

consultants

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To: Mr. Thomas Lubozynski, P.E.
FDEP - Solid Waste Section, Central District
3319 Maguire Boulevard, Suite 232
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phone: (407) 893-3328

TRANSMITTAL

Date	28-Apr-11	Job No.	FL1858.03
Attention	Mr. Thomas Lubozynski, P.E.		
Re:	Response to Request for Add'l Information Class I - Partial Closure J.E.D. Solid Waste Mgmt. Facility Permit App No. SC49-0199726-018		

We are sending you:

☒ Attached/
Enclosed

☐ Under separate covers via the following items

Tracings

☐ Drilling Log

☐ Test Results

☐ **Photostats**

☐ Contracts

Documents

Prints

Photos

☐ **Sepias/Drawings**

CD ROM

[illegible]

These are transmitted as checked below:

☒ For approval☐ **Approved as submitted**☐ Resubmit _____ copies for approval

☐ **For your use**

☐ **Approved as noted**☐ **Submit** ☐ **copies for distribution**

☐ As you requested

☐ Returned for corrections☐ Return **corrected prints**

Remarks

Copy to *Mike Kaiser, WSI*

Signed *Craig R. Browne, P.E.*

28 April 2011

Mr. Thomas Lubozynski, P.E.
Waste Program Administrator
Florida Department of Environmental Protection
Central District Office
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

RECEIVED

APR 29 2011

DEP Central Dist.

**Subject: Response to Request for Additional Information dated 6 April 2011
J.E.D. Solid Waste Management Facility (SW WACS #89544)
Class I – Final Closure of Upper Side Slopes and Top Areas of Phase I
Osceola County, Florida
(Permit Application No. SC49-0199726-018)**

Dear Mr. Lubozynski:

On behalf of Omni Waste of Osceola County, LLC (Omni), Geosyntec Consultants (Geosyntec) has prepared this letter to respond to Florida Department of Environmental Protection's (FDEP's) first request for additional information (RAI) regarding the major permit modification application for the partial closure of the J.E.D. Solid Waste Management Facility (JED facility) located in St. Cloud, Florida. The "Partial Landfill Closure – Application for an Intermediate Permit Modification, J.E.D. Solid Waste Management Facility." (Report) dated 10 March 2011 was received by the FDEP on 11 March 2011. The RAI was addressed to Mr. Mike Kaiser of Omni in a letter dated 6 April 2011.

Each FDEP comment has been provided below in italic font followed by the corresponding response in normal font. In this response, deletions to the original document have been shown with a strikethrough and additions have been shown with an underline.

RESPONSE TO FDEP COMMENTS

FDEP Comment #1

- 1. In Appendix A on Page 4 of 39, DEP Form 62-701.900(1), of the Report, Item 2, Type of application is indicated as 'Closure'. Although this application is for placing final cover on a portion of the landfill, the Department considers this a modification of the operating permit.*

28 April 2011

Mr. Thomas Lubozynski, P.E.
Waste Program Administrator
Florida Department of Environmental Protection
Central District Office
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

**Subject: Response to Request for Additional Information dated 6 April 2011
J.E.D. Solid Waste Management Facility (SW WACS #89544)
Class I – Final Closure of Upper Side Slopes and Top Areas of Phase I
Osceola County, Florida
(Permit Application No. SC49-0199726-018)**

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FDEP Comment #1

- 1. In Appendix A on Page 4 of 39, DEP Form 62-701.900(1), of the Report, Item 2, Type of application is indicated as 'Closure'. Although this application is for placing final cover on*

a portion of the landfill, the Department considers this a modification of the operating permit.

- a. J.E.D. Solid Waste Management Facility does not have a specific closure permit to modify. If processed as a closure permit you would be required to pay the \$7,500 permit fee, rather than the \$5,000 fee for an intermediate modification of the existing operations permit.*
- b. The facility will continue to operate. This is just a partial closure with no long-term care. Submit a revised page 4 indicating 'Operation'; if you wish, the Department may make this change for you.*

Response # 1:

Omni agrees with this comment and requests that the Department make the necessary changes to Appendix A of the Report, Page 4 of 39 of DEP Form 62-701.900(1), indicating the Type of application as 'Operation'.

FDEP Comment #2

- 2. In Appendix A on Page 5 of 39, DEP Form 62-701.900(1), of the Report, Item 14, Expected life of the facility is blank. The recent Application submittal to the Department regarding the Gas Probe Replacement indicated that the expected life of the facility is 20 years. Submit a revised page 5 indicating the expected life of the facility; if you wish, the Department may make this change for you as 20 years.*

Response # 2:

Omni agrees with this comment and requests that the Department make the necessary changes to Appendix A of the Report, Page 5 of 39 of DEP Form 62-701.900(1), Item 14 indicating the expected life of the facility as 20 years.

FDEP Comment #3

- 3. On page 3 Section 2.4 Final Cover System Design, of the Report, an approved closure plan is referenced as part of Permit Modification Nos. SC49-0199726-006 and SO49-0199726-007. The Department was unable to locate a closure plan as part of this permit modification. A closure plan was located as part of Permit Renewal SC49-0199726-004 and SO49-0199726-005 submitted on 9/11/2006.*
 - a. Indicate if this is the approved closure plan being referred to. If not, submit the correct approved closure plan or reference information so it can be located in our files.*

- b. *If the closure plan in permit renewal SC49-0199726-004 and SO49-0199726-005 submitted on 9/11/2006 is the correct approved closure plan being referred to, the plan needs to be updated (for example, the final elevation has changed, the side slopes have changed, 15' benches every 40 foot NGVD have been added, etc...). Submit an updated closure plan per 62-701.600, F.A.C.*

Response # 3:

An updated Landfill Closure Plan has been prepared and is provided as Appendix E of the Report. The text in *Section 2.4 Final Cover System Design* of the Report has been updated accordingly to reflect these changes. The revised report text and new appendix are included in **Attachment 1** of this response letter.

FDEP Comment #4

4. *On page 5 Section 2.8 Final Cover System Construction Procedure, of the Report, states the geomembrane layers will tie-in to the existing closed areas as shown in the Construction Drawings. The tie-in should also be completed per the requirements of the CQA Plan, Section 6 Geomembrane. Include a statement either in Section 2.8 or in the notes of Construction Drawing 11 stating that the tie-in to the existing closed area geomembrane per the requirements of the CQA Plan, Section 6 Geomembrane.*

Response # 4:

The text in *Section 2.8 Final Cover System Construction Procedure* of the Report has been modified, stating that the tie-in to the existing closed area geomembrane “*will be performed as shown in the Construction Drawings and following the requirements of the CQA Plan, Section 6 Geomembrane*”. The revised report text is included in **Attachment 1** of this response letter.

FDEP Comment #5

5. *Provide a time and event schedule for the Final Closure of the Upper Side Slopes and Top Areas of Phase I (Cells 1 through 4).*

Response # 5:

The estimated start date of the construction activities associated with the JED Facility partial closure is 1 November 2011. The duration of the construction activities associated with the Phase 1 closure is estimated to be approximately 5 months. The estimated start and end dates may vary depending on the completion of ongoing fill operations in the proposed partial closure area, as well as seasonal weather issues.

Mr. Thomas Lubozynski, P.E.
28 April 2011
Page 4

CLOSURE

If you have any questions or require additional information, please do not hesitate to contact Mr. Mike Kaiser of Waste Services, Inc. at (904) 673-0446, mkaiser@wsii.us, or the undersigned at (813) 558-0990.

Sincerely,



4/28/2011

Craig Browne, P.E.
Engineer
P.E. Number 68613



Attachments

Copies to: Mike Kaiser, WSI

ATTACHMENT 1

Revised Text and Appendix E of Engineering Report

Applicant:



Omni Waste of Osceola County, LLC

1501 Omni Way
St. Cloud, Florida 34773

**PARTIAL LANDFILL CLOSURE –
APPLICATION FOR AN INTERMEDIATE
PERMIT MODIFICATION**

J.E.D. SOLID WASTE MANAGEMENT FACILITY

**1501 Omni Way
St. Cloud, Osceola County, Florida 34773**

Prepared by:

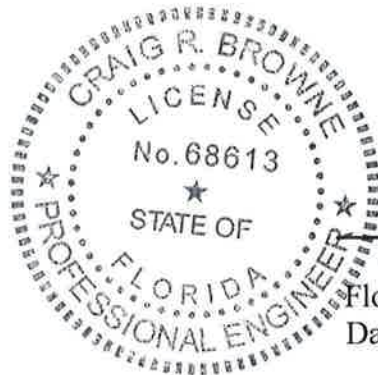
Geosyntec

consultants

13101 Telecom Drive, Suite 120
Temple Terrace, FL 33637
Cert. of Authorization No. 4321

Project No. FL1858

March 2011
(Revised April 2011)




Craig Browne, P.E.
Florida Registration No. 68613
Date: 4/28/2011

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APPENDICES

Appendix A	FDEP Form 62-701.900(1)
Appendix B	Construction Drawings
Appendix C	Technical Specifications
Appendix D	Partial Closure Cost Estimate
Appendix E	Closure Plan

1 INTRODUCTION

1.1 Terms of Reference

Geosyntec Consultants (Geosyntec) has prepared this partial landfill closure design report as part of an intermediate modification to the existing Florida Department of Environmental Protection (FDEP) solid waste permit (Permit Nos. SC49-0199726-004 and SO49-0199726-005) for the J.E.D. Solid Waste Management Facility (JED Facility), a Class I landfill located in Osceola County, Florida (west of highway U.S. 441, approximately 6.5 miles south of Holopaw). The JED Facility is owned and operated by Omni Waste of Osceola County, LLC (Omni).

This intermediate modification application is submitted to the FDEP Central District on behalf of Omni, and was developed to comply with the requirements of Chapter 62-701 of the Florida Administrative Code (F.A.C.). FDEP Form 62-701.900(1), *Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility* has been used to verify the completeness of this report, and is included as Appendix A. Those items for which responses have not substantially changed from previous submittals to FDEP have been marked on the application form in Appendix A as “N/C” for no change.

Construction Drawings titled “Partial Landfill Closure Construction – Event 2, Phase 1 Disposal Area” show plans, cross-sections, and details associated with the partial landfill closure, and are included in Appendix B. These Drawings are intended to provide sufficient detail for approval and construction. Technical specifications for construction materials associated with the partial landfill closure are provided in Appendix C of this report.

This report was prepared by Dr. Victor M. Damasceno and Mr. Craig R. Browne, P.E., of Geosyntec. Professional engineer certification is provided on the cover sheet of this report, on the FDEP Form 62-701.900(1), on the cover page of the technical specifications, and on each sheet of the Construction Drawings.

1.2 Purpose and Scope

~~The JED Facility has an approved closure plan, including a construction quality assurance (CQA) plan and financial assurance mechanism, under Permit Modification Nos. SC49-0199726-006 and SO49-0199726-007, for final closure of the facility.~~ This intermediate permit modification application has been prepared to modify the existing permits to facilitate partial closure of the facility. The purpose of this report is to describe the landfill closure design that will be implemented to partially close the upper side slope and top slope areas of the Phase 1 disposal area at the JED Facility. It is the intent of this report to address all the applicable parts of the FDEP Form 62-701.900(1) in accordance with all the applicable provisions of Chapter 62-701, F.A.C., specifically Rules 62-701.500 and 600.

1.3 Report Organization

In accordance with Rule 62-701.600, F.A.C., the remainder of this report describes the partial landfill closure design and supporting documentation, i.e., Construction Drawings and Technical Specifications. Details regarding the proposed final cover system design are provided in Section 2.

2 PARTIAL CLOSURE DESIGN

2.1 Introduction

In accordance with Rule 62-701.600(3), F.A.C., the closure design for the JED Facility was developed to provide the final cover system design that applies to the entire landfill. Areas of the side slopes of the Phase 1 disposal area were partially closed in 2009 and include side slopes from the toe of Cells 1 – 4 up to an approximate elevation of 180 feet National Geodetic Vertical Datum (NGVD). This partial closure event was certified by the FDEP on March 16, 2010. This report describes the closure of the additional areas of the Phase 1 disposal area (i.e., portion of the side slope and top deck). The Construction Drawings provided in Appendix B present the existing site topography, final cover grades, sections and details regarding this partial closure event of the JED Facility.

2.2 Construction Quality Assurance Plan

The partial closure of the JED Facility will be constructed using industry standard construction practices and the facility approved construction quality assurance (CQA) plan. In accordance with Rule 62-701.600(3)(f)1, F.A.C., the CQA Plan for construction activities associated with final closure, including final cover system construction, was submitted as part of a permit application titled “Major Modification Application for Vertical Expansion of the J.E.D. Solid Waste Management Facility, Phases 1 through 3” dated September 2007, which is on file with FDEP. This CQA Plan is adequate to complete the closure activities described herein.

2.3 Technical Specifications

The partial closure of the JED Facility will be constructed with quality materials. The technical specifications for all construction materials, including the final cover system geosynthetics and soils are presented in Appendix C of this report.

2.4 Final Cover System Design

In accordance with Rule 62-701.600(3)(f)2, F.A.C. ~~and the approved closure plan of Permit Modification Nos. SC49-0199726-006 and SO49-0199726-007~~, final cover will be placed over the entire surface of each solid waste disposal unit within 180 days after final waste placement. The final cover system along the side and top slopes of Phase 1 at the JED Facility will be constructed after final waste grade elevations are achieved, ~~and in accordance with the items outlined in this section and the Closure Plan provided as Appendix E of this Report.~~ design details of Permit Modification Nos. SC49-0199726-006 and SO49-0199726-007. The partial closure of the JED Facility involves construction of the final cover system from an elevation of approximately 180 ft NGVD to the maximum elevation of approximately 272 ft, NGVD. The landfill partial closure will have side slopes graded at 3H:1V, with 15-ft wide benches at elevations 218 and 258 ft, NGVD.

Drainage swales will be constructed along the landfill benches to collect and divert surface water runoff via downdrains to the storm water ponds and ditches at the toe of the landfill slope. This will help minimize erosion at the surface of the landfill cover system.

In accordance with Rule 62-701.600(3)(g), F.A.C., the proposed final cover system on the landfill side slopes is presented in the Construction Drawings and consists of, from top to bottom:

- a 0.5-ft thick vegetative layer;
- a 1.5-ft thick cap protective layer (vegetative support layer);
- a geocomposite drainage layer;
- a 40-mil thick polyethylene (PE) geomembrane; and
- a 1-ft thick intermediate cover layer.

The proposed final cover system on the top deck consists of, from top to bottom:

- a 0.5-ft thick vegetative layer;
- a 1.5-ft thick cap protective layer (vegetative support layer);
- a 40-mil thick polyethylene (PE) geomembrane; and
- a 1-ft thick intermediate cover layer.

The following sections discuss the various components of the approved final cover system.

2.5 Final Cover System Materials

2.5.1 Vegetation

The surface of the final cover system will be vegetated either by hydroseeding, sodding, or other equivalent method. The minimum requirements of the grass seed and sod are presented in the Technical Specifications attached as Appendix C to this report.

2.5.2 Vegetative and Cap Protective Layers

The upper 6 inches of the final cover system will consist of a soil suitable to sustain a good stand of grass. The cap protective layer below the vegetative layer will consist of 18 inches of permeable soil.

2.5.3 Geocomposite and Geomembrane Layers

A geocomposite drainage layer underlain by a 40-mil PE geomembrane will be used in combination to provide a lateral drainage layer and barrier layer, respectively, to reduce infiltration of storm water through the final cover system into the waste. This geosynthetic combination will be utilized along the landfill side slopes. Specified property values for the geocomposite and 40-mil geomembrane layers are provided in the Technical

Specifications attached as Appendix C to this design report. The specified geomembrane meets the requirements of Rule 62-701.600(3)(g)(4), F.A.C.

2.5.4 *Intermediate Cover Layer*

A 1-ft thick soil layer will be constructed below the geomembrane to provide a suitable foundation layer for placement of the final cover geomembrane. The intermediate cover layer will consist of general fill, and will be placed on top of the daily cover layer.

2.6 **Surface Water Drainage System Design**

The relevant features of the surface water drainage system for the JED Facility partial closure are presented in the Construction Drawings. In accordance with the approved FDEP Environmental Resources Permit (ERP) Nos. ERP49-0199752-001-EI through ERP49-0199752-003-EI and ERP49-0199752-004-EM, drainage swales will be incorporated along the side slopes of the landfill as indicated in the Construction Drawings to collect and convey surface-water runoff, and minimize the formation of erosion rills and gullies in the vegetative layer. The downrain pipes will convey storm water from the side slope benches to the storm water ponds and ditches at the toe of the landfill. The downrain pipes will be 18-inch diameter double-wall corrugated HDPE pipes (smooth inside) buried within the 2-ft thick vegetative and protective cover layers of the final cover system.

2.7 **Gas Management System**

The gas management system at JED Facility was designed in accordance with Rule 62-701.530, F.A.C. Details regarding the location of landfill gas extraction wells are provided in the Construction Drawings. No changes to the FDEP approved gas management system design are proposed in this report.

Features of the gas management system such as well heads and valves will penetrate through the final cover system. Details regarding the landfill gas system penetrations are provided in the Construction Drawings.

2.8 **Final Cover System Construction Procedure**

The surface of the intermediate cover layer will be graded and compacted to prepare a smooth base for placement of the final cover geomembrane. The geomembrane layers will cover the side and top slope areas of Cells 1 through 4 up to the final permitted elevations. ~~and will~~ The tie-in to the existing closed areas will be performed as shown in the Construction Drawings and following the requirements of the CQA Plan (dated September 2007), Section 6 Geomembrane.

2.9 Certification of Closure Construction Completion

In accordance with Rule 62-701.600(6), F.A.C., a certification of partial closure construction completion, signed and sealed by a professional engineer independent of the contractor, will be submitted to FDEP upon completion of the partial landfill closure. All substantial deviations, if any, from the approved design will be noted.

2.10 Final Cover Maintenance

In accordance with Rule 62-701.600(3) (f)4, F.A.C., a stockpile of cover material for long-term care erosion control, filling areas of subsidence, maintaining berms, and general maintenance of the facility will be maintained on-site. Additional cover material, if required, will be obtained from local borrow sources. The partial landfill closure area will be periodically inspected and maintained, as needed, by Omni.

2.11 Financial Assurance

Omni has executed a financial funding mechanism in the form of an insurance certificate for the final closure and long-term care of JED Facility. In accordance with Rules 62-701.630(3) and (4), F.A.C., final closure and long-term care cost estimates for Cells 1 through 7 have been previously approved by FDEP. No changes to the currently approved final closure and long-term care cost estimate are proposed in this partial closure report. However, a revised financial assurance cost estimate will be submitted for review and approval by the FDEP as a minor modification of the JED Facility's permit to construct and operate to allow for a reduction in the closure costs requiring financial assurance based on this partial closure event.

2.12 Closure Cost Estimate

Per FDEP Form 62-701.900(1), Part A.15, a closure cost estimate has been developed for the proposed partial landfill closure at JED. The closure costs are estimated to be approximately \$1,400,000 as detailed in Appendix D. It is noted that the unit costs presented in Appendix D are based on average bid prices for the previous (2009) partial closure event.

APPENDIX E

Closure Plan

LANDFILL CLOSURE PLAN

1 INTRODUCTION

This section describes the methodology and approach for closure of the J.E.D. Solid Waste Management Facility (JED Facility). The purpose of this section is to describe how the closure requirements of Chapter 62-701, FAC, will be met.

The remainder of this section is organized to:

- describe the closure schedule;
- describe the closure report;
- present the final cover system design;
- describe the closure operation;
- describe the closure procedures;
- present the long-term care procedures; and
- demonstrate financial responsibility.

2 CLOSURE SCHEDULE

The footprint of the proposed JED Facility covers approximately 264 acres, with a top elevation at closure of approximately 330 ft, NGVD. The currently permitted JED Facility (i.e., Cells 1 through 21) has a design capacity of approximately 53.2 million cubic yards, as presented in the 2007 Vertical Expansion Permit Application. Each portion of the proposed landfill will be closed as it reaches the maximum design height on a close-as-you-go basis.

The ongoing, partial closure of the landfill (i.e., close-as-you-go) is proposed to minimize leachate generation in the landfill. Partial closure will be accomplished concurrent with waste placement in the landfill. Areas that have reached final elevations will receive the final cover system within 180 days of reaching the final elevation, or a 12-inch thick intermediate cover will be placed over the area.

3 CLOSURE REPORT

This closure plan has been prepared to modify the existing operation permit to facilitate partial closure of the facility. The purpose of this closure plan is to describe the general aspects of the landfill closure design that will be implemented during close-as-you-go activities at the JED Facility. Furthermore, the intent of this closure plan is to address the applicable parts of the FDEP Form 62-701.900(1) in accordance with the applicable provisions of Chapter 62-701, F.A.C., specifically Rule 62-701.600.

4 FINAL COVER SYSTEM DESIGN

4.1 Introduction

The final cover system of the JED Facility will be constructed after achieving final waste elevations (i.e., close-as-you-go). The landfill will have side slopes graded at 3 horizontal to 1 vertical (3H:1V) with 15-ft wide benches every 40 vertical feet and top slopes graded at 5 percent to maximize runoff and minimize erosion.

Drainage swales will be constructed along the landfill benches to collect and divert surface water runoff via downdrains to the storm water ponds and ditches at the toe of the landfill slope. This will help minimize erosion at the surface of the landfill cover system.

The maximum final elevation of the landfill before settlement will be 330 ft NGVD. The plans and details for the proposed final cover system are provided in the 2007 Vertical Expansion Permit Application. The various components of the final cover system are discussed in the remainder of this section.

4.2 Final Cover System Components

In accordance with Rule 62-701.600(3)(g), F.A.C., the proposed final cover system on the landfill 5 percent top slopes is presented in the Construction Drawings and consists of, from top to bottom:

- 0.5-ft thick vegetative layer
- 1.5-ft thick cap protective layer
- 40-mil thick smooth polyethylene (PE) geomembrane
- 1-ft thick (minimum) intermediate cover layer over the compacted waste

The final cover system on the 3H:1V side slopes of the landfill as indicated on the Construction Drawings consists of, from top to bottom:

- 0.5-ft thick vegetative layer
- 1.5-ft thick cap protective layer
- geocomposite drainage layer
- 40-mil thick textured PE geomembrane
- 1-ft thick (minimum) intermediate cover layer over the compacted waste

4.3 Final Cover System Materials

4.3.1 Vegetation

The surface of the final cover system will be vegetated either by seeding or sodding. The grass seed or sod will be Bahia, which has a high tolerance to drought. The contractor may

use an alternate grass seed contingent upon proof that the grass is drought-resistant. The minimum requirements of the grass seed and sod are presented in the Technical Specifications attached as Appendix C of the partial landfill closure design report.

4.3.2 Vegetative and Cap Protective Layers

The upper 6 inches of the final cover system will consist of loosely placed vegetative layer and will be vegetated to minimize erosion. The cap protective layer below the vegetative layer will consist of 18 inches of on-site soil (or approved equal). The cap protective layer will be compacted in the upper 6 inches during construction to inhibit root penetration into the drainage layer underlying the cap protective layer on the side slopes.

4.3.3 Geocomposite Drainage Layer

A geocomposite drainage layer consisting of a geotextile filter, a geonet drainage layer, and a geotextile friction layer will be placed beneath the cap protective layer on the 3H:1V side slopes. The geotextile filter, the geonet drainage layer, and the geotextile friction layer are bonded together to form the geocomposite drainage layer. The function of the proposed geotextile filter is to prevent soil particles of the overlying cap protective layer from penetrating and clogging the underlying geonet drainage layer. The purpose of the drainage layer is to remove the storm water reaching the geonet and to minimize the potential of pore water pressure build-up in the overlying cap protective layer. The purpose of the geotextile friction layer is to increase the interface friction between the geomembrane and the geonet and thereby increase the stability of the final cover system.

4.3.4 Geomembrane

A geomembrane is proposed as a component of the final cover system to reduce infiltration of the storm water through the final cover system into the waste. The specified geomembrane is a 40-mil thick textured polyethylene geomembrane on the 3H:1V side slopes and a smooth polyethylene geomembrane on the 5 percent top deck surface. The texturing is necessary to increase the stability of the final cover system. Specified property values for the final cover geomembrane are provided in the Technical Specifications attached as Appendix C of the partial landfill closure design report. The specified geomembrane meets the requirements of Section 62-701.600(3)(g), FAC.

4.4 Final Cover System Construction Procedure

The surface of the intermediate cover will be graded and compacted to prepare a smooth base for the final cover geomembrane. The geomembrane and the geocomposite drainage layer will be tied into the existing final cover termination location. At the termination point, the final cover geomembrane will be welded to the existing cap geomembrane. The geocomposite drainage layer will be terminated into drainage pipes that discharge into the drainage swales. The details of the final cover geomembrane and the geocomposite drainage layer termination are presented in the Construction Drawings.

4.5 Final Cover System Design

The general design of the final cover system is the same as that presented in the 2007 Vertical Expansion Permit Application. Namely, the final cover system will include 3H:1V side slopes (between benches) with 15-ft wide benches every 40 vertical feet (at elevations 138, 178, 218, 258, and 298 feet, NGVD) and the top slopes will be graded at 5 percent.

The final cover system performance evaluation provided in Appendix H of the 2007 Vertical Expansion Permit Application remains valid because the configuration of the side slopes remains unchanged. The final cover system performance evaluation included analysis of head on the geomembrane in the final cover system, veneer stability, and soil erosion resistance.

4.6 Surface-Water Drainage System

Drainage swales are incorporated in the final cover system on the top and on the side slopes of the landfill as indicated in the 2007 Vertical Expansion Permit Drawings. The drainage swales will convey water to the downdrains. The downdrains will convey the storm water runoff to the storm water retention basins at the toe of the landfill. The downdrains consist of corrugated HDPE pipes that tie into energy dissipater/junction boxes located at the toe of the waste slope.

Design calculations confirming the adequacy of the drainage swales and the downdrains to convey the storm water runoff are presented in the 2007 *Major Modification of Environmental Resources Permit Applications for Vertical Expansion of the J.E.D. Solid Waste Management Facility*.