the Department accepts the Construction Certification documents and the Declaration to the Public, the Department will establish an official date of closure. There are no changes proposed to the information previously submitted. The operations permit application has been marked "No Change."

No temporary closure is proposed. The Interim closure of the south slope of the North Cell using exposed geomembrane cover is described in the December 2006 Closure Permit was changed, when the proposed infill between the North Cell and the South cell was eliminated. The operations permit application has been marked "Not Applicable."

11.5 Other Closure Procedures (62-701.610, FAC)

No final use for the closed landfill unit other than passive green space has been determined. If the County proposes any structures or active use, the Department will be notified and a modification of the closure permit will be filed.There are no changes proposed to the information previously submitted in August 2010 closure permit application. The operations permit application has been marked "No Change." No waste relocation is expected in the post- closure period. If necessary, the waste would be relocated to an active disposal unit.

11.6 Long-Term Care Requirements (62-701.620, FAC)

A final Long-Term Care Plan will be submitted to the FDEP with the Design plans for Phase 3 of the defined and permitted closure sequence. The preliminary long-term care plan included with the November 2010 responses for the closure permit renewal application, now on file with the Department, would be modified for any changes.

The long-term care of the North Cell closed disposal area will be in accordance with 62-701.620, FAC. The county will maintain the gas collection and monitoring system, maintain the closed landfill cover and stormwater system, and conduct water quality monitoring. Stabilization reports will be filed as required to document the physical status of

SECTION 12.0

Part S - Financial Responsibility Requirements (62-701.630, FAC)

A Financial Responsibility Cost Estimate report for the Period ending September 30, 2012 for the Tomoka Farms Landfill Facility was submitted and approved. This estimate used an inflation factor that adjusted the prior year's estimate.

At the October 22, 2012 pre-application meeting it was discussed that an update of the 2010 Financial Responsibility Cost Estimate Report that had detailed estimates and backup was required for this permit application submittal. The updated detailed closure and long-term cost estimate for the North Cell is provided in Attachment F. This report is signed and sealed by a Florida Professional Engineer.

Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Permittee:
Volusia County Solid Waste Division
3151 East New York Avenue
DeLand, FL 32724

Attention: Mr. Leonard Marion

WACS Facility: 27540
Permit Number: SO64-0078767-023
Expiration Date: 03/3/2013
County: Volusia
Section 9, Township 16 South, Range 32 East
Latitude 29° 07' 50" North, Longitude: 81° 06' 02" West
Project: Tomoka Farms Road Landfill, North Cell, Phase I, Class I

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 62-4, 62-701 and 62-711. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

- To operate the Tomoka Farms Road Landfill, North Cell, Phase I, Class I. The actual disposal area is 69.2 acres.
- The combination of the existing North Cell, East Cell – Phase I and East Cell – Phase II are to be designated as North Cell due to the contiguity of these disposal areas. Areas 1 and 2 of East Cell – Phase I now known as North Cell – Phase I have been constructed, certified and are in operation. The construction of Areas 3 and 4 (collectively designated as "Phase II") of the North Cell (formerly East Cell) are permitted under construction Permit No. SC64-0078767-022 issued December 6, 2007.
- This operations permit consolidates the original North Cell (43.2 acres) and the Phase I East Expansion (26.0 acres) into one coordinated permit for 69.2 acres operational area known as the North Cell – Phase I area.
- The North Cell – Phase I area has a double composite bottom liner system.
- Leachate will be disposed of on-site by evaporation, recirculation into the lined landfill, or by trucking off-site for treatment and disposal.
- Solid waste has been disposed of at the Tomoka Landfill site since 1969. The landfill will receive residential, commercial, agricultural and industrial waste.
- Major features of the Class I, North Cell – Phase I shared with the overall facility include site fencing and security, a scale house, a household hazardous waste facility, a tire and white goods facility, a Class III landfill, equipment maintenance facilities, ground water monitoring, borrow pits and administration facilities.
- The landfill will service Flagler and Volusia Counties.
- The project incorporates a ground water and surface water monitoring plan.

LOCATION: The facility can be reached on I-4 east to I-95, north on I-95 to U.S. 92, left on U.S. 92 approximately 1/4 mile, turn left on C.R. 415 (Tomoka Road) and proceed about 3 miles-landfill entrance is on the right at 1990 Tomoka Farms Road in Volusia County, Florida.

Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

May 9, 2012

NOTICE OF PERMIT

By-Email
lmarion@co.volusia.fl.us

In the matter of an
Application for Permit By:

Leonard Marion
Volusia County Solid Waste Division
3151 East New York Avenue
DeLand, Florida 32724

OCD-SW-12-191

Volusia County - SW WACS No. 27540
Tomoka Farms Road Landfill Class I
Closure of the North Cell Phase I & Post-Closure Care of the South Cell
Renewal of Closure Permit
DEP File No. SF64-0078767-028

Dear Mr. Marion:

Enclosed is Permit Number SF64-0078767-028 for closure of the North Cell Phase I and post-closure care of the South Cell, issued under Sections 403.061(14) and 403.707, of the Florida Statutes.

Any party to this order (permit) has the right to seek judicial review of the permit under section 120.68 of the Florida Statutes, by the filing of a Notice of Appeal under rule 9.110 of the Florida Rules of Appellate Procedure, with the Clerk of the Department of Environmental Protection, Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000 and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this notice is filed with the Clerk of the Department.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

For: Jeff Prather
Director, Central District

FILING AND ACKNOWLEDGMENT

FILED, May 9, 2012, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

May 9, 2012
Date

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were sent before the close of business on May 9, 2012 to the listed persons.

Clerk

JP/tl/ll

Enclosure
Permit No. SF64-0078767-028

Copies furnished to:
Richard Tedder, P.E. - DEP - Tallahassee, Richard.Tedder@dep.state.fl.us
Jennifer Stirk, Volusia County Solid Waste Division, jstirk@co.volusia.fl.us
Kanishka Perera, P.E., HDR Engineering, Inc., Kanishka.Perera@hdrinc.com
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Solid.Waste.Financial.Coordinator@dep.state.fl.us

Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

NOTICE OF FINAL TITLE V AIR OPERATION PERMIT

In the Matter of an
Application for Permit:

Mr. Leonard Marion, Director
Volusia County Solid Waste Services Division
3151 New York Avenue
DeLand, Florida 32724

Final Permit No.: 1270117-006-AV
Volusia County

Enclosed is the FINAL Permit, No. 1270117-006-AV. The purpose is for the renewal and revision of the Title V Air Operation Permit No. 1270117-005-AV. The facility is located at 1990 Tomoka Farms Road, Port Orange, Volusia County. This permit renewal and revision is issued pursuant to Chapter 403, Florida Statutes (F.S.). There were no comments received from Region 4, U.S. EPA, regarding the PROPOSED Permit.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and, by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Orange County, Florida.

Caroline D. Shine
District Air Program Administrator

CDS/jr

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL TITLE V AIR OPERATION PERMIT (including the FINAL Determination and the FINAL Permit) was sent electronically before the close of business on 7/29/11 to the person(s) listed:

Mr. Leonard Marion, Director, Volusia County Solid Waste Services Division: lmarion@co.volusia.fl.us
Mr. Carlo Lebron, P.E., VP and Project Manager, HDR Engineering, Inc.: carlo.lebron@hdrinc.com
Ms. Teri Liermann, EIT, Project Designer, HDR Engineering, Inc.: theresa.liermann@hdrinc.com
Ms. Jennifer Stirk, Environmental Specialist, Volusia County Solid Waste Services Division: JStirk@co.volusia.fl.us
Ms. Ana Oquendo, EPA Region 4: oquendo.ana@epamail.epa.gov
Ms. Barbara Friday, DEP BAR: barbara.friday@dep.state.fl.us (for posting with U.S. EPA, Region 4)

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 7/29/11 (Date)

Title V Air Operation Permit Renewal and Revision
Permit No. 1270117-006-AV

APPLICANT

The applicant for this project is Volusia County Solid Waste Services Department. The applicant's responsible official and mailing address are:

Mr. Leonard Marion, Director
Volusia County Solid Waste Services Department
3151 New York Avenue
DeLand, Florida 32724

FACILITY DESCRIPTION

The applicant operates the Tomoka Farms Road Landfill, which is located at 1990 Tomoka Farms Rd. in Port Orange, Florida.

This facility is a municipal solid waste disposal facility (landfill) with an active gas collection system. The collection system terminates in a candlestick flare destruction device (utility flare) or generator set of 4 Caterpillar 3516 SITA engines.

EU 001 is subject to the following: 40 CFR Part 60, Subparts A (General Provisions) and WWW (Standards of Performance for Municipal Solid Waste Landfills); 40 CFR Part 63, Subparts A (General Provisions) and AAAA (National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills); with the exception of the candlestick flare control system, which shall have no visible emissions per 40 CFR Part 60.18(c)(1), The facility is subject to the General Visible Emissions (VE) limit of less than 20 percent per Rule 62-296.320(4)(b)1., F.A.C., VE testing of the candlestick flare is required annually; the General Volatile Organic Compound (VOC) standard per Rule 62-296.320(1)(a), F.A.C.; and the Objectionable Odor Rule per Rule 62-296.320(2), F.A.C.

EU 002 (generator set of 4 Caterpillar 3516 engines) is subject to 40 CFR 63, Subpart ZZZZ.

PROJECT DESCRIPTION

The purpose of this permitting project is to renew and revise the existing Title V permit(s) to incorporate the terms and conditions of Air Construction Permit 1270117-007-AC for the above referenced facility.

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Application(s) Received on: July 22, 2010
Additional Information Requested (No. 1) on: 09/20/2010
Additional Information Received on: 10/21/2010
Additional Information Requested (No. 2) on: 11/18/2010
Additional Information Received on: 11/18/2010
Applications(s) Complete: 11/18/2010

Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

By E-Mail
JAngiulli@co.volusia.fl.us

In the Matter of an
Application for Permit by:
Volusia County Solid Waste Division
3151 East New York Avenue
DeLand, FL 32724

Attention: Mr. John V. Angiulli

OCD-SW-07-0429
Volusia County – SW
Tomoka Farms Road Landfill,
North Cell – Phase II, Class I
DEP File No SC64-0078767-022

This is the Department's Intent to Issue Permit No. SC64-0078767-022. Enclosed are the "Notice of Proposed Agency Action" and Draft Permit for the project and file number noted above. Please contact the Central District's Solid Waste Program at 407-893-3328 if you have questions or need further information.

INTENT TO ISSUE

The Department of Environmental Protection gives notice of its intent to issue a permit (copy of conditions attached) for the proposed project as detailed in the application specified above, for the reasons stated below.

The applicant, Volusia County Solid Waste Division/John V. Angiulli, applied on June 15, 2007, to the Department of Environmental Protection, for a permit to construct the Tomoka Farms Road Landfill, North Cell – Phase II, Class I, in Volusia County, Florida.

The Department has permitting jurisdiction under Section 403.707(1), F.S. and Chapters 62-4, and 62-701, F.A.C. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S., you are required to publish at your own expense the enclosed Notice of Proposed Agency Action. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. You must provide proof of publication to the Department at the address listed below as soon as practical after publication. Department of Environmental Protection, 3319 Maguire Boulevard, Suite 232, Orlando, FL 32803, telephone 407/893-3328.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S.

The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Petitions by the applicant or any of the parties listed below must be filed within 14 days of receipt of this written notice. Petitions filed by other persons must be filed within 14 days of publication of the notice or receipt of the written notice, whichever occurs first. Under Section 120.60(3), F.A.C., however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of such notice, regardless of the date of publication. The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
(d) A statement of all material facts disputed by petitioner or a statement that there are no disputed facts;
(e) A statement of the ultimate facts alleged, including a statement of the specific facts which the petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wants the Department to take with respect to the Department's action or proposed action.

A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available in this proceeding.

Any party to this order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110, Florida Rules of Appellate Procedure, with the clerk of the Department in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

F. Thomas Lubozynski for

Vivian F. Garfein
Director, Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803
407/894-7555

Date: October 30, 2007

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

	October 30, 2007
Clerk	**Date**

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed before the close of business on October 30, 2007 to the listed persons.

Clerk

VFG/gc/ew

Enclosures
1. Wording for "Notice of Proposed Agency Action"
2. Draft Permit SC64-0078767-022

Copies furnished to:
Richard Tedder, P.E. – DEP – Tallahassee
Fred Wick – DEP – Tallahassee
Frank Hornbrook – DEP – Tallahassee
Jim Bradner, P.E. – DEP – Air Program
Jennifer Stirk – Volusia County Solid Waste Division jstirk@co.volusia.fl.us
Stephen Kintner – Volusia County Environmental Management skintner@co.volusia.fl.us
Mehran (Ron) S. Beladi, P.E. – Neel-Schaffer, Inc. ron.beladi@neel-schaffer.com

Florida Department of
Environmental Protection
Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

STATE OF FLORIDA
INDUSTRIAL WASTEWATER FACILITY PERMIT

PERMITTEE:
Volusia County - Solid Waste Division

PERMIT NUMBER: 64-FL0037877-003 (Minor)
FILE NUMBER: 64-FL0037877-003-IW7D
ISSUANCE DATE: February 01, 2011
EXPIRATION DATE: January 31, 2016

RESPONSIBLE OFFICIAL:
Leonard L Marion
Director – Volusia County Solid Waste Division
1990 Tomoka Farms Road
Port Orange, FL 32128-3752
(386) 943-7889

FACILITY:

VCDSWM-Tomoka Farms Road Landfill, Minor NPDES Discharge (WBID # 2634)
1990 Tomoka Farms Road
Port Orange, FL 32128-3752
Volusia County
Latitude: 29°7' 41.55" N Longitude: 81°5' 37.91" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and applicable rules of the Florida Administrative Code (F.A.C.) and constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System. This permit does not constitute authorization to discharge wastewater other than as expressly stated in this permit. The above named permittee is hereby authorized to operate the facilities in accordance with the documents attached hereto and specifically described as follows:

FACILITY DESCRIPTION:

The Tomoka Farms Road Landfill is a Solid Waste Landfill facility. This permit covers only two wastewater systems associated with the landfill. They are (i) the closed loop recycle system for equipment wash and (ii) the "contact wastewater" generated from the footprint of unlined South Cell (Cell) of the landfill which has been closed for use. The South Cell was used for Class I landfill material. The South Cell has perimeter canals on all four sides of its footprint to intercept contact stormwater runoff and laterally flowing ground water mixed with leachate which is collectively termed as "contact wastewater" (See DEP Orlando Exhibit #2). Flows entering these perimeter canals are entirely rainfall based.

WASTEWATER TREATMENT:

(i) Closed Loop Recycle System:

The wastewater generated from washing the vehicles and equipment is treated in a pre-engineered treatment system built by "Ultra-sorb". The treated effluent from the Ultra-sorb system is reused in the washing operation. There is no discharge from the closed loop recycle system to the ground or surface waters of the State. (See DEP Exhibit number 1).

(ii) Contact Wastewater:

The contact wastewater flows into a treatment system approximately halfway along the south side of the cell. The

wastewater treatment system consists of 4 ponds & an artificial wetland. The wastewater is treated by natural attenuation in the ponds and wetlands prior to discharge. The artificial wetland discharges to the South External Canal (Canal) via an overflow structure and discharge pipe located near the easternmost end of the Canal. There is a pump station beside the South External Canal at a point about 100 feet from the eastern end of that canal. This pump discharges to the swale going east along the landfill access road. The landfill access road swale is designated as ground water discharge system (G-001). The NPDES surface water discharge system designated D-001 is at the eastern end of the roadside swale where a control structure has been constructed to limit flow to periods following very heavy rainfall. This permit authorizes only conditional surface water discharge under heavy rainfall situations. The heavy rainfall is defined as 10 year, 24 hour storm event or a chronic rainfall event equivalent to 10 year 24 hour storm.

There is an emergency overflow structure in the southwest corner of the perimeter canal system for discharges from the system under extreme rainfall conditions such as a hurricane. The discharge pipe from the structure is connected to a large borrow pit on County land west of the access road to the road out to the leachate land application area. The borrow pit is not active and has no point of outfall. The borrow pit and emergency discharges to the borrow pit are not a part of the industrial wastewater permit.

REUSE OR DISPOSAL:

Surface Water Discharge D-001: An existing permitted discharge to Tomoka River, Class III Fresh Waters, (WBID# 2634) which is a pipe approximately 30 feet in length and discharges at a variable depth of approximately 2 feet. The point of discharge is located approximately at latitude 29°7' 42" N, longitude 81°4' 43" W. The NPDES Outfall D-001 is at the eastern end of the roadside swale where a control structure has been constructed to limit flow to periods following very heavy rainfall. The discharge flows through a pipe under the access road north into a wetland. The outfall is approximately 30 feet long under the access road. This permit authorizes only conditional surface water discharge under heavy rainfall situations as a backup discharge system. The heavy rainfall is defined as 10 year, 24 hour storm event or a chronic rainfall event equivalent to 10 year 24 hour storm. See Part I.C.7.

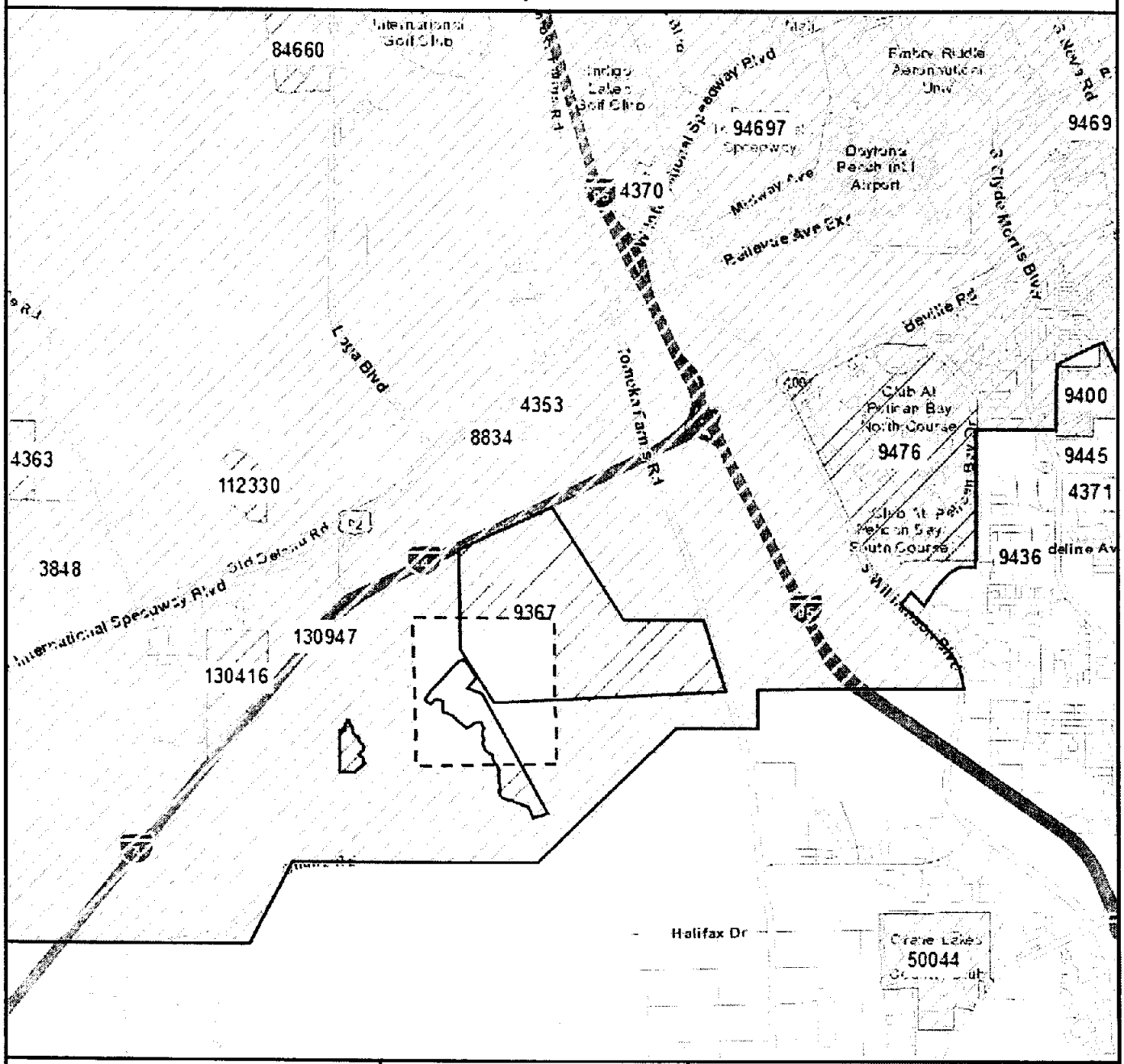
Land Application G-001: An existing land application system consisting of a 3,125 foot long roadside swale adjacent to the access drive to the landfill. There is a pump station beside the South External Canal at a point about 100 feet from the eastern end of that canal. Treated effluent from an intake pipe is pumped through an 8 inch diameter discharge pipe built under the scale house. The pipe has an outfall to the western end of the access road swale. The outfall is designated G-001. The swale is the primary industrial wastewater effluent disposal system for the facility under this permit.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions set forth in this Cover Sheet and Part I through Part IX on pages 1 through 16 of this permit.

Figure B-8

Offsite Well Location Information (October 2012)

Consumptive Use Permit



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Legend

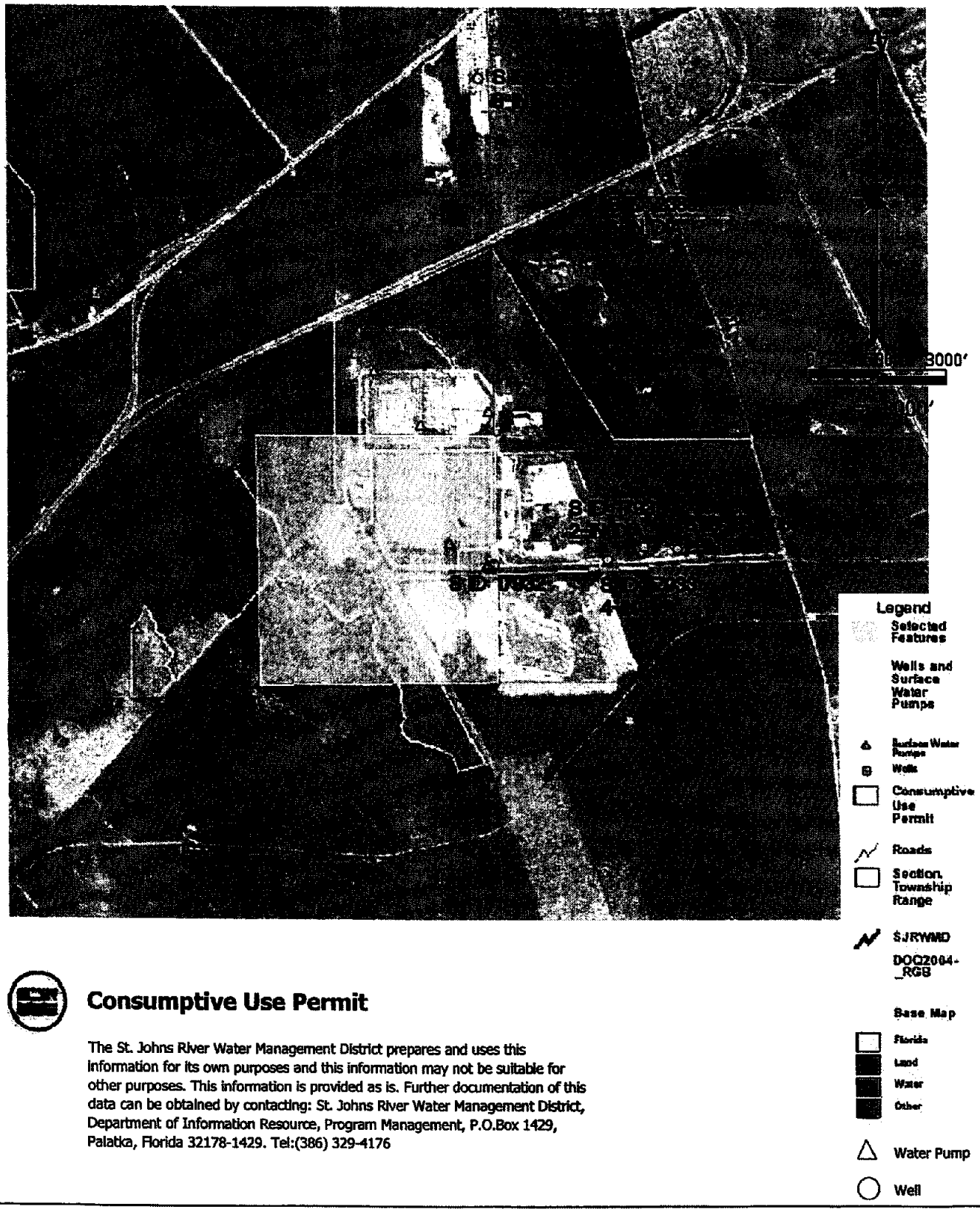
SJRWMD Boundary

CUP Boundaries

Compliance

Other

Dislaimer: The St.Johns River Water Management District of Florida prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting St.Johns River Water Management District, Bureau of Regulatory Support, P.O.Box 1429, Palatka, FL 32178-1429. Tel: (386) 329-4176.



Consumptive Use Permit

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Department of Information Resource, Program Management, P.O.Box 1429, Palatka, Florida 32178-1429. Tel:(386) 329-4176

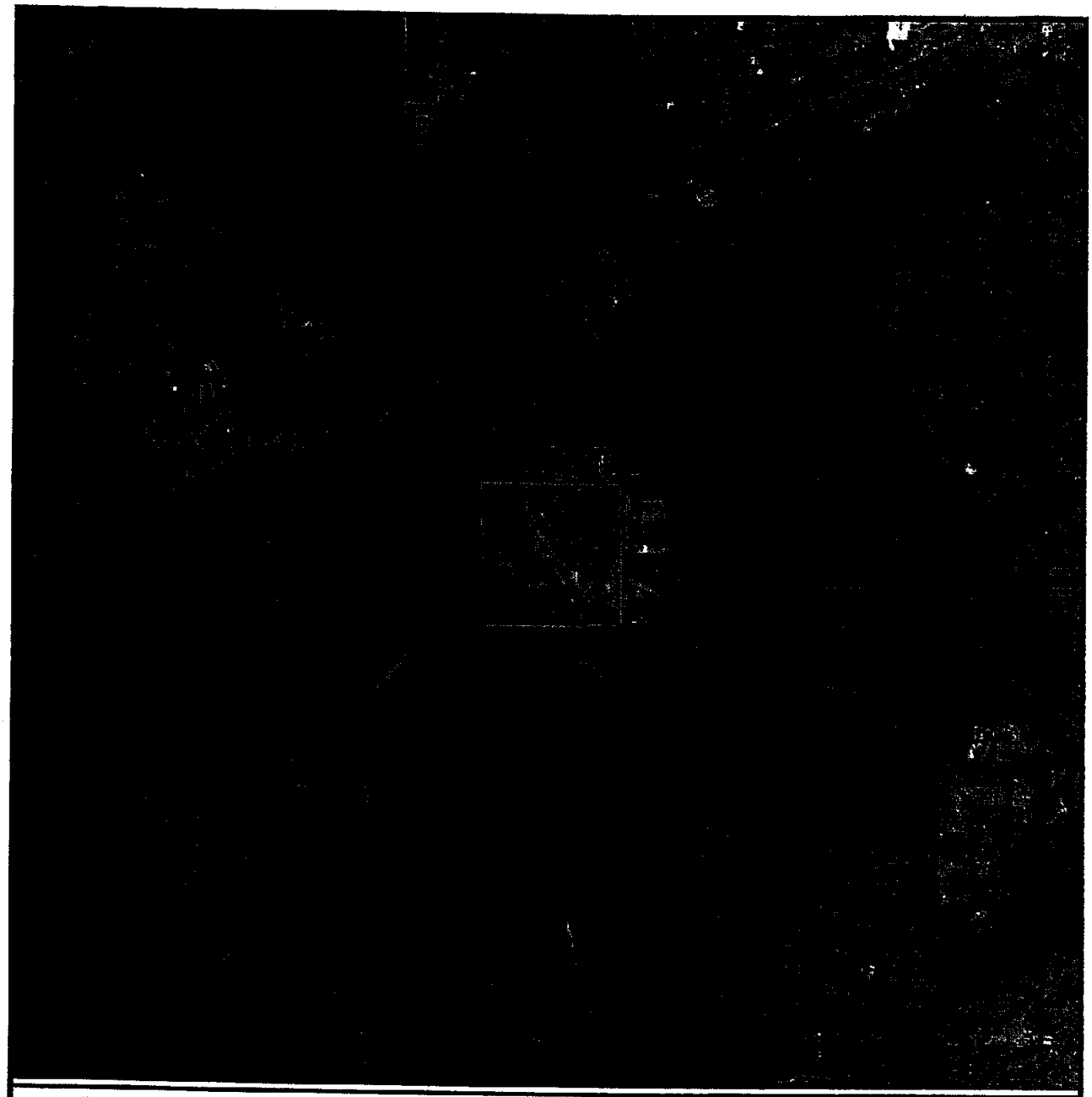
SECTION 9, TOWNSHIP 16S, RANGE 32E

NEEL-SCHAFFER
SOLUTIONS YOU CAN BUILD UPON
2600 Lake Lucien Drive, Ste. 117
Maitland, FL 32751
Phone: (407) 647-6623 / FAX: (407) 539-0575

TOMOKA NORTH CELL PERMIT RENEWAL
VOLUSIA COUNTY, FLORIDA

PROJECT NO. 00.06529.001

SCALE: AS SHOWN



Consumptive Use Permit

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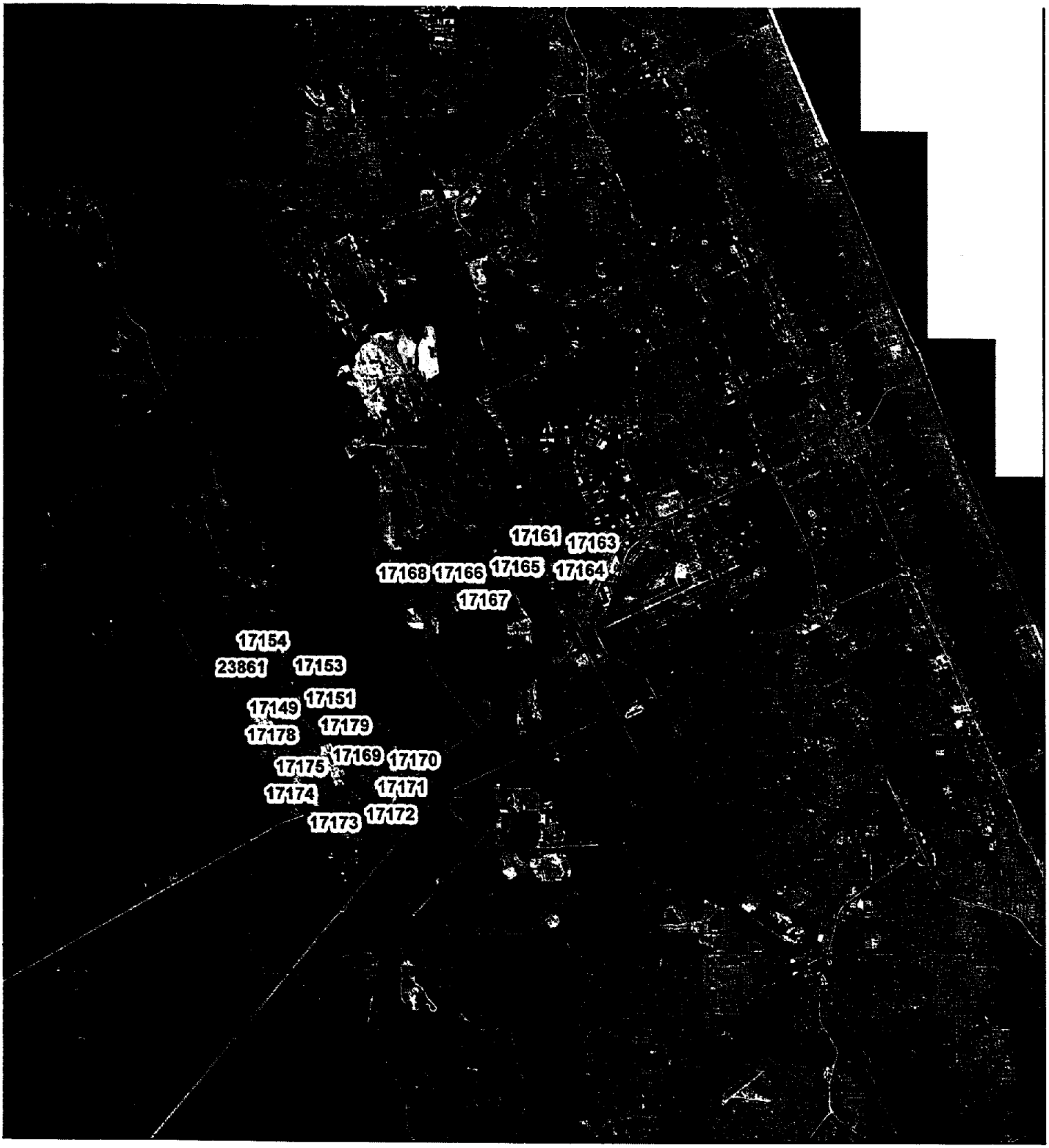

N

0 1 2 Miles

Created: September 6, 2011

Nicole Price

City of Daytona Beach
Volusia County

2009 Digital Ortho Quadrangle

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems,Program Management, P.O.Box 1429, 4049 Reid Street Palatka, Florida 32178-1429
Tel: (386) 329-4207
Tel: (386) 329-4566

OPERATION PLAN
TOMOKA FARMS ROAD LANDFILL
VOLUSIA COUNTY, FLORIDA

Prepared for:

Volusia County Solid Waste Division
3151 East New York Avenue
DeLand, Florida 32724

Updated November 2012

TABLE OF CONTENTS

APPENDICES

TABLES

EXECUTIVE SUMMARY

The purpose of this document is to provide a consolidated manual of operating procedures for the Tomoka Farms Road Landfill Class I and Class III disposal cells. This document is intended to fulfill the requirement for an Operation Plan as listed in F.A.C. 62-701.500(2). This operations plan supersedes previous operations plans submitted to FDEP for this facility.

This plan has been prepared in accordance with Florida Rule 62-701, Florida Administrative Code (F.A.C.). Part L of FDEP's permit application form for solid waste management facilities (Part L) includes requirements for an operations plan. All information identified in Part L is provided herein, or in referenced documents. This operations plan is organized in accordance with Part L. In addition, Table 1-1 cross-references this document with the requirements of Part L.

Except where specific procedures are required by F.A.C. 62-701, this plan is intended to represent the best management practices and working goals of the Tomoka Farms Road Landfill.

Table 1-1
Cross Reference of FDEP Permit Application
(Part L Requirements)

PART L- LANDFILL OPERATION REQUIREMENTS (RULE 62-701.500, F.A.C.)	Corresponding Section of Operation Plan
1. Provide documentation that landfill will have at least one trained operator during operation and at least one trained spotter at each working face; (62-701.500(1), F.A.C.)	Section 2.1.1
2. Provide a landfill operation plan including procedures for: (62-701.500(2), F.A.C.)	
a. Designating responsible operating and maintenance personnel;	Section 2.2
b. Contingency operations for emergencies;	Section 2.3
c. Controlling types of waste received at the landfill;	Section 2.4
d. Weighing incoming waste;	Section 2.5
e. Vehicle traffic control and unloading;	Section 2.6
f. Method and sequence of filling waste;	Section 2.7
g. Waste compaction and application of cover;	Section 2.8
h. Operations of gas, leachate, and stormwater controls;	Section 2.9
i. Water quality monitoring;	Section 2.10
j. Maintaining and cleaning the leachate collection system.	Section 2.11
3. Provide a description of the landfill operation record to be used at the landfill; details as to location of where various operational records will be kept (i.e.	Section 3

FDEP permit, engineering drawings, water quality records, etc.); (62-701.500(3), F.A.C.)	
4. Describe the waste records that will be compiled monthly and provided to the Department quarterly; (62-701.500(4), F.A.C.)	Section 4
5. Describe methods of access control; (62-701.500(5), F.A.C.)	Section 5
6. Describe load checking program to be implemented at the landfill to discourage disposal of unauthorized wastes at the landfill; (62-701.500(6), F.A.C.)	Section 6
7. Describe procedures for spreading and compacting waste at the landfill that include: (62-701.500(7), F.A.C.)	
a. Waste layer thickness and compaction;	Section 7.1
b. Special considerations for first layer of waste placed above liner and leachate collection system;	Section 7.2
c. Slopes of cell working face and side grades above land surface, planned lift depths during operation;	Section 7.3
d. Maximum width of working face;	Section 7.4
e. Description of type of initial cover to be used at the facility that controls:	
(1) Disease vector breeding/animal attraction	Section 7.5
(2) Fires	Section 7.5
(3) Odors	Section 7.5
(4) Blowing litter	Section 7.5
(5) Moisture infiltration	Section 7.5
f. Procedures for applying initial cover including minimum cover frequencies;	Section 7.5
g. Procedures for applying intermediate cover;	Section 7.6
h. Time frames for applying final cover;	Section 7.7
i. Procedures for controlling scavenging and salvaging;	Section 7.8
j. Description of litter policing methods;	Section 7.9
k. Erosion control procedures.	Section 7.10

8. Describe operational procedures for leachate management including: (62-701.500(8), F.A.C.)	
a. Leachate level monitoring, sampling, analysis and data results submitted to the Department;	Section 8.1
b. Operation and maintenance of leachate collection and removal system, and treatment as required;	Section 8.2
c. Procedures for managing leachate if it becomes regulated as a hazardous waste;	Section 8.3
d. Agreements for off-site discharge and treatment of leachate;	Section 8.4
e. Provisions for on-site leachate treatment;	Section 8.5
f. Contingency plan for managing leachate during emergencies or equipment problems;	Section 8.6
g. Procedures for recording quantities of leachate generated in gal/day and including this in the operating record;	Section 8.7
h. Procedures for comparing precipitation experienced at the landfill with leachate generation rates and including this information in the operating record;	Section 8.8
i. Procedures for water pressure cleaning or video inspection of leachate collection systems.	Section 8.9
j. Controlling Leachate Seeps	Section 8.10
9. Describe how the landfill receiving degradable wastes shall implement a gas management system meeting the requirements of rule 62-701.530, F.A.C.; (62-701.500(9), F.A.C.)	Section 9
10. Describe procedures for operating and maintaining the landfill stormwater management system to comply with the requirements of Rule 62-710.400(9); (62-701.500(10), F.A.C.)	Section 10
11. Equipment and operation feature requirements; (62-701.500(11), F.A.C.)	
a. Sufficient equipment for excavating, spreading, compacting and covering waste;	Section 11.1
b. Reserve equipment or arrangements to obtain additional equipment within 24 hours of breakdown;	Section 11.2
c. Communications equipment;	Section 11.3
d. Dust control methods;	Section 11.4

e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;	Section 11.5
f. litter control devices;	Section 11.6
g. Signs indicating operating authority, traffic flow, hours of operation, disposal restrictions.	Section 11.7
12. Roads; (62-701.500(12), F.A.C.)	
a. Provide a description of all-weather access road;	Section 12.1
b. Provide a description of inside perimeter road and other roads necessary for access which shall be provided at the landfill.	Section 12.2
13. Additional record keeping and reporting requirements: (62-701.500(13), F.A.C.)	
a. Records used for developing permit applications and supplemental information maintained for the design period of the landfill;	Section 13.1
b. Monitoring information, calibration and maintenance records, copies of reports required by permit maintained for at least 10 years;	Section 13.2
c. Maintain annual estimates of remaining life of constructed landfills and or other permitted areas not yet constructed and submit this estimate annually to the Department;	Section 13.3
d. Procedures for archiving and retrieving records which are more than five years old.	Section 13.4
14. Closed cell inspections	Section 14

1.1 CURRENT OPERATING CONDITIONS

The Tomoka Farms Road Landfill is owned and operated by the Volusia County Solid Waste Division and is located approximately three miles south of US 92 on Tomoka Farms Road in Section 9, Township 16 South, Range 32 East. The landfill is open for waste acceptance Monday through Saturday from 7:00 a.m. until 5:30 p.m. Vehicles access the Tomoka Farms Road Landfill via Tomoka Farms Road. With proposed expansions the landfill is expected to be able to provide disposal of Class I and Class III materials until approximately 2020. A site plan of the Tomoka Farms Road landfill is included as Figure 1-1.

Waste hauling vehicles arriving at the Tomoka Farms Road Landfill travel west along the entrance road to the scale house where loads are weighed. The scale house attendant directs

vehicles to the Class I or Class III active areas, or to the Special Waste area where the wastes are unloaded. Any unacceptable waste identified prior to acceptance by the landfill will remain the responsibility of the waste hauler. The various disposal areas will be clearly identified by signs at the locations within the landfill. The landfill does not operate a separated active face for the general public (private vehicles).

Class I waste is directed to the Class I working face where it is spread over the working face area of the landfill, placed in two-foot layers, compacted by a compactor, and covered at the end of the working day. Initial cover is applied at the end of each workday. A 12-inch thick intermediate cover, in addition to the initial cover, is placed on areas where no additional waste will be placed within 180 days. This intermediate cover may be removed before placing additional waste. The final cover system is installed as areas reach the final permitted elevation.

Class III waste is directed to the Class III working face where it is spread in two to five-foot lifts. Class III waste is covered with an initial cover weekly. A 12-inch thick intermediate cover, in addition to the initial cover, is placed on areas where no additional waste will be placed within 180 days. This intermediate cover may be removed before placing additional waste. The final cover system is installed as areas reach the final permitted elevation.

Leachate generated from the Class I landfill is conveyed to the landfill's leachate system. Leachate management at the Tomoka Farms Road Landfill is accomplished by the onsite leachate treatment facility Treated effluent will be delivered to a dedicated spray field, or used for dust control and/ irrigation.

Stormwater run-off is directed away from open areas on the active face of the landfill by means of ditches and swales around the landfill. The swales outside the disposal area divert stormwater into the perimeter ditches that are located outside the lined berms and, therefore, isolated from the leachate and solid waste. Within the landfill disposal area, stormwater run-off that has not contacted waste or mixed with leachate is conveyed to the stormwater management system. Stormwater run-off which contacts waste or mixes with leachate is treated as leachate.

LANDFILL OPERATIONS AND MAINTENANCE
(RULE 62-701.500(2), F.A.C.)

2.1 TRAINING AND CERTIFICATION OF OPERATORS AND SPOTTERS (RULE 62-701.500(1), F.A.C.)

2.1.1 TRAINING PROGRAM

Volusia County Solid Waste Division trains employees who are landfill operators and spotters by requiring them to attend a pre-paid training course conducted by the University of Florida TREEO Center who are certified by the State of Florida to be a qualified third party continuing education institution.

Operators at the Tomoka Farms Road Landfill participate in at least twenty-four (24) hours of initial training. Every three (3) years landfill operators participate in continuing education courses totaling sixteen (16) hours. Operator training will consist of courses conducted by the University of Florida TREEO Center. In accordance with Rule 62-701.500(1), F.A.C., at least one trained operator will be on duty at the Tomoka Farms Road landfill whenever waste is received at the facility. The Operators who attend the continuing education courses at the TREEO or other approved providers receive a Certificate of Completion.

At least one trained spotter will be present at each working face whenever waste is being processed for disposal. Spotters participate in eight (8) hours of initial training that include spotting at Construction and Demolition Sites, Landfills, and transfer Stations and/or Waste Screening and Identification for Landfill Operators and Spotters conducted by the University of Florida TREEO Center. Every three (3) years, spotters participate in continuing education courses totaling four hours. The spotters who attend the training courses at TREEO or other approved providers receive a Certificate of Completion.

The County uses equipment operators/spotters, trained in accordance with F.A.C. 62-701.320(15), to perform spotter duties at the active disposal area to visually screen incoming waste.

2.1.2 TRAINING ADMINISTRATION

The County's Training Coordinator has been designated as the person in charge of administrating the training program to ensure the operators and spotters are registered for the training courses and obtaining their certifications and renewals prior to expiration.

It is acknowledged that all training courses for the County Operators and Spotters, whether public or in-house, shall be approved by the Department in accordance with Section 403.716, F.S., and that a third party must administer any examination required by this sub-section for an in-house operator-training program.

It is acknowledged that any other in-house operator-training program must be administered by a trained operator, and that the Training Plan, along with records documenting how the Training Plan is being implemented, shall be kept at the Facility at all times and be made available for inspection by Department staff.

2.1.3 CERTIFIED OPERATORS AND SPOTTERS

The Solid Waste Division maintains a list of current landfill personnel and their training and certification for landfill operations and spotters. The list is continuously updated by the Training Coordinator. Please refer to the current Training/Certification list in Appendix B of this Operations and Contingency Plan.

2.2 DESIGNATION OF PERSONS RESPONSIBLE FOR OPERATION AND MAINTENANCE (RULE 62-701.500(2) (A), F.A.C.)

The persons directly responsible for major components of the landfill follow:

Component	Responsible Party
Overall County Solid Waste Operations Responsibility	Solid Waste Division Director
Landfill Operations and Maintenance	Operations Manager
Permitting Requirements	Environmental Specialist (ESIII)
Water Quality and Leachate Testing	Environmental Specialist (ESIII)

The Operations Manager has overall responsibility for the operation and maintenance of the solid waste receiving, processing, and disposal activities at the landfill. The landfill Operations Manager is responsible for the day-to-day implementation of the operations plan and, along with the Solid Waste Division Director, responsible for environmentally safe operations in accordance with the state and federal regulations. The Environmental Specialist III is responsible for compliance with permit conditions and reporting requirements.

2.3 CONTINGENCY OPERATIONS FOR EMERGENCIES (RULE 62-701.500(2) (B), F.A.C.)

Emergencies that result in disruption of normal operations at the Tomoka Farms Road Landfill for more than 24 hours and that would result in the landfill being unable to comply with its permit must be reported to FDEP-Central District Office at (407) 897-4100. The contingency plan for the facility addresses the following four potential emergencies:

- Equipment failure
- Unusual operating conditions resulting from poor weather conditions
- Accidents
- Fire
- Unavailable landfill capacity

2.3.1 EMERGENCY ASSISTANCE

Emergency telephone numbers are listed below. This table will be updated as needed and an up-to-date version will be posted at the landfill operations office.

Table 2-1
EMERGENCY TELEPHONE NUMBERS

Organization	Phone Number
Tomoka Farms Road Landfill On-site Phone:	(386) 947-2952
Primary Emergency Response:	911
Fire Department (County):	(386) 254-4657
Hospital: Halifax Medical Center 303 N. Clyde Morris Blvd. Daytona Beach, FL 32174	(386) 254-4000 (switchboard) (386) 254-4100 (emergency line)
Ambulance: EVAC Ambulance Service	(386) 252-4911
EQ Florida Inc.	(813) 623-5302
Sheriff:	(386) 248-1777
Solid Waste Operations Manager: Cell: Junos Reed Home: Office:	(386) 527-6333 (386)736-2885 (386) 947-2952
Environmental Specialist: Cell: Home: Jennifer Stirk Office:	(386) 527-6336 (386) 960-6670 (386) 947-2952
Solid Waste Services Director: Cell: Leonard Marion Home: Office:	(386) 527-6332 (386) 624-7959 (386) 943-7889
Florida Department of Environmental Protection Main Reception: Solid Waste Section:	 (407) 897-4100 (407) 897-4300
Poison Control Assistance	(800) 222-1222
State Warning Point	(800) 320-0519

2.3.2 EQUIPMENT FAILURE

In the event of equipment failure at the Tomoka Farms Road Landfill, sufficient backup equipment is available at the landfill site for equipment breakdowns and downtime associated with normal routine equipment maintenance. In the case of major equipment failure, the following procedures will be followed:

- Arrangements with other County departments and/or contractors will be made to furnish equipment on a short-term basis.
- Applicable site operations will cease until equipment capacity is restored.
- Contact rental equipment dealers to furnish equipment on short-term notice.

In the event of equipment failure, the Landfill Supervisor will be notified. Within 24 hours of notification of the Landfill Supervisor, the equipment will be replaced with back-up capability if necessary, or repaired and placed back in operating condition.

Equipment that could require the use of backup or rental equipment for continued, normal operation of the Tomoka Farms Road Landfill may include:

- Landfill Compactor
- Dozer
- Off-Road Dump Truck
- Back-hoe
- Water Truck

All equipment maintenance will either be performed by Volusia County or will be contracted by Volusia County to a maintenance contractor.

2.3.3 POOR WEATHER CONDITIONS

Unusual operating conditions could result from excessive rainfall and electrical storms. The type and volume of materials to be disposed of after a hurricane or excessive storms differ from normal landfill operations. During extremely high wind conditions or electrical storms, disposal operations will be temporarily suspended to protect the workers. Disposal operations will be suspended immediately before and during a hurricane or tornado.

During rainy weather, access to the working face along on-site roads must be maintained. It may be necessary to grade out ruts more frequently than during normal operations, or it may be necessary to apply additional material to the on-site access roads to counteract the effects of rain.

2.3.4 NATURAL DISASTERS

In the event of a natural disaster, such as a hurricane, the Tomoka Farms Road Landfill will continue normal operations extreme weather limits safe operations. Normal operations will resume after threatening weather conditions subside.

2.3.5 PROCEDURES PRIOR TO STORM

Prior to the arrival of a severe storm or hurricane, operations at the Tomoka Farms Road Landfill will continue for as long as the Division Director or Operations Supervisor determines that operations can be safely conducted. Beginning 24 - 48 hours prior to the storms arrival, the following will occur:

- Materials and debris that could pose an airborne hazard will be moved to an inside location or secured to the ground.
- Leachate holding ponds, tankage within the leachate treatment facility and the gas system will be inspected to ensure that adequate storage capacity is available. If necessary, leachate will be transported for off-site disposal or recirculated into the active Class I cell to provide adequate capacity.
- A stockpile of soil for use as initial cover will be established in case of sudden shut down.

2.3.6 LANDFILL SHUT-DOWN PROCEDURES

The following steps will be taken once it is determined that safe landfill operations can no longer continue:

- Notify on-site personnel and Solid Waste Division employees.
- Scale house attendants will begin notifying haulers as soon as the decision has been made to shut-down the landfill.
- Apply initial soil cover to active face. Alternate daily covers such as tarps or other materials that could be damaged or removed by high winds should not be used.
- Ensure that all personnel have exited the landfill prior to closing, and secure the facility.

2.3.7 PROCEDURES DURING SEVERE STORMS OR HURRICANES

If it has been determined that operations cannot safety continue due to a severe storm or hurricane, the Tomoka Farms Road Landfill will be closed and unattended. No operations will take place during the storm.

2.3.8 LANDFILL START-UP PROCEDURES

Following a severe storm or hurricane, the landfill will re-open when the Division Director determines that safe operations can resume. Prior to resuming operations, the following will occur:

- Inspect the landfill for unsafe conditions and remediate as necessary.
- Inspect leachate and gas systems for damage.
- Ensure safe, adequate access to the working face(s).
- If electrical power service is interrupted, utilize generators or other sources of back-up power, as needed, for normal operations.
- If scales are not operational, the volume of incoming waste will be estimated and repairs to the scale system will be initiated.

2.3.9 MANAGEMENT OF EXCESS LEACHATE

Severe storms or hurricanes are likely to result in leachate generation rates above those observed during normal weather conditions. Following a severe storm or hurricane, the leachate levels in the storage ponds (and tankage within the leachate treatment system, will be observed to ensure that the ponds do not overflow. Onsite leachate storage is the first option for managing excessive leachate generation. However, in the unlikely event that leachate must be transported off-site for disposal and no disposal facility is available due to the storm, temporary storage tanks may be used until disposal capacity is available.

2.3.10 ACCIDENTS

The following emergency or equipment procedures will be followed for the various types of accidents that may occur at the facility.

2.3.11 VEHICULAR ACCIDENTS

- Determine if personal injury has occurred. If so, contact the Landfill Supervisor.
- Determine if the vehicle(s) can be safely moved under its own power. If so, move the vehicle(s) out of the way of normal traffic flow.
- If the vehicle(s) cannot move under its own power and is interrupting traffic flow, push the vehicle(s) out of the way with site equipment or reroute traffic if serious injuries are involved.
- Notify landfill and personnel officials of the details of the accident.
- Arrange to have disabled vehicles towed from the site to maintain operations.
- Report incident to the County Risk Management Officer and other appropriate personnel.

2.3.12 PERSONAL INJURY

- Determine the nature and extent of the injuries.
- If qualified, administer emergency first aid techniques.
- Call for outside emergency assistance if necessary.
- Report incident to the Landfill Supervisor and personnel officials.
- If injuries require non-emergency medical attention, arrange to transport victim(s) to a place of professional medical care (e.g., hospital emergency room, doctor's office, and clinic) by conventional means in accordance with County Safety Procedures.
- Report incident to the County Risk Management Officer and other appropriate personnel.

2.3.13 FIRE

Waste loads that arrive at the landfill on fire will not be deposited at the working face. They will be deposited away from the working face on an area that has previously been covered with daily soil cover. The load will then be extinguished prior to being moved to the working face.

Small fires on the landfill working face will be extinguished with fire extinguishers when possible without endangering human health. If a fire at the landfill working face cannot be extinguished by fire extinguishers or the water wagon, on-site equipment will be used to spread soil over the fire thus decreasing oxygen supply to the fire.

If necessary, a temporary waste unloading area may be located as far away from the fire as possible but still within the limits of the lined disposal area where daily soil cover has previously been placed. Solid waste entering the facility will be placed in the temporary area until the fire is extinguished.

When a landfill fire is observed, the Site Supervisor will be notified immediately and shall determine if the fire can be extinguished using on-site equipment and materials or if the local

fire department must be contacted for assistance. If on-site equipment and materials are not sufficient to extinguish the fire, the local fire department will be contacted by calling 911.

The first consideration when dealing with a fire is human safety. If the Site Supervisor determines that a fire cannot be safely controlled while awaiting assistance, the immediate area will be evacuated. Depending on weather and other conditions, areas where the fire may potentially spread may also be evacuated.

For any fire at the landfill, a written report will be submitted to the FDEP Central District Office within five (5) days of the fire explaining the cause of the fire, remedial actions taken, and measures taken to prevent recurrence. If the fire is of such size and/or intensity that smoke can be seen from outside the landfill, the County will make every effort to notify the Department, by phone or e-mail, within 24 hours of the fire.

2.3.14 UNAVAILABLE LANDFILL CAPACITY

It is unlikely, based on the permitted capacity of the Class I and Class III landfills, that disposal capacity would become unavailable. However, if disposal capacity is temporarily unavailable, waste will not be accepted into the landfill for disposal. Signs will be posted notifying waste haulers that the landfill is closed, identifying alternate disposal facilities, and listing a projected reopening date.

2.4 CONTROL/INSPECTION OF INCOMING WASTE (RULE 62-701.500(2) (C), F.A.C.)

All solid waste arriving at the landfill is routed through the scalehouse. Scalehouse attendants screen visible loads for unacceptable materials including regulated hazardous waste, and regulated medical waste. Scalehouse attendants at the Tomoka Farms Road Landfill typically receive spotter training in accordance with F.A.C. 62-701.320. (15)(c). From the scalehouse, vehicles are directed to either the Class I disposal, the Class III disposal area, or to the Special Waste area. The various areas will be clearly identified by signs within the landfill. If prohibited wastes are discovered, the spotter will direct the vehicle back to the scale house. If the unacceptable waste has not yet been unloaded, the person responsible for shipping the waste will be notified. If the waste has been deposited, the area of the waste load should be blocked from public access until the generator or hauler of the waste cleans up the waste. If the generator or hauler of the waste cannot be identified or is unable to remove the waste, Volusia County will be responsible for cleanup, transportation, and disposal of the waste at an appropriate waste management facility.

CCA TREATED WOOD MANAGEMENT PLAN

The Tomoka Farms Road Landfill does not accept CCA treated wood for disposal in the Class III landfill. However, if, during the inspection process, CCA treated wood is found the working face of the Class III landfill, the spotter will separate it into piles and haul it to the Class I landfill working face for disposal weekly on a first-in, first-out basis.

2.5 WEIGHING OF INCOMING WASTES (RULE 62-701.500(2) (D), F.A.C.)

Weighing of incoming wastes will be performed at the scalehouse. Each customer receives a receipt showing the type of refuse, amount, and fee. These receipts are utilized for financial

accountability and to complete the necessary daily, weekly, monthly, and annual activities/materials reports required by the Florida Department of Environmental Protection (FDEP) and Volusia County.

2.6 VEHICLE TRAFFIC CONTROL AND UNLOADING (RULE 62-701.500(2)(E), F.A.C.)

All waste hauling vehicles entering the landfill must proceed to the scalehouse. Vehicles are directed to the appropriate unloading areas by the scale house attendant and assisted by signage around the landfill. The attendant will direct the vehicle to the point of unloading area compatible with the waste. Additional traffic directions will be provided, when needed, by equipment operators or spotters.

2.7 METHOD AND SEQUENCING OF FILLING WASTES (RULE 62-701.500(2)(F), F.A.C.)

The Tomoka Farms Road Landfill will be operated using the area fill method. Waste delivered to landfill will be directed to the working face area of either the Class I or Class III landfill for unloading.

Class I waste will be spread in layers approximately 2-feet in thickness and compacted. Following this method, waste will be placed in 10-foot lifts across the site. Initial cover is applied at the end of each workday. Sequencing diagrams for the Class I landfill are included as Figure 2-1, 2-2, and 2-3.

Class III waste will be spread in layers approximately 2- to 5-feet thick and compacted. Following this method, waste will be placed in 20-foot lifts across the site. An initial cover is applied weekly. The Class III landfill will be systematically filled to the elevations shown in the final grading plan.

2.8 WASTE COMPACTION AND APPLICATION OF COVER (RULE 62-701.50(2) (G), F.A.C.)

2.8.1 METHOD OF FILLING WASTES/COMPACTION

The procedure for filling and compacting of the initial waste lifts over areas of exposed liner in the Class I landfill will be as follows:

- To protect the integrity of the leachate collection system and liner, driving vehicles directly over the liner will be prohibited.
- The liner will be covered with a minimum of two (2) feet of protective soil at least one week prior to the placement of waste.
- The protective soil layer is carefully placed on the liner using a low ground pressure tracked dozer approximately 1 week prior to the placement of waste. The equipment operator is directed by a spotter to ensure that the soil is placed correctly and that the equipment does not come in contact with the liner. The 2-foot minimum in-place thickness of the protective soil layer is verified by the landfill operator.

- The landfill spotter directs equipment away from the side slope liner during normal operations.
- The initial lift of waste will be 4 feet thick and selected for material that will not cause damage to the liner. The initial lift of waste will be spread with equipment that will preserve the integrity of the liner system.

The procedures for filling and compacting all waste will be as follows:

- Waste will be placed in accordance with the FDEP- approved Fill Sequence Plan.
- Waste will be placed against the working face of the previous day's waste, so that the first row will act as a means of access and a berm to guide the placement of waste material for the remaining rows.
- Class I waste will be spread and completed in 2-foot lifts and compacted to approximately 1 foot in thickness by a minimum of five passes using a landfill compactor.
- Class III waste will be spread and completed in 2 to 5-foot lifts and compacted by a minimum of five passes using a landfill compactor or dozer.

2.8.2 INITIAL AND INTERMEDIATE COVER

Cover material will be utilized to minimize vector breeding, animal attraction, and fire potential, as well as to prevent blowing litter and control odors. Initial cover will be composed of a 50/50 mixture by volume of mulch and soil from the on-site stockpile, or synthetic materials such as tarps and geomembranes. Initial cover will be compacted to a minimum thickness of 6 inches or equivalent. The intermediate cover will comprise of local soil which will be placed and compacted to a minimum thickness of 12 inches.

2.8.3 FINAL COVER

The final cover system for the Class I landfill will be designed in accordance with Rule 62-701.600(5), F.A.C. The final cover will be placed on the intermediate cover as phases of the facility are closed. The conceptual final cover system for landfill closure, from top to bottom includes the following:

- 6-inch layer of topsoil material with surface vegetation
- 18-inch soil layer
- Composite drainage net layer (geosynthetic filter fabric with drainage net)
- 40-mil textured geomembrane

2.9 OPERATION OF GAS, LEACHATE, AND STORMWATER CONTROLS (RULE 62-701.500(2) (H), F.A.C.)

2.9.1 LANDFILL GAS CONTROLS

An active gas collection system is being installed in the Class I cell. Passive gas vents will be installed as part of final closure for the Class III cell. If it becomes apparent prior to or at the time of closure that passive vents are not adequate to control odors or migration of landfill gas from the landfill, an active landfill gas control system will be installed. The operations plan

will be updated as necessary to provide for operation and maintenance of the landfill gas controls.

2.9.2 LEACHATE CONTROLS

Leachate is collected by a leachate collection and transfer system. The leachate is conveyed by gravity to leachate sumps located as shown in the Tomoka Farms Road Landfill Construction Plans. Collected leachate is currently pumped from the leachate sumps in the landfill to the north leachate impoundment (pond) or to the leachate treatment facility.

The second (south) leachate storage pond is normally used for the storage of leachate treatment plant effluent, should the effluent quantities temporarily exceed the capacity of the spray fields, in conjunction with requirements for dust control and irrigation. The south leachate storage pond can be used to provide additional raw leachate storage capacity, should the quantities of leachate delivered by the leachate collection system temporarily exceed north pond storage capacity and treatment plant capacity. Please refer to Chapter 4 of the Preliminary Design Report (PDR), provided with the minor permit modification application for the leachate treatment facility submitted to FDEP in August, 2008, for a process flow diagram that details the future management of leachate flows. Additional information is also provided in Section 8.0 of this operations plan.

During normal operations, the collected leachate is pumped to the north pond for temporary storage. When the treatment plant control system determines that the treatment plant needs a batch of leachate, telemetry instructs leachate pumps at the impoundment (pond) to pump leachate from the north pond to the plant for treatment.

Leachate generation will be minimized by operating a single working face and keeping the working face as small as possible. The County's goal is to operate a working face no larger than approximately 150′ by 200′ under normal operating conditions. Daily and/or intermediate cover will be placed on slopes to promote stormwater runoff. The mixing of stormwater with leachate will be minimized by grading the daily and/or intermediate cover away from the working face and by using soil berms to direct stormwater runoff away. Swales and conveyance ditches will also be used to collect and transport stormwater to stormwater management facilities.

2.9.3 STORMWATER CONTROLS

Operation of the existing stormwater system is discussed in Section 10.0 of this operations plan. The stormwater system will be managed as required by Rule 62-701.500(10), F.A.C., to meet applicable standards for Rule 62-302, F.A.C., and Rule 62-330, F.A.C. The system shall minimize stormwater from entering waste filled areas and avoid the mixing of stormwater with leachate. All stormwater conveyances shall be inspected at least weekly to verify adequate performance. Conveyances not performing adequately will be repaired within three (3) working days. Documentation of all inspections and repairs will be kept on file at the landfill office.

2.10 WATER QUALITY MONITORING (RULE 62-701.500(2) (I), F.A.C.)

Groundwater, surface water, and leachate monitoring will be conducted as described in the Tomoka Farms Road Landfill Groundwater and Leachate Monitoring Plan, which is kept in the landfill office.

2.11 MAINTAINING AND CLEANING THE LEACHATE COLLECTION SYSTEM (RULE 62-701.500(2) (J), F.A.C.)

The leachate system at the landfill consists of collection, pumping, storage, and disposal facilities. A sequencing batch reactor (SBR) was placed in service in 2010 to provide on-site leachate treatment. Maintenance of the leachate pumping facilities is performed as specified in the manufacturer's manuals kept on file in the landfill office. Inspection and cleaning of the leachate collection system will be performed every 5 years.

OPERATING RECORDS
(RULE 62-701.500(3), F.A.C.)

Volusia County will maintain a separate operating record for the Class I and Class III landfills. The operating record will consist of all records, reports, analytical results, and all notifications as required by Rule 62-701, F.A.C. These records are considered an integral part of the operations plan and will be kept at or near the facility. The operating records will be available for inspection at reasonable times upon request by FDEP personnel.

The Volusia County Solid Waste Division Director will be responsible for the storage and filing of all operational records. The minimum records to be kept as part of the official operating record include the following:

- Current permits and applications
- Monthly waste disposal records (volume, weight, or truckloads)
- Random load checking records
- Leachate quantities
- On-site rain gauge data
- Monthly leachate operating reports (FDEP monthly facility report)
- Leachate Treatment Facility Operations Reports (once the facility has been placed in service)
- Annual estimates of remaining capacity (permitted disposal) in cubic yards
- Regulatory agency inspection reports
- Groundwater, surface water, and leachate sampling plan, including well construction information, sampling locations, and water quality sampling results
- All official notifications to or from FDEP regarding the facility
- Training verifications/certifications
- Landfill operations plan, including all supplementary material incorporated by reference
- Gas monitoring records

WASTE RECORDS
(RULE 62-701.500(4), F.A.C.)

Each month, a report of the amount of waste received, in tons, will be compiled. This report will include best estimates of the amounts of the following waste types based on type of hauler and tip fee rates:

- Household waste;
- Commercial waste;
- Ash residue;
- Incinerator by-pass waste;
- Construction and demolition debris;
- Treated biomedical waste;
- Agricultural waste;
- Industrial waste;
- Yard trash;
- Sewage sludge;
- Industrial sludge;
- Water/air treatment sludges;
- Waste tires; and
- Class III waste.

Reports are compiled monthly and submitted on an annual basis to:

FDEP-Central District Office
Solid Waste Section
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803

I
ACCESS CONTROL
(RULE 62-701.500(5), F.A.C.)

The entire Volusia County Landfill facility is fenced, and access is gate-controlled at all times. Figure 1-1 is a site plan of the entire landfill and illustrates the landfill access control facilities. The landfill may be operated for up to 24 hours per day, seven days per week.

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WASTE MONITORING
(RULE 62-701.500(6), F.A.C.)

6.1 WASTE INSPECTION (RULE 62-701.500(6) (A), F.A.C.)

Volusia County has implemented a load checking program to detect and discourage attempts to dispose of unauthorized wastes at the landfill. This program includes at least three (3) random checks by landfill personnel each week and inspection of suspicious loads, which are vehicles that have previously been determined to have delivered unauthorized waste, or loads that have unusual physical characteristics.

If any regulated hazardous wastes are identified during load checking, the following is a summary of the load inspection program.

1. Scalehouse personnel will direct at least three (3) vehicles per week of Class I waste and at least three (3) vehicles per week of Class III waste to a separate disposal area.
2. The driver of the vehicle will be asked the source of the waste by the inspector. The load will be completely discharged and spread uniformly by a front end loader so that all waste is visible.
3. The inspector will proceed to inspect the load for unauthorized waste. These shall include, but are not limited to the following:
    - Restricted materials.
    - Regulated hazardous waste.
    - Biomedical waste.
    - Used oil filters motor oil
    - Compressed gas cylinders.
    - PCB wastes.
    - Household hazardous waste.
    - Batteries containing heavy metals
    - Fats and Greases
    - Fluorescent lamps and ballasts
    - Liquid wastes
    - Pesticides
    - Tires
    - White goods
4. If unacceptable items or prohibited items are discovered, the vehicle operator shall be informed immediately. Landfill Facility staff must determine the safest manner to remove or mitigate the prohibited or unacceptable waste and remove it if possible. The unauthorized waste will be segregated and, if possible, returned to the hauler for proper disposal.
5. Removed items shall be taken by the delivery driver for alternate proper disposal. All incidents of unacceptable or prohibited wastes shall be documented. If discovered,

any tires, automotive batteries, oil, paints, cleaners or special wastes such as white goods should be set aside in designated areas and removed as soon as possible.

6. If any regulated hazardous waste or biomedical waste is observed, the Landfill Operations Manager will segregate the waste; notify FDEP, persons responsible for shipping the waste, and the generator of the waste. The waste shall be removed from the facility and disposed of properly.
7. Landfill personnel or haulers will relocate all special wastes such as tires and appliances to the proper disposal areas. Automotive batteries, oil, paints, cleaners or special wastes should be set aside in designated areas and removed as soon as possible but no longer than the end of the operating day. Waste oil, solvents, paints, and automotive batteries should be taken to the onsite HHW area for temporary storage. Any tires should be taken to the used tires storage roll off bin.
8. Copies of all completed inspection reports will be maintained for the life of the landfill.
9. Vehicles that have previously been determined to have delivered unauthorized waste will be considered suspicious and may be subjected to inspection at any time and in the same manner as the random inspections.
10. Spotters are positioned on the equipment rather than on the ground. When non-conforming waste is observed, the spotter contacts a day laborer via walkie-talkie for its removal. Should a day laborer not be available, the spotter contacts the Landfill Operations Manager or a supervisor via walkie-talkie to arrange for removal of the non-conforming material.

6.2 HAZARDOUS WASTES AND HANDLING PROCEDURES (RULE 62-701.500(6) (B), F.A.C.)

No regulated hazardous wastes will be accepted at the landfill for disposal. If unauthorized material is transported to the facility, the appropriate supervisory personnel will be notified immediately and appropriate actions taken to remove any unauthorized materials or wastes from the facility. Special wastes that are discovered will be removed from the landfill and placed in the appropriate processing area.

6.3 RECORDING INSPECTION RESULTS (RULE 62-701.500(6) (C), F.A.C.)

Results of the load checking inspections described in Section 6.1 of this document will be recorded in writing and retained at the landfill. This information will include date and time of inspection, name of hauling firm, name of driver of the vehicle, vehicle license plate number, source of waste as stated by the driver, and observations made by landfill personnel during the inspection. The inspector will sign the written record. A sample form used to document the inspection results is provided in Appendix A.

season as needed to control erosion. Yard waste, mulch, or sod may also be used to help control erosion.

7.10.2 DOWN DRAINS

Stormwater collected in the benches will be directed to the stormwater system located at the toe of the slope using downpipes, downchutes, or other conveyances.

7.10.3 INSPECTIONS

The intermediate soil cover will be regularly inspected for erosion damage. Repairs to any damage that is discovered will be initiated within 3 days to contain solid waste and leachate; and anything that cannot be repaired within 7 days will be reported to FDEP.

8
LEACHATE MANAGEMENT
(RULE 62-701.500(8), F.A.C.)

Leachate in the Class I landfill is collected in the leachate drainage layer that slopes to collection sumps equipped with leachate pumps. Clean outs are provided to allow access for inspection and cleaning. Leachate from the pump stations is pumped directly to the treatment facility unless conditions warrant temporary storage in the designated leachate storage pond.

Leachate is pumped from the pump stations to the treatment plant or designated leachate storage pond via force mains that run around the north and west sides of the landfill.

8.1 MONITORING, SAMPLING, AND ANALYSIS OF LEACHATE (RULE 62-701.500(8) (A), F.A.C.)

Annual leachate testing, analysis and results reporting are no longer required under Chapter 62-701.500. Leachate sampling and analysis is performed by the leachate treatment plant vendor/ operator to meet requirements of the Industrial Waste Permit that regulates the operation of the treatment plant. Sampling results are used optimize the treatment plant process.

The leachate pump side-slope risers and leachate collection pipe clean out side-slope risers on the North Cell provide a mechanism for Solid Waste Division personnel to observe leachate levels through physical measurements.

8.2 OPERATION AND MAINTENANCE OF LEACHATE COLLECTION SYSTEM (RULE 62-701 .500(8) (B), F.A.C.)

The Landfill Operations Manager will be responsible for maintenance of the leachate systems, including the piping, pump stations and piping to the leachate storage ponds. The Landfill Operations Manager also oversees the operation of the leachate treatment facility and related components. The equipment manufacturers have provided operation and maintenance manuals for each of the system components. Maintenance of each component will be performed in accordance with manufacturer specifications. Maintenance documentation may also include a video of the cleaning procedures. Operation and maintenance manuals include the following:

- Description of unit and component parts, including normal operating characteristics and limiting conditions.
- Operating procedures.
- Maintenance and overhaul procedures.
- Installation instructions.
- Original manufacturer's parts list, illustrations, and detailed assembly drawings.
- Spare parts ordering instructions.
- Manufacturer's printed operating and maintenance instructions.

Flow will be monitored from the leachate pumps. Facility personnel will record leachate flows. This will allow determination of leachate production as a function of rainfall and provide information to assess the efficiency of leachate and stormwater management practices. Leachate generation/flow records will be kept at the facility as part of the official operation record.

Leachate pump station maintenance will include reading meters and making sure each pump is operational. Pumping rates and electrical draw will be confirmed semiannually. If these tests indicate significantly reduced performance, the pumps will be pulled for inspection and repair. A replacement pump will be installed while the repairs are being made.

If leachate flow volume is noticeably decreased, the leachate collection system will be inspected. Possible reasons for low or no flow are header collapse or header blockage. If pipe blockage is identified, the header pipe will be power jetted to remove sediment buildup. Power jetting or rodding will be done from either or both ends of the header.

8.3 LEACHATE HANDLING (IF REGULATED AS HAZARDOUS WASTE) (RULE 62-701 .500(8) (B), F.A.C.)

The Landfill Operations Manager is responsible for the operation of the leachate collection and removal system and for maintaining the system as designed for the life of the facility. Leachate will be collected and pumped to the on-site storage and spray evaporation ponds, and disposed of by spray evaporation or by trucking to one of several wastewater treatment plants. Once the leachate treatment facility is placed in service, leachate shall be treated on site, with effluent sent to a dedicated spray field or used for dust control and/or side slope irrigation.

8.4 OFF-SITE TREATMENT (RULE 62-701.500(8) (C), F.A.C.)

The onsite treatment plant has been in service since 2010. The north leachate storage pond is used to provide supplemental storage of raw leachate that is collected from the landfill, but temporarily exceeds the capacity of the leachate treatment plant. The south pond is dedicated to the storage of excess treated effluent, when the generation of effluent exceeds the capacity of both spray fields and the need for dust control and irrigation. When other onsite storage is full, the south impoundment can be used for emergency leachate storage.

Leachate that, due to precipitation volumes, cannot be managed through the treatment plant or stored in the impoundments will be transported off-site by county contractor to an Industrial Wastewater Facility for treatment. The Tomoka Farms Road Landfill will transport leachate for off-site disposal when less than one-foot of freeboard is available in the leachate storage pond.

8.5 ON-SITE TREATMENT (RULE 62-701.500(8) (D), F.A.C.)

Currently, leachate treatment is performed at the Tomoka Farms Road Landfill. A Sequence Batch Reactor (SBR) provides leachate treatment. The design of the SBR is based on actual leachate quality data obtained from the TFRL, and includes provisions for plant modification as necessary to respond to changing leachate quality or quantity in future years, in accordance with Rule 62-701.500(8) (d), F.A.C.

8.6 CONTINGENCY PLAN FOR MANAGING LEACHATE (RULE 62-701.500(8) (E), F.A.C.)

Temporary pumps and emergency power generators are locally available in the event of pump failure or power interruption. Alternate wastewater treatment plants are available for leachate disposal. Therefore, complete interruption of off-site disposal capability is not anticipated.

The SBR has been placed in service, Excess raw leachate will be pumped to the north storage pond should the level within the tanks exceed design levels. If the north pond is full, the south pond normally used for treated effluent storage can be pumped down, and then used for raw leachate storage. This procedure is intended to maintain sufficient storage capacity in the event of a heavy rainfall event. Leachate will be transported off-site for disposal, when less than one foot of freeboard is available in the leachate storage ponds.

8.7 RECORDING LEACHATE QUANTITIES (RULE 62-701.500(8) (F), F.A.C.)

Quantities of leachate collected and removed for treatment and/or disposal are recorded and those records are maintained at the landfill. These quantities will be recorded in gallons per day.

8.8 RECORDING PRECIPITATION (RULE 62-701.500(8) (G), F.A.C.)

A rain gauge has been installed and is operated and maintained by Volusia County personnel to record precipitation at the disposal facility. Precipitation records will be maintained in the facility's operating record and will be compared with leachate generation rates.

8.9 INSPECTION AND CLEANING (RULE 62-101.500(8) (H), F.A.C.)

The leachate collection system for future cells will either be pressure cleaned or inspected by video recording after construction but prior to the initial placement of waste. Thereafter, existing leachate collection systems at the Tomoka Farms Road Landfill will be pressure cleaned or inspected by video as required by FDEP permit. Results of the cleanings and inspections are kept on file in the landfill office.

8.10 CONTROLLING LEACHATE SEEPS

In the event a leachate seep occurs at the landfill, Volusia County Personnel will take immediate action. The following guidelines will be followed:

- Assess the area impacted by the seep. Determine the extent of the impacted area, the origin of the seep and its potential to travel outside of waste limits.
- If the seep is slowly percolating and does not have potential to travel outside the limits of waste then the following corrective actions will be taken:
  - Excavate the seep origin and at least five feet down gradient to a minimum of 3 feet below the existing surface.
  - Fill the bottom of the excavated area with 2 feet of gravel or similar pervious

material and top foot with uncontaminated soil.

- Leachate shall not cross waste limits or edge of liner at any time nor shall it mix with stormwater runoff.
- Inform FDEP about the seep location, extent, and corrective actions taken to control the seep.
- This information will be recorded and kept on-site. Continue to monitor seep location for signs of repeated outbreaks.

- If seep is seeping quickly then the following corrective actions will be taken:
  - Contain the seep within the waste limits by appropriately implementing one or a combination of the actions below:
    (a) Construct a temporary 4-foot high containment berm down gradient of the seep and within the waste limits. The temporary berm will have a maximum sideslope of 2:1 and provide a swale with a bottom width of 3 feet to allow for percolation into waste.
    (b) Construct a 2-foot deep by 2-foot wide French drain or similar structure down gradient of the seep and within the limits of waste to allow leachate to re-enter waste. The length of the structure shall be determined by the impacted area.
    (c) Excavate a pit in waste limits such that the seep is collected in the excavated pit. Pimp the collected leachate on into the landfill through a nearby cleanout.
  - Inform FDEP about the seep location, extent, and corrective actions taken to control the seep.
  - Develop and implement a long-term solution addressing the control of the seep after discussing potential solutions with FDEP.
  - This information will be recorded and kept on-site. Continue to monitor seep location for signs of repeated outbreaks.

9
LANDFILL GAS MONITORING
(RULE 62-701 500(9), F.A.C.)

This Landfill Gas Monitoring Plan for the Tomoka Farms Road Landfill has been prepared in accordance with the provision of Rule 62-701.530, F.A.C. This plan includes measures of comprehensive monitoring of landfill gas (LFG) from the landfill.

9.1 LANDFILL GAS MONITORING PROBES

Seven locations around the active and closed landfill cells are monitored for the presence of LFG. These monitoring probes are located around the perimeter of the working area of the landfill. Each probe is monitored for the presence of combustible gas on a quarterly basis and the results are submitted to FDEP.

9.2 GAS PROBE MONITORING

The probes are monitored for concentrations of combustible gas using an instrument calibrated to methane and capable of measuring methane in percent by volume. Combustible gas concentrations will be converted to a percent of the lower explosive limit (LEL). Five percent methane by volume is equal to 100 percent LEL. The gas instrument is calibrated with calibration gas each day before monitoring is performed.

Any problems encountered during monitoring, observations, or other pertinent information that could impact the interpretation of the data are recorded. For example, if a probe is full of groundwater or suspected of being so, the comments should be noted for the monitoring round. A map depicting the locations of gas probes is provided at the end of this Section.

9.3 GAS MONITORING IN STRUCTURES

The following gas monitoring will be performed in structures at the facility:

- The insides of enclosed buildings within 500 feet of disposal areas are monitored for methane on a quarterly basis along with the perimeter probes. Monitoring is done with portable test equipment. The sampling hose of the instrument is held above the floor and inserted into any conduit spaces or cracks that could act as conduits for LFG to enter into the structure. All monitoring is reported to the FDEP.
- Currently, LFG Sampling is performed for the maintenance building, scalehouse, and the TFRLF administration building, The following structures will be added beginning in 2013:
  - GEL Recycling Center east of the North Cell,
  - the household hazardous waste facility east of the North Cell,
  - the sludge processing facility west of the South Cell, and
  - The Leachate Treatment Facility at the southwest corner of the North Cell.

- Quarterly readings at these locations are ambient air readings and do not require the installation of in-ground LFG probes.

- All monitoring points are sampled quarterly, and the results reported to the Department.

9.4 REPORTING

Landfill gas monitoring is reported quarterly to FDEP-Central District office at:

FDEP-Central District Office
Solid Waste Section
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803

Any odor complaints due to landfill gas at or beyond the property boundary are recorded and maintained on site. If methane gas is measured above 25 percent LEL in the structures, Volusia County will take all necessary steps to ensure protection of human health. All exceedance will be included in the quarterly reports to FDEP. The report will also include a description of the nature and extent of the exceedance and measures implemented in response to the exceedance.

STORMWATER MANAGEMENT SYSTEM AND MAINTENANCE (RULE 62-701.500(10), F.A.C.)

The Stormwater Management System will be operated and maintained as necessary to meet the requirements of Rule 62-701.400(9), F.A.C.

10.1 STORMWATER BEST MANAGEMENT PRACTICES

The landfill will use the following stormwater best management practices (BMPs):

- Sideswales
- Grass
- Sod
- Downdrains
- Benches
- Dry retention stormwater ponds
- Pumps to transport stormwater
- Ditches

10.2 STORMWATER MAINTENANCE PROCEDURES

The stormwater management system operation and maintenance will include the following:

- All stormwater conveyance systems will be inspected periodically or after major storm events.
- Any damaged systems will be repaired.
- Accumulated sediment will be removed as necessary.
- All stormwater pumps will be serviced as specified by the pump manufacturer.

11
EQUIPMENT AND OPERATION FEATURES (RULE 62-701.500(11), F.A.C.)

11.1 EQUIPMENT (RULE 62-701.500(11) (A), F.A.C.)

Volusia County owns a diverse mix of equipment to spread, compact, and cover the waste in the landfill. This equipment may include:

- Landfill Compactor
- Dozer
- Off-Road Dump Truck
- Back-hoe
- Water Truck

While the actual equipment at the landfill may vary, sufficient equipment will be maintained at the site to ensure proper operation of the landfill.

Normal equipment maintenance will be performed on site. Major maintenance item repairs (e.g., engine, transmissions, and auxiliary drives) will be handled either at the maintenance facilities or at off-site service facilities.

11.2 BACKUP EQUIPMENT (RULE 62-701.500(11) (B), F.A.C.)

There is sufficient equipment available to Volusia County to maintain normal operations during equipment breakdown or during emergency operating conditions. Arrangements will be made with suppliers to obtain reserve equipment within 24 hours of equipment breakdown if sufficient equipment is not available to properly operate the landfill.

11.3 COMMUNICATION EQUIPMENT (RULE 62-701.500(11) (C), F.A.C.)

Landfill employees will be able to communicate by two-way radios, and telephones are located at the office and scale house.

11.4 DUST CONTROL (RULE 62-701.500(11) (D), F.A.C.)

Control of dust will be maintained by wetting roads as necessary.

11.5 FIRE PROTECTION AND FIRE FIGHTING CAPABILITIES (RULE 62-701.500(11) (E), F.A.C.)

The initial cover aids in fire prevention at the landfill. The main method of fire extinguishing is to apply soil to the burning waste. Ample soil is stockpiled on-site if needed for fire extinguishing purposes.

All key equipment and vehicles at the landfill will be equipped with fire extinguishers, and all personnel will be trained in their use. All extinguishers will be inspected regularly and repaired or replaced as needed. Emergency services are notified telephonically using 911.

11.6 LITTER CONTROL PROGRAM (RULE 62-701.500(11) (F), F.A.C.)

Initial cover will provide the main litter control. Perimeter fencing will provide a barrier to blowing litter. In addition, portable litter fences will be located adjacent to the working face to prevent litter from being blown. Temporary fencing is also mobile and easily relocated around the facility as needed. Litter outside the working area of the landfill will be picked up as soon as possible. Litter policing will include the removal of litter from the perimeter ditch.

11.7 SIGNS (RULE 62-701.500 (11) (G), F.A.C.)

Appropriate signs will be utilized and maintained to ensure maximum safety, efficiency, and general information. Signage will include, at a minimum, facility name and operating authority, traffic flow, hours of operation, disposal rates, and restrictions or conditions of disposal.

12
ROADS
(RULE 62-701.500(12), F.A.C.)

12.1 ALL-WEATHER ROADS (RULE 62-701.500(12) (A), F.A.C.)

All-weather roads, passable and safe under normal operating conditions, will be maintained to prevent dust, rutting, or loss of traction. Where possible, select source separated Class III materials such as roofing and concrete will be reused as road base materials.

12.2 PERIMETER AND OTHER ON-SITE ROADS (RULE 62-701.500(12) (B), F.A.C.)

Some perimeter roads and internal roads are paved. Other on-site roads are constructed of limerock and/or stabilized soils. Limerock roads are scraped and smoothed with a road grader or dozer as necessary. When needed, roadways are wetted to control dust and to ensure high visibility. On-site roads are maintained to allow access to monitoring devices and stormwater controls, for landfill inspections, and fire-fighting.

13
RECORDKEEPING
(RULE 62-701.500(13), F.A.C.)

13.1 PERMIT APPLICATION DOCUMENTATION (RULE 62 -701 .500(13) (A), F.A.C.)

Records of all information used to develop or support the permit applications and any supplemental information submitted to comply with Rule 62-701, F.A.C., pertaining to construction of the facility will be kept throughout the life of the facility. Records pertaining to the operation of the landfill will be kept for the life of the facility.

13.2 MONITORING INFORMATION (RULE 62-701.500(13) (B), F.A.C.)

Records of all monitoring information, including calibration and maintenance records and copies of all reports required by permit, will be retained for at least 10 years. Background water quality records will be kept for the life of the facility.

13.3 REMAINING LIFE AND CAPACITY ESTIMATE (RULE 62-701.500(13) (C), F.A.C.)

The County prepares an annual estimate of the remaining life and capacity (in cubic yards) of the existing constructed landfill and the remaining capacity and site life of other permitted areas not yet constructed. The annual estimate is based on scale house records and aerial photomapping of solid waste disposal units. The estimate is reported annually to the FDEP as part of the annual update to the closure and long-term care cost estimates.

13.4 ARCHIVED RECORDS (RULE 62-701.500(13) (D), F.A.C.)

The landfill may archive records that are more than five years old, if necessary. Archived records will be available for inspection within seven days of the receipt of the request.

I
CLOSED CELL INSPECTIONS

Closed cells at the Tomoka Farms Road Landfill are inspected quarterly, at a minimum. These inspections will typically be performed during the landfill gas surface emissions monitoring. Inspections will include observations for cap integrity, differential settlement, ponding, erosion, and condition of the vegetation. Corrective actions will be initiated within three working days.

Appendix A

Sample Load Checking Inspection Forms

TOMOKA FARMS ROAD LANFILL FACILITY
LOAD INSPECTION REPORT

DATE: _____

TIME: _____

NAME OF HAULING COMPANY: _____

NAME OF DRIVER: _____

VEHICLE LICENSE PLATE NUMBER: _____

SOURCE OF THE WASTE: (GENERAL LOCATION) _____

OBSERVATIONS MADE BY THE INSPECTOR:

GARDEN:

[ ] HERBICIDES [ ] FERTILIZER [ ] PESTICIDES [ ] POOL CHEMICALS

HOUSEHOLD:

[ ] DRAIN CLEANERS [ ] CHLORINE [ ] FURNITURE POLISH
[ ] SPOT REMOVER [ ] WINDOW CLEANERS, ETC. [ ] HOUSEHOLD GARBAGE ONLY

AUTO:

[ ] MOTOR OIL [ ] BRAKE FLUID [ ] TRANSMISSION FLUID
[ ] ANTI FREEZE [ ] CAR BATTERIES [ ] CAR TIRES

PAINT:

[ ] ENAMEL OIL BASE [ ] LATEX WATER BASE [ ] THINNERS (OTHERS)

MEDICAL WASTE:

[ ] NEEDLES [ ] MEDICAL SUPPLIES

INSPECTOR'S COMMENTS:

_____

_____

_____

_____

INSPECTOR'S SIGNATURE

_____

Appendix B

North Cell Class I Disposal Area Fill Sequence Plans-August 2009

West Volusia Solid Waste Division Training Plan

The purpose of this document is to provide a detailed training plan for the Volusia County Solid Waste Division. All training received for the purposes of Department of Environmental Protection (DEP) certification will be obtained through public sources approved by the DEP in accordance with Section 403.716, F.S., such as the University of Florida's TREEO Center and/or Kohl Consulting.

Landfill and Transfer Station Supervisors, Operations Manager, and applicable administrative and operational employees that are identified by the Solid Waste Director will receive the initial 16 hour Waste Facility training. Every three (3) years thereafter these employees will be scheduled to attend eight (8) hours of continued training. In addition, at a minimum the Transfer Station floor equipment operator(s) and yard waste operator(s) will receive an initial eight (8) hour spotter training and every three (3) years thereafter they will be scheduled to attend four (4) hours of continued training.

Solid Waste Division employee training certificates are kept on file in the administration office at the Landfill. Volusia County Solid Waste Division maintains a detailed spreadsheet that tracks by employee the specific training received, the continued training credits needed and the timeframe for completion. Attached is the current edition of the spreadsheet along with a copy of the TREEO catalog identifying potential continued training credits.

CERTIFICATION INFORMATION

NAME	POSITION	ASSIGNED TO	DUTY	EXP Date	Have	Bal Need	Req'd	Bal for next period	Dates CEUs are needed
ADAMS, JAMES	EOIII	TRANSFER STATION	SPOTTER	03/06/15	0	4	4	0	3/7/12 - 3/06/15
BAILEY, WALLACE	COMPLIANCE OFFICER	TOMOKA	SPOTTER	03/24/15	0	4	4	0	3/26/12 - 3/23/15
BAKER, CHARLES DAVID	EO III	TRANSFER STATION	SPOTTER	08/05/15	0	0	4	0	8/06/12 - 8/04/15
BUNCH, BRETT	EO III	TRANSFER STATION	SPOTTER	03/11/14	0	4	4	0	3/13/11 - 3/10/14
CASEY, PATRICK	EOIII	TRANSFER STATION	SPOTTER	03/06/15	0	4	4	0	3/7/12 - 3/06/15
CLEMENT, CHARLES	MAINT WORKER III	TOMOKA	SPOTTER	3/16/13	0	4	4	0	3/17/13 - 3/15/16
			HAZWOPER	2/22/13	0	8	8	0	2/27/11 - 2/25/12
CSERNAI, MICHAEL	EO III	TOMOKA	STANDARD LANDFILL	12/07/15	0	16	16	0	12/08/12- 12/06/15
			SPOTTER	8/06/15	0	4	4	0	8/08/09 - 8/05/12
			HAZWOPER	2/22/13	0	8	8	0	02/27/11 - 2/25/12
			C&D LANDFILL OPER	12/07/15	0	16	16	0	12/08/12 - 12/06/15
DANIELS, DUANE	EO III	TOMOKA	SPOTTER	08/06/15	0	4	4	0	8/07/12 - 8/05/15
ELLIS, CHRIS	SUPERVISOR III	TOMOKA	STANDARD LANDFILL	11/16/13	0	4	16	0	11/17/10 - 11/15/13
			SPOTTER	3/24/15	0	4	4	0	3/24/12 - 3/25/15
FAIRCLOTH, JEFFERY	EO III	TOMOKA	SPOTTER	08/05/15	0	4	4	0	8/06/12 - 8/04/15
GOMBOZ, RICHARD	MAINT WORKER III	TRANSFER STATION	SPOTTER	03/24/15	0	4	4	0	3/25/12 - 3/23/15
			HAZWOPER	2/22/13	0	8	8	0	02/27/11 - 2/25/12
HARRIS, RICHARD	EO III	TOMOKA	SPOTTER	08/06/15	0	4	4	0	8/07/12 - 08/05/15
HASTINGS, HERMAN	EO III	TOMOKA	SPOTTER	03/24/15	0	4	4	0	3/25/12 - 3/23/15
HILL, ERIC	SUPERVISOR III	TRANSFER STATION	TRANSFER STA OPER	07/23/17	0	8	8	0	7/24/11 - 7/22/14
			MRF OPER	07/23/17	0	8	8	0	7/24/11 - 7/22/14
			SPOTTER	8/05/15	0	4	4	0	8/07/09 - 8/04/12
HOPTON, TROY	EO III	TRANSFER STATION	SPOTTER	08/05/15	0	4	4	0	8/06/12 - 8/05/15
			HAZWOPER	2/22/13	0	8	8	0	02/27/11 - 2/26/12
HUBBARD, C. RANDY	EO III	TOMOKA	SPOTTER	03/24/15	0	4	4	0	03/25/12 - 3/23/15
			STANDARD LANDFILL	12/07/15	4	4	16	0	12/08/12 - 12/06/15
			C&D LANDFILL OPER	12/07/15	4	4	16	0	12/08/12 - 12/06/15
HUFFMAN, RONALD	EO III	TRANSFER STATION	SPOTTER	11/17/14	0	4	4	0	11/18/11 - 11/16/14
HUNTER, RANDAL	COMPLIANCE OFFICER	COMPLIANCE	SPOTTER	EXPIRED	X	X	X	X	8/06/06 - 8/04/09
JONES, RICHARD	MAINT WORKER II	TRANSFER STATION	SPOTTER	03/20/14	0	4	4	0	3/21/11 - 3/19/14
KELLY, DAVID	SUPERVISOR III	TRANSFER STATION	TRANSFER STA OPER	7/23/17	4	4	8	0	7/24/15- 7/22/17
			MRF OPER	7/23/17	4	4	8	0	7/24/15 - 7/22/17
			SPOTTER	08/05/15	0	4	4	0	8/06/12- 8/04/15
			C&D LANDFILL OPER	12/07/15	12	4	16	0	12/08/12- 12/06/15
LAWSON, DAVID	MAINT WORKER III	TOMOKA	SPOTTER	03/11/2014	0	4	4	0	3/12/11 - 3/10/14
			HAZWOPER	02/22/13	0	8	8	0	02/26/11 - 02/25/12
LOPEZ NIEVES, VICTOR M	EO III	TOMOKA	SPOTTER	08/06/015	0	4	4	0	8/07/12 - 8/05/15
LYONS, ROBERT	EO III	TOMOKA	SPOTTER	03/24/15	0	4	4	0	3/26/12- 3/23/15
			HAZWOPER	2/22/13	0	8	0	0	02/27/11 - 2/25/12
MCCONNELL, MICHAEL	EO III	TOMOKA	SPOTTER	08/05/12	0	4	4	0	8/07/09 - 8/04/12
MCCORMICK, DAN	SUPERVISOR III	TOMOKA	STANDARD LANDFILL	05/20/16	4	12	16	0	5/21/13 - 5/19/16
			C&D	05/20/16	4	12	16	0	5/21/13- 5/19/16
			TRANSFER STA OPER	10/30/15	0	8	8	0	10/31/12 - 10/29/15
			MRF OPER	10/30/15	0	8	8	0	10/31/12- 10/29/15
			SPOTTER FACE	3/30/12	0	4	4	0	3/31/12 - 3/29/15
MONTGOMERY, REGINA	RECYCLING COORD	TRANSFER STATION	C&D	11/17/14	0	16	16	0	11/18/11- 11/17/14
			TRANSFER STA OPER	10/30/15	0	8	8	0	10/31/12 - 10/27/15
			MRF OPER	10/30/15	0	8	8	0	10/31/12 - 10/27/15
			SPOTTER	3/30/15	0	4	4	0	03/31/12 - 3/29/15
MOORE, SANDRA	LANDFILL ATENDANT	TOMOKA SCALE	SPOTTER	03/16/13	0	4	4	0	3/17/13 - 3/15/13
MOREHOURSE, ED	EO III	TRANSFER STATION	SPOTTER	03/24/15	0	4	4	0	3/25/12 - 3/23/15
NORMAN, WILLIE	EO III	TOMOKA	SPOTTER	03/12/14	2	2	4	0	3/13/11 - 3/10/14
PALMER, VICTOR LOUIE	EO III	TOMOKA	SPOTTER	03/11/14	0	4	4	0	3/12/11 - 3/13/14
PETERSON, JERRY	COMPLIANCE OFFICER	COMPLIANCE	SPOTTER	03/30/15	0	4	4	0	03/31/12 - 3/29/15
			FACE	7/01/14	0	\	?	?	1/1/14
PETERSON, SAMUEL	EOIII	TOMOKA	SPOTTER	02/27/16	0	4	4	0	2/28/13 - 02/26/16
			HAZWOPER	2/22/13	0	8	8	0	2/27/11- 2/25/12
PHILIBERT, SUSAN	ATENDANT	TRANSFER STATION	SPOTTER	11/17/14	0	4	4	0	11/18/11 - 11/16/14
POWERS, GREGORY	EO III	TOMOKA	SPOTTER	10/21/15	0	4	4	0	10/22/12 - 10/20/15

			STANDARD LANDFILL	11/16/13	12	4	16	0	11/17/10 - 11/15/13
			TRANSFER STA OPER	7/21/15	0	8	8	0	7/22/12 - 7/20/15
			SPOTTER	4/16/14	0	4	4	0	4/20/11 - 4/18/14
QUINN, CHARLES	EO III	TOMOKA	HAZWOPER	2/22/13	0	8	8	0	2/27/11 - 2/25/12
			STANDARD LANDFILL	11/15/15	0	16	16	0	11/17/12- 11/14/15
REED, JUNOS	CE III	TOMOKA	C&D OPERATOR	11/15/15	0	16	16	0	11/16/12 - 11/14/15
RICHARDSON, REYNOLDS	EO III	TOMOKA	SPOTTER	02/27/16	0	4	4	0	2/29/13 - 2/26/16
			C&D LANDFILL OPER	12/06/15	0	16	16	0	12/07/12 - 12/05/15
			TRANSFER STA OPER	4/14/17	4	4	8	0	4/15/13 - 4/13/17
			MRF OPER	4/14/17	4	4	8	0	4/15/13 - 4/13/17
ROBINSON, BOBBY	EO III	TRANSFER STATION	SPOTTER	8/06/2015	0	4	4	0	08/07/12- 08/05/15
SOUSA, MICHAEL	EO III	TOMOKA	SPOTTER	03/20/14	0	4	4	0	3/21/11 - 3/19/14
STAUFFER, JON	LANDFILL ATENDANT	TRANSFER STATION	SPOTTER	08/06/15	0	4	4	0	8/07/12 - 8/05/15
STATES, KEVIN	MATERIAL COORD	TOMOKA	SPOTTER	03/07/15	0	4	4	0	3/8/12 - 3/6/15
STEWART, ANDREW	EO III	TRANSFER STATION	SPOTTER	08/06/15	8	0	4	0	8/07/12 - 8/05/15
			STANDARD LANDFILL	11/17/14	4	12	16	0	11/19/11- 11/16/14
	ENVIRONMENTAL		C&D OPERATOR	11/17/14	4	12	16	0	11/19/11 - 11/16/14
STIRK, JENNIFER	SPEC III	TOMOKA	HAZWOPER	2/22/13	0	8	8	0	2/27/11 - 2/25/12
STONE, PETER J	EO III	TOMOKA	SPOTTER	08/05/12	0	4	4	0	8/06/09 - 8/04/12
TABOR, JON	MW III	TRANSFER STATION	SPOTTER	03/07/15	0	4	4	0	3/8/12 - 3/6/15
TRUSSEL, WILLIE	EO III	TOMOKA	SPOTTER	03/30/15	0	4	4	0	3/31/12 - 3/29/15
WEBER, JENNIE	ADMIN COORD I	TOMOKA	SPOTTER	02/28/16	0	4	4	0	2/29/13 - 2/27/16
WILLIAMS, DENNIS	EO III	TOMOKA	SPOTTER	08/06/15	0	4	4	0	8/07/12 - 8/05/15
WOULARD, KORY	EO III	TOMOKA	SPOTTER	08/06/15	0	4	4	0	8/07/12 - 8/05/15
				11/15/15	0	16	16	0	11/17/12 - 11/14/15
			STANDARD LANDFILL	11/15/15	0	16	16	0	11/17/12 - 11/14/15
ZOW, S. DEXTER	SUPERVISOR III	TOMOKA	C&D OPERATOR SPOTTER	3/06/15	0	4	4	0	3/7/12 - 3/05/15

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FLORIDAJETCLEAN@YAHOO.COM

Volusia County Solid Waste
Tomoka Landfill
North Cell
LCS Pipe Video Inspections

Work Performed
June 2012

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
VIDEO PIPELINE INSPECTION
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FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 7/11/2012
TO : Volusia County Solid Waste - Tomoka Landfill
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : North Cell - Leachate Collection Pipe - Video Inspections

Florida Jetclean was mobilized to the Volusia County Solid Waste - Tomoka Landfill on 6/20/12 to carry out explosion-proof video-inspection services on the leachate collection system piping. This report contains the video-inspection logs associated with that work, the included DVD's should be reviewed for further details.

EXPLOSION-PROOF VIDEO-INSPECTION:
The landfill leachate collection piping listed in the below table was video-inspected as far as possible from the available access points utilizing explosion-proof video-inspection equipment (see included DVD's, Pipe Graphic Reports, and CCTV Survey Listing). A summary of these inspections is included below for quick reference.

LOCATION	ACHIEVED DISTANCE	REMARKS / RESULT
Setup 1 – CO 1	72.3'	Pipe crushed at 70.4'. Camera can not pass.
Setup 2 – CO 3	283.0'	Debris in pipe from 210.6' to survey termination at 283.0'. Camera can not pass through 283.0'.
Setup 3 – CO 4	61.3'	Sand/Debris in pipe at 61.2'. Camera can not pass.
Setup 4 – CO 5	185.4'	Pipe crushed at 70.4'. Camera can not pass.
Setup 5 – CO 6	106.4'	Sand/Silt in pipe at 105.2'. Camera can not pass.
Setup 6 – CO 7	77.7'	Camera stops submerged under black leachate with no camera picture. Reason for impasse can not be determined.
Setup 7 – Sump Riser 1	79.8'	Sump bottom reached.

The removal of the identified debris / sand / silt can be removed from the identified lateral pipes through targeted jetcleaning and vacuum removal efforts at each cleanout where these materials were identified.

Please call us with questions or concerns.

Regards,
Ralph Calistri
Ralph Calistri - Florida Jetclean America - 800-226-8013

CCTV Surveys List for VOLUSIA CO

Number of surveys in this list is 7 **as of** Wednesday, June 20, 2012 **Unit of measure:** ft

Setup	Date	Street	Start MH	Finish MH	Dir	Size inch	Pre Clean	Vid Cassette	Scheduled Length	Surveyed Length
1	6/20/2012	TOMOKA FARMS RD	CO.1	ENDCAP.1	U	6		DVD1		72.3
2	6/20/2012	TOMOKA FARMS RD	CO.3	ENDCAP.3	U	6		DVD1		283.0
3	6/20/2012	TOMOKA FARMS RD	CO.4	ENDCAP.4	U	6		DVD1		61.3
4	6/20/2012	TOMOKA FARMS RD	CO.5	ENDCAP.5	U	6		DVD1		185.4
5	6/20/2012	TOMOKA FARMS RD	CO.6	ENDCAP.6	U	6		DVD1		106.4
6	6/20/2012	TOMOKA FARMS RD	CO.7	ENDCPA.7	U	6		DVD1		77.7
7	6/20/2012	TOMOKA FARMS RD	SUMP RISER 1	SUMP.1	D	18		DVD1	79.8	79.8
								Total Scheduled Length	79.8	
								Total Length Surveyed		865.9

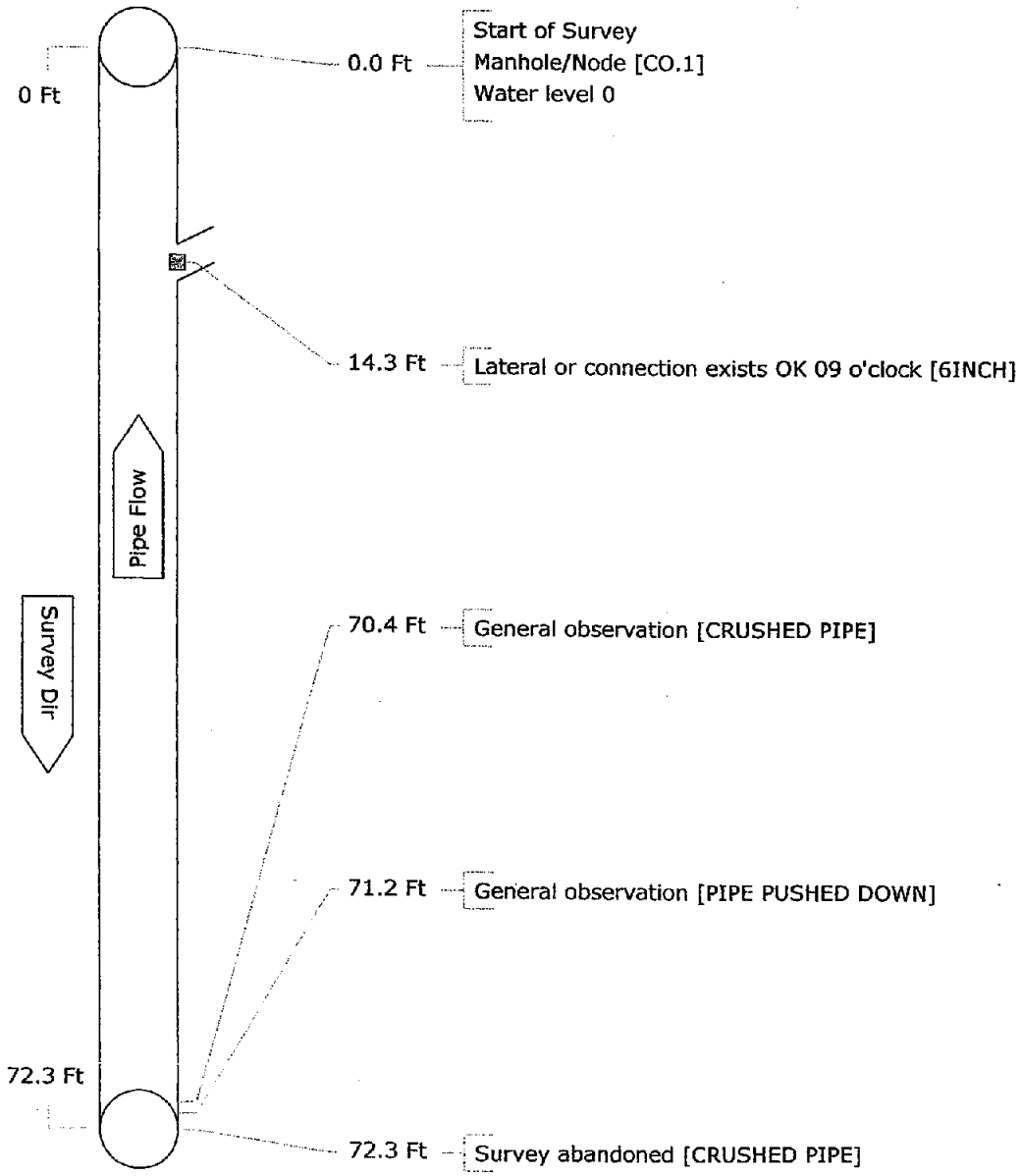
Pipe Graphic Report of PLR ENDCAP.1 X **for** VOLUSIA CO

Work Order		**Contract**	**Video**	DVD1	**Setup** 1
Facility		**Operator** DWH	**Van Ref** 3		**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL		
Location type	Berm				
Surface					
Survey purpose	Re-survey for any reason		**Weather** Dry		

Pipe Use	**Schedule length** Ft	**From** CO.1 **Depth** Ft
Shape Circular	**Size** 6 **by** ins	**To** ENDCAP.1 **Depth** Ft
Material Polyethylene - High density	**Joint spacing** Ft	**Direction** Upstream
Lining	**Year laid**	**Pre-clean** **Last cleaned**

General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

Location note NORTH CELL



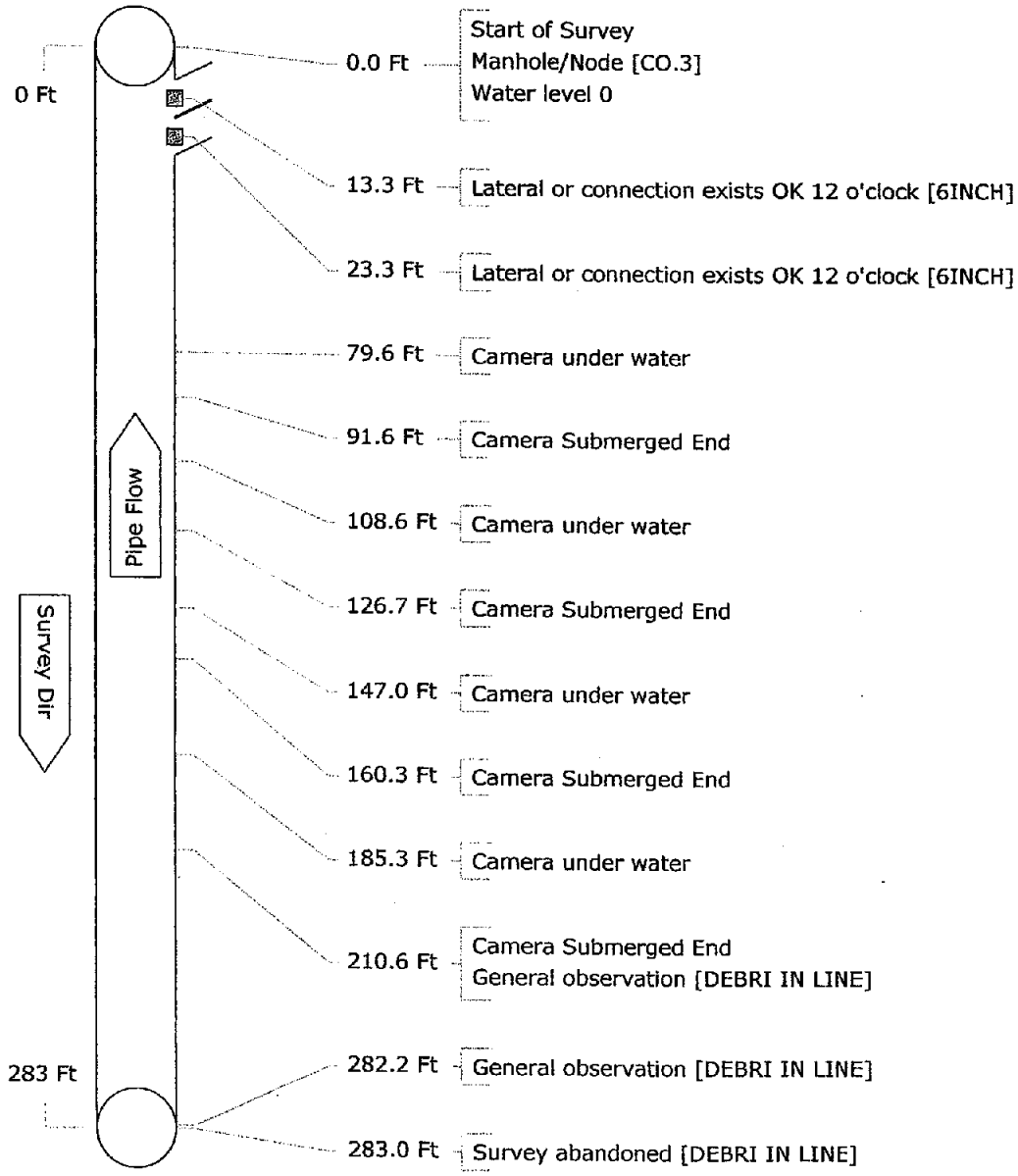
Pipe Graphic Report of PLR ENDCAP.3 X **for** VOLUSIA CO

Work Order		**Contract**	**Video** DVD1	**Setup** 2	
Facility		**Operator** DWH	**Van Ref** 3	**Surveyed On** 06/20/2012	
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL		
Location type	Berm				
Surface					
Survey purpose	Re-survey for any reason		**Weather** Dry		

Pipe Use		**Schedule length**	Ft	**From** CO.3	**Depth** Ft
Shape	Circular	**Size** 6	**by** ins	**To** ENDCAP.3	**Depth** Ft
Material	Polyethylene - High density	**Joint spacing**	Ft	**Direction** Upstream	
Lining		**Year laid**		**Pre-clean**	**Last cleaned**

General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

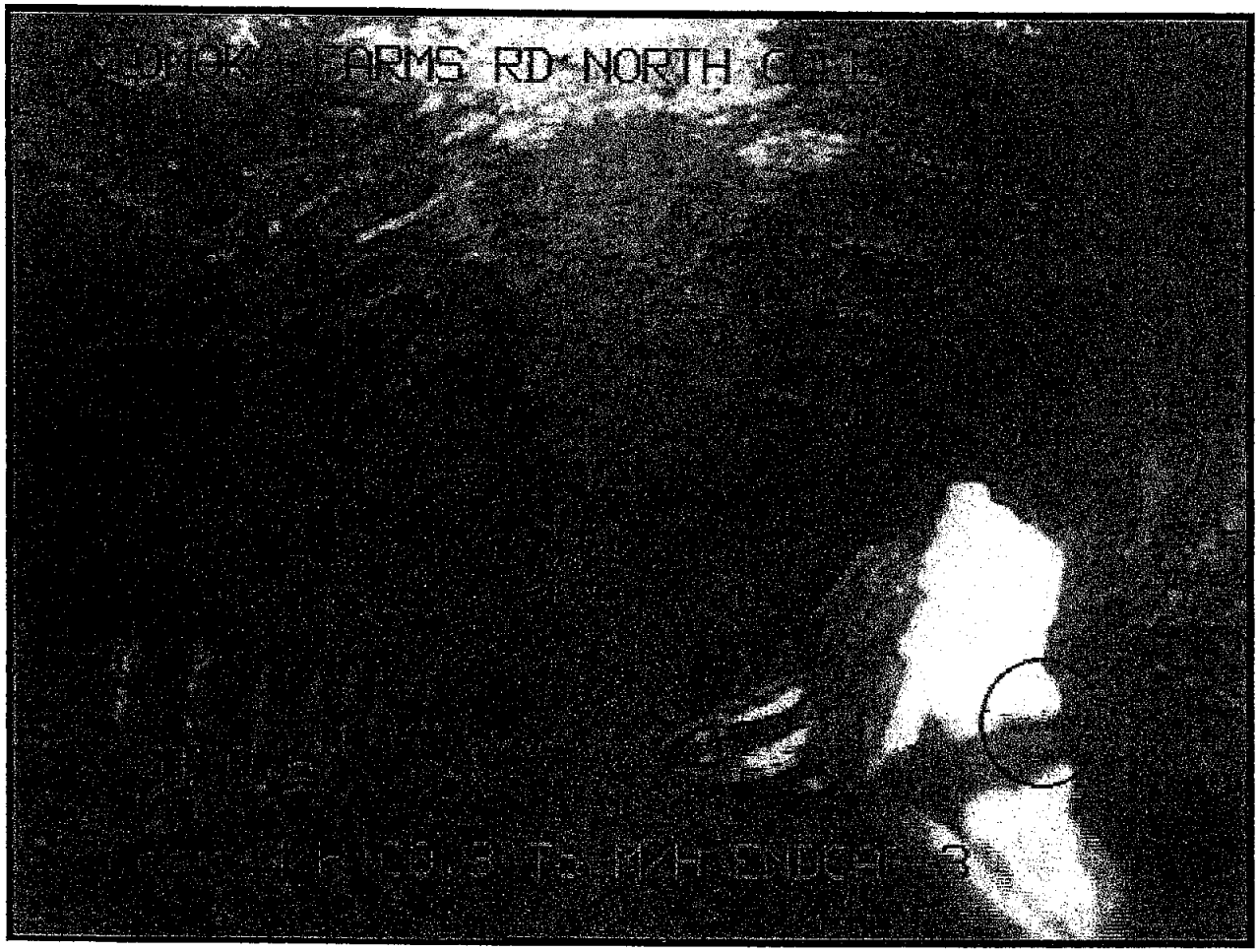
Location note NORTH CELL



CCTV pictures of ENDCAP.3 X
For VOLUSIA CO

Work Order			**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD		**Video** DVD1
City Name	NORTH CELL	**Weather** Dry	
Location	Berm		
From Manhole	CO.3	**To Manhole** ENDCAP.3	**Survey Direction** Upstream

Setup 2 **Counter** 210.6 Ft



E:\Snaps\TOMOKA LANDFILL\6.jpg 06/20/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 6 **By** ins

Material Polyethylene - High **Lining** **Use**

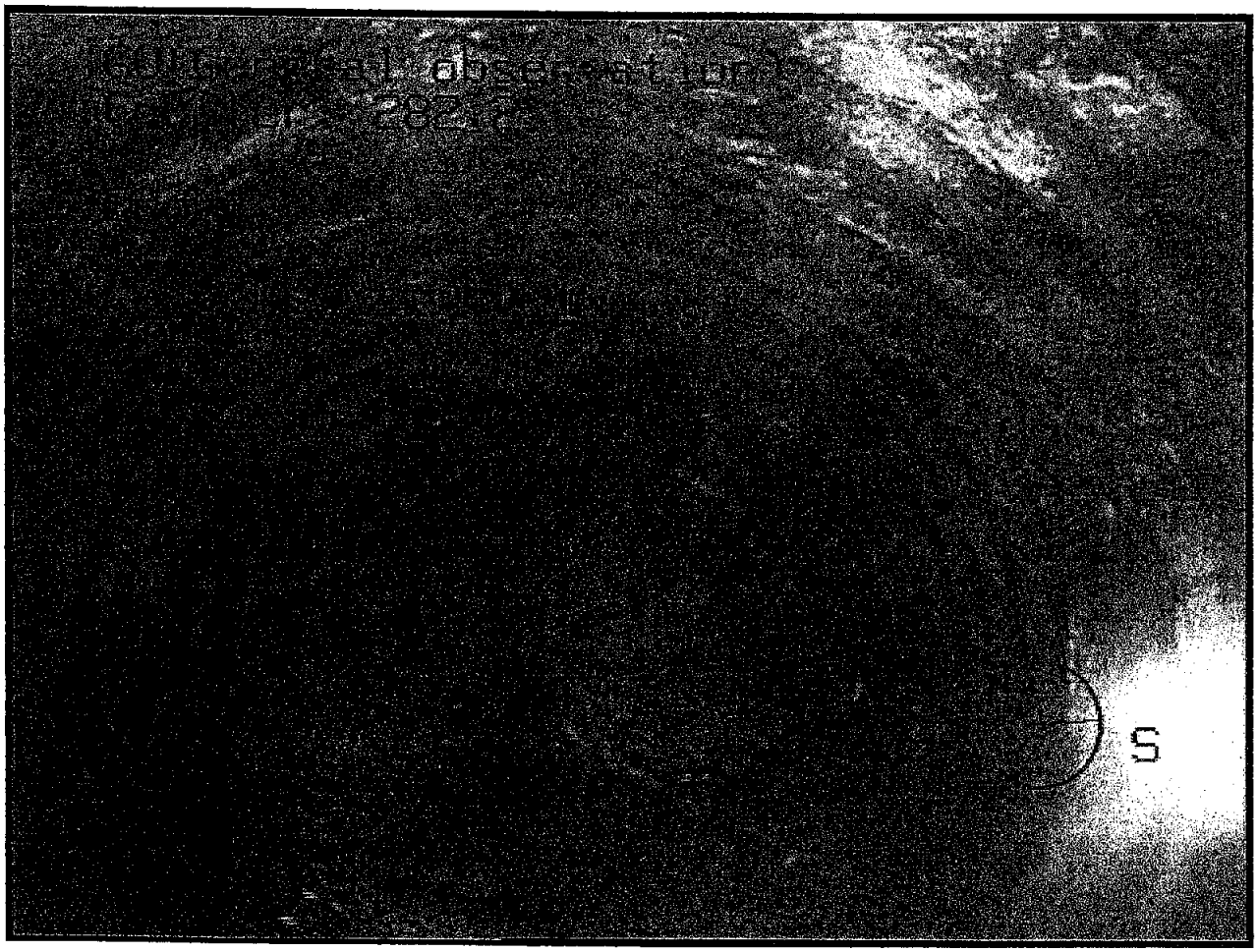
Observation: General observation

Comments: DEBRI IN LINE

CCTV pictures of ENDCAP.3 X
For VOLUSIA CO

Work Order			**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD		**Video** DVD1
City Name	NORTH CELL	**Weather** Dry	
Location	Berm		
From Manhole	CO.3	**To Manhole** ENDCAP.3	**Survey Direction** Upstream

Setup 2 **Counter** 282.2 Ft



E:\Snaps\TOMOKA LANDFILL\7.jpg 06/20/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 6 **By** ins

Material Polyethylene - High **Lining** **Use**

Observation: General observation

Comments: DEBRI IN LINE

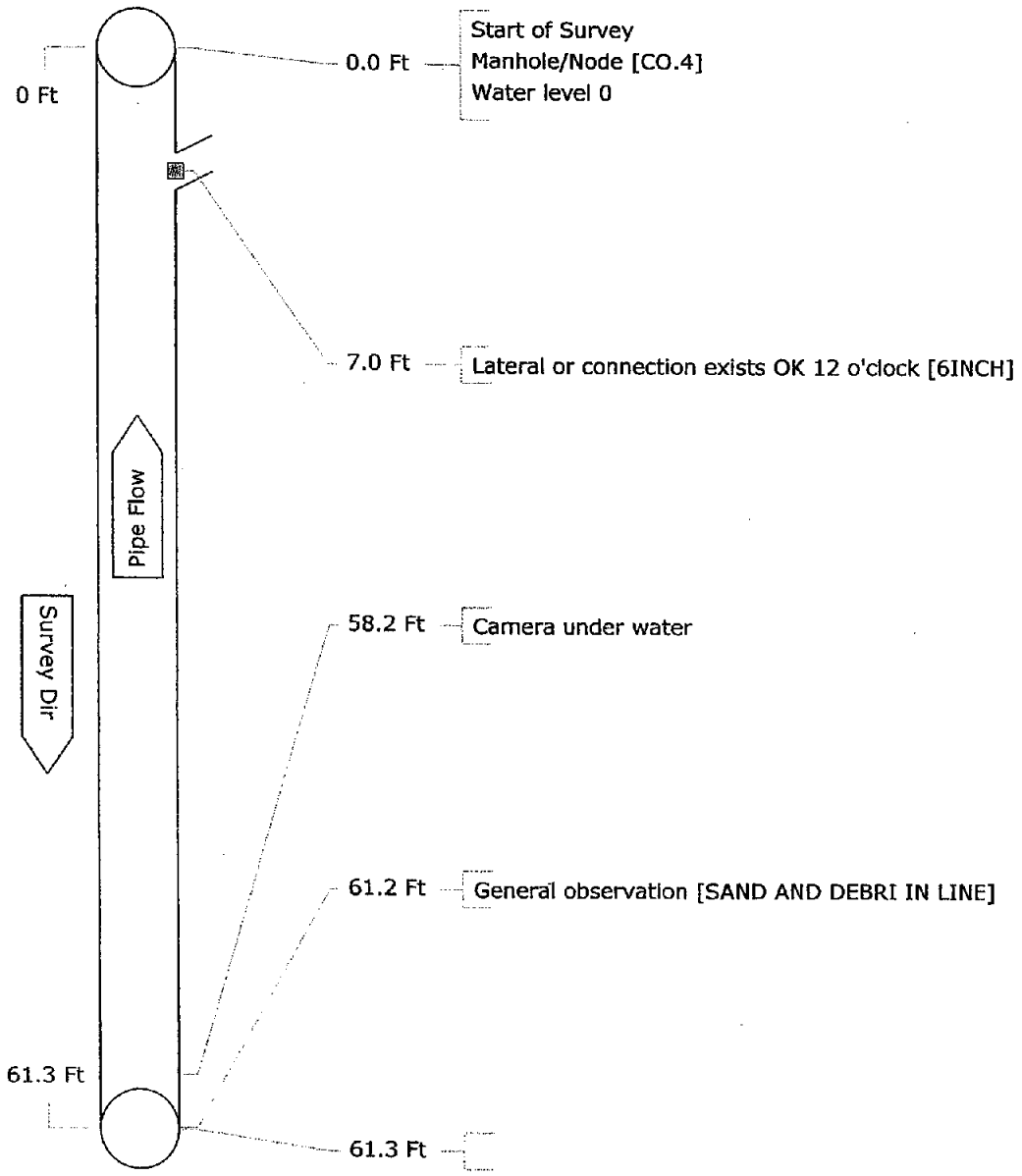
Pipe Graphic Report of PLR ENDCAP.4 X for VOLUSIA CO

Work Order		**Contract**	**Video**	DVD1	**Setup** 3
Facility		**Operator** DWH	**Van Ref** 3		**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL		
Location type	Berm				
Surface					
Survey purpose	Re-survey for any reason		**Weather** Dry		

Pipe Use		**Schedule length**	Ft	**From** CO.4	**Depth** Ft
Shape	Circular	**Size** 6	**by** ins	**To** ENDCAP.4	**Depth** Ft
Material	Polyethylene - High density	**Joint spacing**	Ft	**Direction** Upstream	
Lining		**Year laid**		**Pre-clean**	**Last cleaned**

General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

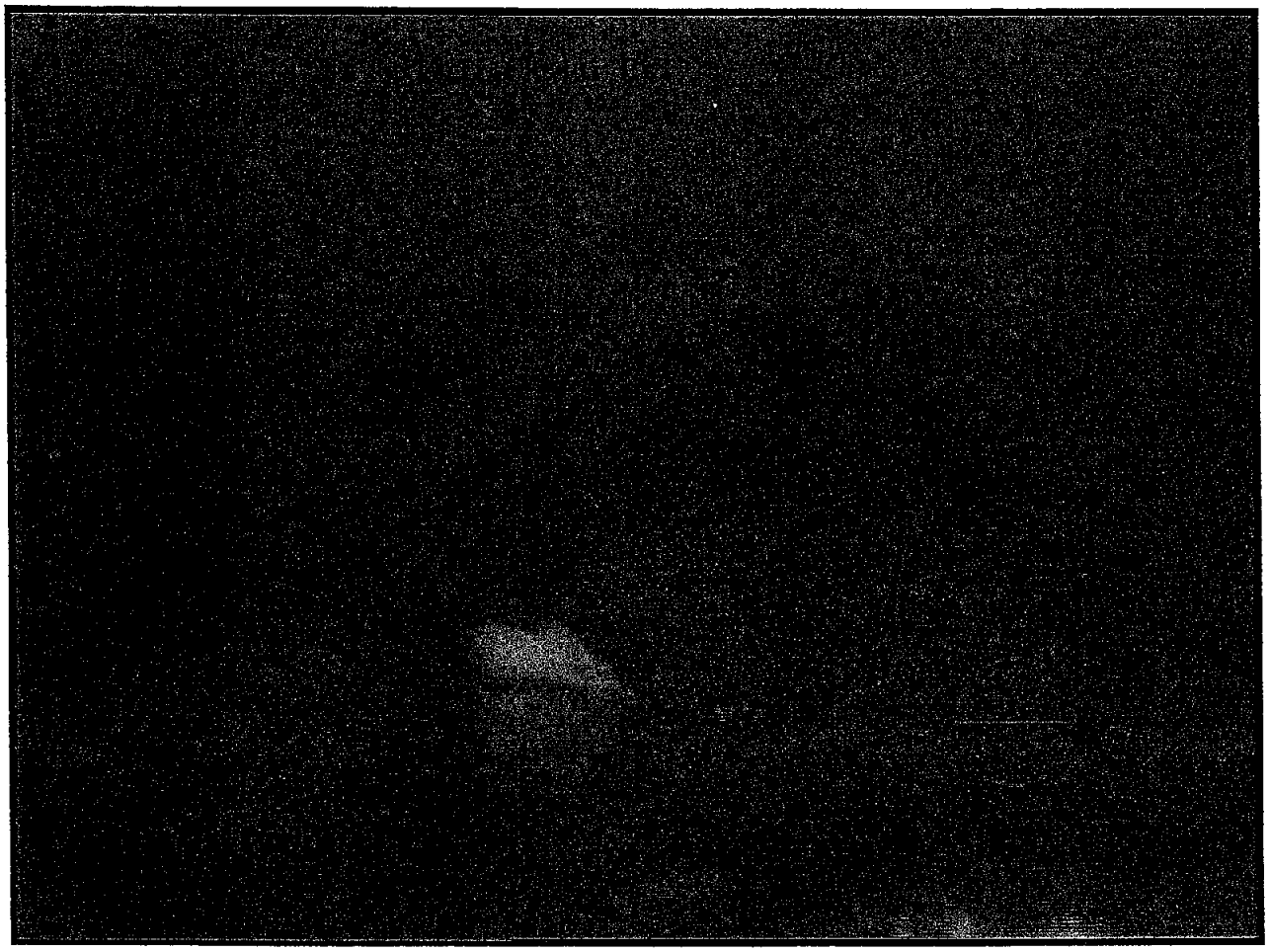
Location note NORTH CELL



CCTV pictures of ENDCAP.4 X
For VOLUSIA CO

Work Order			**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD		**Video** DVD1
City Name	NORTH CELL	**Weather** Dry	
Location	Berm		
From Manhole	CO.4	**To Manhole** ENDCAP.4	**Survey Direction** Upstream

Setup 3 **Counter** 61.3 Ft



E:\Snaps\TOMOKA LANDFILL\9.jpg 06/20/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 6 **By** ins

Material Polyethylene - High **Lining** **Use**

Observation: Survey abandoned

Comments: DEBRI IN LINE

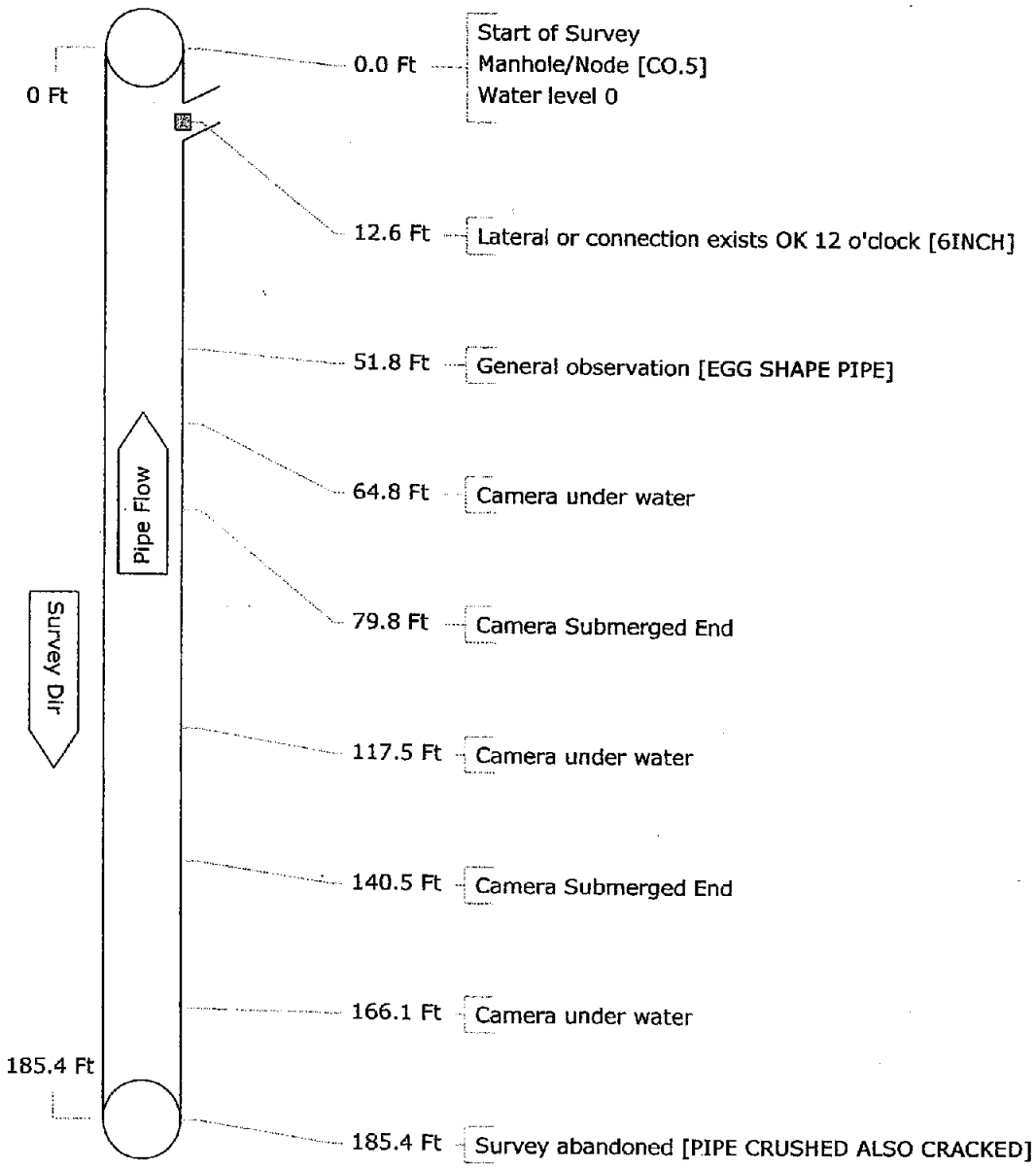
Pipe Graphic Report of PLR ENDCAP.5 X **for** VOLUSIA CO

Work Order		**Contract**		**Video**	DVD1	**Setup**	4
Facility		**Operator**	DWH	**Van Ref**	3	**Surveyed On**	06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL				
Location type	Berm						
Surface							
Survey purpose	Re-survey for any reason			**Weather**	Dry		

Pipe Use		**Schedule length**	Ft	**From**	CO.5	**Depth**	Ft
Shape	Circular	**Size** 6	**by** ins	**To**	ENDCAP.5	**Depth**	Ft
Material	Polyethylene - High density	**Joint spacing**	Ft	**Direction**	Upstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

Location note NORTH CELL

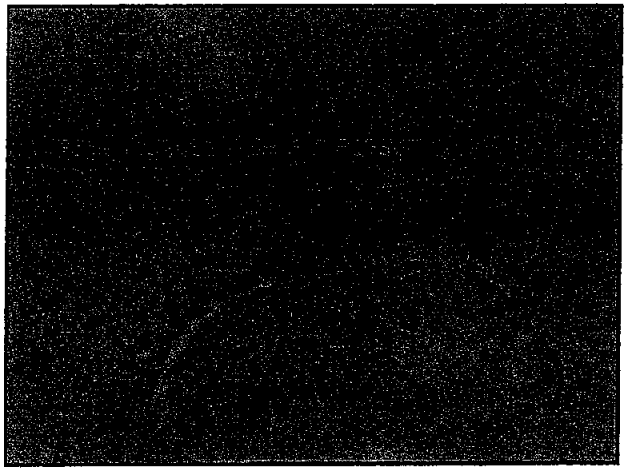


CCTV pictures of ENDCAP.5 X **for** VOLUSIA CO

Work Order	**Video** DVD1	**Surveyed On** 06/20/2012	**Direction** Upstream **Setup** 4
Street Name TOMOKA FARMS RD	**City Name** NORTH CELL		**Weather** Dry
Location Berm		**From Manhole** CO.5	**To Manhole** ENDCAP.5

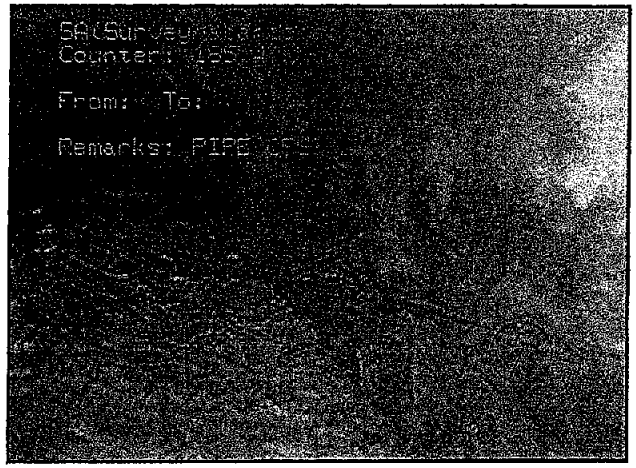
Date: 06/20/2012
Distance: 51.8 Ft
Obs: General observation

Comments:
EGG SHAPE PIPE



Date: 06/20/2012
Distance: 185.4 Ft
Obs: Survey abandoned

Comments:
PIPE CRUSHED ALSO CRACKED



Date: 06/20/2012
Distance: 185.4 Ft
Obs: Survey abandoned

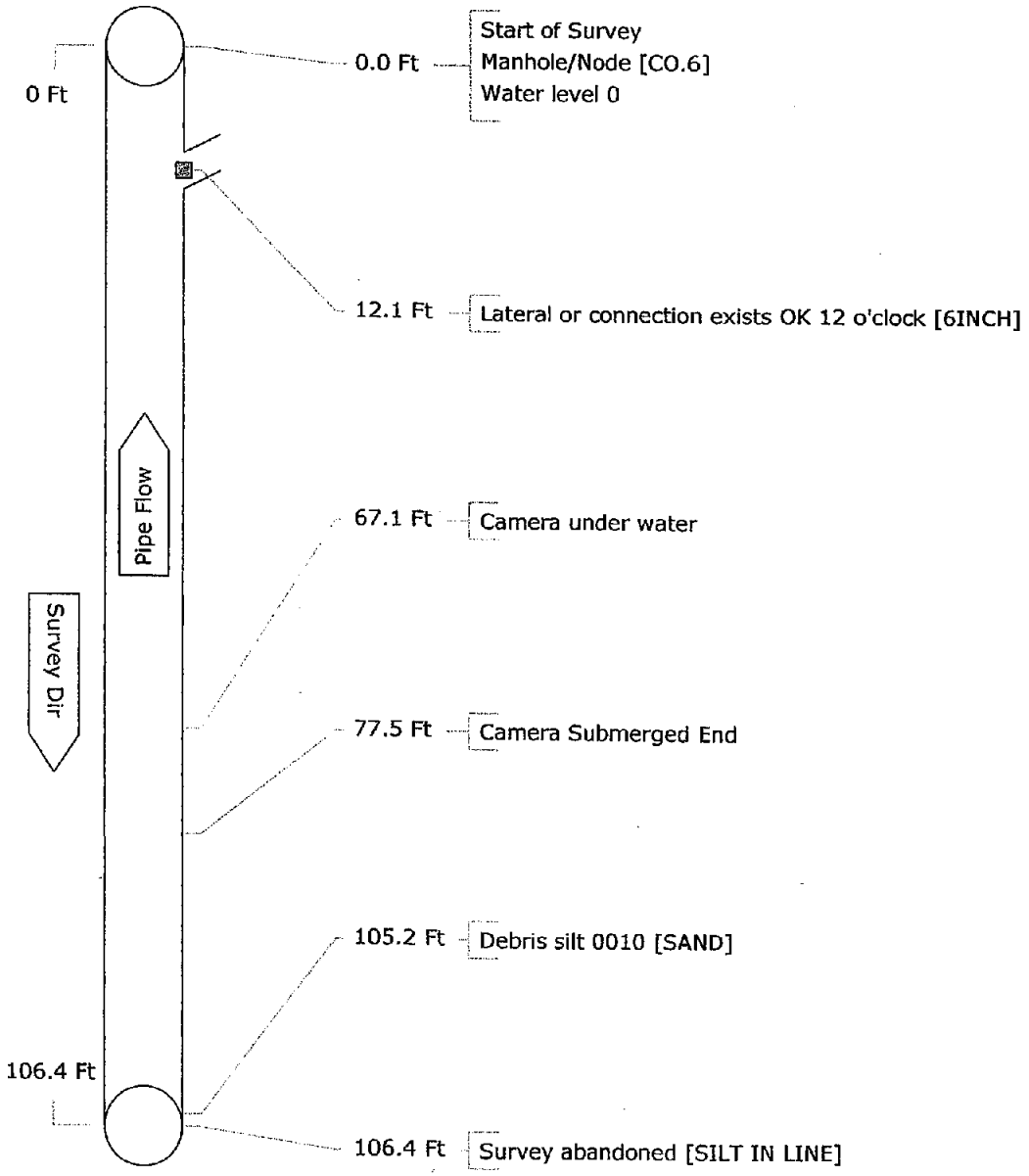
Comments:
PIPE CRUSHED ALSO CRACKED

Pipe Graphic Report of PLR ENDCAP.6 X **for** VOLUSIA CO

Work Order		**Contract**	**Video**	DVD1	**Setup** 5
Facility		**Operator** DWH	**Van Ref** 3		**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL		
Location type	Berm				
Surface					
Survey purpose	Re-survey for any reason		**Weather** Dry		

Pipe Use	**Schedule length** Ft	**From** CO.6 **Depth** Ft
Shape Circular	**Size** 6 **by** ins	**To** ENDCAP.6 **Depth** Ft
Material Polyethylene - High density	**Joint spacing** Ft	**Direction** Upstream
Lining	**Year laid**	**Pre-clean** **Last cleaned**

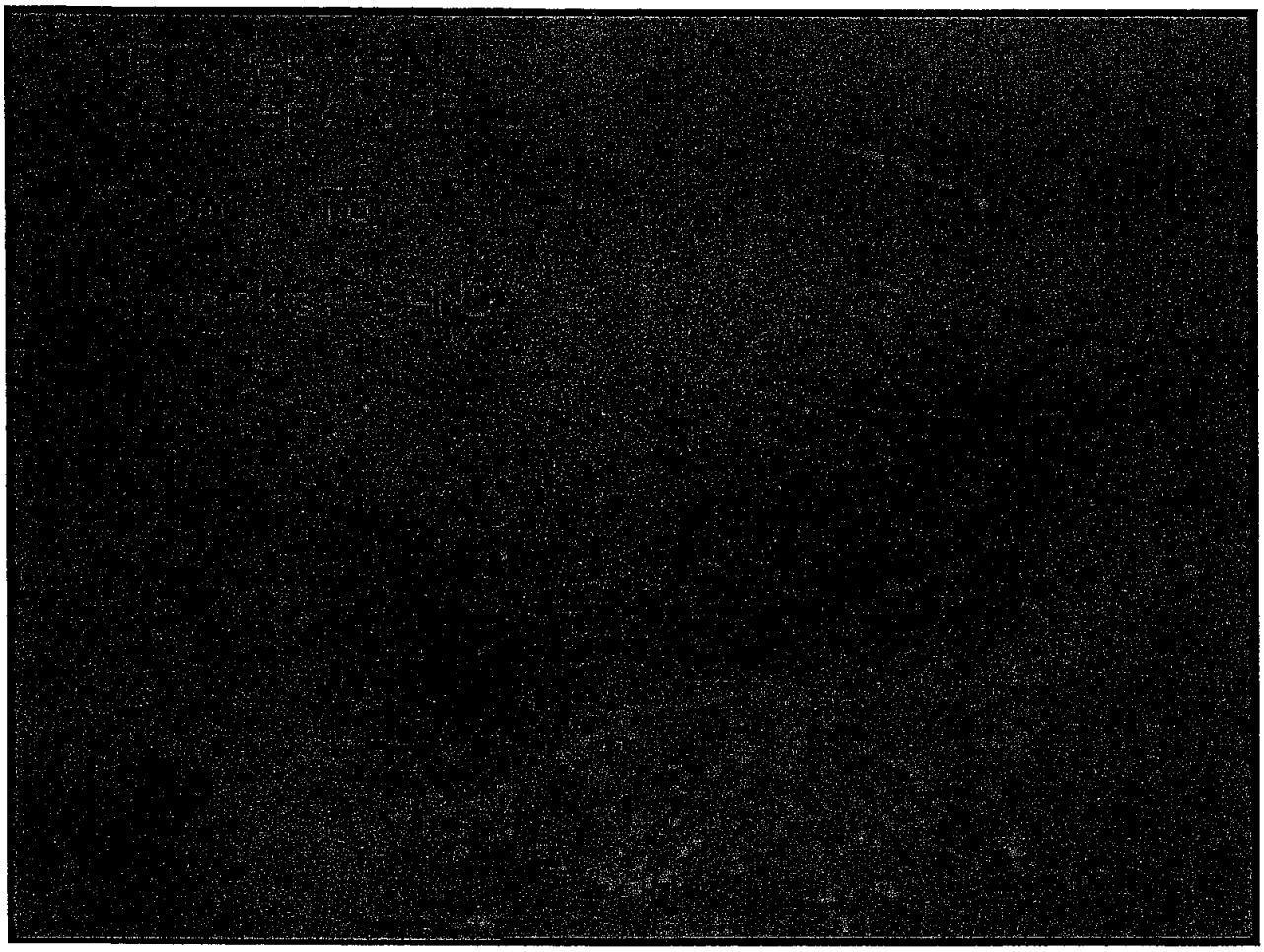
General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS
Location note NORTH CELL



CCTV pictures of ENDCAP.6 X
For VOLUSIA CO

Work Order			**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD		**Video** DVD1
City Name	NORTH CELL	**Weather** Dry	
Location	Berm		
From Manhole	CO.6	**To Manhole** ENDCAP.6	**Survey Direction** Upstream

Setup 5 **Counter** 105.2 Ft



E:\Snaps\TOMOKA LANDFILL\15.jpg 06/20/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 6 **By** ins

Material Polyethylene - High **Lining** **Use**

Observation: Debris silt

Comments: SAND

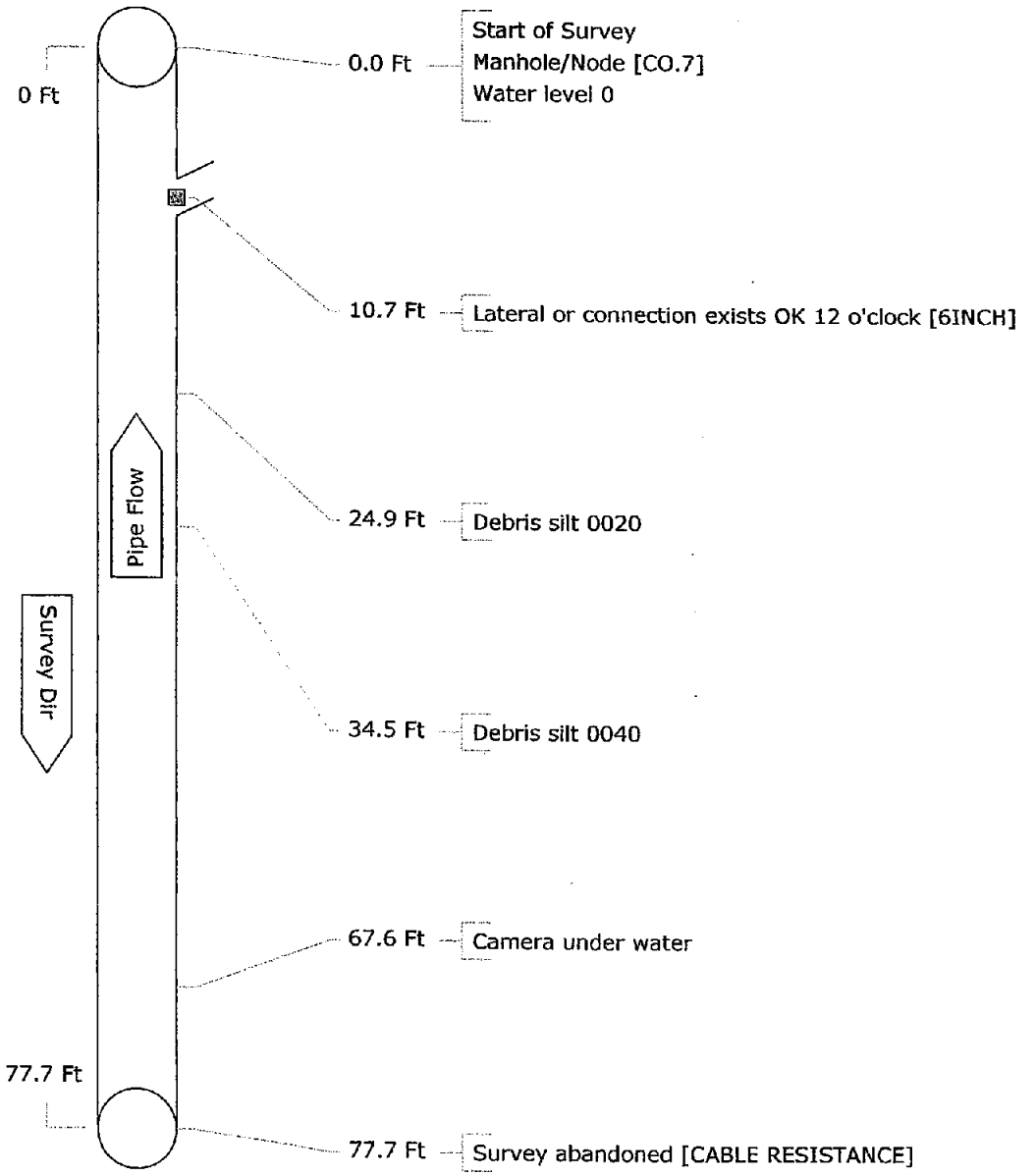
Pipe Graphic Report of PLR ENDCPA.7 X **for** VOLUSIA CO

Work Order		**Contract**	**Video**	DVD1	**Setup** 6
Facility		**Operator** DWH	**Van Ref** 3		**Surveyed On** 06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL		
Location type	Berm				
Surface					
Survey purpose	Re-survey for any reason		**Weather** Dry		

Pipe Use		**Schedule length**	Ft	**From** CO.7	**Depth** Ft
Shape	Circular	**Size** 6	**by** ins	**To** ENDCPA.7	**Depth** Ft
Material	Polyethylene - High density	**Joint spacing**	Ft	**Direction** Upstream	
Lining		**Year laid**		**Pre-clean**	**Last cleaned**

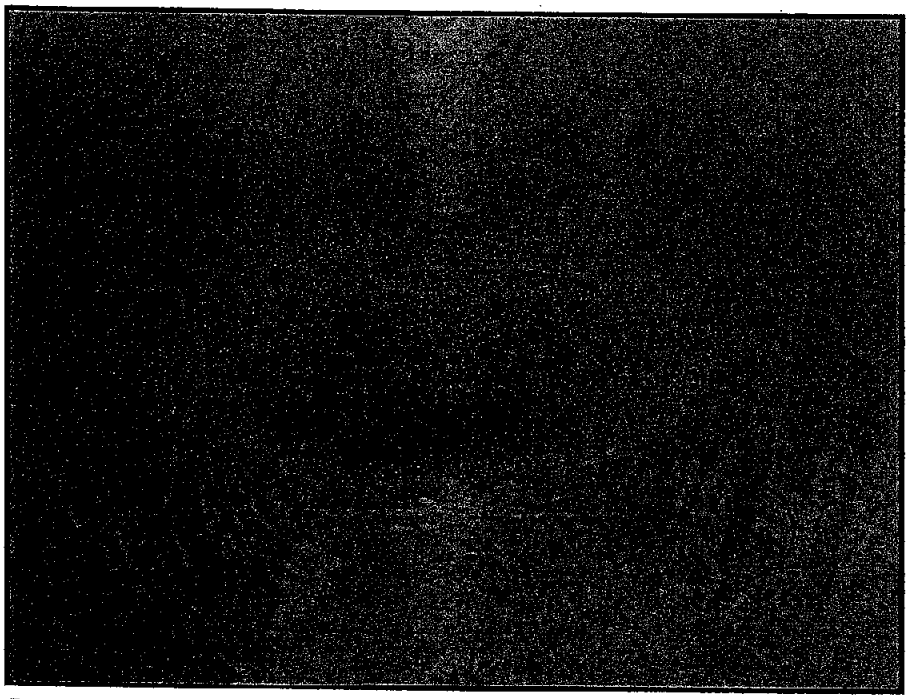
General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

Location note NORTH CELL



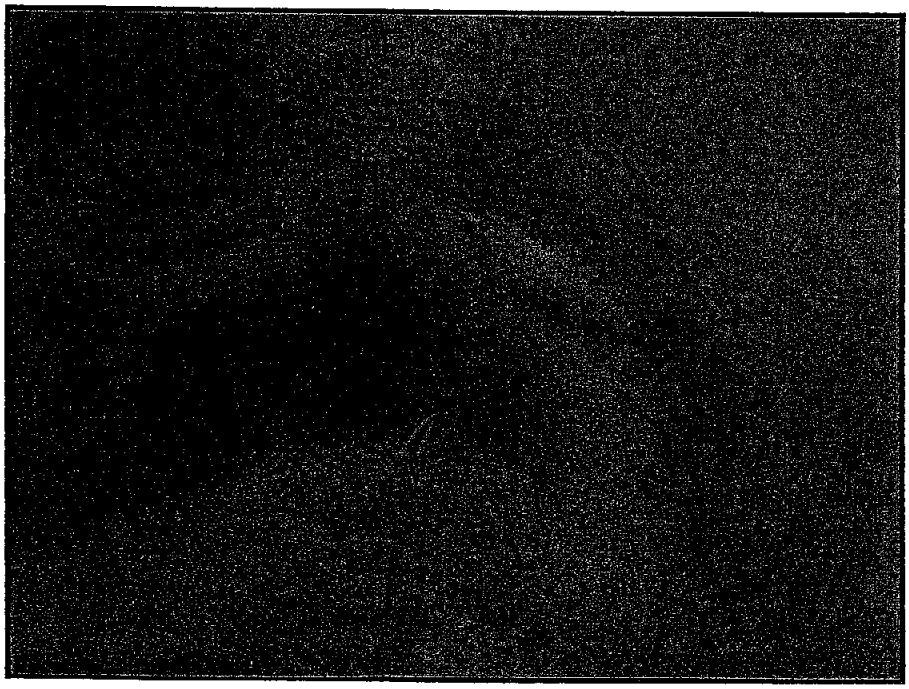
CCTV pictures of ENDCPA.7 X **for** VOLUSIA CO

Work Order	**Surveyed On** 06/20/2012	**Setup** 6
Street Name TOMOKA FARMS RD		**Video** DVD1
City Name NORTH CELL	**Weather** Dry	
Location Berm		
From Manhole CO.7	**To Manhole** ENDCPA.7	**Direction** Upstream



Date: 06/20/2012 **Distance:** 24.9 Ft **Obs:** Debris silt

Comments:



Date: 06/20/2012 **Distance:** 34.5 Ft **Obs:** Debris silt

Comments:

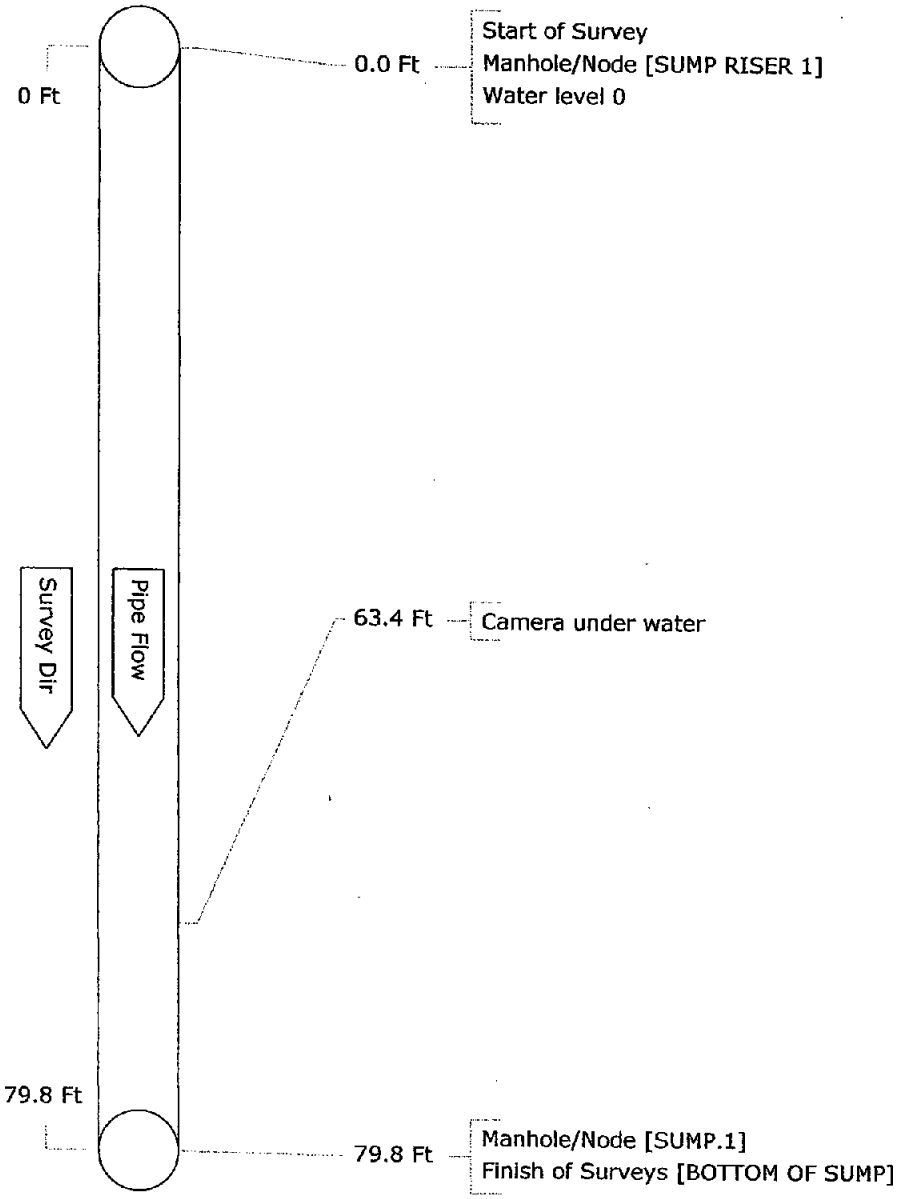
Pipe Graphic Report of PLR SUMP RISER 1 X **for** VOLUSIA CO

Work Order		**Contract**		**Video**	DVD1	**Setup**	7
Facility		**Operator**	DWH	**Van Ref**	3	**Surveyed On**	06/20/2012
Street Name	TOMOKA FARMS RD	**City**	NORTH CELL				
Location type	Berm						
Surface							
Survey purpose	Re-survey for any reason			**Weather**	Dry		

Pipe Use		**Schedule length**	79.8 Ft	**From**	SUMP RISER 1 **Depth** Ft
Shape	Circular	**Size**	18 **by** ins	**To**	SUMP.1 **Depth** Ft
Material	Polyethylene - High density	**Joint spacing**	Ft	**Direction**	Downstream
Lining		**Year laid**		**Pre-clean**	**Last cleaned**

General note VIDEO INSPECTION OF LEACHATE COLLECTION SYS

Location note NORTH CELL



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FLORIDAJETCLEAN@YAHOO.COM

Volusia County Solid Waste
Tomoka Landfill
Explosion-Proof Video-Inspection
Sumps 2-3 and CO's 4/5

Work Performed
July 2012

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
VIDEO PIPELINE INSPECTION
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LUTZ, FL 33558
TEL: 800-226-8013 FAX: 813-926-4616
FLORIDAJETCLEAN@YAHOO.COM

REPORT

DATE : 8/22/2012
TO : Volusia County Solid Waste - Tomoka Landfill
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Leachate Collection Pipe - Video Inspections - Risers 2-5, CO's 4/5

Florida Jetclean was mobilized to the Volusia County Solid Waste - Tomoka Landfill on 7/19/12 to carry out explosion-proof video-inspection services on the leachate collection system piping. This report contains the video-inspection logs associated with that work, the included DVD's should be reviewed for further details.

EXPLOSION-PROOF VIDEO-INSPECTION:

The landfill leachate collection piping listed in the below table was video-inspected as far as possible from the available access points utilizing explosion-proof video-inspection equipment (see included DVD's and Survey Listing). A summary of these inspections is included below for quick reference.

LOCATION	ACHIEVED DISTANCE	REMARKS / RESULT
Setup 1 – Riser 2	74.3'	Camera under liquid at 50.5'. Camera stops submerged at 74.3'.
Setup 2 – Riser 3	66.1'	Pipe becomes ovaled at 21.8'. Pipe torn at 23.3'. Camera under liquid at 47.0'. Camera stops submerged at 66.1'.
Setup 3 – CO5	438.6'	Lateral at 10.1'. Lateral at 12.5'. Perforations start at 18.1'. Camera under liquid at 54.9'. Camera can not be pushed further than 438.6'.
Setup 4 – CO 4	145.3'	Loose debris at 142.2'. Camera stops under liquid at 145.3'.
Setup 5 – Riser 5	61.4'	Camera under liquid at 45.8'. Camera stops submerged at 61.4'.
Setup 6 – Riser 4	74.4'	Camera under liquid at 64.0'. Camera stops submerged at 74.4'.

Please call us with questions or concerns.

Regards,
Ralph Calistri
Ralph Calistri - Florida Jetclean America - 800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
PIPELINE VIDEO INSPECTION (EX)
VACUUM TRUCK SERVICES
LASER PROFILING / NO DIG REPAIRS

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WEB: WWW.FLORIDAJETCLEAN.COM
EMAIL: FLORIDAJETCLEAN@YAHOO.COM

Volusia County Solid Waste
Tomoka Landfill
Explosion-proof Video-inspection
Sumps

Work Performed
September 2012

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
PIPELINE VIDEO INSPECTION (EX)
VACUUM TRUCK SERVICES
LASER PROFILING / NO DIG REPAIRS

7538 DUNBRIDGE DR., ODESSA, FL 33556
TEL: 800-226-8013 FAX: 813-926-4616
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REPORT

DATE : 9/20/2012
TO : Volusia County Solid Waste - Tomoka Landfill
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Leachate Collection Pipe - Video Inspections - Detection/Sumps

Florida Jetclean was mobilized to the Volusia County Solid Waste - Tomoka Landfill on 9/11/12 to carry out explosion-proof video-inspection services on the leachate collection system piping. This report contains the video-inspection logs associated with that work, the included DVD's should be reviewed for further details.

EXPLOSION-PROOF VIDEO-INSPECTION:
The landfill leachate collection piping listed in the below table was video-inspected as far as possible from the available access points utilizing explosion-proof video-inspection equipment (see included DVD's and Survey Listing). A summary of these inspections is included below for quick reference.

LOCATION	ACHIEVED DISTANCE	REMARKS / RESULT
Setup 1 – D6 Sump 6	59.8'	Camera under liquid at 51.8'. Camera stops submerged at 59.8'.
Setup 2 – D5 Sump 5	66.3'	Debris at 4.8'. Camera under liquid at 51.0'. Camera stops submerged at 66.3'.
Setup 3 – S4 Sump 4	75.4'	Camera under liquid at 53.6'. Camera stops submerged at 75.4'.
Setup 4 – D3 Sump 3	57.9'	Broken pipe at 12.6'. Camera under liquid at 43.1'. Camera stops submerged at 57.9'.
Setup 5 – D2 Sump 2	16.8'	Cables/wires bocking passage at 16.8'
Setup 6 – D1 Sump 1	70.4'	Camera under liquid at 59.1'. Camera stops submerged at 70.4'.
Setup 7 – D2 Sump 2	21.4'	Broken pipe at 15.8'. Broken pipe at 19.0'. Impassable at 21.4'.
Setup 8 – C3 Sump 3	66.5'	Broken pipe at 15.4'. Impassable due to foam at 66.5'.
Setup 9 – D2 Sump 2	50.3'	Camera under liquid at 50.3'. Survey abandoned.
Setup 10 - C2 Sump 2	85.9'	Camera stops submerged at 85.9'.
Setup 11 - C3 Sump 3	65.9'	Broken pipe at 12.3'. Camera under liquid at

		59.3'. Camera stops submerged at 65.9'.

Please call us with questions or concerns.

Regards,

Ralph Calistri - Florida Jetclean America - 800-226-8013

CCTV Surveys List for VCSW

Number of surveys in this list is 11 **as of** Tuesday, September 11, 2012 **Unit of measure:** ft

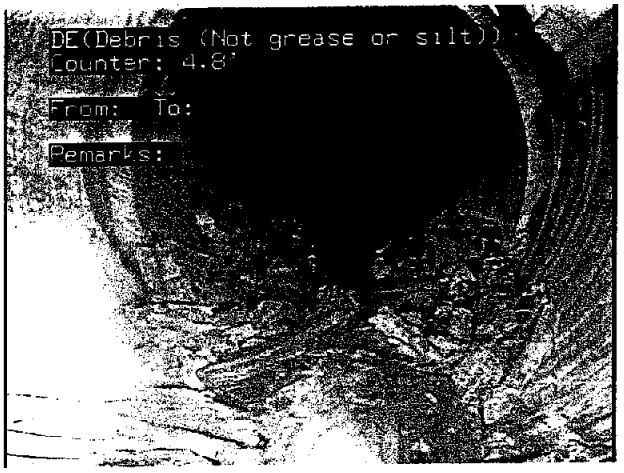
Setup	Date	Street	Start MH	Finish MH	Dir	Size inch	Pre Clean	Vid Cassette	Scheduled Length	Surveyed Length
1	9/11/2012	VOLUSIA COUNTY LANDFILL	D6	SUMP 6	D	12		1	59.8	59.8
2	9/11/2012	VOLUSIA COUNTY LANDFILL	D5	SUMP 5	D	12		1	66.3	66.3
3	9/11/2012	VOLUSIA COUNTY LANDFILL	D4	SUMP4	D	12		1	75.4	75.4
4	9/11/2012	VOLUSIA COUNTY LANDFILL	D3	SUMP 3	D	12		1	57.9	57.9
5	9/11/2012	VOLUSIA COUNTY LANDFILL	D2	SUMP 2	D	12		1		16.8
6	9/11/2012	VOLUSIA COUNTY LANDFILL	D1	SUMP 1	D	12		1	70.4	70.4
7	9/11/2012	VOLUSIA COUNTY LANDFILL	D2	SUMP 2	D	12		1		21.4
8	9/11/2012	VOLUSIA COUNTY LANDFILL	C3	SUMP 3	D	27		1	66.5	66.5
9	9/11/2012	VOLUSIA COUNTY LANDFILL	D2	SUMP 2	D	12		1		50.3
10	9/11/2012	VOLUSIA COUNTY LANDFILL	C2	SUMP 2	D	27		1	85.9	85.9
11	9/11/2012	VOLUSIA COUNTY LANDFILL	C3	SUMP 3	D	27		1		65.9
								Total Scheduled Length	482.2	
								Total Length Surveyed		636.6

CCTV pictures of D5 B **for** VCSW

Work Order	**Video** 1	**Surveyed On** 09/11/2012	**Direction** Downstream **Setup** 2
Street Name VOLUSIA COUNTY LANDFILL	**City Name** CELL 5		**Weather** Dry
Location Berm		**From Manhole** D5	**To Manhole** SUMP 5

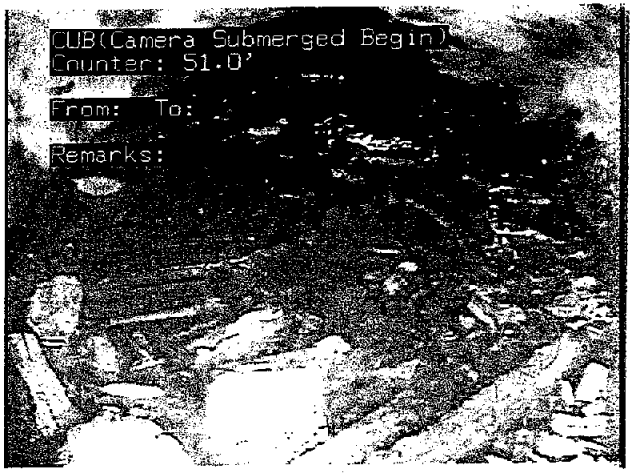
Date: 09/11/2012
Distance: 4.8 Ft
Obs: Debris (Not grease or silt)

Comments:



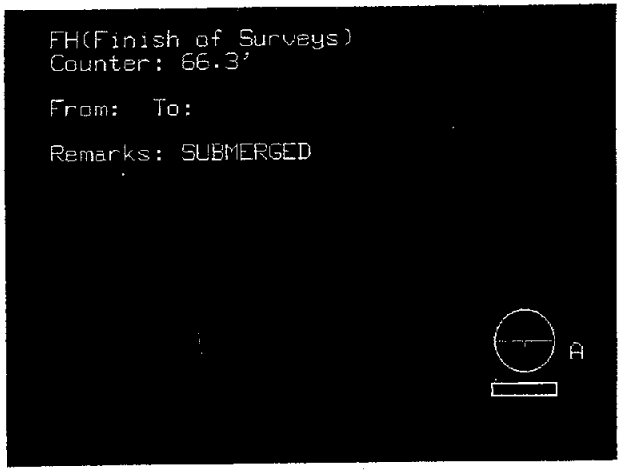
Date: 09/11/2012
Distance: 51.0 Ft
Obs: Camera Submerged Begin

Comments:



Date: 09/11/2012
Distance: 66.3 Ft
Obs: Finish of Surveys

Comments:
SUBMERGED



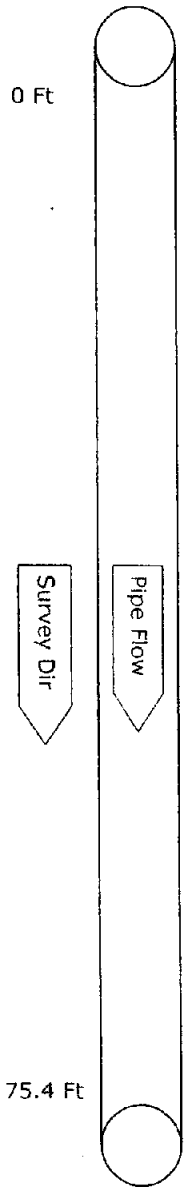
Pipe Graphic Report of PLR D4 C for VCSW

Work Order		**Contract**		**Video**	1	**Setup**	3
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 4
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	75.4 Ft	**From**	D4	**Depth**	Ft
Shape	Circular	**Size**	12 **by** ins	**To**	SUMP4	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



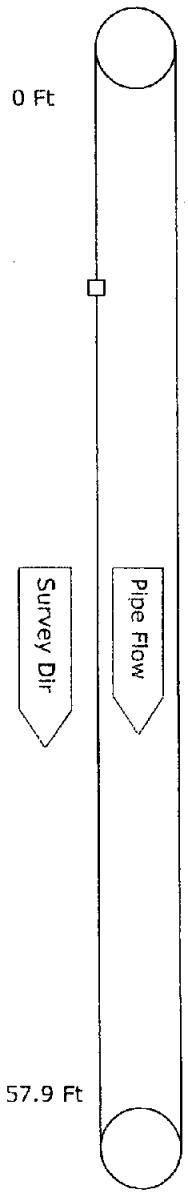
	Start of Survey
0.0 Ft	Manhole/Node [D4]
	Water level 0
53.6 Ft	Camera Submerged Begin
75.3 Ft	Manhole/Node [SUMP4]
75.4 Ft	

Pipe Graphic Report of PLR D3 D **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	4
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012
Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 3				
Location type	Berm						
Surface							
Survey purpose	Other (state in comments)			**Weather**	Dry		

Pipe Use	Other (state in comments)	**Schedule length**	57.9 Ft	**From**	D3	**Depth**	Ft
Shape	Circular	**Size**	12 **by** ins	**To**	SUMP 3	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



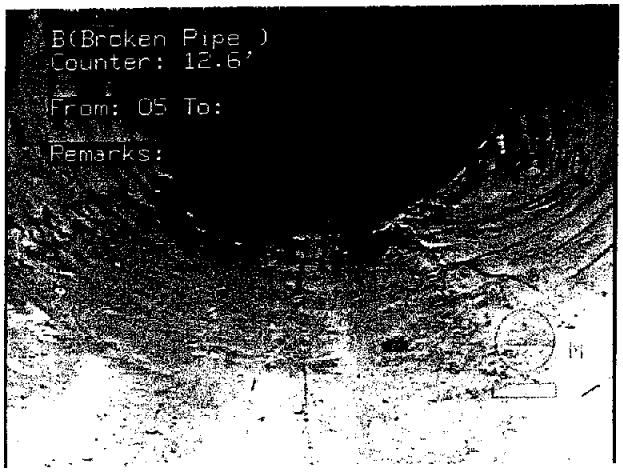
0.0 Ft	Start of Survey Manhole/Node [D3] Water level 0
12.6 Ft	Broken Pipe 05 o'clock ST: 10
43.1 Ft	Camera Submerged Begin
57.9 Ft	Manhole/Node [SUMP 3] Finish of Surveys [SUBMERGED]

CCTV pictures of D3 D **for** VCSW

Work Order	**Video** 1	**Surveyed On** 09/11/2012	**Direction** Downstream **Setup** 4
Street Name VOLUSIA COUNTY LANDFILL	**City Name** CELL 3	**Weather** Dry	
Location Berm		**From Manhole** D3	**To Manhole** SUMP 3

Date: 09/11/2012
Distance: 12.6 Ft
Obs: Broken Pipe

Comments:

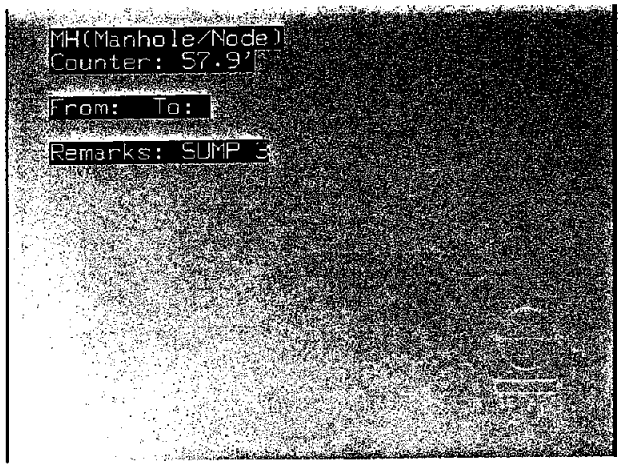


Date: 09/11/2012
Distance: 43.1 Ft
Obs: Camera Submerged Begin

Comments:

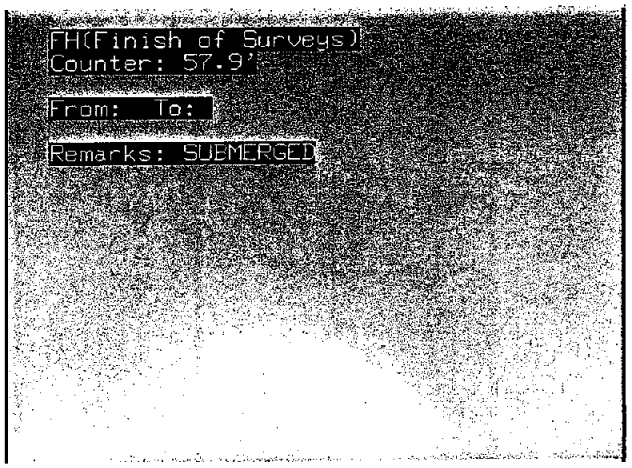
Date: 09/11/2012
Distance: 57.9 Ft
Obs: Manhole/Node

Comments:
SUMP 3



Date: 09/11/2012
Distance: 57.9 Ft
Obs: Finish of Surveys

Comments:
SUBMERGED



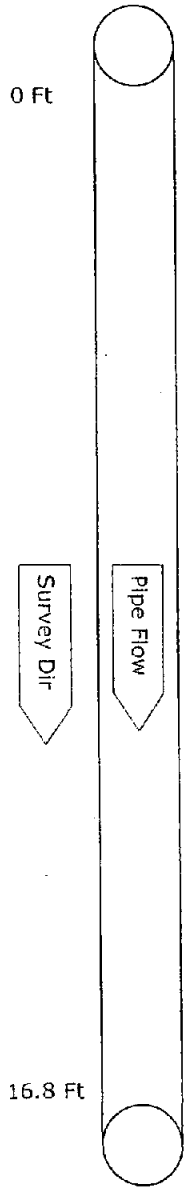
Pipe Graphic Report of PLR D2 E **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	5
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 2
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	Ft	**From**	D2	**Depth**	Ft
Shape	Circular	**Size** 12	**by** ins	**To**	SUMP 2	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	Hydraulic	

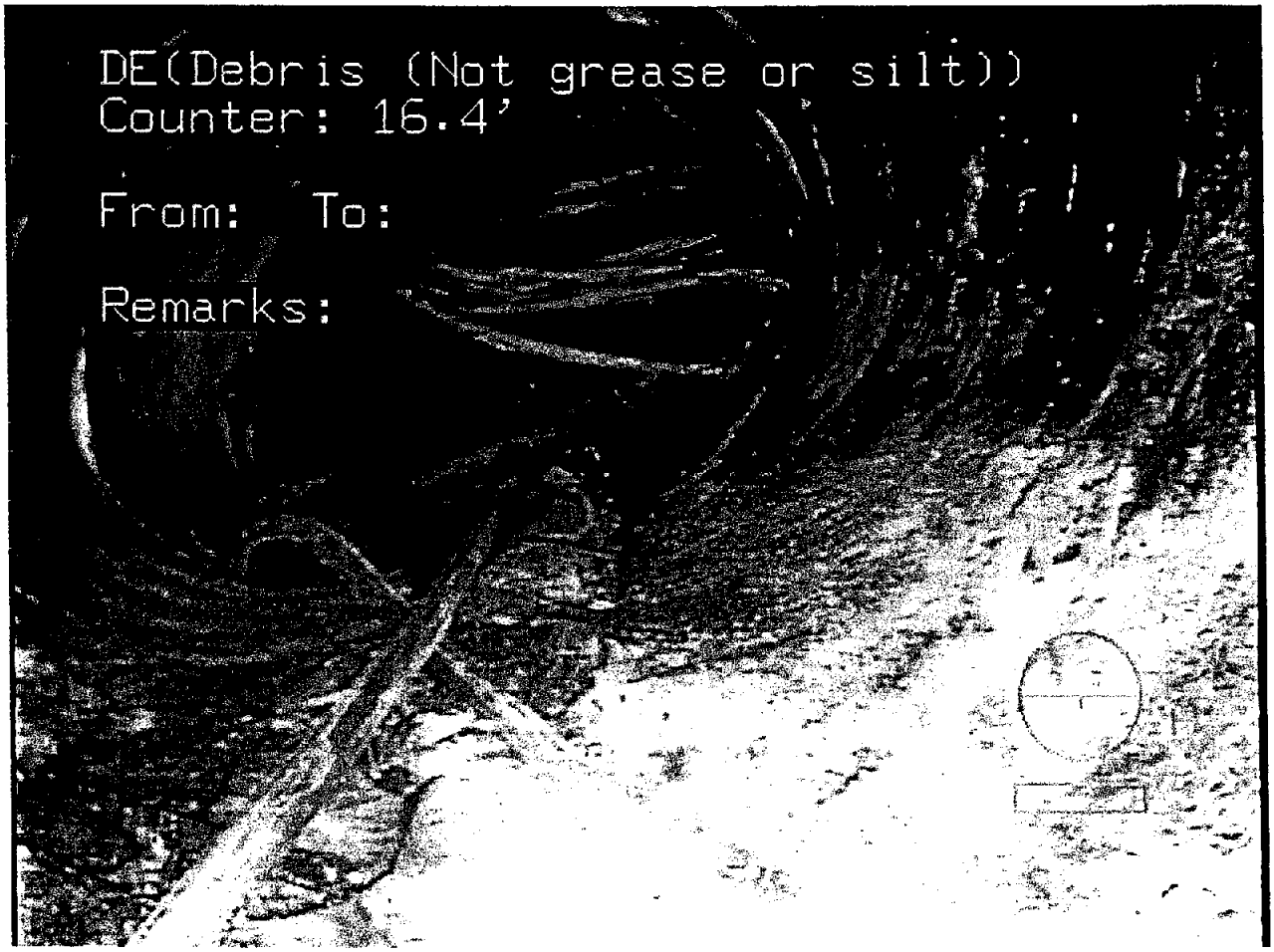


	Start of Survey
0.0 Ft	Manhole/Node [D2]
	Water level 0
16.4 Ft	Debris (Not grease or silt)
16.8 Ft	

CCTV pictures of D2 E
For VCSW

Work Order			Surveyed On 09/11/2012
Street Name	VOLUSIA COUNTY LANDFILL		Video 1
City Name	CELL 2	Weather Dry	
Location	Berm		
From Manhole	D2	To Manhole SUMP 2	Survey Direction Downstream

Setup 5 **Counter** 16.4 Ft



C:\FLEX6\Snaps\TOMOKA\49.jpg 09/11/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 12 **By** ins

Material Other (state in comments) **Lining** **Use** Other (state

Observation: Debris (Not grease or silt)

Comments:

PiPE INC

FLORIDA JETCLEAN
Phone: 800-226-8013

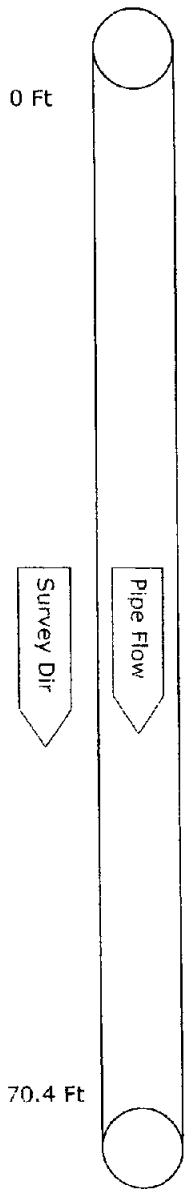
Pipe Graphic Report of PLR D1 F **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	6
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 1
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	70.4 Ft	**From**	D1	**Depth**	Ft
Shape	Circular	**Size**	12 by ins	**To**	SUMP 1	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



	Start of Survey
0.0 Ft	Manhole/Node [D1]
	Water level 0
59.1 Ft	Camera Submerged Begin
70.4 Ft	Manhole/Node [SUMP 1]
	Finish of Surveys [SUBMERGED]

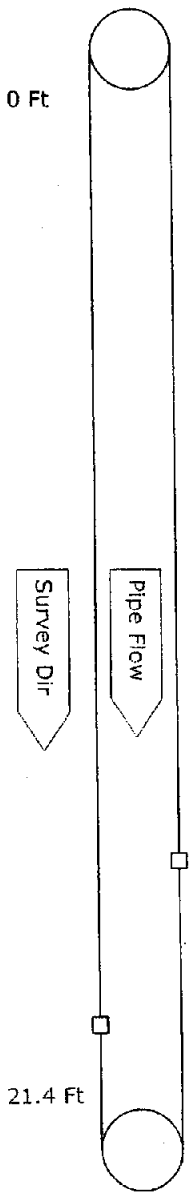
Pipe Graphic Report of PLR D2 G **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	7
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 2
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	Ft	**From**	D2	**Depth**	Ft
Shape	Circular	**Size** 12	**by** ins	**To**	SUMP 2	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



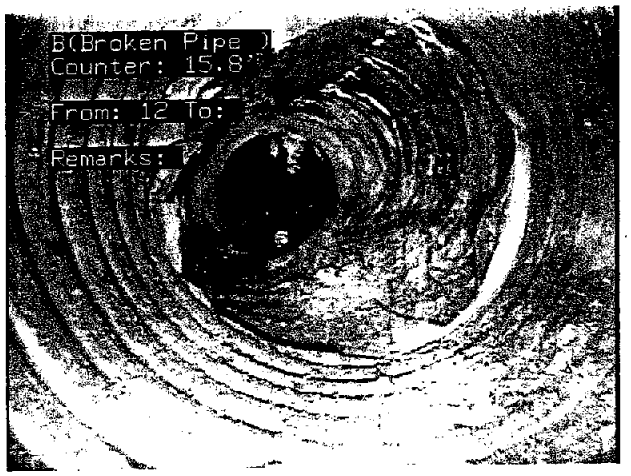
	Start of Survey
0.0 Ft	Manhole/Node [D2]
	Water level 0
15.8 Ft	Broken Pipe 12 o'clock
19.0 Ft	Broken Pipe 06 o'clock
21.4 Ft	Survey abandoned [CAMERA FLIP]

CCTV pictures of D2 G **for** VCSW

Work Order	**Video** 1	**Surveyed On** 09/11/2012	**Direction** Downstream **Setup** 7
Street Name VOLUSIA COUNTY LANDFILL	**City Name** CELL 2		**Weather** Dry
Location Berm		**From Manhole** D2	**To Manhole** SUMP 2

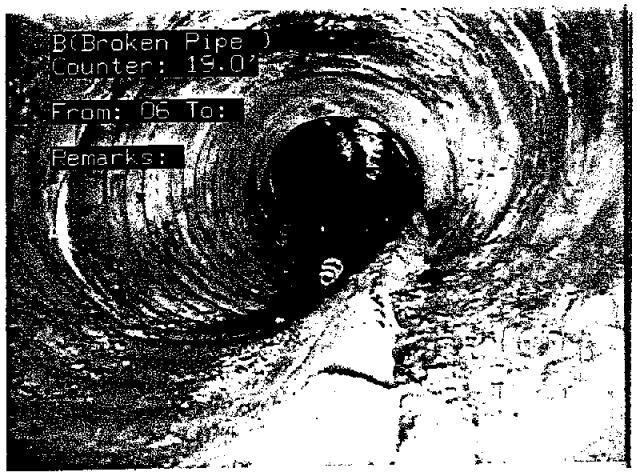
Date: 09/11/2012
Distance: 15.8 Ft
Obs: Broken Pipe

Comments:



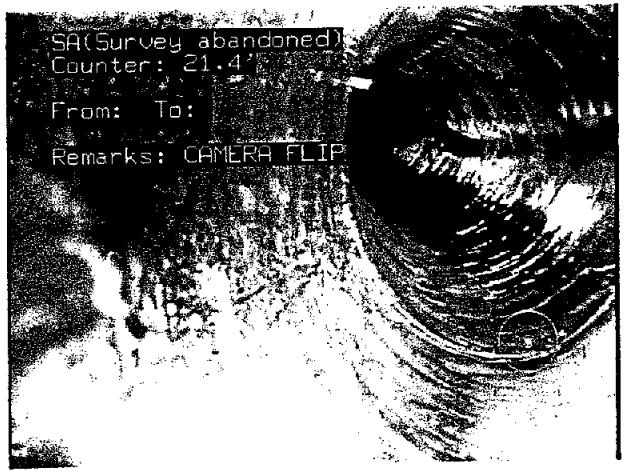
Date: 09/11/2012
Distance: 19.0 Ft
Obs: Broken Pipe

Comments:



Date: 09/11/2012
Distance: 21.4 Ft
Obs: Survey abandoned

Comments:
CAMERA FLIP

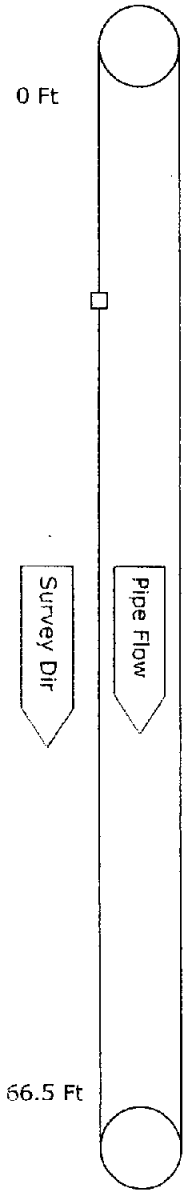


Pipe Graphic Report of PLR C3 H **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	8
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012
Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 3				
Location type	Berm						
Surface							
Survey purpose	Other (state in comments)			**Weather**	Dry		

Pipe Use	Other (state in comments)	**Schedule length**	66.5 Ft	**From**	C3	**Depth**	Ft
Shape	Circular	**Size** 27	**by** ins	**To**	SUMP 3	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE COLLECTION	Structural	Service	Constructional
Location note		Miscellaneous	Hydraulic	



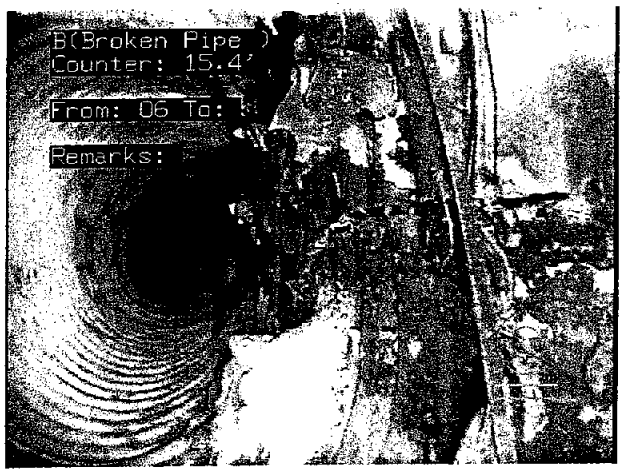
	Start of Survey
0.0 Ft	Manhole/Node [C3]
	Water level 0
15.4 Ft	Broken Pipe 06 o'clock ST: 10
59.3 Ft	General observation [SUDS]
66.5 Ft	Manhole/Node [SUMP 3]
	Finish of Surveys [SUDS]

CCTV pictures of C3 H **for** VCSW

Work Order	**Video** 1	**Surveyed On** 09/11/2012	**Direction** Downstream **Setup** 8
Street Name VOLUSIA COUNTY LANDFILL	**City Name** CELL 3	**Weather** Dry	
Location Berm		**From Manhole** C3	**To Manhole** SUMP 3

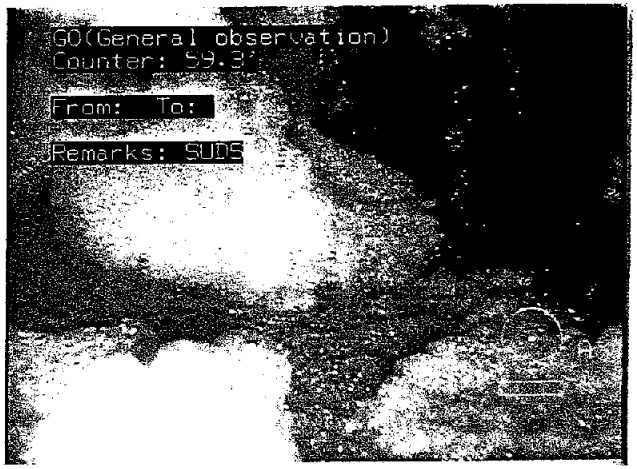
Date: 09/11/2012
Distance: 15.4 Ft
Obs: Broken Pipe

Comments:



Date: 09/11/2012
Distance: 59.3 Ft
Obs: General observation

Comments:
SUDS



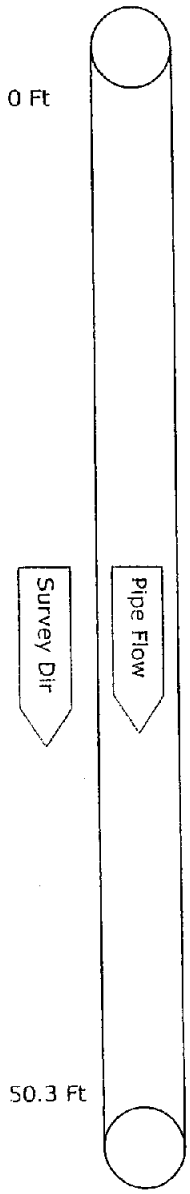
Pipe Graphic Report of PLR D2 I **for** VCSW

Work Order		**Contract**		**Video**	1	**Setup**	9
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 2
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	Ft	**From**	D2	**Depth**	Ft
Shape	Circular	**Size** 12	**by** ins	**To**	SUMP 2	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE DETECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



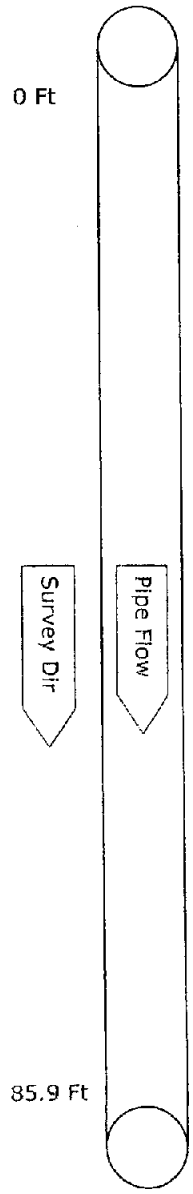
	Start of Survey
0.0 Ft	Manhole/Node [D2]
	Water level 0
	Camera Submerged Begin
50.3 Ft	Survey abandoned
	Survey abandoned

Pipe Graphic Report of PLR C2 J for VCSW

Work Order		**Contract**		**Video**	1	**Setup**	10
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012
Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 2				
Location type	Berm						
Surface							
Survey purpose	Other (state in comments)			**Weather**	Dry		

Pipe Use	Other (state in comments)	**Schedule length**	85.9 Ft	**From**	C2	**Depth**	Ft
Shape	Circular	**Size** 27	**by** ins	**To**	SUMP 2	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE COLLECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	

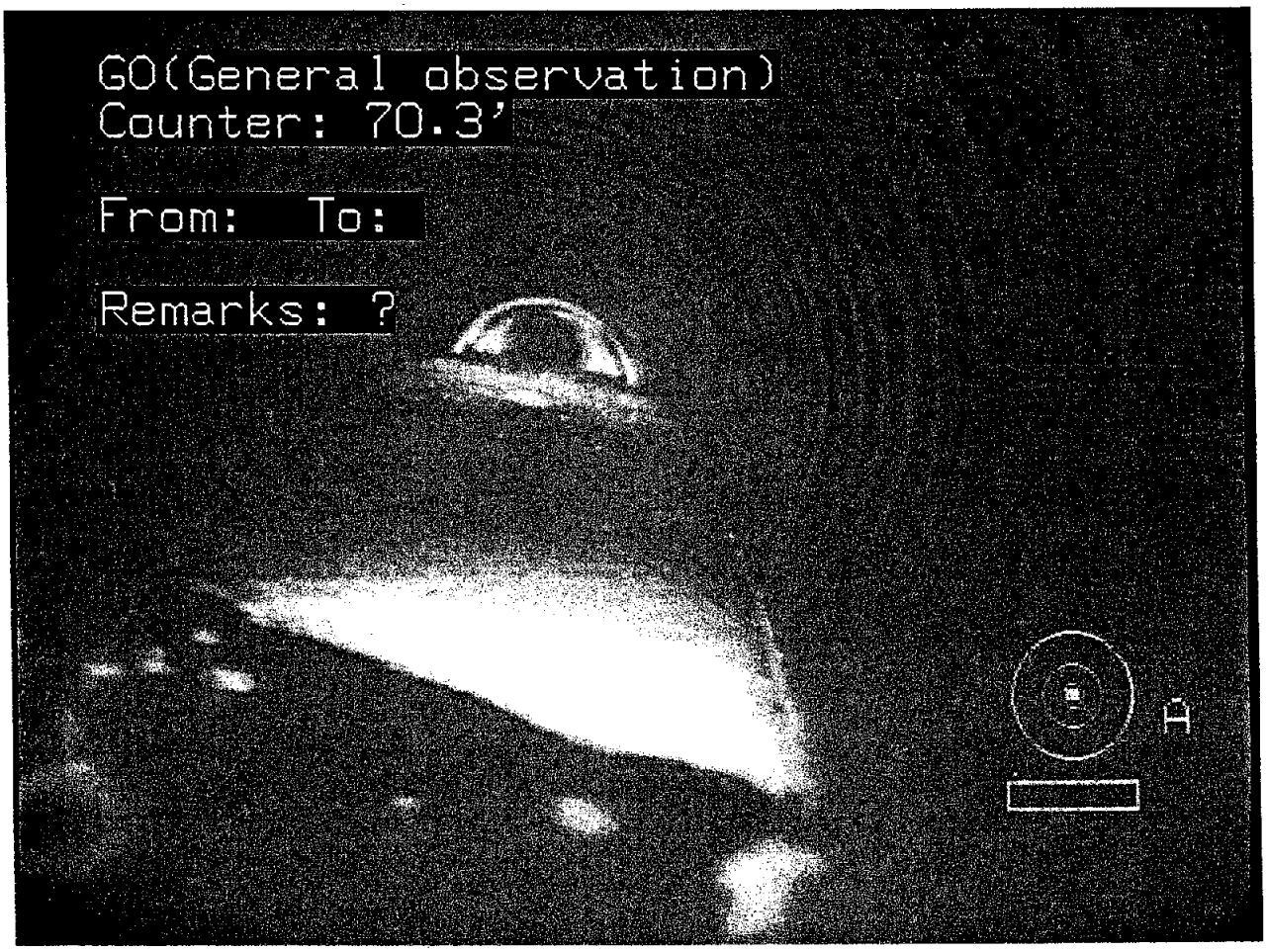


0.0 Ft	Start of Survey Manhole/Node [C2] Water level 0
70.3 Ft	General observation [?]
85.9 Ft	Manhole/Node [SUMP 2] Finish of Surveys [SUBMERGED]

CCTV pictures of C2 J
For VCSW

Work Order			**Surveyed On** 09/11/2012
Street Name	VOLUSIA COUNTY LANDFILL		**Video** 1
City Name	CELL 2	**Weather** Dry	
Location	Berm		
From Manhole	C2	**To Manhole** SUMP 2	**Survey Direction** Downstream

Setup 10 **Counter** 70.3 Ft



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Pipe Details:

Year Laid **Shape** Circular **Size** 27 **By** ins

Material Other (state in comments) **Lining** **Use** Other (state

Observation: General observation

Comments: ?

PIPE INC

FLORIDA JETCLEAN
Phone: 800-226-8013

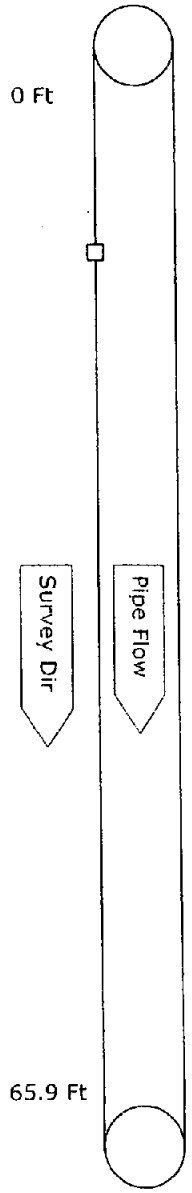
Pipe Graphic Report of PLR C3 L for VCSW

Work Order		**Contract**		**Video**	1	**Setup**	11
Facility		**Operator**	BMN	**Van Ref**	2	**Surveyed On**	09/11/2012

Street Name	VOLUSIA COUNTY LANDFILL	**City**	CELL 3
Location type	Berm		
Surface			
Survey purpose	Other (state in comments)	**Weather**	Dry

Pipe Use	Other (state in comments)	**Schedule length**	Ft	**From**	C3	**Depth**	Ft
Shape	Circular	**Size** 27	**by** ins	**To**	SUMP 3	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE COLLECTION	Structural	Service	Constructional
Location note		Miscellaneous	Hydraulic	



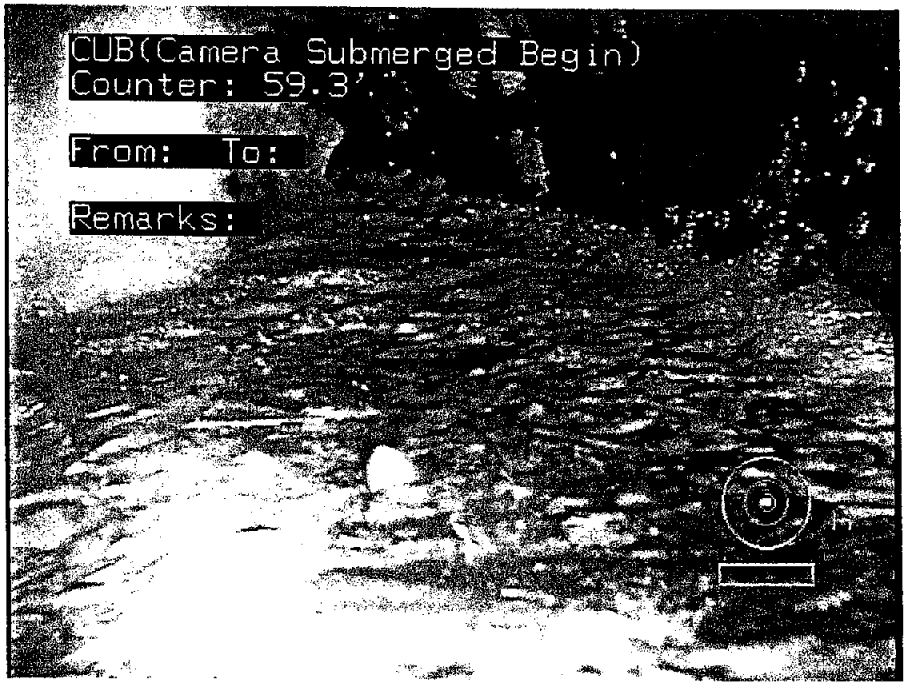
	Start of Survey
0.0 Ft	Manhole/Node [C3]
	Water level 0
12.3 Ft	Broken Pipe 06 o'clock
59.3 Ft	Camera Submerged Begin
65.9 Ft	Survey abandoned [SUBMERGED]

CCTV pictures of C3 L for VCSW

Work Order		**Surveyed On** 09/11/2012	**Setup** 11
Street Name	VOLUSIA COUNTY LANDFILL		**Video** 1
City Name	CELL 3	**Weather** Dry	
Location	Berm		
From Manhole	C3	**To Manhole** SUMP 3	**Direction** Downstream

Date: 09/11/2012 **Distance:** 12.3 Ft **Obs:** Broken Pipe

Comments:



Date: 09/11/2012 **Distance:** 59.3 Ft **Obs:** Camera Submerged Begin

Comments:

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
PIPELINE VIDEO INSPECTION (EX)
VACUUM TRUCK SERVICES
LASER PROFILING / NO DIG REPAIRS

7538 DUNBRIDGE DR., ODESSA, FL 33556
TEL: 800-226-8013 FAX: 813-926-4616
WEB: WWW.FLORIDAJETCLEAN.COM
EMAIL: FLORIDAJETCLEAN@YAHOO.COM

Volusia County Solid Waste
Tomoka Landfill
Explosion Proof Video Inspections
Sump 3 & Cell 6

Work Performed
October 2012

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
PIPELINE VIDEO INSPECTION (EX)
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REPORT

DATE : 11/6/2012
TO : Volusia County Solid Waste - Tomoka Landfill
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : Leachate Collection Pipe - Video Inspections - Sump 3 & Cell 6

Florida Jetclean was mobilized to the Volusia County Solid Waste - Tomoka Landfill on 10/17/12 to carry out explosion-proof video-inspection services on the leachate collection system piping. This report contains the video-inspection logs associated with that work, the included DVD's should be reviewed for further details.

EXPLOSION-PROOF VIDEO-INSPECTION:
The landfill leachate collection piping listed in the below table was video-inspected from the available access points utilizing explosion-proof video-inspection equipment (see included DVD's and Survey Listing). A summary of these inspections is included below for quick reference.

LOCATION	ACHIEVED DISTANCE	REMARKS / RESULT
Setup 1 – Riser 3	77.0'	End of sump reached. Some loose debris / sludge is visible at sump bottom.
Setup 2 – Cell 6 C/O	838.4'	Object in pipe preventing further camera advancement. No defects noted.

Please call us with questions or concerns.

Regards,
Ralph Calistri
Ralph Calistri - Florida Jetclean - 800-226-8013

CCTV Surveys List for VCSW

Number of surveys in this list is 2 **as of** Wednesday, October 17, 2012 **Unit of measure:** ft

Setup	Date	Street	Start MH	Finish MH	Dir	Size inch	Pre Clean	Vid Cassette	Scheduled Length	Surveyed Length
7	10/17/2012	VOLUSIA COUNTY RISERS	RISER 3	SUMP	D	24		2	77.0	77.0
8	10/17/2012	VOLUSIA COUNTY	CELL 6 CO	SUMP 6	D	8		2		838.4

Total Scheduled Length 77.0

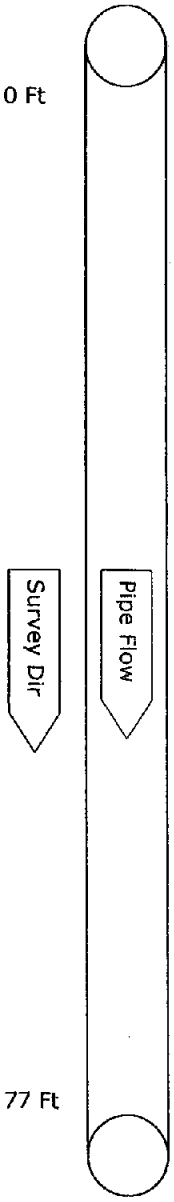
Total Length Surveyed 915.4

Pipe Graphic Report of PLR RISER 3 G **for** VCSW

Work Order		**Contract**		**Video**	2	**Setup**	7
Facility		**Operator**	BMN	**Van Ref**	4	**Surveyed On**	10/17/2012
Street Name	VOLUSIA COUNTY RISERS	**City**	VOLUSIA				
Location type	Berm						
Surface							
Survey purpose	Other (state in comments)			**Weather**	Dry		

Pipe Use	Other (state in comments)	**Schedule length**	77.0 Ft	**From**	RISER 3	**Depth**	Ft
Shape	Circular	**Size**	24 **by** ins	**To**	SUMP	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE CORRUGATED	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



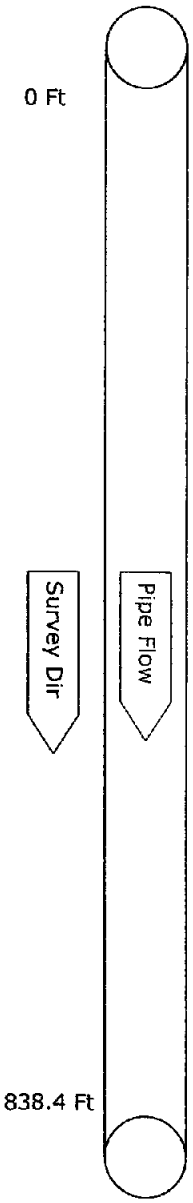
	Start of Survey
0.0 Ft	Manhole/Node [RISER 3]
	Water level 0
60.1 Ft	Debris (Not grease or silt) SE: 25
69.6 Ft	General observation [?]
70.1 Ft	General observation [?]
73.8 Ft	Manhole/Node [SUMP?]
73.9 Ft	
	General observation [SUMP/8INCH REDUCER]
77.0 Ft	Manhole/Node [SUMP]
	Finish of Surveys

Pipe Graphic Report of PLR CELL 6 CO H for VCSW

Work Order		**Contract**		**Video**	2	**Setup**	8
Facility		**Operator**	BMN	**Van Ref**	4	**Surveyed On**	10/17/2012
Street Name	VOLUSIA COUNTY	**City**	VOLUSIA				
Location type	Berm						
Surface							
Survey purpose	Other (state in comments)			**Weather**	Dry		

Pipe Use	Other (state in comments)	**Schedule length**	Ft	**From**	CELL 6 CO	**Depth**	Ft
Shape	Circular	**Size** 8	**by** ins	**To**	SUMP 6	**Depth**	Ft
Material	Other (state in comments)	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**		**Last cleaned**	

General note	HDPE LEACHATE COLLECTION	Structural	Service	Constructional
Location note		Miscellaneous	**Hydraulic**	



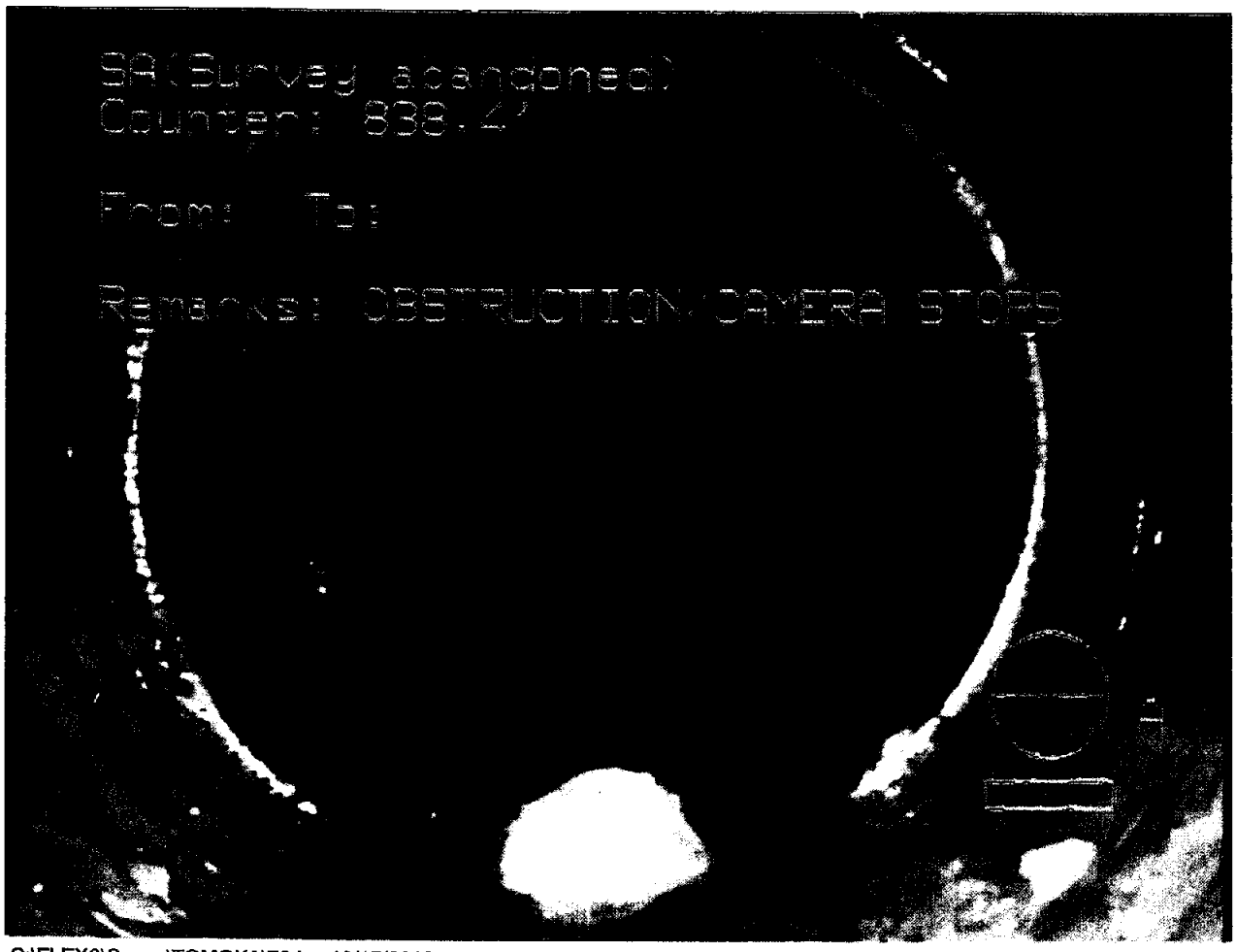
0.0 Ft Start of Survey
Manhole/Node [CELL 6 CO]
Water level 0

838.4 Ft Survey abandoned [OBSTRUCTION/CAMERA STOPS]

CCTV pictures of CELL 6 CO H
For VCSW

Work Order			**Surveyed On** 10/17/2012
Street Name	VOLUSIA COUNTY		**Video** 2
City Name	VOLUSIA	**Weather** Dry	
Location	Berm		
From Manhole	CELL 6 CO	**To Manhole** SUMP 6	**Survey Direction** Downstream

Setup 8 **Counter** 838.4 Ft



C:\FLEX6\Snaps\TOMOKA\78.jpg 10/17/2012

Pipe Details:

Year Laid **Shape** Circular **Size** 8 **By** ins

Material Other (state in comments) **Lining** **Use** Other (state

Observation: Survey abandoned

Comments: OBSTRUCTION/CAMERA STOPS

PIPE INC

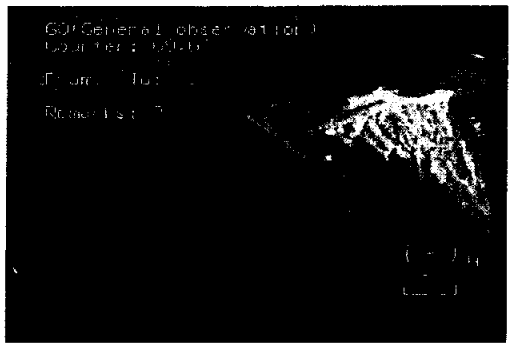
FLORIDA JETCLEAN
Phone: 800-226-8013

CCTV pictures of RISER 3 G for **VCSW**

Work Order	**Video** 2	**Surveyed On** 10/17/2012	**Direction** Downstream **Setup** 7
Street Name VOLUSIA COUNTY RISERS	**City Name** VOLUSIA		**Weather** Dry
Location Berm		**From Manhole** RISER 3	**To Manhole** SUMP

Date: 10/17/2012 **Distance:** 60.1 Ft

Obs: Debris (Not grease or silt)



Date: 10/17/2012 **Distance:** 69.6 Ft

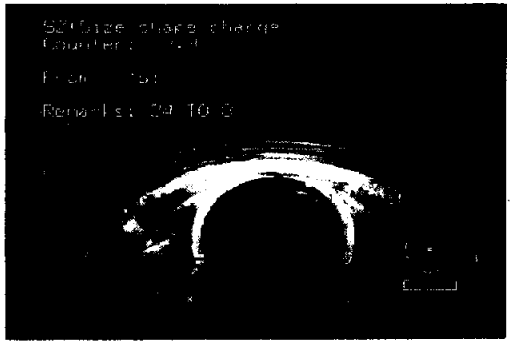
Obs: General observation

Date: 10/17/2012 **Distance:** 70.1 Ft

Obs: General observation

Date: 10/17/2012 **Distance:** 73.8 Ft

Obs: Manhole/Node



Date: 10/17/2012 **Distance:** 73.9 Ft

Obs: Size/shape change

Date: 10/17/2012 **Distance:** 77.0 Ft

Obs: General observation

Date: 10/17/2012 **Distance:** 77.0 Ft

Obs: Finish of Surveys

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: Tomoka Farms Road Landfill-North Cell, Phase I, Class I WACS ID: 27540

Permit Application or Consent Order No.: SF64-0078767-028 Expiration Date: 03/19/2017

Facility Address: 1990 Tomoka Farms Road, Daytona Beach, Florida

Permittee or Owner/Operator: Volusia County Solid Waste Division

Mailing Address: 3151 East New York Avenue, DeLand, Florida 32724

Latitude: 29 ° 07 ' 50 " Longitude: 81 ° 06 ' 02 "

Coordinate Method: AutoCAD/GPS Datum: NAD 1983/90 (east)

Collected by: J.E. Zapert Company/Affiliation: Sliger & Associates, Inc.

Solid Waste Disposal Units Included in Estimate:

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
North Cell	65.65	June 1999	13.5 years	5.0 years	NA	NA

Total disposal unit acreage included in this estimate: Closure: 65.65 Long-Term Care: 65.65

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

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

III. ESTIMATE ADJUSTMENT

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 nual 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	200 W Forsyth St, Ste 800 Address
Carlo Lebron, Project Manager Name & Title	Jacksonville, FL 32202 City, State, Zip Code
12/7/12 Date	Carlo.Lebron@hdrinc.com E-Mail Address
(904) 598-8900 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 ex

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			
Off-Site Material	CY			
Delivery	CY			
			Subtotal Slope and Fill:	
3. Cover Material (Barrier Layer):				
Off-Site Clay	CY	175,086	$13.50	$2,363,661.00
Synthetics - 40 mil	SY	346,837	$3.81	$1,321,448.97
Synthetics - GCL	SY			
Synthetics - Geonet	SY			
Synthetics - Other (explain)	SY	346,837	$5.55	$1,924,945.35
Double Sided Geocomposite			Subtotal Cover Material:	$5,610,055.32
4. Top Soil Cover:				
Off-Site Material	CY	58,362	$14.00	$817,068.00
Delivery	CY			
Spread	CY			
			Subtotal Top Soil Cover:	$817,068.00
5. Vegetative Layer				
Sodding	SY	307,333	$1.82	$559,346.06
Hydroseeding	AC	5.41	$2,833.33	$15,328.32
Fertilizer	AC			
Mulch	AC			
Other (explain)				
			Subtotal Vegetative Layer:	$574,674.38
6. Stormwater Control System:				
Earthwork	CY			
Grading	SY			
Piping	LF	6,778	$20.97	$142,134.66
Ditches	LF			
Berms	LF			
Control Structures	EA	12	$3,366.67	$40,400.04
Other (explain)	LS	1	$372,590.00	$372,590.00
See Attachment R-2			Subtotal Stormwater Control System:	$555,124.70

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)	LS	1	$434,187.88	$434,187.88
See Attachment R-3			Subtotal Active Gas Extraction Control:	$434,187.88
9. Security System:				
Fencing	LF	1	$2,000.00	$2,000.00
Gate(s)	EA			
Sign(s)	EA			
			Subtotal Security System:	$2,000.00
10. Engineering:				
Closure Plan Report	LS	1	$50,000.00	$50,000.00
Certified Engineering Drawings	LS	1	$25,000.00	$25,000.00
NSPS/Title V Air Permit	LS	1	$20,000.00	$20,000.00
Final Survey	LS	1	$25,000.00	$25,000.00
Certification of Closure	LS	1	$50,000.00	$50,000.00
Other (explain)				
			Subtotal Engineering:	$170,000.00

Description	Hours	Cost / Hour	Hours	Cost / Hour	Total Cost
11. Professional Services					
	Contract Management		Quality Assurance		
P.E. Supervisor	160	$130.0(	80	$130.0(	$31,200.00
On-Site Engineer	300	$100.0(	180	$100.0(	$48,000.00
Office Engineer	200	$100.0(	144	$100.0(	$34,400.00
On-Site Technician			2,992	$65.00	$194,480.00
Other (explain)			1	$50,00(	$50,000.00
Lump Sump Amount					

Description	Unit	Number of Units	Cost / Unit	Total Cost
Quality Assurance Testing	LS	1	$50,000.00	$50,000.00
			Subtotal Professional Services:	$408,080.00

Subtotal of 1-11 Above:	$8,571,190.28

12. Contingency 10 % of Subtotal of 1-11 Above $857,119.03

Subtotal Contingency: $857,119.03

Estimated Closing Cost Subtotal: $9,428,309.30

Description	Total Cost
13. Site Specific Costs	
Mobilization	$428,559.51
Waste Tire Facility	
Materials Recovery Facility	
Special Wastes	
Leachate Management System Modification	
Other (explain) _____	
_____ Subtotal Site Specific Costs:	$428,559.51

TOTAL ESTIMATED CLOSING COSTS ($): $9,856,868.81

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			
Annually	1			
			Subtotal Groundwater Monitoring:	
2. Surface Water Monitoring [62-701.510(4), and (8)(b)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	7	$426.36	$5,969.04
Annually	1			
			Subtotal Surface Water Monitoring:	$5,969.04
3. Gas Monitoring [62-701.400(10)]				
Monthly	12			
Quarterly	4	1	$2,035.50	$8,142.00
Semi-Annually	2			
Annually	1			
			Subtotal Gas Monitoring:	$8,142.00
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			
Lift Stations	EA			
Cleaning	LS	1	$2,000.00	$2,000.00
Tanks	EA			

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. (continued)				
Impoundments				
Liner Repair	SY	20	$9.00	$180.00
Sludge Removal	CY			
Aeration Systems				
Floating Aerators	EA			
Spray Aerators	EA			
Disposal				
Off-site (Includes transportation and disposal)	1000 gallon	1,000	$30.00	$30,000.00
			Subtotal Leachate Collection / Treatment Systems Maintenance:	$32,180.00
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			
Flame Arrestors	EA	1	$1,200.00	$1,200.00
Operation	LS	1	$24,840.00	$24,840.00
			Subtotal Gas System Maintenance:	$33,140.00
8. Landscape Maintenance				
Mowing	AC	65.65	$290.00	$19,038.50
Fertilizer	AC			
			Subtotal Landscape Maintenance:	$19,038.50
9. Erosion Control and Cover Maintenance				
Sodding	SY	7,164	$1.82	$13,038.48
Regrading	AC			
Liner Repair	SY	1,194	$9.00	$10,746.00
Clay	CY	796	$14.00	$11,144.00
			Subtotal Erosion Control and Cover Maintenance:	$34,928.48
10. Storm Water Management System Maintenance				
Conveyance Maintenance	LS	1	$5,000.00	$5,000.00
			Subtotal Storm Water Management System Maintenance:	$5,000.00
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	$1,800.00	$1,800.00
			Subtotal Utilities:	$1,800.00
13. Leachate Collection/Treatment Systems Operation				
Operation				
P.E. Supervisor	HR			
On-Site Engineer	HR			
Office Engineer	HR			
OnSite Technician	HR	104	$65.00	$6,760.00
Materials	LS	1		
	Subtotal Leachate Collection/Treatment Systems Operation:			$6,760.00
14. Administrative				
P.E. Supervisor	HR	30	$135.00	$4,050.00
On-Site Engineer	HR	48	$75.00	$3,600.00
Office Engineer	HR	60	$75.00	$4,500.00
OnSite Technician	HR			
Other	HR	30	$35.00	$1,050.00
Administrative Assistant			Subtotal Administrative:	$13,200.00
			Subtotal of 1-14 Above:	$161,158.02
15. Contingency	10	% of Subtotal of 1-14 Above		$16,115.80
			Subtotal Contingency:	$16,115.80

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
16. Site Specific Costs				
			Subtotal Site Specific Costs:	
			ANNUAL LONG-TERM CARE COST ($ / YEAR):	$177,273.82
			Number of Years of Long-Term Care:	30
			TOTAL LONG-TERM CARE COST ($):	$5,318,214.66

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	200 W. Forsyth St., Ste. 800 Mailing Address
Carlo Lebron, Project Manager Name and Title (please type)	Jacksonville, FL 32202-4321 City, State, Zip Code
12/7/12 Date	Carlo.Lebron@hdrinc.com E-Mail address (if available)
60815 Florida Registration Number (please affix seal)	(904)-598-8900 Telephone Number

VII. SIGNATURE BY OWNER/OPERATOR

Signature of Applicant	3151 East New York Avenue Mailing Address
Leonard Marion, Director Name and Title (please type)	DeLand, FL 32724 City, State, Zip Code
lmarion@co.volusia.fl.us E-Mail address (if available)	(386)-943-7889 Telephone Number

Financial Assurance Responsibility
Closure and Long-term Care Cost Estimates
Tomoka Farms Road Landfill North Cell, Phase I
Volusia County, Florida
December 2012

Closure and long-term care cost estimates for the Tomoka Farms Road Landfill North Cell, excluding Phase II, are being re-calculated according to 62-701.630(3)(a), FAC. The basis for cost estimates include current pricing, closure design and regulations contained in Chapter 62-701 of the Florida Administrative Code (FAC).

The updated FDEP Form 62-701.900(28) is provided in Attachment R-1. Quotes from third-party sources are provided in Attachment R-2. The 2012 RSMeans Heavy Construction Cost Data 26th Annual Edition was used to estimate some unit costs. In order to correct the costs to region specific, a city factor provided by RSMeans in the manual is used. The Daytona Beach city factor of 0.979 was applied to all unit costs from RSMeans. The page has been provided in Attachment R-2.

CLOSURE COSTS

Monitoring Wells (Item 1)

Monitoring wells were installed during the construction of Phase I of the North Cell and therefore and not included as part of the closure construction estimate.

Slope and Fill (Item 2)

As a part of on-going landfill operations a 12-inch bedding layer will be installed over compacted waste once the intermediate cover grades are achieved. The associated cost of placing this layer is not included in this cost estimate.

Cover Material (Item 3)

The proposed final cover consists of either 40-mil textured LLDPE & double sided geocomposite, and 18" layer of cover soil. The geosynthetic quantities have been adjusted by 4% to account for seams, destructive testing, wastage, anchoring, toe of slope run-out, and booting. The cover soil has been increased by 5% to account for soil bulking and other losses. A slope factor of 1.054 has been accounted in the side slope area for 3:1 side-slope.

Waste Footprint = 65.65 AC
Total Surface Area = Side Slope Area + Top Flat Area

Side Slope Area =	2,766,001 ft^2	(obtained from AutoCAD Civil 3D)
Top Area =	235,476 ft^2	(obtained from AutoCAD Civil 3D)
Total Surface Area =	3,001,477 ft^2	

(a) <u>Cover Soil:</u>
Volume of Cover Soil in 18" layer= (3,001,477 ft^2 × 1.5 ft × 1.05/ 27) = 175,086 CY

Please note that the unit price of installed cover soil is based on an average of two quotes from third-party installers. Quotations are provided in Attachment R-2.

(b) Synthetics:
Area of Geosynthetics = (3,001,477 ft^2 × 1.04 / 9) = 346,837 yd^2

Please note that the unit prices of installed geomembrane and geocomposite are based on an average of three quotes from third-party installers. Quotations are provided in Attachment R-2.

Top Soil Cover (Item 4)

The top soil cover consists of 6" layer over the entire closure area. Top soil has been increased by 5% to account for soil bulking and other losses.

Volume of Cover Soil in 6" layer= (3,001,477 ft^2 × 0.5 ft × 1.05/ 27) = 58,362 CY

Please note that the unit price of installed top soil is based on an average of two quotes from third-party installers. Quotations are provided in Attachment R-2.

Vegetation (Item 5)

Sod will be installed on a side slopes for the entire closure area. The top surface closure area will be vegetated by Hydroseeding.

Quantity of sod required = 2,766,001 ft^2 = 307,333 SY

Area of Hydroseeding required = 235,476 ft^2 = 5.41 AC

Please note that the unit prices for installed sod and Hydroseeding are based on an average of three quotes from third-party installers. Quotations are provided in Attachment R-2.

Stormwater Control System (Item 6)

No separate earthwork, grading and ditches are considered as part of North Cell closure as it will be covered in items 2 through 4. Also, the installation of the perimeter ditch and berm installation are part of the landfill's on-going operations and therefore, not included in this updated cost estimate.

- Piping*:
  Total length of 18" downdrain piping required for drainage = 5,222 LF
  Unit Cost of 18" downdrain pipe = $20.50 per LF x 0.979 (City Factor) = $20.07

  Total length of 24" downdrain piping required for drainage = 1,556 LF
  Unit Cost of 24" downdrain pipe = $24.50 per LF x 0.979 (City Factor) = $24.00

  Total length of downdrain pipe = 6,778 LF
  Average Unit cost of downdrain pipe = $20.97 per LF

  Please refer to Attachment R-2 for unit price of downdrain piping.

- Control Structures*:
  Number of control structures, i.e., Baffled Endwall FDOT No. 261= 12

Please refer to Attachment R-2 for unit price of control structures.

- Others*:
  Number of inlets = 42
  Cost per Inlet = $5,745.00
  Total cost of Inlets = $241,290.00

  Assume $2,000 per AC for Sedimentation and Erosion Control.
  Total for Sedimentation and Erosion Control = $2,000 x 65.65 AC = $131,300.00

  Total "Others" Cost = $372,590.00

*Note that quantities are based on FDEP approved cost estimates included as part of the North Cell Closure Permit Renewal Application dated December 6, 2011.

Passive Gas Control (Item 7)
No passive gas control system is proposed as a part of the North Cell closure.

Active Gas Extraction Control (Item 8)
Active gas extraction control will be part of the North Cell closure. The quantities associated with the active gas extraction system required for the North Cell closure were identified in the FDEP approved cost estimates included as part of the North Cell Closure Permit Renewal Application dated December 6, 2011. It should be noted that existing gas extraction system was expanded from December 2011 through April 2012 by installing several vertical wells, associated piping, condensate sumps etc. Out of the installed items, the following items can be considered as part of the active gas extraction system required for North Cell closure.

- 3 vertical wells (275 ft total depth)
- 3 vertical wells required benching
- 3 well heads
- 3 pipe boots
- 1,611 ft of 18-inch header pipe
- 596 ft of 16-inch header pipe
- 399 ft of 4-inch lateral pipe
- 5 condensate sumps
- 7 access points
- One 18-inch and one 16-inch header isolation valve

The active gas extraction system quantities have been updated by taking into account the above listed quantities of the items recently installed. A detailed breakdown of the costs associated with the gas extraction system installation at closure is included in Appendix R-2.

Security System (Item 9)
Perimeter fencing, gates and signs already exists at the facility. A $2,000 lump sum is allocated for additional signs as part of the closure costs.

Closure Permit, Contracts, CQA and Certification (Items 10 & 11)
Professional engineering services will be needed during three phases of the closure process: permitting, construction and certification. The fee for certification of closure includes a professional engineer's time spent at the landfill reviewing test data and submitting the certification report to the FDEP.

Contingency (Item 12)
A 10% of total closure cost will be allocated as a contingency.

Site Specific Costs (Item 13)
The mobilization fee has been estimated to be 5% of Items 1 through 11.

LONG-TERM CARE COSTS

Total long-term care area = 65.65 AC

Ground Water Monitoring (Item 1)
Per previous correspondence with FDEP, the long-term care costs for groundwater monitoring at the facility are included wholly in the long-term care financial assurance for the South Cell.

Surface Water Monitoring (Item 2)

There are seven surface water monitoring locations associated with the North Cell, and all the locations are monitored on a semi-annual basis.

It is estimated that it takes four hours to sample, travel to the site and submit results to FDEP. Lab analysis costs are based upon the facility's master agreement with the lab. Applicable pages from the master agreement are included in Appendix R-2. A detailed cost breakup is provided below:

- Cost Associated with Ammonia as N, Hardness as CaCO3, Organic Carbon, TDS, TSS, BOD, COD, Nitrogen as N, Nitrate as N, Phosphates, Chlorophyll A, and Fecal Coliform = $182.00
- Cost Associated with Iron, Mercury, and Sodium = $31.50
- Cost Associated with 40 CFR Part 258 Appendix I Parameters = $190.00
- Assuming 4 hours of sampling @ $40 per hour
- Total Cost per semi-annual monitoring event = 7 ($182.00 + $31.50 + $190.00) + 40×4 = $2,984.50

Gas Monitoring (Item 3)

There are 8 gas monitoring probes as well as surface monitoring for the North Cell long-term care and all the locations are monitored on a quarterly basis.

It is estimated that it takes approximately 2 days (10 hours per day) to perform monitoring, travel to the site and submit results to the FDEP for both probe monitoring and surface monitoring. The field technician charge is estimated to be $65/hour. Equipment rental for a GEM2000 monitor is $100/day and $60/day for a RKI Eagle Multi Gas Detector (see quotes from AJAX Environmental and Safety Supply in Attachment R-2) and miscellaneous expenses are estimated to be $250. A 15% profit and contingency fee was added to the sum. Assuming monitoring will be performed in 2 days (10 hours per day), the cost estimate per quarterly monitoring event is $2035.50 =115% * ($60*20 + $100*2 + $60*2 + $250).

Leachate Monitoring (Item 4)

Per Chapter 62-701 of the Florida Administrative Code (FAC), annual leachate monitoring is no longer required and therefore, no included as part of this long-term care cost estimates.

Leachate Collection & Treatment System (Item 5)

<u>Maintenance:</u>

- Assume lump sum allocation of $500/year for repairs to piping, valves, etc.

- Jet cleaning of leachate collection system is performed every 5 years for the North Cell @ $7,500 (refer to Attachment R-2).
- Therefore, annual maintenance cost = $2,000.

Impoundments and Aeration Systems: It is assumed that 20 SY of liner repairs will be required every year @ $9 per SY.

Offsite Disposal: The cost is based on average annual generation of 1,000,000 gallons of leachate and $30 per 1,000 gallons of total disposal cost for leachate (disposal cost per Volusia County).

Groundwater Monitoring Well Maintenance (Item 6)
Assume a lump sum amount of $500 per year for well maintenance and replacement.

Gas System Maintenance (Item 7)
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. Installation of replacement collection wells, especially in the years immediately after closure, was budgeted in addition to replacement of the blower every fifteen years. It was assumed a field technician would be needed for two days per month (20 hours @ $65 per hour, $500 misc expenses, and 15% profit and contingency fee) to monitor the collection wells, perform well field adjustments and document readings.

Landscaping (Item 8)
It is anticipated the landfill cap will need landscaping/mowing four times a year.

Unit cost of mowing from 2012 RS Means= $1.70 per 1000 SF × 0.979 = $1.66 per 1000 SF = $72.50 per AC (refer to Attachment R-2)

Total annual mowing cost = $72.50 per AC * 4 = $290.00 per AC

Erosion Control and Cover Maintenance (Item 9)

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. An annual average soil loss of 796 CY was calculated using the United Soil Loss Equation (USLE). This is a conservative assumption since it is assumed that 60% of the ground is covered by vegetation. Please refer to Attachment R-3 for further explanation of the USLE equation.

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

- Sodding: 7,164 SY = 796 CY * 27 CF/CY * 150% machinery disturbance / (0.5 FT average depth)
- Liner Repair: 1,194 SY = 796 CY * 27 CF/CY * 25% / 0.5 FT
- Soil: 796 CY

Please refer to Attachment R-2 for unit price of sodding.

- Jet cleaning of leachate collection system is performed every 5 years for the North Cell @ $7,500 (refer to Attachment R-2).
- Therefore, annual maintenance cost = $2,000.

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- Liner Repair: 1,194 SY = 796 CY * 27 CF/CY * 25% / 0.5 FT
- Soil: 796 CY

Please refer to Attachment R-2 for unit price of sodding.

It was assumed that 25% of the disturbed area will require liner repairs. Replacement soil will include cover soil and top soil. As the unit price of installed top soil is higher, the unit cost of replacement soil was assumed similar to that of top soil. See Item 4 of the closure cost for installed replacement soil.

Stormwater Maintenance (Item 10)
A lump sum amount of $5,000 has been allocated for annual storm water management system maintenance.

Security System Maintenance (Item 11)
A lump sum amount of $500 is assumed as cost associated with fence repairs and other security management.

Utilities (Item 12)
Estimated power requirement for site equipment = $150/month = $1,800/year

Leachate Collection/Treatment Systems Operation (Item 13)
It is assumed that a technician will be needed for an average of eight hours every four weeks to monitor, inspect, and maintain the system.

Administrative Costs (Item 14)
Professional engineering services expected during the long-term care period include semiannual water quality monitoring, water quality technical reports, ten-year long-term care permit renewal applications, stabilization reports and other miscellaneous reporting requirements. Time was added for inspections of the stormwater and landfill cap systems.

Tomoka Farms Road Landfill - North Cell
Class I Financial Assurance Closure Cost
Average of Quotations

Item NO.	Description	Unit	Unit Cost			
			ERC	Comanco	Southeast Environmental	Average
1	18" Cover Soil Layer (See Note 1)	CY	$7.50	$13.00	$14.00	$13.50
2	6" Top Vegetative Soil Layer (See Note 1)	CY	$8.50	$13.00	$15.00	$14.00
3	Textured 40-mil LLDPE	SY	$2.88	$4.05	$4.50	$3.81
4	Double Sided Geo-Composite	SY	$4.05	$4.50	$8.10	$5.55
5	Sodding	SY	$1.85	$1.80	$1.80	$1.82
6	Hydroseeding	AC	$2,500.00	$3,500.00	$2,500.00	$2,833.33

Notes:
1. For calculating average cover soil and top soil costs, ERC unit costs were neglected as the unit costs seem low per HDR experience.

Albers, Jonathan

To: Beben, David
Subject: RE: Volusia County - Cost Estimates

AMServiceURLStr: https://Slingshot.hdrinc.com:443/CFSS/control?view=services/FTService

From: Beben, David
Sent: Monday, November 26, 2012 1:10 PM
To: Albers, Jonathan
Subject: FW: Volusia County - Cost Estimates

From: Jerry L. Pinder [mailto:jerry.pinder@ercflorida.com]
Sent: Monday, November 26, 2012 12:21 PM
To: Beben, David
Subject: RE: Volusia County - Cost Estimates

THESE cost should be close.

Jerry L. Pinder, President

ERC General Contracting Services, Inc.
890 Carter Road, Suite 170
Winter Garden FL 34787
Phone (407) 656-3900
Fax (407) 656-2128
Mobile (407) 468-1046
WWW.ERCFLORIDA.COM

From: Beben, David [mailto:David.Beben@hdrinc.com]
Sent: Monday, November 26, 2012 12:10 PM
To: Jerry L. Pinder
Cc: Albers, Jonathan
Subject: Volusia County - Cost Estimates

Hi Jerry:

I have a favor to ask. We are collecting cost quotes for the Tomoka Farms Road Landfill in Daytona. It will be for a FDEP regulatory submittal for future closure of their North Cell. A table below is provided with the cost estimates that are needed. Please complete the unit cost for the six items to the best of your knowledge. There is an upcoming closure project in Volusia that we expect to occur in the next couple of months. We'll keep you informed.

Item	Quantity	Unit	Unit Cost	Comments
18" Cover soil Layer (**off-site material**)	221,281	CY	7.50	Installed unit cost including materials, hauling and installation costs.
6" Top vegetative soil (**off-site materials**)	73,760	CY	8.50	Installed unit cost including materials, hauling and installation costs.
Textured 40-mil LLDPE	460,264	SF	.32	Installed unit cost including materials and installation costs.
Double sided geocomposite	460,264	SF	.45	Installed unit cost including materials and installation costs.
Sodding	387,175	SY	1.85	Installed unit cost including materials and installation costs.
Hydro seeding	11.44	AC	2,500	

Thanks,
David

DAVID BEBEN
PE

HDR Engineering, Inc.
Project Engineer

200 West Forsyth St. Suite 800 | Jacksonville, FL 32202
904.598.8923 | f:904.598.8988
david.beben@hdrinc.com | hdrinc.com

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Albers, Jonathan

From: David Scherbaty [dscherbaty@comanco.com]
Sent: Friday, November 30, 2012 8:31 AM
To: Albers, Jonathan
Cc: John Jacobs
Subject: RE: Request for Unit Cost Data for Tomoka Farms Road Landfill

Jonathan,

Please see below. As for the Erosion Control, I wasn't able to get a number for it without knowing what exact type of erosion control you are referring to. Please let me know if you have any questions.

Thanks,

David Scherbaty
Estimator
COMANCO Environmental Corporation
4301 Sterling Commerce Drive
Plant City, Florida 33566-7372
Office: (813) 988-8829
Fax: (813)-386-7364
Email: dscherbaty@comanco.com
Web: www.comanco.com

From: Albers, Jonathan [mailto:Jonathan.Albers@hdrinc.com]
Sent: Tuesday, November 27, 2012 8:50 AM
To: David Scherbaty
Subject: Request for Unit Cost Data for Tomoka Farms Road Landfill

David,

The Tomoka Farms Road Landfill in Volusia County, FL is required per FDEP to provide 3rd party quotes for items in their upcoming closure cost estimate. We would appreciate it if you could provide quotes for the following items on a unit price basis based on:

- Assume off-site borrow source for cover soil and top soil. Estimate typical off-site haul distance, if necessary.
- All costs shall include material, transportation, and installation.
- The costs shall be based on current (2012) prices

Closure Item	Approximate Quantity	Unit
18" Cover Soil	175,000	CY $13.00
6" Top Soil	58,500	CY $13.00
Textured 40-mil Geomembrane	350,000	SY $4.05
Double-Sided 300-mil Geocomposite	350,000	SY $4.50
Turf Sodding	324,000	SY $1.80
Hydroseeding	5.40	AC $3,500.00
Erosion Control	65.0	AC Type?

Any information you might be able to provide would be appreciated. If you have any questions or would like to discuss, please give me a call at 904-598-8916 or email me at jonathan.albers@hdrinc.com.

JONATHAN ALBERS, PE

HDR Engineering, Inc.
Solid Waste Engineer

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904.598.8916 | c: 806.773.8765
jonathan.albers@hdrinc.com | hdrinc.com

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Albers, Jonathan

From: Earl Holmes [secontracting@windstream.net]
Sent: Wednesday, November 28, 2012 4:27 PM
To: Albers, Jonathan
Subject: Re: Request for Unit Cost Data for Tomoka Farms Road Landfill

Please see the attached estimate.

Closure Item	Approximate Quantity	Unit	Cost	Extension
18" Cover Soil	175,000	CY	$14.00	$2,450,000.00
6" Top Soil	58,500	CY	$15.00	$877,500.00
Textured 40-mil Geomembrane	350,000	SY	$4.50	$1,575,000.00
Double-Sided 300-mil Geocomposite	350,000	SY	$8.10	$2,835,000.00
Turf Sodding	324,000	SY	$1.80	$583,200.00
Hydroseeding	5.40	AC	$2,500.00	$13,500.00
Erosion Control	65.00	AC	?	$0.00
			Total	**$8,334,200.00**

Earl Holmes
President
Southeast Environmental Contracting, Inc.
229-794-3330 Fax 229-794-3332
www.southeastenvironmental.com

From: Albers, Jonathan
Sent: Monday, November 26, 2012 11:30 AM
To: mailto:earl@southeastenvironmental.com
Subject: FW: Request for Unit Cost Data for Tomoka Farms Road Landfill

Mr. Holmes,

I sent this request to your general information email address this morning, but wanted to send it directly to you as well. Thanks.

JONATHAN ALBERS, PE

HDR Engineering, Inc.
Solid Waste Engineer

200 W. Forsyth Street, Suite 800 | Jacksonville, FL 32202
904.598.8916 | c: 806.773.8765
jonathan.albers@hdrinc.com | hdrinc.com

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From: Albers, Jonathan
Sent: Monday, November 26, 2012 8:55 AM
To: 'info@southeastenvironmental.com'
Subject: Request for Unit Cost Data for Tomoka Farms Road Landfill

The Tomoka Farms Road Landfill in Volusia County, FL is required per FDEP to provide 3rd party quotes for items in their upcoming closure cost estimate. We would appreciate it if you could provide quotes for the following items on a unit price basis based on:

- Assume off-site borrow source for cover soil and top soil. Estimate typical off-site haul distance, if necessary.
- All costs shall include material, transportation, and installation.
- The costs shall be based on current (2012) prices

Closure Item	Approximate Quantity	Unit
18" Cover Soil	175,000	CY
6" Top Soil	58,500	CY
Textured 40-mil Geomembrane	350,000	SY
Double-Sided 300-mil Geocomposite	350,000	SY
Turf Sodding	324,000	SY
Hydroseeding	5.40	AC
Erosion Control	65.0	AC

Thanks for any help you may be able to provide. If you have any questions or would like to discuss, please give me a call at 904-598-8916 or email me at jonathan.albers@hdrinc.com.

JONATHAN ALBERS, PE

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Solid Waste Engineer

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0162

The *2012 Heavy Construction Cost Data*, 26th Annual Edition, and all of the RSMeans annual cost data books are dedicated to the memory of our respected friend and colleague, Hsiao-Cheng (John) Chiang, PE.

2012

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015433	CONTRACTOR EQUIPMENT		96.5	96.5		100.4	100.4		100.4	100.4		100.4	100.4		100.9	100.9		100.4	100.4
0241, 31 - 34	SITE & INFRASTRUCTURE, DEMOLITION	123.6	95.0	103.9	111.8	103.3	105.9	111.0	103.3	105.7	103.6	103.3	103.4	109.2	104.0	105.6	111.2	103.3	105.7
0310	Concrete Forming & Accessories	110.1	79.2	83.3	99.3	121.7	118.8	99.3	121.6	118.7	97.3	121.6	118.4	99.0	121.6	118.6	99.6	121.6	118.7
0320	Concrete Reinforcing	104.3	80.7	92.4	103.6	128.8	116.3	103.6	128.8	116.3	103.6	128.8	116.3	103.6	128.8	116.3	103.6	128.8	116.3
0330	Cast-in-Place Concrete	114.1	81.4	101.2	107.8	125.0	114.6	101.0	125.0	110.4	107.0	125.0	114.1	97.1	125.0	108.1	102.6	125.0	111.4
03	CONCRETE	111.5	80.4	96.3	110.6	124.0	117.1	107.1	123.9	115.3	110.0	123.9	116.8	105.2	123.9	114.3	108.0	123.9	115.7
04	MASONRY	134.8	75.6	98.7	104.1	129.8	119.8	96.7	129.8	116.9	97.2	129.8	117.1	96.3	129.8	116.7	98.0	129.8	117.4
05	METALS	94.6	82.4	90.6	99.1	125.2	107.7	99.1	125.0	107.7	103.9	125.0	110.9	96.5	125.0	105.9	95.7	125.0	105.4
06	WOOD, PLASTICS & COMPOSITES	96.5	82.4	88.3	98.6	120.3	111.1	98.6	120.3	111.1	97.1	120.3	110.5	98.6	120.3	111.1	98.6	120.3	111.1
07	THERMAL & MOISTURE PROTECTION	105.0	81.9	95.6	101.2	126.6	111.6	101.3	123.7	110.4	102.6	123.7	111.2	101.3	123.7	110.4	101.3	123.7	110.4
08	OPENINGS	95.7	83.7	92.7	102.4	130.1	109.4	102.4	130.1	109.4	103.1	130.1	109.9	105.1	130.1	111.4	102.4	130.1	109.4
0920	Plaster & Gypsum Board	81.2	81.8	81.6	97.8	120.3	113.8	97.8	120.3	113.8	95.9	120.3	113.3	99.6	120.3	114.4	97.8	120.3	113.8
0950, 0980	Ceilings & Acoustic Treatment	108.8	81.8	90.9	102.0	120.3	114.1	102.0	120.3	114.1	100.2	120.3	113.5	106.3	120.3	115.5	102.0	120.3	114.1
0960	Flooring	119.1	47.5	98.1	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2
0970, 0990	Wall Finishes & Painting/Coating	107.9	24.9	56.7	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0
09	FINISHES	107.9	67.7	85.5	101.7	123.2	113.7	101.8	123.2	113.7	99.9	123.2	112.9	102.9	123.2	114.2	101.8	123.2	113.7
COVERS	DIVS. 10 - 14, 25, 28, 41, 43, 44, 46	100.0	91.0	98.2	100.0	108.6	101.7	100.0	108.6	101.7	100.0	108.6	101.7	100.0	108.6	101.7	100.0	108.6	101.7
21, 22, 23	FIRE SUPPRESSION, PLUMBING & HVAC	94.1	74.6	86.2	100.0	114.7	106.0	100.0	114.7	106.0	100.1	114.7	106.0	94.1	114.7	102.4	100.0	114.7	106.0
26, 27, 3370	ELECTRICAL, COMMUNICATIONS & UTIL.	95.1	75.1	84.8	102.2	109.9	106.2	102.2	109.6	106.0	99.2	110.5	105.1	102.1	109.6	106.0	102.3	109.6	106.1
MF2010	WEIGHTED AVERAGE	101.3	78.3	91.2	102.2	118.7	109.5	101.5	118.6	109.0	102.0	118.7	109.4	99.7	118.6	108.0	101.1	118.6	108.8

DIVISION		CONNECTICUT																	
		NEW HAVEN			NEW LONDON			NORWALK			STAMFORD			WATERBURY			WILLIMANTIC		
		065			063			068			069			067			062		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
015433	CONTRACTOR EQUIPMENT		100.9	100.9		100.9	100.9		100.4	100.4		100.4	100.4		100.4	100.4		100.4	100.4
0241, 31 - 34	SITE & INFRASTRUCTURE, DEMOLITION	111.1	104.0	106.2	102.8	104.0	103.6	111.6	103.3	105.9	112.3	103.3	106.1	111.4	103.3	105.8	111.9	103.3	105.9
0310	Concrete Forming & Accessories	99.0	121.6	118.6	99.0	121.6	118.6	99.3	122.1	119.1	99.3	122.1	119.1	99.3	121.6	118.7	99.3	121.5	118.6
0320	Concrete Reinforcing	103.6	128.8	116.3	81.2	128.8	105.2	103.6	129.0	116.4	103.6	129.0	116.4	103.6	128.8	116.3	103.6	128.8	116.3
0330	Cast-in-Place Concrete	104.4	125.0	112.5	88.9	125.0	103.1	106.0	126.5	114.1	107.8	126.5	115.2	107.8	125.0	114.6	100.7	124.9	110.2
03	CONCRETE	123.2	123.9	123.5	94.7	123.9	108.9	109.7	124.7	117.0	110.6	124.7	117.4	110.6	123.9	117.0	107.0	123.8	115.2
04	MASONRY	96.9	129.8	117.0	95.3	129.8	116.3	96.4	131.3	117.7	97.2	131.3	118.0	97.2	129.8	117.1	96.5	129.8	116.8
05	METALS	95.9	125.0	105.5	95.6	125.0	105.3	99.1	125.7	107.9	99.1	125.7	107.9	99.1	125.0	107.7	98.9	124.9	107.5
06	WOOD, PLASTICS & COMPOSITES	98.6	120.3	111.1	98.6	120.3	111.1	98.6	120.3	111.1	98.6	120.3	111.1	98.6	120.3	111.1	98.6	120.3	111.1
07	THERMAL & MOISTURE PROTECTION	101.4	123.6	110.4	101.3	123.7	110.4	101.4	127.3	111.9	101.3	127.3	111.9	101.3	123.6	110.4	101.5	123.3	110.4
08	OPENINGS	102.4	130.1	109.4	105.6	130.1	111.8	102.4	130.1	109.4	102.4	130.1	109.4	102.4	130.1	109.4	105.6	130.1	111.8
0920	Plaster & Gypsum Board	97.8	120.3	113.8	97.8	120.3	113.8	97.8	120.3	113.8	97.8	120.3	113.8	97.8	120.3	113.8	97.8	120.3	113.8
0950, 0980	Ceilings & Acoustic Treatment	102.0	120.3	114.1	100.0	120.3	113.4	102.0	120.3	114.1	102.0	120.3	114.1	102.0	120.3	114.1	100.0	120.3	113.4
0960	Flooring	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2	94.5	134.4	106.2	94.5	119.7	101.9
0970, 0990	Wall Finishes & Painting/Coating	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0	90.1	117.5	107.0
09	FINISHES	101.8	123.2	113.7	100.6	123.2	113.2	101.8	123.2	113.7	101.9	123.2	113.7	101.6	123.2	113.6	101.5	120.7	112.2
COVERS	DIVS. 10 - 14, 25, 28, 41, 43, 44, 46	100.0	108.6	101.7	100.0	108.6	101.7	100.0	108.8	101.7	100.0	108.8	101.7	100.0	108.6	101.7	100.0	108.6	101.7
21, 22, 23	FIRE SUPPRESSION, PLUMBING & HVAC	100.0	114.7	106.0	94.1	114.7	102.4	100.0	114.8	106.0	100.0	114.8	106.0	100.0	114.7	106.0	100.0	114.7	106.0
26, 27, 3370	ELECTRICAL, COMMUNICATIONS & UTIL.	102.1	109.6	106.0	98.7	109.6	104.3	102.2	162.3	133.2	102.2	162.3	133.2	101.6	109.9	105.9	102.2	110.5	106.5
MF2010	WEIGHTED AVERAGE	102.8	118.6	109.8	97.6	118.6	106.9	101.8	126.3	112.6	101.9	126.3	112.7	101.8	118.6	109.2	101.7	118.4	109.1

DIVISION		D.C.			DELAWARE									FLORIDA					
		WASHINGTON			DOVER			NEWARK			WILMINGTON			DAYTONA BEACH			FORT LAUDERDALE		
		200 - 205			199			197			198			321			333		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
015433	CONTRACTOR EQUIPMENT		103.2	103.2		116.9	116.9		116.9	116.9		117.0	117.0		98.0	98.0		90.9	90.9
0241, 31 - 34	SITE & INFRASTRUCTURE, DEMOLITION	109.6	92.6	97.9	98.2	111.9	107.6	98.6	111.9	107.8	88.8	112.2	104.9	116.5	89.6	97.9	99.7	77.9	84.6
0310	Concrete Forming & Accessories	97.4	81.1	83.2	98.3	102.7	102.1	100.4	102.7	102.4	101.4	102.7	102.5	96.7	72.1	75.3	95.3	72.8	75.7
0320	Concrete Reinforcing	98.5	89.7	94.1	96.0	102.1	99.1	96.8	102.1	99.5	96.8	102.1	99.5	96.3	77.0	86.6	96.3	76.7	86.4
0330	Cast-in-Place Concrete	129.8	90.0	114.1	96.5	101.9	98.0	85.8	101.9	92.2	92.6	101.9	96.3	91.8	73.9	84.7	96.2	81.0	90.2
03	CONCRETE	115.7	87.0	101.7	97.3	103.2	100.2	92.7	103.2	97.8	96.2	103.2	99.6	91.6	74.8	83.4	93.8	77.5	85.8
04	MASONRY	101.4	81.4	89.2	103.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	93.6	69.4	78.8	93.9	72.2	80.6
05	METALS	96.5	106.6	99.8	103.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	96.1	92.2	94.8	96.0	93.1	95.1
06	WOOD, PLASTICS & COMPOSITES	101.9	79.9	89.2	97.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.0	73.6	84.7	95.9	71.4	81.8
07	THERMAL & MOISTURE PROTECTION	100.2	84.9	94.0	97.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	95.1	77.8	88.1	95.1	85.4	91.2
08	OPENINGS	103.0	88.8	99.4	95.6	110.4	99.3	95.6	110.4	99.3	95.3	110.4	99.1	100.2	70.5	92.7	97.9	69.5	90.7
0920	Plaster & Gypsum Board	108.6	79.3	87.7	105.9	102.5	103.5	107.3	102.5	103.9	107.8	102.5	104.0	93.2	73.2	78.9	92.3	71.0	77.1
0950, 0980	Ceilings & Acoustic Treatment	105.8	79.3	88.3	104.2	102.5	103.1	104.2	102.5	103.1	99.5	102.5	101.5	95.8	73.2	80.9	95.8	71.0	79.4
0960	Flooring	115.0	97.2	109.8	97.1	107.6	100.1	97.3	107.6	100.3	96.9	107.6	100.0	117.7	77.1	105.8	117.7	72.6	104.5
0970, 0990	Wall Finishes & Painting/Coating	121.0	86.6	99.8	98.1	102.8	101.0	98.1	102.8	101.0	98.1	102.8	101.0	111.2	78.1	90.8	105.7	74.0	86.2
09	FINISHES	107.0	83.9	94.1	100.1	103.1	101.6	100.6	103.1	102.0	99.4	103.1	101.5	107.1	73.4	88.3	103.9	72.1	87.0
COVERS	DIVS. 10 - 14, 25, 28, 41, 43, 44, 46	100.0	99.4	99.9	100.0	93.7	98.7	100.0	93.7	98.7	100.0	93.7	98.7	100.0	78.3	95.7	100.0	84.8	98.1
21, [illegible]23	FIRE SUPPRESSION, PLUMBING & HVAC	100.2	94.2	97.7	99.9	113.4	105.4	100.0	113.4	105.5	100.1	113.4	105.5	99.9	77.0	90.6	99.9	70.6	85.8
2[illegible]70	ELECTRICAL, COMMUNICATIONS & UTIL.	98.8	106.0	102.5	96.4	110.1	103.5	100.3	110.1	105.3	98.6	110.1	104.5	98.0	58.4	77.6	98.0	74.3	86.3
M[illegible]	WEIGHTED AVERAGE	102.4	92.8	98.2	99.5	107.9	103.2	99.4	107.9	103.2	99.1	108.0	103.0	98.8	75.2	88.4	98.1	75.9	88.3

Daytona Beach City Factor = 0.979

	33 41 13.40 Piping, Storm Drainage, Corrugated Metal	Crew	Daily Output	Labor-Hours	Unit	2012 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2860	24" diameter				Ea.	21			21	23.50
2865	30" diameter					24			24	26.50
2870	36" diameter					26.50			26.50	29
2875	48" diameter					35			35	38.50
2880	60" diameter					53			53	58.50
2885	72" diameter					70			70	77

	33 41 13.50 Piping, Drainage & Sewage, Corrug. HDPE Type S									
0010	**PIPING, DRAINAGE & SEWAGE, CORRUGATED HDPE TYPE S**									
0020	Not including excavation & backfill, bell & spigot									
1000	With gaskets, 4" diameter	B-20	425	.056	L.F.	.85	2.21		3.06	[illegible]
1010	6" diameter		400	.060		2	2.35		4.35	[illegible]
1020	8" diameter		380	.063		4.15	2.48		6.63	8.40
1030	10" diameter		370	.065		6	2.54		8.54	10.50
1040	12" diameter		340	.071		6.70	2.77		9.47	11.60
1050	15" diameter		300	.080		7.95	3.14		11.09	13.60
1060	18" diameter	B-21	275	.102		12.65	4.12	.48	17.25	[illegible]
1070	24" diameter		250	.112		15.55	4.53	.53	20.61	[illegible]
1080	30" diameter		200	.140		22	5.65	.66	28.31	[illegible]
1090	36" diameter		180	.156		29.50	6.30	.74	36.54	[illegible]
1100	42" diameter		175	.160		39.50	6.45	.76	46.71	54.50
1110	48" diameter		170	.165		47	6.65	.78	54.43	62.50
1120	54" diameter		160	.175		88	7.10	.83	95.93	109
1130	60" diameter		150	.187		115	7.55	.88	123.43	140
1135	Add 15% to material pipe cost for water tight connection bell & spigot									
1140	HDPE type S, elbows 12" diameter	B-20	11	2.182	Ea.	61	85.50		146.50	[illegible]
1150	15" diameter	"	9	2.667		93	105		198	[illegible]
1160	18" diameter	B-21	9	3.111		153	126	14.70	293.70	[illegible]
1170	24" diameter		9	3.111		325	126	14.70	465.70	565
1180	30" diameter		8	3.500		515	142	16.55	673.55	800
1190	36" diameter		8	3.500		660	142	16.55	818.55	960
1240	HDPE type S, Tee 12" diameter	B-20	7	3.429		104	134		238	320
1260	15" diameter	"	6	4		155	157		312	[illegible]
[illegible]	18" diameter	B-21	6	4.667		218	189	22	429	[illegible]
[illegible]	24" diameter		5	5.600		298	226	26.50	550.50	710
[illegible]	30" diameter		5	5.600		595	226	26.50	847.50	1,025
1340	36" diameter		4	7		670	283	33	986	1,200
1360	42" diameter		4	7		735	283	33	1,051	1,275
1380	48" diameter		4	7		1,250	283	33	1,566	1,850
1400	Add to basic installation cost for each split coupling joint									
1402	HDPE type S, split coupling, 12" diameter	B-20	17	1.412	Ea.	7.35	55.50		62.85	93.50
1420	15" diameter		15	1.600		12.25	62.50		74.75	110
1440	18" diameter		13	1.846		21	72.50		93.50	135
1460	24" diameter		12	2		31	78.50		109.50	155
1480	30" diameter		10	2.400		68.50	94		162.50	221
1500	36" diameter		9	2.667		95.50	105		200.50	266
1520	42" diameter		8	3		107	118		225	298
1540	48" diameter		8	3		138	118		256	335

	33 41 13.60 Sewage/Drainage Collection, Concrete Pipe									
0010	**SEWAGE/DRAINAGE COLLECTION, CONCRETE PIPE**									
0020	Not including excavation or backfill									
0050	Box culvert, cast in place, 6' x 6'	C-15	16	4.500	L.F.	206	187		393	510
0060	8' x 8'		14	5.143		300	213		513	655

Florida Department of Transportation
Item Average Unit Cost
From 2011/11/01 to 2012/10/31

Contract Type: CC STATEWIDE
Displaying: VALID ITEMS WITH HITS
From: 0102 1 To: 9999999

Item	No. of Conts	Weighted Average	Total Amount	Total Quantity	Unit Meas	Obs?	Description
0430610223	1	$1,025.00	$1,025.00	1.000	EA	N	U-ENDWALL,STD 261,1:3 SLP, 15"
0430610225	2	$1,030.24	$3,090.73	3.000	EA	N	U-ENDWALL,STD 261,1:3 SLP, 18"
0430610233	1	$3,350.00	$3,350.00	1.000	EA	N	U-ENDWALL,STD 261,1:3 SLP, 30"
0430610329	1	$1,190.00	$1,190.00	1.000	EA	N	U-ENDWALL,STD 261,1:2 SLP, 24"
0430611125	4	$1,211.00	$7,266.00	6.000	EA	N	U-ENDWALL, BAFFLES,STD 261,1:4 SLP, 18"
0430611225	1	$2,716.47	$5,432.94	2.000	EA	N	U-ENDWALL, BAFFLES, STD 261,1:3 SLP,18"
0430611233	2	$2,415.44	$16,908.08	7.000	EA	N	U-ENDWALL,STD 261,BAFFLES,1:3 SLP, 30"
0430611323	1	$1,000.00	$5,000.00	5.000	EA	N	U-ENDWALL, BAFFLES, STD 261,1:2 SLP,15"
0430611325	2	$3,366.67	$10,100.00	3.000	EA	N	U-ENDWALL, BAFFLES, STD 261,1:2 SLP,18"
0430822 25	1	$1,500.00	$1,500.00	1.000	EA	N	CLEANING & SEALING EXIST PIPE JNT,18" CD
0430830	15	$198.82	$443,024.18	2,228.300	CY	N	PIPE FILLING AND PLUGGING
0430950	10	$70.92	$141,921.81	2,001.100	CY	N	DESILTING CONCRETE BOX CULVERT,
0430963 1	3	$22.87	$1,189.04	52.000	LF	N	PVC PIPE FOR BACK OF SIDEWALK, 4"
0430963 2	4	$33.43	$3,108.80	93.000	LF	N	PVC PIPE FOR BACK OF SIDEWALK, NON STAND
0430982121	2	$545.48	$1,090.96	2.000	EA	N	MITERED END SECT, OPTIONAL RD, 12" CD
0430982123	13	$810.44	$20,261.08	25.000	EA	N	MITERED END SECT, OPTIONAL RD, 15" CD
0430982125	32	$965.90	$154,544.50	160.000	EA	N	MITERED END SECT, OPTIONAL RD, 18" CD
0430982129	31	$1,009.83	$115,120.23	114.000	EA	N	MITERED END SECT, OPTIONAL RD, 24" CD
0430982133	15	$1,328.00	$54,447.82	41.000	EA	N	MITERED END SECT, OPTIONAL RD, 30" CD
0430982138	15	$1,771.03	$51,359.77	29.000	EA	N	MITERED END SECT, OPTIONAL RD, 36" CD
0430982140	4	$2,789.66	$13,948.31	5.000	EA	N	MITERED END SECT, OPTIONAL RD, 42" CD
0430982141	4	$3,213.14	$19,278.82	6.000	EA	N	MITERED END SECT, OPTIONAL RD, 48" CD
0430982142	5	$4,582.38	$27,494.26	6.000	EA	N	MITERED END SECT, OPTIONAL RD, 54" CD
0430982143	4	$4,221.00	$16,884.00	4.000	EA	N	MITERED END SECT, OPTIONAL RD, 60" CD
0430982144	1	$5,100.00	$5,100.00	1.000	EA	N	MITERED END SECT, OPTIONAL RD, 66" CD
0430982145	1	$4,913.10	$4,913.10	1.000	EA	N	MITERED END SECT, OPTIONAL RD, 72" CD
0430982625	9	$802.35	$33,698.87	42.000	EA	N	MITERED END SECT, OPT - OTHER, 18" CD
0430982629	3	$1,000.00	$9,000.00	9.000	EA	N	MITERED END SECT, OPT - OTHER, 24" CD
0430982633	5	$1,451.28	$8,707.69	6.000	EA	N	MITERED END SECT, OPT - OTHER, 30" CD
0430982638	2	$2,745.00	$5,490.00	2.000	EA	N	MITERED END SECT, OPT - OTHER, 36" CD
0430982640	2	$2,518.00	$7,554.00	3.000	EA	N	MITERED END SECT, OPT - OTHER, 42" CD
0430982641	2	$6,084.00	$30,420.00	5.000	EA	N	MITERED END SECT, OPT - OTHER, 48" CD
0430982642	2	$4,593.33	$13,780.00	3.000	EA	N	MITERED END SECT, OPT - OTHER, 54" CD
0430982643	2	$3,971.10	$15,884.38	4.000	EA	N	MITERED END SECT, OPT - OTHER, 60" CD
0430984121	1	$1,000.00	$1,000.00	1.000	EA	N	MITERED END SECT, OPTIONAL RD, 12" SD

	33 41 13.40 Piping, Storm Drainage, Corrugated Metal	Crew	Daily Output	Labor-Hours	Unit	2012 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2860	24" diameter				Ea.	21			21	23.50
2865	30" diameter					24			24	[illegible]
2870	36" diameter					26.50			26.50	29
2875	48" diameter					35			35	38.50
2880	60" diameter					53			53	58.50
2885	72" diameter					70			70	77
	33 41 13.50 Piping, Drainage & Sewage, Corrug. HDPE Type S									
0010	**PIPING, DRAINAGE & SEWAGE, CORRUGATED HDPE TYPE S**									
0020	Not including excavation & backfill, bell & spigot									
1000	With gaskets, 4" diameter	B-20	425	.056	L.F.	.85	2.21		3.06	[illegible]
1010	6" diameter		400	.060		2	2.35		4.35	[illegible]
1020	8" diameter		380	.063		4.15	2.48		6.63	8.40
1030	10" diameter		370	.065		6	2.54		8.54	10.50
1040	12" diameter		340	.071		6.70	2.77		9.47	11.60
1050	15" diameter		300	.080		7.95	3.14		11.09	13.60
1060	18" diameter	B-21	275	.102		12.65	4.12	.48	17.25	[illegible]
1070	24" diameter		250	.112		15.55	4.53	.53	20.61	[illegible]
1080	30" diameter		200	.140		22	5.65	.66	28.31	[illegible]
1090	36" diameter		180	.156		29.50	6.30	.74	36.54	[illegible]
1100	42" diameter		175	.160		39.50	6.45	.76	46.71	54.50
1110	48" diameter		170	.165		47	6.65	.78	54.43	62.50
1120	54" diameter		160	.175		88	7.10	.83	95.93	109
1130	60" diameter		150	.187		115	7.55	.88	123.43	140
1135	Add 15% to material pipe cost for water tight connection bell & spigot									
1140	HDPE type S, elbows 12" diameter	B-20	11	2.182	Ea.	61	85.50		146.50	[illegible]
1150	15" diameter	"	9	2.667		93	105		198	[illegible]
1160	18" diameter	B-21	9	3.111		153	126	14.70	293.70	[illegible]
1170	24" diameter		9	3.111		325	126	14.70	465.70	565
1180	30" diameter		8	3.500		515	142	16.55	673.55	800
1190	36" diameter		8	3.500		660	142	16.55	818.55	960
1240	HDPE type S, Tee 12" diameter	B-20	7	3.429		104	134		238	320
1260	15" diameter	"	6	4		155	157		312	[illegible]
[illegible]	18" diameter	B-21	6	4.667		218	189	22	429	[illegible]
[illegible]	24" diameter		5	5.600		298	226	26.50	550.50	710
[illegible]	30" diameter		5	5.600		595	226	26.50	847.50	1,025
1340	36" diameter		4	7		670	283	33	986	1,200
1360	42" diameter		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	1,275
1380	48" diameter									1,850
1400	Add to basic installation cost for each split									
1402	HDPE type S, split coupling, 12" diam									93.50
1420	15" diameter									110
1440	18" diameter									135
1460	24" diameter									155
1480	30" diameter									221
1500	36" diameter									266
1520	42" diameter									298
1540	48" diameter									335
	33 41 13.60 Sewage/Drainage Coll									
0010	**SEWAGE/DRAINAGE COLLECTION, C**									
0020	Not including excavation or backfill									
0050	Box culvert, cast in place, 6' x 6'	C-15	16	4.500	L.F.	206	187		393	510
0060	8' x 8'		14	5.143		300	213		513	655

RS Means 2012 Inlet Cost:

A single inlet includes a tee and 45 degree elbow along with an approximately 50 SY concrete pad.

City Factor = 0.979

Total Cost for Two Inlets = 2 * 0.979 * ($375+$555)*1.15 = $2,095
Total Cost of Concrete (from FDOT) = 50 * $73 = $3,650

Total Cost of Double Inlet = **$5,745**

Florida Department of Transportation
Item Average Unit Cost
From 2011/11/01 to 2012/10/31

Contract Type: CC STATEWIDE
Displaying: VALID ITEMS WITH HITS
From: 0102 1 To: 9999999

Item	No. of Conts	Weighted Average	Total Amount	Total Quantity	Unit Meas	Obs?	Description
0334 1 14	15	$83.34	$5,474,794.67	65,694.700	TN	N	SUPERPAVE ASPHALTIC CONC, TRAFFIC D
0334 1 15	1	$78.15	$39,223.49	501.900	TN	N	SUPERPAVE ASPHALTIC CONC, TRAFFIC E
0334 1 22	16	$88.70	$11,614,267.82	130,944.300	TN	N	SUPERPAVE ASPH CONC, TRAF B, PG76-22
0334 1 23	28	$92.55	$35,834,707.41	387,205.170	TN	N	SUPERPAVE ASPH CONC, TRAF C, PG76-22
0334 1 24	21	$92.22	$22,430,430.88	243,240.360	TN	N	SUPERPAVE ASPH CONC, TRAF D, PG76-22
0334 1 25	6	$85.00	$16,057,507.70	188,913.700	TN	N	SUPERPAVE ASPH CONC, TRAF E, PG76-22
0337 7 5	21	$121.21	$13,455,440.68	111,008.360	TN	N	ASPH CONC FC, INC BIT/RUBBER, FC-5
0337 7 22	37	$116.34	$30,243,196.72	259,950.300	TN	N	ASPH CONC FC,INC BIT,FC-5,PG76-22
0337 7 30	7	$98.59	$1,566,758.71	15,891.200	TN	N	ASPH CONC FC,TRAFFIC B,FC-9.5,RUBBER
0337 7 31	6	$119.81	$1,750,022.61	14,607.130	TN	N	ASPH CONC FC,TRAFFIC B,FC-12.5,RUBBER
0337 7 32	22	$110.23	$8,965,706.42	81,335.440	TN	N	ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER
0337 7 33	31	$102.21	$17,648,981.64	172,668.783	TN	N	ASPH CONC FC,TRAFFIC C,FC-12.5,RUBBER
0337 7 35	1	$86.89	$389,458.36	4,482.200	TN	N	ASPH CONC FC,TRAFFIC D,FC-12.5,RUBBER
0337 7 40	12	$97.51	$4,994,639.31	51,220.300	TN	N	ASPH CONC FC,TRAFFIC B,FC-9.5,PG 76-22
0337 7 41	2	$104.63	$2,016,250.10	19,270.700	TN	N	ASPH CONC FC,TRAFFIC B,FC-12.5,PG 76-22
0337 7 42	12	$100.84	$7,504,748.72	74,421.740	TN	N	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22
0337 7 43	15	$93.94	$10,529,603.25	112,084.700	TN	N	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22
0337 7 45	9	$92.34	$5,482,009.62	59,369.100	TN	N	ASPH CONC FC,TRAFFIC D,FC-12.5,PG 76-22
0337 7 58	1	$91.45	$316,801.09	3,464.200	TN	N	ASPH CONC FC,TRAFFIC D,FC-12.5,PG 82-22
0339 1	83	$138.20	$3,549,157.91	25,681.470	TN	N	MISCELLANEOUS ASPHALT PAVEMENT
0341 70	2	$5.14	$250,452.15	48,723.000	SY	N	ASPHALT RUBBER MEMBRANE INTERLAYER
0350 1 1	1	$35.00	$19,915.00	569.000	SY	N	PLAIN CEMENT CONC PAVT, 6"
0350 1 3	1	$72.90	$9,404.10	129.000	SY	N	PLAIN CEMENT CONC PAVT, 8"
0350 1 4	1	$63.00	$1,380,015.00	21,905.000	SY	N	PLAIN CEMENT CONC PAVT, 9"
0350 1 5	1	$55.00	$720,445.00	13,099.000	SY	N	PLAIN CEMENT CONC PAVT, 10"
0350 2 10	1	$336.00	$19,152.00	57.000	SY	N	CEMENT CONC PAVT REINFORCED,12"
0350 72	3	$1.79	$419,625.42	234,325.000	LF	N	CLEANING & RESEALING JOINTS - CONC PVMT
0350 78	2	$2.04	$21,890.40	10,740.000	LF	N	CLEANING & SEALING RAN CRACKS CONC PVMT
0352 70	3	$4.85	$772,009.00	159,099.000	SY	N	GRINDING CONCRETE PAVT
0353 70	1	$395.00	$2,363,285.00	5,983.000	CY	N	CONC PAVT SLAB REPLACEMENT
0400 0 11	30	$448.21	$4,078,890.56	9,100.486	CY	N	CONC CLASS NS, GRAVITY WALL
0400 1 2	44	$839.90	$525,119.40	625.220	CY	N	CONC CLASS I, ENDWALLS
0400 1 11	6	$441.14	$304,826.18	691.000	CY	N	CONC CLASS I, RETAINING WALLS
0400 2 1	5	$1,085.30	$107,227.86	98.800	CY	N	CONC CLASS II, CULVERTS
0400 2 2	4	$1,656.00	$146,887.00	88.700	CY	N	CONC CLASS II, ENDWALLS

Tomoka Farms Road Landfill - North Cell
Class I Financial Assurance Closure Cost
Estimates Landfill Gas Collection System

Item NO.	Description	Quantity	Unit	Unit Cost				2011 Total Cost	2012 Total Cost [2]
				Shaw Environmental	Comanco	SCS Field Services	Average		
1	Mobilization/Demobilization	1	LS	$12,400.00	$5,500.00	$15,000.00	$10,966.67	$10,966.67	$11,186.00
2	Wellhead Assembly	17	EA	$500.00	$700.00	$620.00	$606.67	$10,313.33	$10,519.60
3	Drilling of 36" borehole and completion of Vertical Well (0'-274')	274	LF	$131.00	$185.00	$140.00	$152.00	$41,648.00	$42,480.96
4	Drilling of 36" borehole and completion of Vertical Well (275'-549')	275	LF	$93.00	$135.00	$120.00	$116.00	$31,900.00	$32,538.00
5	Drilling of 36" Borehole and Completion of Vertical Well (550' - 999')	450	LF	$78.50	$120.00	$100.00	$99.50	$44,775.00	$45,670.50
6	Drilling of 36" Borehole and Completion of Vertical Well (1,000'+)	878	LF	$76.00	$100.00	$98.00	$91.33	$80,190.67	$81,794.48
7	Benching	14	EA	$400.00	$250.00	$350.00	$333.33	$4,666.67	$4,760.00
8	18" HDPE SDR 17 Header Pipe (0'-499)	318	LF	$52.00	$80.00	$66.00	$66.00	$20,988.00	$21,407.76
9	16" HDPE SDR 17 Header Pipe (0'-499')	349	LF	$50.00	$72.00	$61.00	$61.00	$21,289.00	$21,714.78
10	6" HDPE SDR 11 Lateral Pipe (0'-499')	499	LF	$20.00	$17.00	$26.00	$21.00	$10,479.00	$10,688.58
11	6" HDPE SDR 11 Lateral Pipe (500'-1,499')	1000	LF	$18.00	$15.00	$25.00	$19.33	$19,333.33	$19,720.00
12	6" HDPE SDR 11 Lateral Pipe (1,500'+)	1177	LF	$17.00	$14.00	$24.00	$18.33	$21,578.33	$22,009.90
13	4" HDPE SDR 11 Lateral Pipe (0'-499')	499	LF	$15.00	$21.00	$29.00	$21.67	$10,811.67	$11,027.90
14	4" HDPE SDR 11 Lateral Pipe (500'-1,499')	1000	LF	$14.00	$20.00	$25.00	$19.67	$19,666.67	$20,060.00
15	4" HDPE SDR 11 Lateral Pipe (1,500'+)	584	LF	$13.00	$19.00	$24.00	$18.67	$10,901.33	$11,119.36
16	Header/Condensate Access Point	3	EA	$2,300.00	$5,000.00	$3,700.00	$3,666.67	$11,000.00	$11,220.00
17	Condensate Sump	2	EA	$16,000.00	$28,000.00	$29,400.00	$24,466.67	$48,933.33	$49,912.00
18	Pipe Boot	17	EA	-	$500.00	$600.00	$366.67	$6,233.39	$6,358.06
								TOTAL =	$434,187.88

Notes:

1. Unit Prices are based on the bids received from Shawn Environmental, Comanco, and SCS Field Services for "Landfill Gas Collection System Installation" Project at Tomoka Farms Road Landfill (June 2011)
2. Inflation Factor of 1.020 Sourced from link Below
http://www.dep.state.fl.us/waste/categories/swfr/pages/CostEstimates.htm

Pages from Volusia County's Master Agreement

09-S-76KW

ATTACHMENT A

REVISION 1

SOLID WASTE DIVISION

Organics	Price Per Test	*Metals*	Price Per Test
Lindane	$25.00	Aluminum	$7.00
Endrin	$25.00	Antimony	$7.00
Methoxychlor	$25.00	Arsenic	$7.00
Toxaphene	$25.00	Barium	$7.00
2, 4-D	$25.00	Beryllium	$7.00
2, 4, 5-TP (silvex)	$25.00	Cadmium	$7.00
Ethylene Dibromide	$25.00	Calcium	$7.00
Vinyl Chloride	$5.00	Chromium	$7.00
1, 2-Dichloroethane	$5.00	Copper	$7.00
1, 1, 1-Trichloroethane	$5.00	Cobalt	$7.00
Trichloroethene	$5.00	Iron	$7.00
Tetrachloroethene	$5.00	Lead	$7.00
Benzene	$5.00	Magnesium	$7.00
Carbon Tetrachloride	$5.00	Manganese	$7.00
1,3-Dichlorobenzene	$5.00	Mercury	$17.50
Tolune	$5.00	Nickel	$7.00
Xylenes (total)	$5.00	Potassium	$7.00
1,2,4-Trichlorobenzene	$5.00	Selenium	$7.00
1,4-Dichlorobenzene	$5.00	Silver	$7.00
1,2-Dichlorobenzene	$5.00	Sodium	$7.00
Chlorobenzene	$5.00	Thallium	$7.00
1,1-Dichloroethylene	$5.00	Tin	$7.00
cis-1,2-Dichloroethylene	$5.00	Vanadium	$7.00
1,2-Dichloropropane	$5.00	Zinc	$7.00
Ethylbenzene	$5.00	Toxicity Characteristic Leaching Procedure (TCLP)	$75.00
Styrene	$5.00	Arsenic	$7.00
Trans-1,2-Dichloroethylene	$5.00	Barium	$7.00
Dichloromethane	$5.00	Cadmium	$7.00
1,1,2-Trichloroethane	$5.00	Chromium	$7.00
Trihalomethane	$35.00	Lead	$7.00
Chlorinated Phenols	$150.00	Mercury	$17.50
Purgable Halocarbons 601/8260	$75.00	Selenium	$7.00
Purgable Volitals	$75.00	Silver	$7.00
Purgable Aromatics 602/8260	$40.00	TCPL Organics – Price includes extraction plus methods 8260,8270,8151,8081	$625.00
Total Organic Halogens	$120.00	*Orangic & Demands*	Price Per Test
Total Recovery Hydrocarbon/FLPRO	$65.00	Biochemical Oxygen Demand	$20.00
Polynuclear Aromatic Hydrocarbs	$90.00	Chemical Oxygen Demand	$15.00
Organic Toxic Pollutants – VOC	$75.00	Oil & Grease	$45.00
Organic Toxic Pollutants – BNA	$150.00	Phenols, Total	$20.00
Organic Toxic Pollutants – Pesticides	$125.00	Total Organic Carbon	$15.00
Organic Toxic Pollutants – VOC	$75.00	Total Inorganic Carbon	$15.00

Pages from Volusia County's Master Agreement

09-B-76KW

ATTACHMENT A

REVISION 1

Nutrients	Price Per Test	*Groups*	Price Per Test
Ammonia Nitrogen	$15.00	**Hazardous Waste Characterization**	
Ammonium	$15.00	Reactive Cyanide	$50.00
Kjeldahl Nitrogen, Total	$17.00	Reactive Sulfide	$50.00
Nitrate Nitrogen	$8.00	**Metals**	Price Per Test
Nitrite Nitrogen	$8.00	RCRA Metals (8)	$56.00
Nitrogen, Total	$30.00	Priortiy Pollutant Metals (13)	$85.00
Organic Nitrogen	$32.00	TAL Metals	$125.00
Mircobiological	Price Per Test	**Semi-Volatile Organics**	Price Per Test
Fecal Coliform	15	PAH's by EPA 625 or 8270C	90
Total Coliform	15	Base/Neutrals by EPA 625 or 8270C, PP or TCL list	$125.00
Residue/Solids	Price Per Test	Base/Neutrals and Acid Extractables by EPA 625 or 8270C, PP or TCL List	$150.00
Total Dissolved Solids	$10.00	BNA RCRA List with TCLP extraction (EPA 1311 & 8270C)	$200.00
Total Suspended Solids	$10.00	STARS PAH's by EPA 8270C	$90.00
Percent Solids	$5.00	PCB's by EPA 8082	$70.00
Field Test	Price Per Test	Pesticides by EPA 8081	$100.00
Total Well Depth	$0.00	Pesticides & PCB's by EPA 8081/8082	$150.00
Water Elevation	$0.00	Herbicides-WATER by EPA 8151 or 515.1	$135.00
Temperature	$0.00	Herbicides-SOIL by EPA 8151	$175.00
Specific Conductance	$0.00	**Toxicity Characteristic Leaching Procedure (TCLP)**	Price Per Test
Dissolved Oxygen	$0.00	TCLP Metals	$66.50
pH	$0.00	TCLP Volatile Organics	$75.00
Turbidity	$0.00	TCLP Pesticides	$100.00
Miscellaneous	Price Per Test	TCLP Herbicides	135
Bicarbonates as HCO_3	$10.00	Full TCLP	675
Calcium Hardness as $CaCO_3$	$7.00	AHE Extraction	75
Chloride	$8.00	SPLP Extraction	50
Color	$5.00	**Volitile Organics**	Price Per Test
Cyanide	$20.00	BTEX + MTBE by EPA 624 or 8260B	40
Corrosivity	$20.00	VOHs by EPA 624 or 8260B	75
Flouride	$8.00	VOC's by EPA 624 or 8260B (chlorinated and aromatic compounds)	75
Hydrogen Sulfide	$20.00	VOC's by EPA 8021 (chlorinated and aromatic compounds)	90
Odor	$5.00	VOC's by GC/MS EPA 624 or 8260B	75
pH	$5.00	NYSDEC STARS List VOC's by EPA 8260B	75
Sulfate	$8.00	**Miscellaneous**	Price Per Test
Total Alkalinity	$10.00	40 CFR Part 258 Appendix I	$190.00
Total Hardness as $CaCO_3$	$7.00	40 CFR Part 258 Appendix II	$750.00
Total Phosphorus	$15.00	Primary Metals 62-550.310(1)(a)	$94.50
Total Phosphate	$15.00	Primary VOC 62-550.310(2)(C)	$75.00
Chlorophyll A	$35.00	Full Primary Drinking Water Scan 62-550.310	$1,000.00
		Secondary Drinking Water Scan 62-550.320(1)	$135.00
		Field Parameters	0
Hourly Rate for time in field during regular working hours (8:00 a.m. to 5:00 p.m. Monday through Friday			40
Hourly Rate for time in field after regular working hours (nights, weekends and county recognized holidays			75
		GRAND TOTAL	$17,475.80

09-B-76KW

ATTACHMENT A

REVISION 1

Definitions			
BNA = Base, Neutral, Acid extractable organics			
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes			
CFR = Code of Federal Regulations			
MTBE = Methyl Tert-Butyl Ether			
PAHs = Polynuclear Aromatic Hydrocarbons			
PCBs = Polychlorinated Biphenyls			
RCRA = Resource Conservation and Recovery Act			
SPLP = Synthetic Precipitation Leaching Procedure			
TAL = Target Analyte List			
TCLP = Toxicity Characteristic Leaching Procedure			
TRPH = Total Recoverable Petroleum Hydrocarbons			
VOAs = Volatile Organic Aromatics			
VOCs = Volatile Organic Compunds			
VOHs - Volatile Organic Halogens			

Pace Analytical Services, Inc.
8 East Tower Circle
Ormond Beach, FL 32174
386.672.5668
fax 386.673.4001

Pace Quote No.: 10-0241

Date: 7/14/10

To: Volusia County Solid Waste
1990 Tomoka Farms Rd.
Port Orange, FL 32128
Attn: Jennifer Stirk
Email: jstirk@co.volusia.fl.us
Project Name: Additional Parameters
Start Date: as required

Duration: as required
Samples Per Day: NA
Report Results: NA
Deliverable: Florida
Surcharge: NA
Turnaround: 10 business days
TAT Surcharge: NA

Phone: 386-947-2952
Fax:
P.O. Number:
Qualifiers: NA
Special Analytes: NA
Shipping: NA
Shipping Charges: NA
EDD: Client generated from PacePort
Primary Lab: Ormond Beach
Sampling Org.: Pace/client
Hourly Rate: NA
Pace Contact:
Paul Jackson
813.731.1595
Paul.Jackson@pacelabs.com

Qty	Matrix	Test Description	Method	Unit Price	Total
NA	water	Ethane/Ethene	Microseeps SOP-AM20GAx	$96.00	NA
NA	water	2-Butanone	8260	$75.00	NA
NA	water	Mercury, Low-level (field QC samples are invoiced at the same unit price)	1631E	$85.00	NA
NA	water	Solids, Total Volatile	160.4	$20.00	NA
NA	water	Molybdenum (when run with >3 other 200.7/6010 analytes	200.7/6010	$7.00	NA
NA	water	Organophosphorus Pesticides	8141	$145.00	NA
				Estimated Project Total	NA

To: Volusia County Solid Waste
Attn: Jennifer Stirk

Pace Quote No.: 10-0241
Pace Contact: Paul R. Jackson

Notes:

Please write Pace quotation number on chain of custody.
Terms and conditions as follows unless superceded by existing MSA or contract.

We appreciate the opportunity to be of service to you.
Please call Paul Jackson at 813.731.1595 for questions concerning this quotation.

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Innov-X XRF Anylyzer
In-Situ Level Troll 500
In-Situ Level Troll 700
In-Situ Rugged Reader
INW PS-9800
LaMotte 2020 Turbidity Meter
Landtec GEM 2000 Landfill Gas Monitor
Ludlum NORM Meter
Magellan Handheld GPS
Masterflex Peristaltic Pump
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RKI Single Gas Monitor
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Thermo 580B 11.8 Lamp
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Thermo Foxboro TVA 1000
Thermo Foxboro TVA 1000 PID/FID
Thermo GasTech GT-402
Trimble GeoExplorer 2005
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YSI 600XL
YSI 600XLM
YSI 6820
YSI 6920

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The GEM2000 portable Instrument Is designed for analyzing Landfill Gas (LFG) composition and calculating flow. The GEM2000 combines the capabilities of the now discontinued GA-90 for monitoring gas migration probes and the GEM-500 for monitoring gas extraction systems. The GEM2000 is certified Intrinsically Safe and offers improved speed and accuracy. It also measures and displays Btu content, temperature (with optional Temperature Probe) relative and atmospheric pressures as well as CH4 LEL (Lower Explosive Limit).

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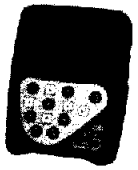

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Features

- Measures % CH4, CO2 and O2Volume, static pressure and differential pressure
- Calculates balance gas, flow (SCFM) and calorific value (KW or BTU)
- Displays % LEL of CH4, and user-defined comments
- Records site and well conditions
- Extended operation (10 - 14 hrs use from one charge)
- Certified intrinsically safe for landfill use
- Dual Mode Two instruments in one (GA and GEM mode)

Benefits

- Designed specifically for use on landfills to monitor landfill gas (LFG) extraction systems, flares, and migration control systems.
- No need to take more than one instrument to site.
- Can be used for routine sub-surface migration monitoring of landfill site perimeter probes.
- Measures gas composition, pressure and flow in gas extraction systems.
- The user is able to set up comments and questions to record information at site and at each sample point.
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- Allows balancing of gas extraction systems.

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The EAGLE's ergonomic design offers easy access to controls such as autocalibration, alarm silence, demand zero, peak hold and a wide variety of other features. Each channel has 2 alarm levels plus TWA and STEL alarms for toxic channels. Alarm levels are adjustable and can be latching or self resetting.

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Standard features on the EAGLE are not available on most other competitive units such as ppm/LEL hydrocarbon detection (5 ppm resolution) and a methane elimination switch for environmental applications. For quick response and recovery, the EAGLE has a strong internal pump which can draw samples from over 125 feet. The EAGLE will continuously operate for over 30 hours on alkaline batteries or 18 hours on Ni-Cads. Many accessories such as long hoses, special probes, datalogging, continuous operation adapters, remote alarms and strobes, dilution fittings, inter-nal hydrophobic filter, etc, are available to help satisfy almost any application. Rugged, weather resistant, easy to operate and maintain, the EAGLE is the industry's answer to portable gas detection in many applications, including land surey.

Features

- Simultaneous detection of up to 6 different gases
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- IR Sensors available for CO2, %LEL CH4, and 0-100% volume CH4
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FAX : 813-926-4616

PROPOSAL

DATE : 12/4/12
TO : Jonathan Albers – HDR
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : 2012 Volusia County Landfill LCS Maintenance Proposal

Thank you for your inquiry. We confirm our capability and interest in providing the required leachate collection system services for HDR at the Volusia County landfill.

Based on prior work at the project location we quote as follows:

High-pressure water-jetting of roughly 10,000' of existing landfill HDPE leachate collection piping at the above location $ 7,500.00

Subject to:

- An adequate no charge on site water for jetcleaning.
- Exposed and opened cleanouts/manholes at ground level.
- Continuity of access allowing work to be carried out on a single mobilization
- Standby time chargeable at $200.00 per hour should delays not of our making delay progress e.g. bad weather, access problems, high leachate flow levels etc.
- Payment : net 30 days

Please call with questions or to schedule service.

Thank you.

Ralph Calistri - Florida Jetclean - 800-226-8013

32 01 30 – Operation and Maintenance of Site Improvements

	Crew	Daily Output	Labor-Hours	Unit	2012 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
32 01 30.10 Site Maintenance									
Spray after mulch	1 Clab	48	.167	M.S.F.		5.85		5.85	9
Tree maintenance									
Clear and grub trees, see Section 31 11 10.10									
Cutting and piling trees, see Section 31 13 13.20									
Fertilize, tablets, slow release, 30 gram/tree	1 Clab	100	.080	Ea.	.52	2.81		3.33	4.89
Guying, including stakes, guy wire & wrap, see Section 32 94 50.10									
Planting, trees, Deciduous, in prep. beds, see Section 32 93 43.20									
Removal, trees see Section 32 96 43.20									
Pest control, spray	1 Clab	24	.333	Ea.	23.50	11.70		35.20	44
Systemic	"	48	.167	"	24	5.85		29.85	35.50

32 01 90 – Operation and Maintenance of Planting

	Crew	Daily Output	Labor-Hours	Unit	Material	Labor	Equipment	Total	Total Incl O&P
32 01 90.13 Fertilizing									
FERTILIZING									
Dry granular, 4#/M.S.F., hand spread	1 Clab	24	.333	M.S.F.	2.59	11.70		14.29	21
Push rotary		140	.057	"	2.59	2.01		4.60	5.95
Push rotary, per 1076 feet squared		130	.062	Ea.	2.59	2.16		4.75	6.15
Tractor towed spreader, 8'	B-66	500	.016	M.S.F.	2.59	.72	.49	3.80	4.47
12' spread		800	.010		2.59	.45	.31	3.35	3.87
Truck whirlwind spreader		1200	.007		2.59	.30	.21	3.10	3.53
Water soluable, hydro spread, 1.5#/M.S.F.	B-64	600	.027		2.66	.93	.59	4.18	4.99
Add for weed control					.45			.45	.50
32 01 90.19 Mowing									
MOWING									
Mowing brush, tractor with rotary mower									
Light density	B-84	22	.364	M.S.F.		16.95	15.60	32.55	42.50
Medium density		13	.615			28.50	26.50	55	72
Heavy density		9	.889			41.50	38	79.50	105
Mowing, brush/grass, tractor, rotary mower, highway/airport median		13	.615			28.50	26.50	55	72
Traffic safety flashing truck for highway/airport median mowing	A-2B	1	8	Day		275	211	486	645
Lawn mowing, power mower, 18" - 22"	1 Clab	65	.123	M.S.F.		4.32		4.32	6.65
22" - 30"		110	.073			2.55		2.55	3.93
30" - 32"		140	.057			2.01		2.01	3.09
Riding mower, 36" - 44"	B-66	300	.027			1.19	.82	2.01	2.71
48" - 58"	"	480	.017			.75	.52	1.27	1.70
Mowing with tractor & attachments									
3 gang reel, 7'	B-66	930	.009	M.S.F.		.38	.27	.65	.87
5 gang reel, 12'		1200	.007			.30	.21	.51	.68
Cutter or sickle-bar, 5', rough terrain		210	.038			1.71	1.18	2.89	3.87
Cutter or sickle-bar, 5', smooth terrain		340	.024			1.05	.73	1.78	2.39
Drainage channel, 5' sickle bar		5	1.600	Mile		71.50	49.50	121	163
Lawnmower, rotary type, sharpen (all sizes)	1 Clab	10	.800	Ea.		28		28	43
Repair or replace part		7	1.143	"		40		40	61.50
Edge trimming with weed whacker		5760	.001	L.F.		.05		.05	.08
32 01 90.23 Pruning									
PRUNING									
1-1/2" caliper	1 Clab	84	.095	Ea.		3.34		3.34	5.15
2" caliper		70	.114			4.01		4.01	6.15
2-1/2" caliper		50	.160			5.60		5.60	8.65
3" caliper		30	.267			9.35		9.35	14.40
4" caliper, by hand	2 Clab	21	.762			26.50		26.50	41
Aerial lift equipment	B-85	38	1.053			39.50	24.50	64	87
6" caliper, by hand	2 Clab	12	1.333			47		47	72

Volusia County- Tomoka Farms Road Landfill
December 2012

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 =	400	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 (North Cell)		
LS =	11.57	Table 3 USDA "Predicting Rainfall Loss Handbook"; 150 ft slope, 33% slope
Topographic Factor (South Cell)		
LS =	5.77	Table 3 USDA "Predicting Rainfall Loss Handbook"; 200 ft slope, 20% 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 for slope with no farming

Assumptions:

density	95	lb/ft^3	dry density for silty sand
acreage	65.65	acres	North Cell Landfill area

Table of Soil Loss

	C	A (tons/AC/year)	tons/ year	CF/ year	CY/ year
North Cell	0.042	15.55	1,021	21,492	796

**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.

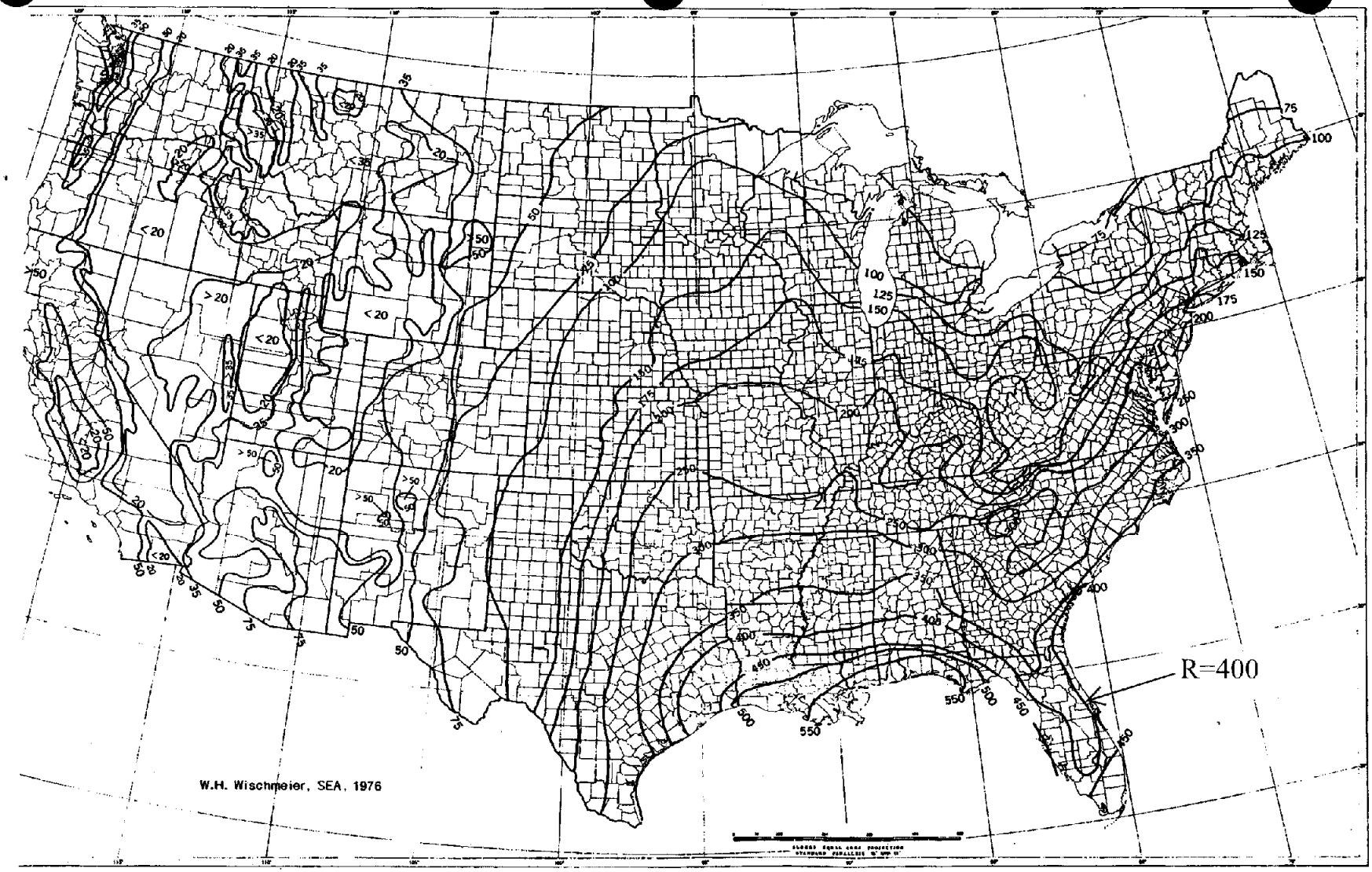

FIGURE 1.—Average annual values of the rainfall erosion index.

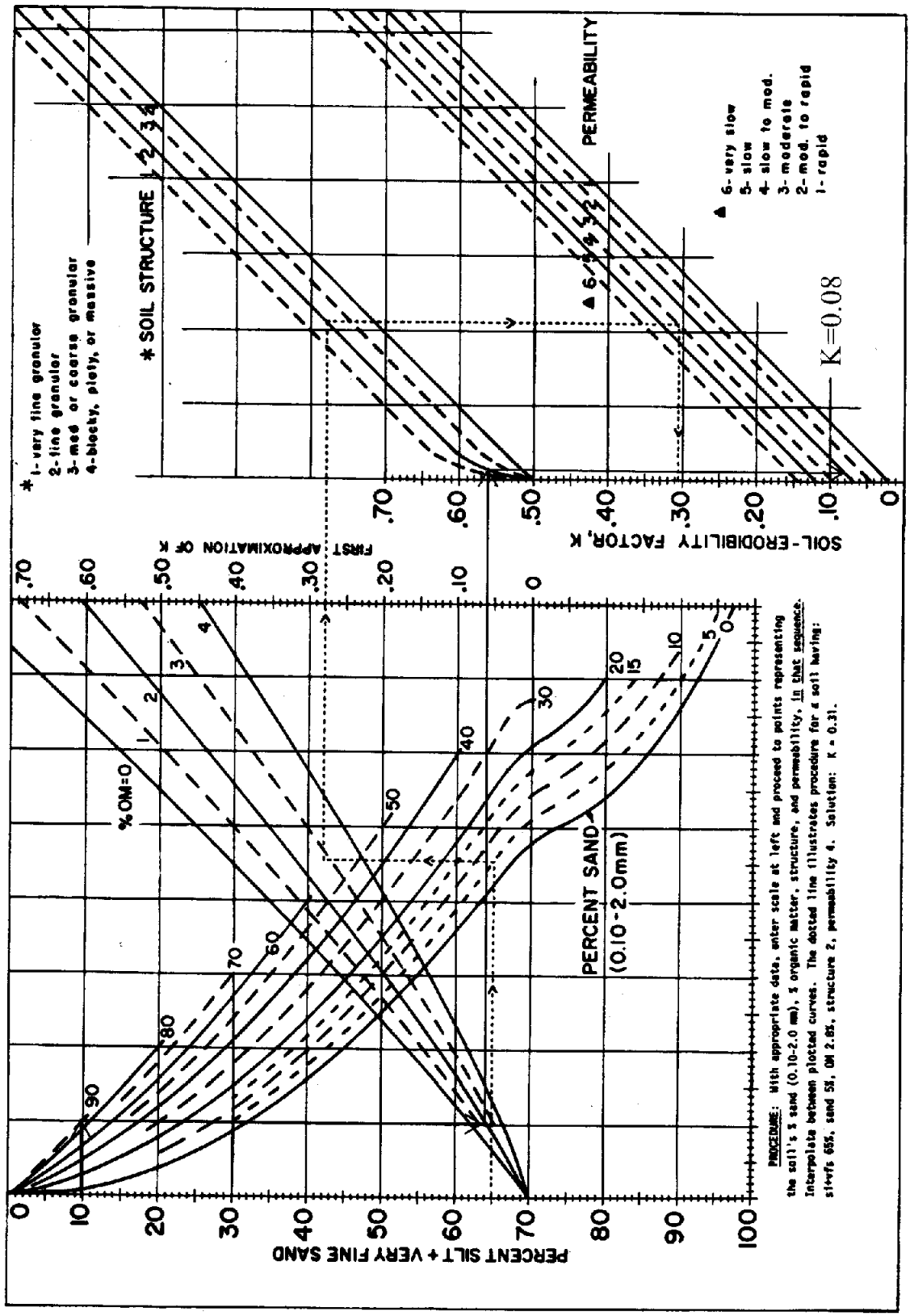

FIGURE 3.—The soil-erodibility nomograph. Where the silt fraction does not exceed 70 percent, the equation is $100\ K = 2.1\ M^{1.14}\ (10^{-4})\ (12 - a) + 3.25\ (b - 2) + 2.5\ (c - 3)$ where M = (percent si + vfs) (100 — percent c), a = percent organic matter, b = structure code, and c = profile permeability 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	3.53	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.)

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.