Submitted to:

Florida Department of
Environmental Protection

CERTIFICATION REPORT
CONSTRUCTION OF CELL 1B
Oak Hammock Disposal Facility
Osceola County, Florida

Prepared for

Omni Waste

Omni Waste of Osceola County, LLC
1501 Omni Way
Holopaw, Florida

d by

GeoSyntec Consultants

iveredge Drive, Suite 300
Florida 33637

Number FX0521
4

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

ELECTRONIC MAIL

May 14, 2004

Mr. Timothy J. Salopek, President
(tjsomni@aol.com)
Omni Waste of Seminole County, LLC
1501 Omni Way
Holopaw, Florida 34773

OCD-SW-04-0164

Osceola County SW
Oak Hammock Disposal Facility
Certification of Construction Completion

Dear Mr. Salopek:

This will acknowledge receipt of the *Certification of Construction Completion of a Solid Waste Management Facility*, dated, May 5, 2004, by Kenneth W. Cargill, P.E. of GeoSyntec Consultants, addressing Cell 1B.

Based upon my inspection on May 6, 2004, construction of the Cell 1B, as certified by the professional engineer of record, has been completed and is substantially consistent with plans and specifications approved under DEP Permit No. SC49-0199726-001. Accordingly, solid waste may be placed in Cell 1B for disposal.

Please contact me at 407-893-3329 if you have questions or need further information.

Sincerely,

James N. Bradner

James N. Bradner, P.E., Manager
Solid and Hazardous Waste Program

/jnb

cc: David S. Dee, Landers and Parsons (ddee@landersandparsons.com)
Kenneth Cargill, P.E., GeoSyntec Consultants (kcargill@geosyntec.com)

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Environmental Protection

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Prepared for

Omni Waste

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1501 Omni Way
Holopaw, Florida

Prepared by

GeoSyntec Consultants

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637

Project Number FX0521
May 2004

GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637 • USA
Telephone (813) 558-0990 • Fax (813) 558-9726

5 May 2004

Mr. James N. Bradner, P.E.
Program Manager, Solid/Hazardous Waste
Florida Department of Environmental Protection, Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Re: Certification Report, Cell 1B
Oak Hammock Disposal Facility
Omni waste of Osceola County, LLC
Permit Application Nos. SC49-0199726-001

Dear Mr. Bradner:

Submitted herewith are two (2) copies of the certification report (including Record Drawings) for Cell 1B at the Oak Hammock Disposal Facility in Osceola County, Florida. FDEP form #62-701.900(2) titled *Certification of Construction Completion of a Solid Waste Management Facility*, completed and signed, is also attached.

If you have any questions or need additional information, please do not hesitate to contact the undersigned.

Sincerely,

Kenneth W. Cargill, P.E.
Principal

Attachments

Copy: Mr. Lenny Marion, Omni Waste of Osceola County

Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No. _____
(Filled by DEP)

Certification of Construction Completion of a Solid Waste Management Facility

DEP Construction Permit No: SC-49-0199726-001 County: Osceola

Name of Project: Oak Hammock Disposal Facility

Name of Owner: Omni Waste of Osceola County, L.L.C.

Name of Engineer: GeoSyntec Consultants

Type of Project: Construction of a Class I Solid Waste Landfill Facility, Cell 1B

Cost: Estimate $ 1.66 million Actual $ 2.0 million

Site Design: Quantity: 1,700 ton/day Site Acreage: Cell 1B, Approximately 7 Acres

Deviations from Plans and Application Approved by DEP:

No significant deviations from the approved plans and permit application.

Address and Telephone No. of Site: 1501 Omni Way, Holopaw, Florida 34773, Phone: (407) 891-3720

Name(s) of Site Supervisor: Leonard Marion (Omni)

Date Site inspection is requested: 6 May 2004

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No. SC-49-0199726-001 :Dated: 18 October 2002

Date: 5 May 2004

Signature of Professional Engineer

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

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

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

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

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1. INTRODUCTION

1.1 Overview

This certification report summarizes the Construction Quality Assurance (CQA) activities performed by GeoSyntec Consultants (GeoSyntec) of Tampa, Florida during construction of Cell 1B at the Oak Hammock Disposal Facility (OHDF), a Class I landfill, in Osceola County, Florida. The CQA activities performed by GeoSyntec include monitoring of:

(i) earthwork construction;

(ii) geosynthetics installation;

(iii) leachate collection system construction; and

(iv) miscellaneous activities associated with development of the landfill.

The CQA activities were performed to confirm that the construction materials and procedures were in compliance with the Construction Permit SC49-0199726-001 issued by the Florida Department of Environmental Protection (FDEP) Central District in accordance with Chapter 62-701, Solid Waste Management Facilities, Florida Administrative Code (FAC).

This certification report was prepared for Messrs. Timothy Salopek and Leonard Marion of Omni Waste of Osceola County, LLC (Omni). It was prepared by Mr. Ayushman Gupta P.E., Mr. Kirk Wills, and Ms. Aidee Cira, and was reviewed by Mr. Ken Cargill, P.E., all of GeoSyntec.

It is noted that this certification report covers the construction of Cell 1B only. Certification for construction of Cell 1A and initial leachate management systems was included in GeoSyntec's report entitled *"Certification Report, Construction of Cell 1A and Leachate Storage Area"*, which was submitted to FDEP in January 2004. Hereafter, the certification report for Cell 1A and the initial leachate management systems is referred to as Certification Report 1.

The liner system of Cell 1A is continuous through Cell 1B except for the primary geocomposite drainage layer. The liner system in Cell 1 terminates in an anchor trench in the intercell berms between Cells 1 and 2 on the east side and Cells 1 and 4 on the south side. Cell 1A is separated from Cell 1B by an inner cell berm and a geomembrane rain flap. The geomembrane rain flap was installed to allow discharge of clean storm water runoff from Cell 1B area prior to waste disposal in Cell 1B.

1.2 Report Organization

This certification report is organized as described below.

- A brief description of the project is provided in Section 2;
- A summary of the CQA program is presented in Section 3;
- A description of the CQA monitoring and testing activities performed during earthwork related construction activities in Cell 1B is provided in Section 4;
- A description of the CQA monitoring and testing activities performed during the geosynthetics installation in Cell 1B is provided in Section 5;
- A description of the CQA monitoring and testing activities performed during construction of the leachate collection system in Cell 1B is provided in Section 6;
- A description of the CQA monitoring and testing performed during miscellaneous activities associated with development of the landfill is provided in Section 7; and
- A summary of the observations resulting from the CQA monitoring and testing activities performed by GeoSyntec and a certification statement signed and sealed by a professional engineer registered in the State of Florida are presented in Section 8.

Record drawings presenting as-built surveys for primary and secondary liners installed in Cell 1B are included in Appendix A. A photographic log of major construction activities is included in Appendix B of this report.

2. PROJECT DESCRIPTION

2.1 General

The OHDF is located in eastern Osceola County, Florida, west of highway U.S. 441, approximately 6.5 miles south of Holopaw. The landfill facility is connected to highway U.S. 441 by a 2.86-mile improved access road, which was constructed as part of the overall project site development.

The OHDF site comprises a total of approximately 2,179 acres. The landfill footprint at build-out is approximately 264 acres and consists of a total of 21 landfill cells that provide available waste capacity for a period of approximately 30 years. FDEP issued a construct and operate permit for the landfill on 18 October 2002. The first five-year construct and operate permit is referenced as Phase 1. Phase 1 includes up to four landfill cells (Cells 1 through 4) in the northern part of the landfill and covers approximately 52 acres. Phase 1 will provide available waste capacity for a period greater than five years based on the projected incoming waste rate of approximately 1,700 tons per day.

The construction of Cell 1 was split into a northern half (Cell 1A) and a southern half (Cell 1B). The construction of Cell 1A, first half of Cell 1 in the Phase 1 development, was completed in January 2004. The construction of Cell 1B was completed in April 2004. The liner system of Cell 1A is continuous through Cell 1B except for the primary geocomposite drainage layer. For initial operation, Cells 1A and 1B are separated by a temporary inner cell berm and a rain flap. After Cell 1A is filled to the planned height, the inner cell berm and rain flap will be removed, the leachate collection systems in Cells 1A and 1B will be connected, and the cell will then operate as a single unit (i.e., Cell 1).

2.2 Construction Activities

This certification report pertains to CQA monitoring and testing activities performed for construction of Cell 1B only. The construction of Cell 1B included earthwork, liner system installation, and leachate collection system construction as indicated in the construction drawings prepared for the initial phase of construction. The CQA monitoring and testing activities performed for construction of Cell 1A and the initial leachate management systems were discussed in the Certification Report 1 (GeoSyntec, January 2004).

The landfill design incorporates a double-composite liner system and other engineering controls that meet or exceed the requirements of Chapter 62-701, FAC. The Cell 1B liner system consists of the following components (from top to bottom):

- minimum 24-in. (610-mm) thick liner protective layer;

- primary geocomposite drainage layer, consisting of a high-density polyethylene (HDPE) geonet with a needle-punched, non-woven geotextile heat bonded to each side, hereafter referred to as primary geocomposite;

- primary liner, consisting of a 60-mil (1.5-mm) thick textured HDPE geomembrane;

- primary geosynthetic clay liner (GCL) consisting of needle-punched reinforced composite composed of granular sodium bentonite encapsulated between non-woven geotextiles (with needle-punched fibers thermally fused to the bottom scrim reinforced non-woven geotextile);

- secondary geocomposite drainage layer, consisting of a HDPE geonet with a needle-punched, non-woven geotextile heat bonded to each side, hereafter referred to as secondary geocomposite;

- secondary liner, consisting of a 60-mil (1.5-mm) thick textured HDPE geomembrane;

- secondary GCL consisting of needle-punched reinforced composite composed of granular sodium bentonite encapsulated between non-woven geotextiles (with needle-punched fibers thermally fused to the bottom scrim reinforced non-woven geotextile); and

- minimum 6-in (152-mm) thick prepared subbase.

The Cell 1B leachate collection system consists of the following components:

- a 6-in. diameter perforated leachate collection pipe surrounded by gravel aggregate and non-woven geotextile filter fabric, as part of the primary leachate collection system; and

- a 6-ft wide secondary geocomposite layer as part of the secondary leachate collection system;

3. CONSTRUCTION QUALITY ASSURANCE PROGRAM

3.1 General

The scope of CQA monitoring, testing, and documentation services performed by GeoSyntec during the OHDF construction included review of documents, field CQA operations, and preparation of a final certification report and record drawings for the liner system. These activities are described in the following sections of this report.

GeoSyntec provided the CQA monitoring, testing, and documentation as well as the original design and construction drawings. A list of personnel involved in construction of the OHDF is included in Section 3.5 of this report.

The earthwork for construction of Cell 1B commenced on 21 October 2003. The installation of the liner system in Cell 1B commenced 8 March 2004. The placement of the liner protective layer in Cell 1B commenced on 31 March 2004. Construction of the Cell 1B described in this certification report was completed 25 April 2004.

3.2 Related Documents

As previously noted, this certification report summarizes the CQA activities performed by GeoSyntec during construction of the OHDF. The CQA activities conducted by GeoSyntec were intended to satisfy the requirements of the following documents:

- permit application entitled "*Application for a Permit to Construct and Operate a Class I Landfill*", prepared and submitted by GeoSyntec of Tampa, Florida on 24 May 2002 and approved by the FDEP Central District on 18 October 2002;
- "*Construction Quality Assurance (CQA) Plan*", Appendix Q of the OHDF Permit Application, dated May 2002;
- "*Technical Specifications*", Appendix P of the OHDF Permit Application, dated May 2002;
- permit drawings entitled "*Oak Hammock Disposal, A Solid Waste Facility*", dated May 2002;
- construction drawings entitled "*OHDF Site Access and Storm Water Management*" and Project Manual containing Technical Specifications, dated May 2003, prepared by GeoSyntec of Tampa, Florida; and

- construction drawings entitled "*OHDF Cell 1 and Leachate Systems*" and Project Manuals for Earthwork and Geosynthetics, dated August 2003, prepared by GeoSyntec of Tampa, Florida.

All of the above documents are collectively referred to as the CQA Documents hereafter in this certification report. During construction, minor modifications to include clarifications to the intent of the design and changes to accommodate existing site conditions or preferred construction techniques were made to these documents. However, no substantial changes were made to the CQA Documents.

Certification for construction of Cell 1A and initial leachate management systems was included in GeoSyntec's report entitled *"Certification Report, Construction of Cell 1A and Leachate Storage Area"*, which was submitted to FDEP in January 2004. As noted earlier, this certification report is referred to as Certification Report 1 in this report.

3.3 Field CQA Operations

The following activities were performed as part of GeoSyntec's on-site CQA services:

Earthwork:

- collecting samples of soils used as general fill to construct the subgrade and liner subbase in Cell 1B for testing at either an on-site or an off-site geotechnical laboratory;
- collecting samples of soils used in the liner protective layer for testing at either an on-site or an off-site geotechnical laboratory;
- reviewing and evaluating geotechnical laboratory test results to ensure compliance with the requirements of the CQA Documents;
- monitoring placement, grading, and compaction of earthwork related construction activities;
- testing in-situ density, moisture content, and/or percent compaction of earthwork related construction activities to ensure compliance with the requirements of the CQA Documents;
- notifying Contractor of areas that need additional compaction based on failing in-situ tests and re-testing these areas to ensure compliance with the requirements of the CQA Documents; and
- monitoring anchorage of the geosynthetics in the perimeter anchor trenches.

Geosynthetics:

- monitoring delivery and storage and tracking the inventory of geosynthetic materials delivered for the project;
- coordinating the collection of geosynthetic conformance samples from in-plant sources or delivered rolls and forwarding samples to an off-site geosynthetics testing laboratory;
- collecting and reviewing geosynthetic manufacturers' quality control (MQC) and certification documents and geosynthetic laboratory conformance test results to verify compliance with the requirements of the CQA Documents;
- monitoring installation of geosynthetic materials in Cell 1B including trial seams, destructive and nondestructive tests, and repair operations; and
- performing destructive testing of geomembrane seams at the minimum frequency required by the CQA Documents.

Leachate Collection System:

- reviewing quality control (QC) documents of materials used in the leachate management system, geotechnical laboratory conformance test results on samples of aggregate, and geosynthetic laboratory conformance test results on samples of geotextile filter/separator fabric to verify compliance with the requirements of the CQA Documents; and
- monitoring construction of leachate collection system in Cell 1B.

Miscellaneous Activities:

- monitoring placement, grading, and compaction of check dams as required by the CQA Documents;
- monitoring restoration of wetlands at check dams as required by the CQA Documents; and
- monitoring placement, grading, and compaction of limerock base course along the perimeter maintenance road around Cell 1.

During construction activities involving monitoring and/or testing, the observations made and results obtained by GeoSyntec CQA personnel were compared with the requirements of the CQA Documents. The construction manager and the appropriate contractor were notified of deficiencies in construction practices and/or materials to

ensure appropriate corrective actions are taken. The corrective actions were monitored and/or tested by CQA personnel to ensure compliance with the requirements of the CQA Documents.

3.4 Certification Report and Record Drawings

Record drawings for Cell 1B primary and secondary liners and this CQA certification report were prepared as the final task of the CQA program for construction of Cell 1B. This certification report summarizes the CQA monitoring, testing, and documentation activities performed by GeoSyntec.

During construction, CQA monitoring and testing activities were documented by CQA personnel in Daily Field Reports (DFRs) and various other forms. In addition, QC certificates for the geosynthetic and other materials and surveyor's data were provided to GeoSyntec for review. These and other documents are maintained by GeoSyntec and will be made available for FDEP review upon request. Results of CQA monitoring and testing activities that are critical with respect to the adequate performance of the OHDF landfill and protection of the surrounding environment have been summarized in a tabular form and are included in this certification report.

3.5 Project Personnel

Senior personnel or representatives of the firms involved in the project are as follows:

Owner: Omni Waste of Osceola County, LLC

- Tim Salopeck, President
- Lenny Marion, Operations Manager

CQA Consultant: GeoSyntec Consultants - Tampa, Florida

- Ken Cargill, P.E., Project Manager and Certification Engineer
- Ayushman Gupta, P.E., Project Engineer
- Kirk Wills, Field Services Manager
- Rick Hastie, Site CQA Manager

Earthwork Contractor: Lundquist Excavating, Inc., Kissimmee, Florida

- William Lundquist, Project Manager

- Fred Brunson, Project Manager
- Kenny Jones, Site Superintendent/Surveyor

Earthwork Subcontractor: Bul-Hed, Mulberry, Florida

- Jerry Martin, Project Manager
- Ruben Brock, Site Superintendent

Geosynthetics Installer: Comanco Environmental Corporation, Tampa, Florida

- Jerry Pryor, Project Manager
- Edgar Mejia, Site Superintendent

Leachate System Contractor Comanco Environmental Corporation, Tampa, Florida

- Steve Kitzmiller, Project Manager
- Mike D'Orazio, Site Superintendent

Surveyor: Atlantic Land Design, Orlando, Florida

- Gary Burden, P.L.E., Professional Surveyor

Geotechnical Laboratories: Excel Geotechnical Testing, Roswell, Georgia

- Nader Rad, Ph.D., P.E., Project Manager

Atlantic Testing Laboratories, Inc., Melbourne, Florida

- Donald Tucker Jr., P.E., Project Manager

Geosynthetics Laboratory: Texas Research Institute, Austin, Texas

- Sam Allen, Project Manager

SGI Testing Services, LLC, Norcross, Georgia

- Rob Swan, Project Manager

4. CONSTRUCTION QUALITY ASSURANCE - EARTHWORK

4.1 General

GeoSyntec monitored earthwork related to construction of Cell 1B of the OHDF landfill. Earthwork activities in Cell 1B included construction of intercell berms between Cells 1B and 2 on the east side and Cells 1B and 4 on the south side, installation of liner protective layer, and anchorage of the geosynthetic components of the double-composite liner system. Earthwork related to construction of Cell 1B is discussed herein. Earthwork related to the landfill perimeter berm; Cell 1A including the intercell berm (between Cells 1A and 2); leachate storage area berms; low-permeability soil layer in sump area of six cells; liner protective layer; building pads; site access road; landfill haul roads (including haul road to leachate storage area and cell access road); storm water management berms (along access road, around the landfill footprint, and around the borrow area); and anchorage of the geosynthetic components of the double-composite liner system in Cell 1A and leachate storage area were discussed in the Certification Report 1 (GeoSyntec, January 2004).

The materials used to construct Cell 1B included general fill and liner protective layer soils. General fill was used to construct Cell 1B base, intercell berms, 6-inch liner subbase, and to anchor the geosynthetics. The liner protective layer soils were used to cover the geosynthetics components of the liner system in Cell 1B.

CQA personnel observed the earthwork related construction activities and tested the soils to confirm that the material properties conformed to the CQA Documents, maximum lift thicknesses were not exceeded, and compaction requirements were met. GeoSyntec personnel also performed geotechnical soil tests during construction. The testing was performed in-situ, in the on-site geotechnical laboratory, or at off-site geotechnical laboratories. The off-site geotechnical laboratories included Atlantic Testing Laboratories, Inc. (ATL) in Melbourne, Florida and Excel Geotechnical Testing (EGT) in Roswell, Georgia.

4.2 Soil Source and Requirements

The general fill and liner protective layer soils were obtained from an on-site borrow area (Borrow Area A). Representative samples of general fill and liner protective layer soils were obtained and tested to verify conformance with specified material requirements in the CQA Documents. The geotechnical tests were performed to confirm that the following requirements were met for the general fill and liner protective layer soils.

- *General Fill:* classified as SW, SP, or SM in accordance with the Unified Soil Classification System (USCS) per ASTM D 2487 and was relatively free of

debris, foreign objects, large rock fragments, organic matter, and other deleterious materials. In addition, general fill used as liner subbase in Cell 1B was free of sharp materials or materials larger than 0.5 inches.

- *Liner Protective Layer Soils:* classified as SW or SP in accordance with the USCS; had maximum particle size of 0.75 inches; had fines content of less than 5 percent per ASTM D 1140; had carbonate content of less than 5 percent per ASTM D 4373; and were relatively homogeneous soils free of deleterious materials. Regardless of the classification, liner protective layer soil was required to exhibit a hydraulic conductivity no less than 1.0×10^{-3} cm/sec in accordance with ASTM D 2434.

A description of the geotechnical tests performed on placed materials and results of these tests are presented below.

4.3 CQA Monitoring and Testing

GeoSyntec's CQA personnel monitored the placement and/or compaction of soils as described in Section 3. At times, several earthwork construction operations were conducted simultaneously. When this occurred, the on-site personnel monitored the operations considered most critical to the performance of the landfill liner system. Potentially nonconforming or questionable practices observed by CQA personnel were brought to the attention of the concerned parties for review and correction.

As part of CQA activities, geotechnical testing was performed on the soils used in construction of Cell 1B of the OHDF landfill. Depending on the specific test, testing was performed in-situ, at the on-site laboratory, or at an off-site laboratory (ATL or EGT).

The following geotechnical tests were performed:

- in-situ nuclear moisture/density tests on compacted lifts of general fill (the tests were performed in accordance with ASTM D 2922 for density and ASTM D 3017 for moisture content);

- in-situ density tests using the sand cone method (ASTM D 1556) to compare to the density tests results obtained using the nuclear gauge;

- moisture content tests on general fill in accordance with ASTM D 2216;

- standard Proctor compaction tests on general fill in accordance with ASTM D 698;

- grain-size analysis or fines content determination in accordance with ASTM D 422, ASTM C 136, or ASTM D 1140, respectively;

- hydraulic conductivity tests on the liner protective layer soils in accordance with ASTM D 2434; and

- interface friction tests for the interfaces between general fill and GCL and between liner protective layer soil and primary geocomposite, as discussed in Section 5.

GeoSyntec supplied two nuclear gauges (Troxler Model #3440 Serial #15334 and Troxler Model #3430 Serial #27657) that were used to perform the moisture/density tests. The gauges were calibrated daily prior to use by the "standard count" method. These counts were recorded on standard count logs, which are not included in the certification report but are available for review upon request. The in-situ density tests using the sand cone method (ASTM D 1556) were performed periodically to compare to the density tests results obtained using the nuclear gauge.

4.4 General Fill

CQA personnel monitored the excavation (from the Borrow Area A), placement, and compaction of general fill, which was used to construct the Cell 1B base, intercell berms, 6-inch liner subbase, and anchorage of geosynthetics. Earthwork in Cell 1B using general fill consisted of following activities:

- monitoring existing subgrade by CQA personnel to confirm that unsuitable materials were removed;

- proof rolling of subgrade by the contractor to detect soft or loose zones using scraper pans, articulated dump trucks, or tires of heavy equipment;

- excavating and hauling general fill from on-site source, Borrow Area A, using scraper pans or excavators and articulated dump trucks;

- placing and spreading general fill in relatively thin lifts using scraper pans and bulldozers or articulated dump trucks and bulldozers;

- compacting general fill using scraper pans or smooth drum rollers;

- scarifying surface of each compacted lift using tracks of a bulldozer or tires of heavy equipment, prior to placement and compaction of subsequent lifts; and

- surveying the limits and elevations of the compacted general fill (Record Drawing for compacted general fill in Cell 1B is included in Appendix A).

General fill was required to be compacted to at least 95 percent of the corresponding standard Proctor (ASTM D 698) maximum dry unit weight. The geotechnical tests performed on compacted general fill materials are discussed below.

4.4.1 Standard Proctor Tests

Standard Proctor tests were performed to evaluate the percent compaction from the measured in-situ densities of compacted general fill. Standard Proctor tests were required to be performed at a minimum frequency of 1 test per 25,000 cubic yards (cyd) of compacted general fill.

Eight standard Proctor tests were performed during construction for approximately 127,000 cyd of compacted general fill placed in Cell 1B. The CQA test frequency of 1 test per 16,000 cyd (approx.) of compacted general fill exceeded the minimum testing frequency required by the CQA Documents. The standard Proctor tests performed during construction are summarized in Table 4-1 and are presented in Figure 4-1. As noted, the maximum dry unit weight varied from 102.9 to 108.4 pounds per cubic foot (pcf) and the optimum moisture content varied from 14.0 to 16.2 percent.

4.4.2 Density and Percent Compaction

In-situ nuclear moisture/density tests were required to be performed at a frequency of 5 tests per acre per lift for earthwork performed using general fill. A minimum of two in-situ nuclear moisture/density tests were performed on each day of active earthwork related construction activities. If the density test failed to meet the minimum compaction requirements, the contractor reworked and recompacted the area surrounding the failure and the area was retested by CQA personnel. The procedure was repeated until satisfactory moisture/density test results were obtained at each test location.

Approximately 127,000 cyd of general fill was used to construct Cell 1B (Cell 1B base, intercell berms, and 6-inch liner subbase). The in-situ nuclear moisture/density tests performed to evaluate the compaction of general fill in Cell 1B are presented in Table 4-2. A total of 416 nuclear moisture/density tests were performed, which correspond to a CQA test frequency of 1 test per 305 cyd (approx.) of compacted general fill. As noted, areas corresponding to the failing test were reworked and recompacted by the contractor and retested by the CQA personnel.

4.4.3 Grain Size Analyses and USCS Classification

Grain-size distribution analyses (ASTM D 422 and ASTM C 136) were performed to evaluate the USCS classification (ASTM D 2487) of general fill materials used to construct Cell 1B. The grain size distribution analyses and USCS classification were required to be performed at a minimum frequency of 1 test per 10,000 cyd of compacted general fill.

Thirty grain-size distribution analyses and USCS classification were performed for approximately 127,000 cyd of compacted general fill used to construct Cell 1B. The CQA test frequency of 1 test per 4,200 cyd (approx.) of compacted general fill exceeded the minimum testing frequency required by the CQA Documents. The grain-size distribution analyses and USCS classification performed during construction are summarized in Table 4-3. As noted, the general fill materials used to construct Cell 1B classified as SP in accordance with the USCS classification.

4.4.4 Sand Cone Tests

In-situ moisture/densities were measured using the sand cone method (ASTM D 1556) periodically to verify the moisture/density tests results obtained using the nuclear gauge. A total of 14 moisture/densities were measured using the sand cone method and the nuclear density gauge during construction of Cell 1B and are summarized in Table 4-4. As noted, the densities measured using the two methods were in general agreement.

4.4.5 Anchorage of Geosynthetics

GeoSyntec CQA personnel periodically monitored the method of anchorage for the geosynthetic materials along the perimeter berm (on west side of Cell 1B) and the intercell berms between Cells 1B and 2 and Cells 1B and 4 (on east and south sides of Cell 1B, respectively). Along the north side of Cell 1B, each layer of geosynthetics was tied to the respective layer of geosynthetics from Cell 1A (i.e., to the layers of geosynthetics from Cell 1A that were extended into Cell 1B, under the inner cell berm, during construction of Cell 1A) except for the primary geocomposite drainage layer. In the anchor trench, geosynthetics were initially ballasted by sand bags placed over top of the last geosynthetic layer deployed. Soil was subsequently placed and compacted in the trench to provide permanent anchorage for the liner system. The construction sequence for the anchor trenches was as follows:

- a 2-ft deep by 2-ft wide (minimum) trench was excavated approximately 2 feet from the inside crest of perimeter berm and 6 feet from the inside crest of intercell berm;

- the geosynthetic components were then placed in and across the bottom of the anchor trench and ballasted with sandbags; and

- lifts of backfill were placed over the geosynthetic materials and compacted.

4.5 Liner Protective Layer Soils

Liner protective layer soil was used to cover the geosynthetic components of the liner system in Cell 1B. The minimum thickness of the liner protective layer atop the geosynthetic components of the liner system in Cell 1B was 2 feet.

Sandy soils from on-site source, Borrow Area A, were used as liner protective layer soils. CQA personnel periodically monitored the placement of the liner protective layer soils in Cell 1B. The construction sequence of liner protective layer was as follows:

- articulated dump trucks hauled the sandy soils from Borrow Area A to Cell 1B; and

- the sandy soils were spread and graded using relatively low ground pressure equipment.

During placement of the liner protective layer soils, CQA personnel periodically monitored the contractor's activities to assure that the risk of damage to the underlying geosynthetics was minimized. CQA personnel also confirmed that at least a 2-ft thick layer of sandy soils was maintained over the geosynthetics where the contractor operated the equipment. A minimum of 3-ft thick layer of sandy soils was maintained over the geosynthetics in heavily trafficked areas.

Grain-size distribution analyses (ASTM D 422 and ASTM C 136) and soil classification in accordance with USCS (ASTM D 2487) for liner protective layer soils were performed at the on-site geotechnical laboratory. The hydraulic conductivity (ASTM D 2434) tests on samples of liner protective layer soils were performed at the off-site geotechnical laboratory EGT. Grain-size distribution analyses (ASTM D 422 and ASTM C 136) and soil classification tests (ASTM D 2487) were required at a minimum frequency of 1 test per 2,000 cyd of in-place liner protective layer soils. Hydraulic conductivity tests were required at a minimum frequency of 1 test per 3,000 cyd of in-place liner protective layer soils.

A total of 24,000 cyd (approx.) of liner protective layer soils were placed in Cell 1B. Twenty five grain-size distribution analyses (and USCS classification) and 8 hydraulic conductivity tests were performed on the liner protective layer soils placed in Cell 1B. The laboratory test results are presented in Table 4-5. The CQA test frequencies of 1 test

per 950 cyd (approx.) for grain-size distribution analyses (and USCS classification) and 1 test per 3,000 cyd (approx.) for hydraulic conductivity, met or exceeded the minimum testing frequencies required by the CQA Documents. As noted, the measured hydraulic conductivities of liner protective layer soils exceeded the minimum hydraulic conductivity of 1.0×10^{-3} cm/sec required by the CQA Documents.

Table 4-1

STANDARD PROCTOR TEST RESULTS FOR GENERAL FILL IN CELL 1B

SAMPLE ID	SOIL DESCRIPTION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)
GF-10S	Dark brown gray sand with trace of silt	15.7	103.4
GF-11S	Dark brownish gray sand with trace of silt	16.0	102.9
GF-16S	Brown sand with trace of silt	16.2	104.7
GF-17S	Brown sand with trace of silt	15.7	103.2
GF-19S	Brown sand with trace of silt	15.6	104.5
GF-21S	Dark brown sand with trace of silt	14.8	106.6
GF-22S	Brown sand with trace of silt	14.0	108.4
GF-23S	Brown sand with trace of silt	15.5	104.0

Table 4-2

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

	TEST RESULTS							
CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-437	11.9	102.6	99.2	GF-10S	15.7	103.4		P
LF-438	12.4	105.5	102.0	GF-10S	15.7	103.4		P
LF-439	16.1	103.0	99.6	GF-10S	15.7	103.4		P
LF-440	13.3	100.1	96.8	GF-10S	15.7	103.4		P
LF-441	8.8	106.3	102.8	GF-10S	15.7	103.4		P
LF-442	10.2	105.0	101.5	GF-10S	15.7	103.4		P
LF-443	11.3	104.3	100.9	GF-10S	15.7	103.4		P
LF-444	12.2	103.2	99.8	GF-10S	15.7	103.4		P
LF-445	9.8	98.5	95.3	GF-10S	15.7	103.4		P
LF-446	10.2	100.4	97.1	GF-10S	15.7	103.4		P
LF-447	16.0	99.9	96.6	GF-10S	15.7	103.4		P
LF-448	14.2	101.3	98.0	GF-10S	15.7	103.4		P
LF-449	7.9	99.0	95.7	GF-10S	15.7	103.4		P
LF-450	13.6	103.7	100.3	GF-10S	15.7	103.4		P
LF-451	11.7	104.0	100.6	GF-10S	15.7	103.4		P
LF-452	10.4	104.4	101.0	GF-10S	15.7	103.4		P
LF-453	10.8	104.2	100.8	GF-10S	15.7	103.4		P
LF-454	11.3	103.5	100.1	GF-10S	15.7	103.4		P
LF-844	12.2	106.0	101.2	GF-16S	16.2	104.7		P
LF-845	13.2	107.7	102.9	GF-16S	16.2	104.7		P
LF-846	13.8	103.1	98.5	GF-16S	16.2	104.7		P
LF-847	20.2	100.2	95.7	GF-16S	16.2	104.7		P
LF-848	14.1	103.1	98.5	GF-16S	16.2	104.7		P
LF-849	17.6	101.0	96.5	GF-16S	16.2	104.7		P
LF-850	10.9	101.4	96.8	GF-16S	16.2	104.7		P
LF-851	11.7	109.6	104.7	GF-16S	16.2	104.7		P
LF-852	12.1	108.5	103.6	GF-16S	16.2	104.7		P
LF-853	10.6	104.5	99.8	GF-16S	16.2	104.7		P
LF-854	11.4	104.8	100.1	GF-16S	16.2	104.7		P
LF-855	10.1	105.3	100.6	GF-16S	16.2	104.7		P
LF-856	11.0	103.9	99.2	GF-16S	16.2	104.7		P
LF-857	13.3	103.3	98.7	GF-16S	16.2	104.7		P
LF-858	11.6	101.8	97.2	GF-16S	16.2	104.7		P
LF-859	12.0	102.2	97.6	GF-16S	16.2	104.7		P
LF-860	11.3	102.9	98.3	GF-16S	16.2	104.7		P
LF-861	10.8	105.6	100.9	GF-16S	16.2	104.7		P
LF-862	10.9	104.8	100.1	GF-16S	16.2	104.7		P
LF-863	11.6	103.4	98.8	GF-16S	16.2	104.7		P
LF-864	12.4	102.2	97.6	GF-16S	16.2	104.7		P
LF-865	10.8	100.8	96.3	GF-16S	16.2	104.7		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1256	18.4	98.8	95.7	GF-17S	15.7	103.2		P
LF-1257	19.9	98.7	95.6	GF-17S	15.7	103.2		P
LF-1258	15.1	103.6	100.4	GF-17S	15.7	103.2		P
LF-1259	12.2	103.4	100.2	GF-17S	15.7	103.2		P
LF-1260	15.5	105.0	101.7	GF-17S	15.7	103.2		P
LF-1261	21.9	98.1	95.1	GF-17S	15.7	103.2		P
LF-1262	14.8	101.8	98.6	GF-17S	15.7	103.2		P
LF-1263	9.1	101.7	98.5	GF-17S	15.7	103.2		P
LF-1264	9.0	109.6	106.2	GF-17S	15.7	103.2		P
LF-1265	18.8	98.3	95.3	GF-17S	15.7	103.2		P
LF-1266	13.7	98.3	95.3	GF-17S	15.7	103.2		P
LF-1267	19.0	97.9	94.9	GF-17S	15.7	103.2		P
LF-1268	15.6	99.3	96.2	GF-17S	15.7	103.2		P
LF-1269	17.6	97.9	94.9	GF-17S	15.7	103.2		P
LF-1270	14.3	102.9	99.7	GF-17S	15.7	103.2		P
LF-1271	14.8	101.2	98.1	GF-17S	15.7	103.2		P
LF-1272	16.5	101.4	98.3	GF-17S	15.7	103.2		P
LF-1273	15.5	101.3	98.2	GF-17S	15.7	103.2		P
LF-1286	13.0	103.6	100.4	GF-17S	15.7	103.2		P
LF-1287	18.5	97.6	94.6	GF-17S	15.7	103.2		P
LF-1315	16.8	101.8	97.4	GF-19S	15.6	104.5		P
LF-1316	14.3	99.4	95.1	GF-19S	15.6	104.5		P
LF-1317	23.6	100.2	95.9	GF-19S	15.6	104.5		P
LF-1318	22.2	100.1	95.8	GF-19S	15.6	104.5		P
LF-1319	17.2	99.8	95.5	GF-19S	15.6	104.5		P
LF-1320	9.2	99.8	95.5	GF-19S	15.6	104.5		P
LF-1321	18.0	99.5	95.2	GF-19S	15.6	104.5		P
LF-1322	13.0	100.2	95.9	GF-19S	15.6	104.5		P
LF-1323	16.1	101.7	97.3	GF-19S	15.6	104.5		P
LF-1324	15.3	100.7	96.4	GF-19S	15.6	104.5		P
LF-1325	16.3	101.3	96.9	GF-19S	15.6	104.5		P
LF-1326	15.8	100.3	96.0	GF-19S	15.6	104.5		P
LF-1327	15.4	99.9	95.6	GF-19S	15.6	104.5		P
LF-1328	15.1	101.0	96.7	GF-19S	15.6	104.5		P
LF-1329	17.3	100.4	96.1	GF-19S	15.6	104.5		P
LF-1330	16.8	101.6	97.2	GF-19S	15.6	104.5		P
LF-1360b	19.7	99.7	96.6	GF-17S	15.7	103.2		P
LF-1366	14.6	106.5	101.9	GF-19S	15.6	104.5		P
LF-1367	21.4	99.5	95.2	GF-19S	15.6	104.5		P
LF-1368	18.7	100.5	96.2	GF-19S	15.6	104.5		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1369	17.0	101.7	97.3	GF-19S	15.6	104.5		P
LF-1370	19.7	99.2	94.9	GF-19S	15.6	104.5		P
LF-1371	16.9	101.4	97.0	GF-19S	15.6	104.5		P
LF-1372	21.8	99.5	95.2	GF-19S	15.6	104.5		P
LF-1373	20.9	99.7	95.4	GF-19S	15.6	104.5		P
LF-1374	20.0	99.5	95.2	GF-19S	15.6	104.5		P
LF-1375	19.3	100.6	96.3	GF-19S	15.6	104.5		P
LF-1376	19.0	99.2	94.9	GF-19S	15.6	104.5		P
LF-1377	20.9	99.9	95.6	GF-19S	15.6	104.5		P
LF-1378	18.7	101.6	97.2	GF-19S	15.6	104.5		P
LF-1379	17.0	101.3	96.9	GF-19S	15.6	104.5		P
LF-1380	15.3	99.8	95.5	GF-19S	15.6	104.5		P
LF-1381	17.3	100.3	96.0	GF-19S	15.6	104.5		P
LF-1382	16.9	100.5	96.2	GF-19S	15.6	104.5		P
LF-1383	16.4	100.7	96.4	GF-19S	15.6	104.5		P
LF-1384	18.4	100.0	95.7	GF-19S	15.6	104.5		P
LF-1385	17.8	100.2	95.9	GF-19S	15.6	104.5		P
LF-1386	18.0	99.6	95.3	GF-19S	15.6	104.5		P
LF-1387	16.5	100.4	96.1	GF-19S	15.6	104.5		P
LF-1388	17.3	100.1	95.8	GF-19S	15.6	104.5		P
LF-1389	16.1	100.5	96.2	GF-19S	15.6	104.5		P
LF-1429	22.6	97.8	95.0	GF-11S	16.0	102.9		P
LF-1430	17.3	103.2	100.3	GF-11S	16.0	102.9		P
LF-1431	14.7	102.0	99.1	GF-11S	16.0	102.9		P
LF-1432	21.5	98.6	95.8	GF-11S	16.0	102.9		P
LF-1433	15.3	101.1	98.3	GF-11S	16.0	102.9		P
LF-1434	17.8	99.3	96.5	GF-11S	16.0	102.9		P
LF-1435	16.2	98.8	96.0	GF-11S	16.0	102.9		P
LF-1436	17.1	98.5	95.7	GF-11S	16.0	102.9		P
LF-1437	15.5	97.7	94.9	GF-11S	16.0	102.9		P
LF-1438	17.3	99.1	96.3	GF-11S	16.0	102.9		P
LF-1468	14.5	101.9	97.5	GF-19S	15.6	104.5		P
LF-1469	12.4	100.1	95.8	GF-19S	15.6	104.5		P
LF-1470	13.3	101.1	96.7	GF-19S	15.6	104.5		P
LF-1471	12.9	101.5	97.1	GF-19S	15.6	104.5		P
LF-1472	15.7	102.3	97.9	GF-19S	15.6	104.5		P
LF-1473	18.8	100.1	95.8	GF-19S	15.6	104.5		P
LF-1474	16.6	100.3	96.0	GF-19S	15.6	104.5		P
LF-1475	16.2	100.8	96.5	GF-19S	15.6	104.5		P
LF-1476	17.7	99.0	94.7	GF-19S	15.6	104.5		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

				TEST RESULTS				
CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1477	17.4	100.0	95.7	GF-19S	15.6	104.5		P
LF-1478	16.9	99.9	95.6	GF-19S	15.6	104.5		P
LF-1479	17.1	100.5	96.2	GF-19S	15.6	104.5		P
LF-1480	16.3	100.1	95.8	GF-19S	15.6	104.5		P
LF-1481	13.9	105.0	100.5	GF-19S	15.6	104.5		P
LF-1482	12.8	103.9	99.4	GF-19S	15.6	104.5		P
LF-1483	12.2	103.3	98.9	GF-19S	15.6	104.5		P
LF-1484	11.8	102.7	98.3	GF-19S	15.6	104.5		P
LF-1485	15.9	103.4	98.9	GF-19S	15.6	104.5		P
LF-1486	15.7	102.1	97.7	GF-19S	15.6	104.5		P
LF-1487	13.1	101.0	96.7	GF-19S	15.6	104.5		P
LF-1488	18.5	100.3	96.0	GF-19S	15.6	104.5		P
LF-1489	12.4	107.6	103.0	GF-19S	15.6	104.5		P
LF-1490	12.2	101.3	96.9	GF-19S	15.6	104.5		P
LF-1491	20.2	99.2	94.9	GF-19S	15.6	104.5		P
LF-1492	22.6	98.9	94.6	GF-19S	15.6	104.5		P
LF-1493	22.0	99.6	95.3	GF-19S	15.6	104.5		P
LF-1494	17.3	102.5	98.1	GF-19S	15.6	104.5		P
LF-1495	18.9	101.8	97.4	GF-19S	15.6	104.5		P
LF-1496	15.4	101.1	96.7	GF-19S	15.6	104.5		P
LF-1497	21.8	99.2	94.9	GF-19S	15.6	104.5		P
LF-1498	20.3	99.4	95.1	GF-19S	15.6	104.5		P
LF-1515	21.4	99.5	95.2	GF-19S	15.6	104.5		P
LF-1516	20.1	100.3	96.0	GF-19S	15.6	104.5		P
LF-1517	18.3	101.5	97.1	GF-19S	15.6	104.5		P
LF-1518	17.7	102.2	97.8	GF-19S	15.6	104.5		P
LF-1519	15.5	102.2	97.8	GF-19S	15.6	104.5		P
LF-1520	18.5	98.9	94.6	GF-19S	15.6	104.5		P
LF-1521	21.2	100.5	96.2	GF-19S	15.6	104.5		P
LF-1522	18.7	101.0	96.7	GF-19S	15.6	104.5		P
LF-1523	18.0	100.2	95.9	GF-19S	15.6	104.5		P
LF-1524	18.4	99.7	95.4	GF-19S	15.6	104.5		P
LF-1525	17.8	100.6	96.3	GF-19S	15.6	104.5		P
LF-1526	19.8	99.2	94.9	GF-19S	15.6	104.5		P
LF-1527	19.0	99.8	95.5	GF-19S	15.6	104.5		P
LF-1528	17.3	101.6	97.2	GF-19S	15.6	104.5		P
LF-1529	18.6	101.0	96.7	GF-19S	15.6	104.5		P
LF-1530	19.0	100.3	96.0	GF-19S	15.6	104.5		P
LF-1542	20.6	100.5	94.3	GF-21S	14.8	106.6	LF-1808	F
LF-1543	21.8	100.9	94.7	GF-21S	14.8	106.6		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1544	20.0	101.5	95.2	GF-21S	14.8	106.6		P
LF-1545	20.8	101.4	95.1	GF-21S	14.8	106.6		P
LF-1546	21.6	101.4	95.1	GF-21S	14.8	106.6		P
LF-1547	20.5	101.3	95.0	GF-21S	14.8	106.6		P
LF-1548	20.9	101.2	94.9	GF-21S	14.8	106.6		P
LF-1549	20.8	101.2	94.9	GF-21S	14.8	106.6		P
LF-1550	19.8	101.4	95.1	GF-21S	14.8	106.6		P
LF-1551	19.9	101.7	95.4	GF-21S	14.8	106.6		P
LF-1552	10.3	101.6	95.3	GF-21S	14.8	106.6		P
LF-1553	9.3	101.1	94.8	GF-21S	14.8	106.6		P
LF-1554	18.3	100.7	94.5	GF-21S	14.8	106.6		P
LF-1555	19.2	101.0	94.7	GF-21S	14.8	106.6		P
LF-1556	14.2	100.9	94.7	GF-21S	14.8	106.6		P
LF-1557	13.9	101.7	95.4	GF-21S	14.8	106.6		P
LF-1558	12.8	104.2	97.7	GF-21S	14.8	106.6		P
LF-1559	12.2	104.4	97.9	GF-21S	14.8	106.6		P
LF-1560	13.3	101.3	95.0	GF-21S	14.8	106.6		P
LF-1561	14.5	101.3	95.0	GF-21S	14.8	106.6		P
LF-1562	15.0	102.6	96.2	GF-21S	14.8	106.6		P
LF-1563	21.5	100.8	94.6	GF-21S	14.8	106.6		P
LF-1564	21.0	101.4	95.1	GF-21S	14.8	106.6		P
LF-1565	19.8	101.8	95.5	GF-21S	14.8	106.6		P
LF-1566	18.2	101.5	95.2	GF-21S	14.8	106.6		P
LF-1567	20.5	100.7	94.5	GF-21S	14.8	106.6		P
LF-1568	15.3	102.0	95.7	GF-21S	14.8	106.6		P
LF-1569	15.5	106.1	99.5	GF-21S	14.8	106.6		P
LF-1570	17.0	104.4	97.9	GF-21S	14.8	106.6		P
LF-1571	12.4	103.0	96.6	GF-21S	14.8	106.6		P
LF-1572	18.7	101.2	94.9	GF-21S	14.8	106.6		P
LF-1573	15.9	102.4	96.1	GF-21S	14.8	106.6		P
LF-1574	17.9	101.7	95.4	GF-21S	14.8	106.6		P
LF-1575	15.2	101.1	94.8	GF-21S	14.8	106.6		P
LF-1576	17.6	102.0	95.7	GF-21S	14.8	106.6		P
LF-1577	18.3	102.5	96.2	GF-21S	14.8	106.6		P
LF-1592	13.4	102.4	96.1	GF-21S	14.8	106.6		P
LF-1593	17.8	102.4	96.1	GF-21S	14.8	106.6		P
LF-1594	16.9	102.1	95.8	GF-21S	14.8	106.6		P
LF-1605	14.7	101.1	94.8	GF-21S	14.8	106.6		P
LF-1606	13.7	101.1	94.8	GF-21S	14.8	106.6		P
LF-1607	12.6	106.8	100.2	GF-21S	14.8	106.6		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
TEST RESULTS								
LF-1608	15.4	102.9	96.5	GF-21S	14.8	106.6		P
LF-1609	17.5	101.3	95.0	GF-21S	14.8	106.6		P
LF-1610	19.1	101.1	94.8	GF-21S	14.8	106.6		P
LF-1611	16.6	101.4	95.1	GF-21S	14.8	106.6		P
LF-1612	18.3	101.0	94.7	GF-21S	14.8	106.6		P
LF-1613	16.1	101.5	95.2	GF-21S	14.8	106.6		P
LF-1614	17.2	102.2	95.9	GF-21S	14.8	106.6		P
LF-1615	14.7	102.2	95.9	GF-21S	14.8	106.6		P
LF-1616	15.3	102.6	96.2	GF-21S	14.8	106.6		P
LF-1617	15.6	102.0	95.7	GF-21S	14.8	106.6		P
LF-1618	15.0	102.1	95.8	GF-21S	14.8	106.6		P
LF-1619	14.9	102.3	96.0	GF-21S	14.8	106.6		P
LF-1620	16.3	101.4	95.1	GF-21S	14.8	106.6		P
LF-1633	10.5	107.2	100.6	GF-21S	14.8	106.6		P
LF-1634	10.4	103.0	96.6	GF-21S	14.8	106.6		P
LF-1635	12.8	103.2	96.8	GF-21S	14.8	106.6		P
LF-1636	15.7	102.3	96.0	GF-21S	14.8	106.6		P
LF-1637	16.8	101.3	95.0	GF-21S	14.8	106.6		P
LF-1638	16.2	103.2	96.8	GF-21S	14.8	106.6		P
LF-1639	18.9	101.3	95.0	GF-21S	14.8	106.6		P
LF-1640	17.3	102.2	95.9	GF-21S	14.8	106.6		P
LF-1642	21.6	99.1	94.7	GF-16S	16.2	104.7		P
LF-1643	18.7	100.1	95.6	GF-16S	16.2	104.7		P
LF-1644	18.2	100.1	95.6	GF-16S	16.2	104.7		P
LF-1645	16.9	99.3	94.8	GF-16S	16.2	104.7		P
LF-1646	20.5	99.8	95.3	GF-16S	16.2	104.7		P
LF-1647	18.5	99.6	95.1	GF-16S	16.2	104.7		P
LF-1648	15.6	105.4	100.7	GF-16S	16.2	104.7		P
LF-1649	11.2	101.7	97.1	GF-16S	16.2	104.7		P
LF-1650	7.8	99.0	94.6	GF-16S	16.2	104.7		P
LF-1651	12.4	105.2	100.5	GF-16S	16.2	104.7		P
LF-1652	13.1	102.3	97.7	GF-16S	16.2	104.7		P
LF-1653	11.5	101.2	96.7	GF-16S	16.2	104.7		P
LF-1654	17.3	99.4	94.9	GF-16S	16.2	104.7		P
LF-1655	14.2	100.4	95.9	GF-16S	16.2	104.7		P
LF-1656	13.8	100.8	96.3	GF-16S	16.2	104.7		P
LF-1657	9.7	101.9	97.3	GF-16S	16.2	104.7		P
LF-1658	19.2	98.8	94.4	GF-16S	16.2	104.7	LF-1810	F
LF-1659	12.4	102.4	97.8	GF-16S	16.2	104.7		P
LF-1660	11.3	99.4	94.9	GF-16S	16.2	104.7		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1661	18.0	99.8	95.3	GF-16S	16.2	104.7		P
LF-1662	15.7	100.5	96.0	GF-16S	16.2	104.7		P
LF-1663	18.3	99.6	95.1	GF-16S	16.2	104.7		P
LF-1664	14.3	100.6	96.1	GF-16S	16.2	104.7		P
LF-1665	16.8	100.4	95.9	GF-16S	16.2	104.7		P
LF-1667	18.4	98.8	95.7	GF-17S	15.7	103.2		P
LF-1668	11.6	98.2	95.2	GF-17S	15.7	103.2		P
LF-1669	11.1	98.5	95.4	GF-17S	15.7	103.2		P
LF-1670	13.9	98.4	95.3	GF-17S	15.7	103.2		P
LF-1671	15.8	98.2	95.2	GF-17S	15.7	103.2		P
LF-1672	16.1	99.4	96.3	GF-17S	15.7	103.2		P
LF-1673	15.9	98.7	95.6	GF-17S	15.7	103.2		P
LF-1674	20.2	98.4	95.3	GF-17S	15.7	103.2		P
LF-1675	9.5	99.5	96.4	GF-17S	15.7	103.2		P
LF-1676	15.5	104.1	100.9	GF-17S	15.7	103.2		P
LF-1677	18.9	100.4	97.3	GF-17S	15.7	103.2		P
LF-1678	16.8	103.2	100.0	GF-17S	15.7	103.2		P
LF-1679	13.4	108.0	104.7	GF-17S	15.7	103.2		P
LF-1680	11.8	100.9	97.8	GF-17S	15.7	103.2		P
LF-1681	12.9	98.7	95.6	GF-17S	15.7	103.2		P
LF-1682	11.4	102.5	97.9	GF-16S	16.2	104.7		P
LF-1683	17.6	99.5	95.0	GF-16S	16.2	104.7		P
LF-1684	16.7	95.4	91.1	GF-16S	16.2	104.7	LF-1687	F
LF-1685	18.7	102.3	97.7	GF-16S	16.2	104.7		P
LF-1686	17.2	103.8	99.1	GF-16S	16.2	104.7		P
LF-1687	19.2	99.7	95.2	GF-16S	16.2	104.7		P
LF-1688	19.6	100.0	95.5	GF-16S	16.2	104.7		P
LF-1689	18.1	97.2	92.8	GF-16S	16.2	104.7	LF-1692	F
LF-1690	11.0	101.6	97.0	GF-16S	16.2	104.7		P
LF-1691	14.9	101.2	96.7	GF-16S	16.2	104.7		P
LF-1692	17.6	99.4	94.9	GF-16S	16.2	104.7		P
LF-1693	14.4	99.6	95.3	GF-19S	15.6	104.5		P
LF-1694	23.5	93.1	89.1	GF-19S	15.6	104.5	LF-1727	F
LF-1695	14.2	99.5	95.2	GF-19S	15.6	104.5		P
LF-1696	13.8	101.6	97.2	GF-19S	15.6	104.5		P
LF-1697	17.3	99.6	95.3	GF-19S	15.6	104.5		P
LF-1698	20.1	99.8	95.5	GF-19S	15.6	104.5		P
LF-1699	15.2	100.3	96.0	GF-19S	15.6	104.5		P
LF-1700	23.1	95.8	91.7	GF-19S	15.6	104.5	LF-1742	F
LF-1701	16.5	100.2	95.9	GF-19S	15.6	104.5		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1702	15.0	101.2	96.8	GF-19S	15.6	104.5		P
LF-1703	19.0	99.4	95.1	GF-19S	15.6	104.5		P
LF-1704	17.0	100.8	96.5	GF-19S	15.6	104.5		P
LF-1705	13.5	101.5	97.1	GF-19S	15.6	104.5		P
LF-1706	18.6	100.9	96.6	GF-19S	15.6	104.5		P
LF-1707	13.7	99.8	95.5	GF-19S	15.6	104.5		P
LF-1708	12.2	106.2	101.6	GF-19S	15.6	104.5		P
LF-1709	16.4	100.0	95.7	GF-19S	15.6	104.5		P
LF-1710	16.1	100.3	96.0	GF-19S	15.6	104.5		P
LF-1711	14.0	99.6	95.3	GF-19S	15.6	104.5		P
LF-1712	19.9	100.3	96.0	GF-19S	15.6	104.5		P
LF-1713	14.5	100.3	96.0	GF-19S	15.6	104.5		P
LF-1714	17.6	101.7	97.3	GF-19S	15.6	104.5		P
LF-1715	16.1	100.8	96.5	GF-19S	15.6	104.5		P
LF-1716	7.9	108.0	103.8	GF-23S	15.5	104.0		P
LF-1717	14.7	107.8	103.7	GF-23S	15.5	104.0		P
LF-1718	18.8	93.0	89.4	GF-23S	15.5	104.0	LF-1746	F
LF-1719	24.1	92.2	88.7	GF-23S	15.5	104.0	LF-1747	F
LF-1720	22.7	93.2	89.6	GF-23S	15.5	104.0	LF-1748	F
LF-1721	12.3	100.8	96.9	GF-23S	15.5	104.0		P
LF-1722	19.0	99.1	95.3	GF-23S	15.5	104.0		P
LF-1723	7.9	103.1	99.1	GF-23S	15.5	104.0		P
LF-1724	12.6	99.2	95.4	GF-23S	15.5	104.0		P
LF-1725	15.1	99.7	95.9	GF-23S	15.5	104.0		P
LF-1726	14.2	103.2	99.2	GF-23S	15.5	104.0		P
LF-1727	20.7	98.8	95.0	GF-23S	15.5	104.0		P
LF-1728	19.0	99.4	95.6	GF-23S	15.5	104.0		P
LF-1729	13.4	98.7	94.9	GF-23S	15.5	104.0		P
LF-1730	12.7	99.6	95.8	GF-23S	15.5	104.0		P
LF-1731	13.4	99.4	95.6	GF-23S	15.5	104.0		P
LF-1732	17.1	98.9	95.1	GF-23S	15.5	104.0		P
LF-1733	11.3	102.1	98.2	GF-23S	15.5	104.0		P
LF-1734	11.7	101.0	97.1	GF-23S	15.5	104.0		P
LF-1735	12.5	99.7	95.9	GF-23S	15.5	104.0		P
LF-1736	10.7	103.2	99.2	GF-23S	15.5	104.0		P
LF-1737	17.5	99.4	95.6	GF-23S	15.5	104.0		P
LF-1738	12.6	99.2	95.4	GF-23S	15.5	104.0		P
LF-1739	11.4	102.4	98.5	GF-23S	15.5	104.0		P
LF-1740	12.9	99.1	95.3	GF-23S	15.5	104.0		P
LF-1741	19.1	98.9	95.1	GF-23S	15.5	104.0		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1742	14.7	101.0	97.1	GF-23S	15.5	104.0		P
LF-1743	19.5	98.9	95.1	GF-23S	15.5	104.0		P
LF-1744	16.7	102.0	98.1	GF-23S	15.5	104.0		P
LF-1745	17.1	99.4	95.6	GF-23S	15.5	104.0		P
LF-1746	17.3	100.1	96.3	GF-23S	15.5	104.0		P
LF-1747	19.9	99.5	95.7	GF-23S	15.5	104.0		P
LF-1748	19.4	99.2	95.4	GF-23S	15.5	104.0		P
LF-1749	12.6	98.6	94.8	GF-23S	15.5	104.0		P
LF-1750	19.7	97.6	93.8	GF-23S	15.5	104.0	LF-1763	F
LF-1751	13.2	96.5	92.8	GF-23S	15.5	104.0	LF-1762	F
LF-1752	20.5	95.9	92.2	GF-23S	15.5	104.0	LF-1761	F
LF-1753	24.4	93.2	89.6	GF-23S	15.5	104.0	LF-1760	F
LF-1754	20.0	100.2	96.3	GF-23S	15.5	104.0		P
LF-1755	17.1	99.5	95.7	GF-23S	15.5	104.0		P
LF-1756	19.0	98.4	94.6	GF-23S	15.5	104.0		P
LF-1757	15.6	104.9	100.9	GF-23S	15.5	104.0		P
LF-1758	16.4	98.9	95.1	GF-23S	15.5	104.0		P
LF-1759	16.4	98.9	95.1	GF-23S	15.5	104.0		P
LF-1760	12.8	100.0	96.2	GF-23S	15.5	104.0		P
LF-1761	16.1	98.6	94.8	GF-23S	15.5	104.0		P
LF-1762	19.7	98.4	94.6	GF-23S	15.5	104.0		P
LF-1763	21.3	99.5	95.7	GF-23S	15.5	104.0		P
LF-1764	17.0	102.8	98.8	GF-23S	15.5	104.0		P
LF-1765	17.1	101.2	97.3	GF-23S	15.5	104.0		P
LF-1766	14.3	98.6	94.8	GF-23S	15.5	104.0		P
LF-1767	7.8	105.3	101.3	GF-23S	15.5	104.0		P
LF-1768	13.3	99.5	95.7	GF-23S	15.5	104.0		P
LF-1769	12.9	104.3	100.3	GF-23S	15.5	104.0		P
LF-1770	13.4	102.5	98.6	GF-23S	15.5	104.0		P
LF-1771	12.6	100.7	96.8	GF-23S	15.5	104.0		P
LF-1772	12.0	101.0	97.1	GF-23S	15.5	104.0		P
LF-1773	12.1	100.2	96.3	GF-23S	15.5	104.0		P
LF-1774	13.3	101.3	97.4	GF-23S	15.5	104.0		P
LF-1775	13.6	103.0	99.0	GF-23S	15.5	104.0		P
LF-1776	14.1	105.4	101.3	GF-23S	15.5	104.0		P
LF-1777	12.2	106.8	102.7	GF-23S	15.5	104.0		P
LF-1778	13.8	104.8	100.8	GF-23S	15.5	104.0		P
LF-1779	14.5	99.3	95.5	GF-23S	15.5	104.0		P
LF-1780	12.7	99.8	96.0	GF-23S	15.5	104.0		P
LF-1781	12.1	99.7	95.9	GF-23S	15.5	104.0		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR					
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698					
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3					
TEST RESULTS								
CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
LF-1782	13.1	100.8	96.9	GF-23S	15.5	104.0		P
LF-1783	11.0	112.8	108.5	GF-23S	15.5	104.0		P
LF-1784	18.1	101.2	97.3	GF-23S	15.5	104.0		P
LF-1785	21.4	99.3	95.5	GF-23S	15.5	104.0		P
LF-1786	12.2	105.3	101.3	GF-23S	15.5	104.0		P
LF-1787	19.9	99.9	96.1	GF-23S	15.5	104.0		P
LF-1788	13.3	105.0	101.0	GF-23S	15.5	104.0		P
LF-1789	19.0	98.9	95.1	GF-23S	15.5	104.0		P
LF-1790	14.4	102.3	98.4	GF-23S	15.5	104.0		P
LF-1791	18.1	100.4	96.5	GF-23S	15.5	104.0		P
LF-1792	13.2	106.2	102.1	GF-23S	15.5	104.0		P
LF-1793	13.3	103.2	99.2	GF-23S	15.5	104.0		P
LF-1794	16.6	99.1	95.3	GF-23S	15.5	104.0		P
LF-1795	14.3	105.5	101.4	GF-23S	15.5	104.0		P
LF-1796	13.1	105.1	101.1	GF-23S	15.5	104.0		P
LF-1797	23.5	95.2	91.5	GF-23S	15.5	104.0	LF-1823	F
LF-1798	22.0	96.3	92.6	GF-23S	15.5	104.0	LF-1824	F
LF-1799	10.9	104.9	98.4	GF-21S	14.8	106.6		P
LF-1800	12.0	102.7	96.3	GF-21S	14.8	106.6		P
LF-1801	8.9	108.4	101.7	GF-21S	14.8	106.6		P
LF-1802	10.2	110.1	103.3	GF-21S	14.8	106.6		P
LF-1803	9.2	102.4	96.1	GF-21S	14.8	106.6		P
LF-1804	10.0	107.7	101.0	GF-21S	14.8	106.6		P
LF-1805	11.8	108.0	101.3	GF-21S	14.8	106.6		P
LF-1806	11.1	106.8	100.2	GF-21S	14.8	106.6		P
LF-1807	9.9	109.4	102.6	GF-21S	14.8	106.6		P
LF-1808	13.1	106.9	100.3	GF-21S	14.8	106.6		P
LF-1809	13.5	105.2	98.7	GF-21S	14.8	106.6		P
LF-1810	11.2	103.4	98.8	GF-16S	16.2	104.7		P
LF-1811	12.1	110.4	103.6	GF-21S	14.8	106.6		P
LF-1812	10.7	105.8	99.2	GF-21S	14.8	106.6		P
LF-1813	13.2	104.7	98.2	GF-21S	14.8	106.6		P
LF-1814	15.9	101.3	95.0	GF-21S	14.8	106.6		P
LF-1815	11.8	107.7	101.0	GF-21S	14.8	106.6		P
LF-1816	10.6	108.3	101.6	GF-21S	14.8	106.6		P
LF-1817	8.8	108.2	101.5	GF-21S	14.8	106.6		P
LF-1818	10.4	106.4	99.8	GF-21S	14.8	106.6		P
LF-1819	11.8	104.6	98.1	GF-21S	14.8	106.6		P
LF-1820	9.7	105.3	98.8	GF-21S	14.8	106.6		P
LF-1821	16.6	101.6	95.3	GF-21S	14.8	106.6		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-2 (continued)

COMPACTION TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	NUCLEAR GAUGE		APPLICABLE STANDARD PROCTOR
TEST STANDARD	ASTM D 3017	ASTM D 2922	ASTM D 698
TESTING FREQUENCY	5 test per acre per lift		1 test per 25,000 yd^3

TEST RESULTS

CQA Test No.[1]	Moisture Content (%)	Dry Unit Weight (pcf)	Percent of Compaction[2] (%)	Sample ID	Optimum Moisture Content (%)	Maximum Dry Unit Weight (pcf)	Retest No.[3]	Pass/Fail (P/F)
1822	15.0	102.6	96.2	GF-21S	14.8	106.6		P
1823	16.9	97.6	91.6	GF-21S	14.8	106.6	LF-1833	F
1824	17.5	99.0	92.9	GF-21S	14.8	106.6	LF-1834	F
1825	11.5	108.5	101.8	GF-21S	14.8	106.6		P
1826	13.4	104.4	97.9	GF-21S	14.8	106.6		P
1827	12.2	105.7	99.2	GF-21S	14.8	106.6		P
1828	10.9	108.5	101.8	GF-21S	14.8	106.6		P
1829	19.4	99.9	93.7	GF-21S	14.8	106.6	LF-1831	F
1830	17.8	99.9	93.7	GF-21S	14.8	106.6	LF-1832	F
1831	15.8	103.1	96.7	GF-21S	14.8	106.6		P
1832	20.5	99.0	92.9	GF-21S	14.8	106.6	LF-1835	F
1833	19.5	99.9	93.7	GF-21S	14.8	106.6	LF-1836	F
1834	17.7	102.3	96.0	GF-21S	14.8	106.6		P
1835	18.0	101.6	95.3	GF-21S	14.8	106.6		P
1836	19.2	101.5	95.2	GF-21S	14.8	106.6		P
1837	8.7	111.3	104.4	GF-21S	14.8	106.6		P
1838	14.7	104.3	97.8	GF-21S	14.8	106.6		P
1839	9.6	107.4	100.8	GF-21S	14.8	106.6		P
1840	10.5	108.9	102.2	GF-21S	14.8	106.6		P
1841	14.9	105.9	99.3	GF-21S	14.8	106.6		P
1842	11.5	107.3	100.7	GF-21S	14.8	106.6		P
1843	11.2	107.8	101.1	GF-21S	14.8	106.6		P
1844	14.2	103.8	97.4	GF-21S	14.8	106.6		P
1845	15.4	103.8	97.4	GF-21S	14.8	106.6		P
1846	13.2	106.8	98.5	GF-22S	14.0	108.4		P
1847	15.0	108.1	99.7	GF-22S	14.0	108.4		P
1848	11.4	108.7	100.3	GF-22S	14.0	108.4		P
1849	13.3	111.4	102.8	GF-22S	14.0	108.4		P
1850	13.7	109.3	100.8	GF-22S	14.0	108.4		P
1851	12.5	108.0	99.6	GF-22S	14.0	108.4		P
1852	12.7	109.4	100.9	GF-22S	14.0	108.4		P
1853	15.3	105.4	97.2	GF-22S	14.0	108.4		P
1854	13.6	107.3	99.0	GF-22S	14.0	108.4		P
1855	11.5	108.8	100.4	GF-22S	14.0	108.4		P
1856	16.8	101.0	94.7	GF-21S	14.8	106.6		P
1857	15.4	101.7	95.4	GF-21S	14.8	106.6		P
1858	15.5	101.8	95.5	GF-21S	14.8	106.6		P

Notes:

1 Tests performed in Cell 1B only are presented herein.

2 Required minimum percent compaction was 95% of Standard Proctor (ASTM D 698) maximum dry unit weight.

3 Retest number for failing density tests.

Table 4-3

GRAIN SIZE ANALYSES AND USCS CLASSIFICATION FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	PARTICLE SIZE ANALYSIS	SOIL CLASSIFICATION
TEST STANDARD	ASTM D 422	ASTM D 2847
TESTING FREQUENCY	1 test per 10,000 yd^3	1 test per 10,000 yd^3

TEST RESULTS

Sample No. [1]	Soil Description	Percent Passing by Weight Through U.S. Standard Sieve						Classification [2]	Pass/Fail (P/F)
		No. 4	No. 10	No. 40	No. 60	No. 100	No. 200		
GF1B-01	Brown silty sand	100	100	96	72	11	1	SP	P
GF1B-02	Brown silty sand	100	100	96	72	10	1	SP	P
GF1B-03	Brown silty sand	100	100	97	76	11	1	SP	P
GF1B-04	Brown silty sand	100	100	96	71	11	1	SP	P
GF1B-05	Brown silty sand	99	97	85	60	7	1	SP	P
GF1B-06	Brown silty sand	99	97	85	61	11	2	SP	P
GF1B-07	Brown silty sand	98	94	77	53	9	1	SP	P
GF1B-08	Brown silty sand	100	99	93	72	6	1	SP	P
GF1B-09	Brown silty sand	100	99	94	73	11	1	SP	P
GF1B-10	Brown silty sand	100	99	90	64	6	1	SP	P
GF1B-11	Brown silty sand	100	100	95	67	11	2	SP	P
GF1B-12	Brown silty sand	100	100	93	69	10	2	SP	P
GF1B-13	Medium brown silty sand	100	100	96	75	7	0	SP	P
GF1B-14	Medium brown silty sand	100	99	95	72	12	2	SP	P
GF1B-15	Medium brown silty sand	100	99	93	74	15	3	SP	P
GF1B-16	Dark brown silty sand	97	94	87	68	18	4	SP	P
GF1B-17	Dark brown silty sand	100	99	90	69	9	2	SP	P
GF1B-18	Medium brown silty sand	100	99	95	78	21	4	SP	P

Notes:

[1] Samples were tested in the on-site laboratory.

[2] General fill material was required to classify as SW, SP, or SM.

Table 4-3 (continued)

GRAIN SIZE ANALYSES AND USCS CLASSIFICATION FOR GENERAL FILL USED TO CONSTRUCT CELL 1B

	PARTICLE SIZE ANALYSIS	SOIL CLASSIFICATION
TEST STANDARD	ASTM D 422	ASTM D 2847
TESTING FREQUENCY	1 test per 10,000 yd^3	1 test per 10,000 yd^3

TEST RESULTS

Sample No. [1]	Soil Description	Percent Passing by Weight Through U.S. Standard Sieve						Classification [2]	Pass/Fail (P/F)
		No. 4	No. 10	No. 40	No. 60	No. 100	No. 200		
GF1B-19	Medium brown silty sand	100	100	97	81	15	3	SP	P
GF1B-20	Medium brown silty sand	100	100	97	82	23	4	SP	P
GF1B-21	Medium brown silty sand	100	100	97	79	20	3	SP	P
GF1B-22	Medium brown silty sand	100	100	97	78	14	2	SP	P
GF1B-23	Medium brown silty sand	100	100	97	78	22	4	SP	P
GF1B-24	Medium brown silty sand	100	100	97	79	21	3	SP	P
GF1B-25	Medium brown silty sand	100	100	97	76	20	3	SP	P
GF1B-26	Medium brown silty sand	100	100	98	82	21	3	SP	P
GF1B-27	Medium brown silty sand	100	99	94	73	17	2	SP	P
GF1B-28	Medium brown silty sand	100	99	95	73	15	2	SP	P
GF1B-29	Dark brown silty sand	100	100	97	80	24	4	SP	P
GF1B-30	Dark brown silty sand	100	100	97	79	17	3	SP	P

Notes:

[1] Samples were tested in the on-site laboratory.

[2] General fill material was required to classify as SW, SP, or SM.

Table 4-4

SAND CONE TESTS FOR GENERAL FILL
PERFORMED TO VERIFY NUCLEAR DENSITY TEST RESULTS

SAND CONE			NUCLEAR GAUGE			DIFFERENCE (Sand Cone - Nuclear)	
Test No.	Dry Unit Weight (pcf)	Moisture Content (%)	Test No.	Dry Unit Weight (pcf)	Moisture Content (%)	Dry Unit Weight (pcf)	Moisture Content (%)
	ASTM D 1556	ASTM D 2216		ASTM D 2922	ASTM D 3017		
SCT1B-1	98.6	19.4	LF-1498	99.4	20.3	-0.8	-0.9
SCT1B-2	107.9	10.8	LF-1651	105.2	12.4	2.7	-1.6
SCT1B-3	96.1	9.3	LF-1675	99.5	9.5	-3.4	-0.2
SCT1B-4	99.4	12.6	LF-1699	100.3	15.2	-0.9	-2.6
SCT1B-5	100.3	10.8	LF-1726	103.2	14.2	-2.9	-3.4
SCT1B-6	104.9	14.4	LF-1757	104.9	15.6	0.0	-1.2
SCT1B-7	104.7	11.6	LF-1769	104.3	12.9	0.4	-1.3
SCT1B-8	103.2	11.7	LF-1777	106.8	12.2	-3.6	-0.5
SCT1B-9	100.7	14.0	LF-1790	102.3	14.4	-1.6	-0.4
SCT1B-10	100.5	12.4	LF-1793	103.2	13.3	-2.7	-0.9
SCT1B-11	104.3	10.6	LF-1806	106.8	11.1	-2.5	-0.5
SCT1B-12	104.3	9.6	LF-1816	108.3	10.6	-4.0	-1.0
SCT1B-13	101.0	12.2	LF-1821	101.6	16.6	-0.6	-4.4
SCT1B-14	102.1	13.7	LF-1844	103.8	14.2	-1.7	-0.5

Table 4-5

LABORATORY TEST RESULTS FOR LINER PROTECTIVE LAYER SOILS PLACED IN CELL 1B

	PARTICLE SIZE ANALYSIS	SOIL CLASSIFICATION	HYDRAULIC CONDUCTIVITY	
TEST STANDARD	ASTM D 422	ASTM D 2487	ASTM D 2434	
TESTING FREQUENCY	1 test per 2,000 yd^3	1 test per 2,000 yd^3	1 test per 3,000 yd^3	
TEST RESULTS				
Sample ID	Percent Passing No. 200 Sieve (%)	Soil Classification [1]	Hydraulic Conductivity [2] (cm/sec)	Pass/Fail (P/F)
PC1B-01	1	SP	$8.9x10^{-3}$	P
PC1B-02	2	SP	$1.4x10^{-2}$	P
PC1B-03	2	SP	$7.0x10^{-3}$	P
PC1B-04	2	SP	$1.2x10^{-2}$	P
PC1B-05	2	SP	$7.8x10^{-3}$	P
PC1B-06	2	SP	$5.7x10^{-3}$	P
PC1B-07	3	SP	$5.4x10^{-3}$	P
PC1B-08	2	SP	$5.4x10^{-3}$	P
PC1B-09	3	SP	-	P
PC1B-10	2	SP	-	P
PC1B-11	1	SP	-	P
PC1B-12	1	SP	-	P
PC1B-13	2	SP	-	P
PC1B-14	2	SP	-	P
PC1B-15	2	SP	-	P
PC1B-16	2	SP	-	P
PC1B-17	3	SP	-	P
PC1B-18	4	SP	-	P
PC1B-19	2	SP	-	P
PC1B-20	2	SP	-	P
PC1B-21	2	SP	-	P
PC1B-22	2	SP	-	P
PC1B-23	3	SP	-	P
PC1B-24	1	SP	-	P
PC1B-25	1	SP	-	P

Notes:

[1] Liner protective layer material was required to classify as SW or SP.

[2] Required hydraulic conductivity was greater than or equal to $1.0x10^{-3}$ cm/sec.

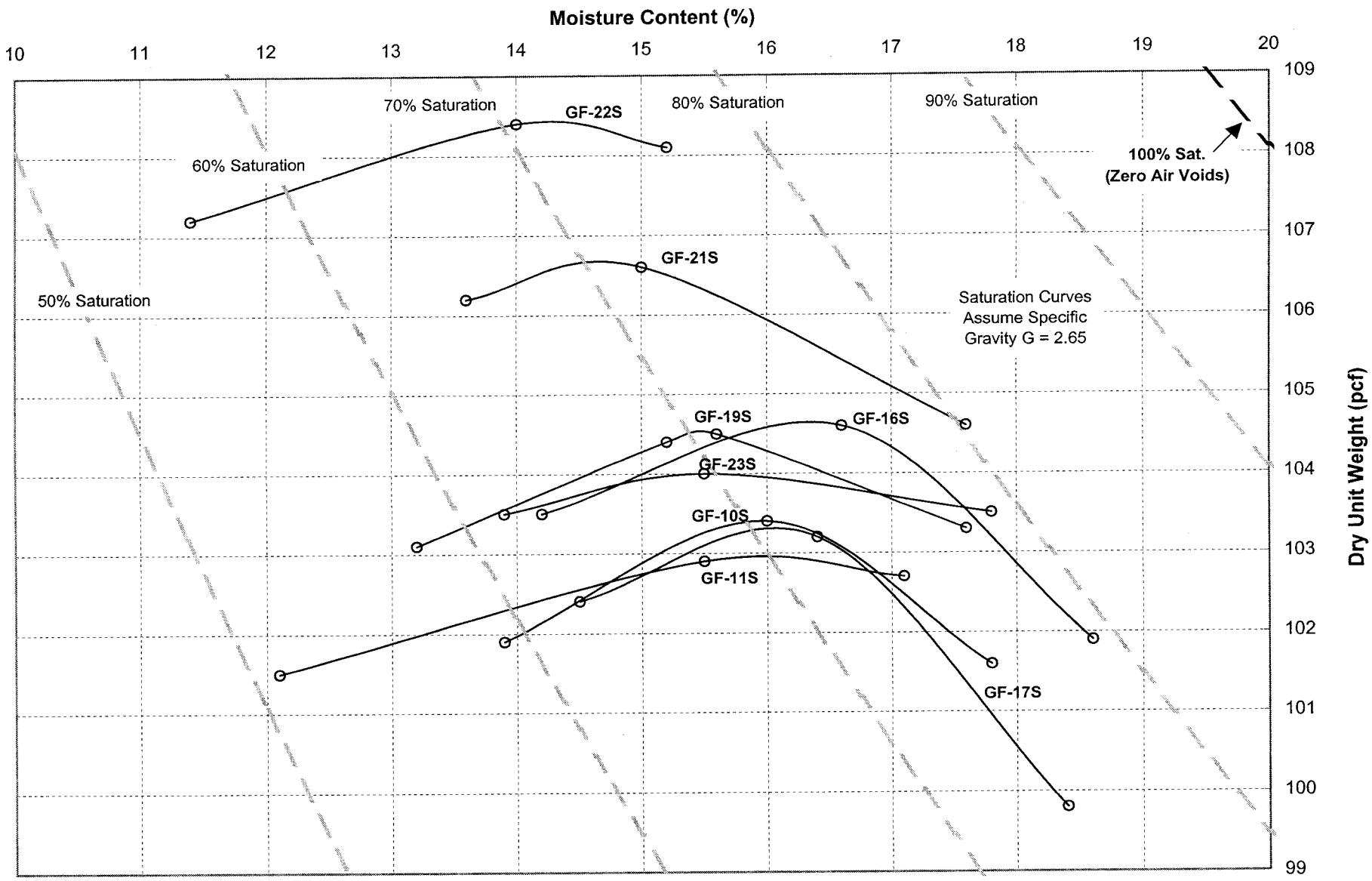


Figure 4-1: Standard Proctor Test Results for General Fill in Cell 1B

5. CONSTRUCTION QUALITY ASSURANCE - GEOSYNTHETICS

5.1 General

GeoSyntec monitored the installation of the geosynthetic components of the double composite liner system in Cell 1B, as described in Section 2. At times, several liner system installation operations were conducted simultaneously during OHDF construction. When this occurred, the on-site CQA personnel monitored the operations that were considered most critical to the performance of the liner systems.

5.2 CQA of Geosynthetic Clay Liner

5.2.1 Conformance Testing and Documentation

A geosynthetic clay liner (GCL) was used in construction of the liner systems in Cell 1B. Thermal Lock NWL-35 GCL used in Cell 1B was manufactured by Bentofix Technologies, Inc. (Bentofix) in Barrie, Ontario, Canada. The GCL conformance samples were collected, from the rolls produced for the project, by Texas Research Institute (TRI) (an independent contractor authorized to collect samples for CQA testing) at Bentofix's manufacturing plant. TRI also performed the CQA conformance testing in accordance with the CQA Documents on the samples of GCL collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The results of the MQC and CQA conformance tests performed for GCL used in Cell 1B were presented in the Certification Report 1 (GeoSyntec, January 2004). A total of 13 CQA conformance samples were tested for 1,860,000 square feet (ft^2) of GCL delivered to the site for installation in Cell 1A, Cell 1B, and the leachate storage area. The CQA test frequency of 1 test per 143,000 ft^2 of GCL exceeded the minimum testing frequency of 1 test per 200,000 ft^2 required by the CQA Documents. As a minimum, one conformance sample was tested during CQA from each lot of GCL supplied for the project.

To evaluate the influence of leachate on the hydraulic conductivity of GCL, a sample from Roll # 86967 (Lot # 23092319) was tested using deionized water and leachate from St. Cloud Landfill (a similar solid waste landfill currently being used by City of St. Cloud in Osceola County) as permeant fluids during MQC testing. The measured hydraulic conductivity of GCL with leachate as the permeant fluid was an order of magnitude lower than the measured hydraulic conductivity of GCL with deionized water as the permeant fluid. As a result, remaining MQC and CQA conformance tests were performed using water as the permeant fluid to avoid collection, handling, and transportation of leachate.

5.2.2 Field Monitoring Activities

5.2.2.1 Delivery and On-Site Storage

Upon delivery, GCL rolls were unloaded in an area located east of the Cell 1A construction area (i.e., in future Cell 2 footprint), stacked on a 1.5-ft high berm, and covered with a plastic sheets. The rolls were typically transported on site by a tractor with a special lifting attachment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures and observed that the GCL was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the GCL rolls delivered to the manufacturer's bill of lading. An inventory of the rolls delivered for the project was maintained by the CQA personnel and is available upon request. This inventory also includes the rolls that were approved for installation based on MQC and CQA test results and the rolls that were used during construction. Only approved rolls were incorporated into the work.

5.2.2.2 Deployment

Prior to GCL deployment, the installer signed certificates of acceptance for the liner subbase, which are not included in the report but are available upon request. The GCL rolls were lifted using a spreader bar attached to a tractor. The panels were positioned using laborers assisted by a track-mounted, low-ground pressure, all-terrain vehicle (ATV).

CQA personnel monitored the deployment of the GCL rolls. During deployment, the CQA personnel checked for the following:

- manufacturing defects;
- damage that may have occurred during shipment, storage, and handling; and
- damage resulting from installation activities.

If any materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the requirements of the CQA Documents.

CQA personnel also periodically monitored the deployment of the GCL as well as its condition after installation to ensure that the installer followed the following procedures:

- the GCL was unrolled and placed in a manner which kept the GCL in sufficient tension to avoid excessive wrinkling and was securely anchored in the anchor trench or ballasted with sand bags;

- the rolls were deployed with the non heat-treated, non-woven geotextile in contact with the geomembrane;
- adjacent GCL panels were overlapped a minimum of 6 inches along the length of the panels and 12 inches along the width of the panels; and
- granular bentonite was added between overlap areas;
- measures were taken to keep the GCL free of contamination and protected from premature hydration; and
- geomembrane installation immediately followed installation of the GCL.

Any observed holes or tears in the GCL were repaired by the installer by placing a patch of the same material over the hole or tear and at a distance of at least 1 ft beyond the edges of the hole or tear. In areas where premature hydration of the GCL was detected, the GCL was removed and replaced with new material.

5.3 CQA of Textured Geomembrane

5.3.1 Conformance Testing and Documentation

A 60-mil textured geomembrane was installed as primary and secondary liners in Cell 1B. The 60-mil textured geomembrane, HDT 060A000, was supplied by GSE Lining Technologies, Inc. (GSE) in Houston, Texas. Conformance samples of textured geomembrane were collected (from the rolls produced for the project) by TRI at GSE's manufacturing plant in Houston Texas. TRI also performed the CQA conformance testing in accordance with the CQA Documents on the samples of textured geomembrane collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The results of the MQC and CQA conformance tests performed for 60-mil textured geomembrane used in Cell 1B were presented in the Certification Report 1 (GeoSyntec, January 2004). A total of 21 CQA conformance samples were tested for approximately 2,021,000 ft^2 of textured geomembrane delivered to the site for installation in Cell 1A, Cell 1B, and the leachate storage area. The CQA test frequency of 1 test per 96,000 ft^2 for the textured geomembrane exceeded the minimum frequency of 1 test per 100,000 ft^2 required by the CQA Documents. As a minimum, one conformance sample was tested during CQA from each resin lot supplied for the project.

5.3.2 Field Monitoring Activities

5.3.2.1 Delivery and On-Site Storage

Upon delivery to the site, geomembrane rolls were stored in an area located east of the Cell 1A construction area (i.e., in future Cell 2 footprint) and stacked on HDPE perforated pipes. The rolls were typically transported by a tractor with a special lifting attachment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the geomembrane rolls delivered to the manufacturer's bill of lading. An inventory of the rolls delivered for the project was maintained by the CQA personnel and is available upon request. This inventory also includes the rolls that were approved for installation based on MQC and CQA test results and the rolls that were used during construction. Only approved rolls were incorporated into the work.

5.3.2.2 Deployment

The geomembrane rolls were lifted using a spreader bar attached to a tractor. The panels were positioned using laborers assisted by a track-mounted, low-ground pressure, ATV.

CQA personnel monitored the deployment of each geomembrane panel. During deployment, the CQA personnel checked for the following:

- manufacturing defects;
- damage that may have occurred during shipment, storage, and handling; and
- damage resulting from installation activities, including damage as a consequence of panel placement, seaming operations, or weather.

If any materials were observed to be damaged or deficient, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed and documented the repair locations to verify compliance with the CQA Documents. Details of the geomembrane panel placement were recorded by CQA personnel on panel placement logs, which are not included in the report but are available upon request. Panel and repair locations are indicated on the Record Drawings included in Appendix A for the primary and secondary liners in Cell 1B.

5.3.2.3 Trial Seams

Prior to production seaming, the installer prepared geomembrane trial seams for each technician using each piece of seaming equipment. Additional trial seams were prepared every four to five hours. CQA personnel evaluated the trial seams as follows:

- trial seams were welded under similar conditions as production seaming;
- test strips were cut from the trial seams at random locations with a die press;
- three test strips were tested using a field tensiometer and compared to the passing criteria for the tests, which were as follows:

Fusion

- *Peel tests* - a minimum bonded seam strength of 78 lb/in.; and
- *Shear test* - a minimum bonded seam strength of 120 lb/in.

Extrusion

- *Peel test* - a minimum bonded seam strength of 70 lb/in.; and
- *Shear test* - a minimum bonded seam strength of 108 lb/in.

A total of 108 trial seams were observed by CQA personnel during construction of Cell 1B; 74 trial seams were made using double-track fusion (i.e., hot wedge) welders and 34 were made using extrusion welders. If trial welds failed, the machine or welding process was adjusted and a new trial seam was made. The new sample was tested to ensure compliance with the above strength requirements. The procedure was repeated, as needed, until passing results were obtained.

Trial seam samples were not archived. Details of the trial seams, including the trial seam test results, are not included in the report but are available upon request.

5.3.2.4 Production Seams

Geomembrane production seaming operations were monitored by CQA personnel. The majority of the geomembrane production seams were fabricated using double-track fusion welders. Seam repairs were made using hand-held extrusion welders. Rub sheets were periodically used during production seaming to provide a clean surface to weld over. During or after fabrication, the geomembrane seams were visually examined for

workmanship and continuity. Geomembrane seaming logs are not included in the report but are available upon request.

5.3.3 Nondestructive Seam Testing

5.3.3.1 Scope

Nondestructive testing of geomembrane seams was periodically monitored by CQA personnel. All geomembrane seams were nondestructively tested for continuity by the installer using the air pressure procedure for double-track fusion seams and the vacuum-box test procedure for extrusion welded seams. Failed air pressure seams, if applicable, were capped and then retested using vacuum-box test methods after determining the failed seam length. Leaks identified using the vacuum-box method were repaired and retested as described in Section 5.3.5.

5.3.3.2 Air Pressure Testing

Accessible double-track fusion seams were nondestructively tested using the air pressure test. The procedure used by the installer for air pressure testing was as follows:

- visually observe the integrity of the annulus of the section of seam being tested and isolating the section by sealing the ends using heat and pressure;
- insert the needle of a pressure test apparatus into the annulus at one end of the seam;
- inflate the annulus to a gauge pressure of a minimum 25 psi with an air pump and maintain the gauge pressure for at least 5 minutes;
- repair faulty area in accordance with Section 5.3.5 if the pressure loss exceeds 3 psi or if the pressure does not stabilize; and
- confirm airflow through the entire annulus by releasing the air from the seam at the opposite end from where the needle was inserted.

5.3.3.3 Vacuum-Box Testing

The vacuum-box was used by the installer to nondestructively test extrusion seams and repairs. The procedure used by the installer for vacuum testing was as follows:

- wet a strip of seam with a soapy solution;

- place the vacuum-box assembly over the wetted area, close the bleed valve and open the vacuum valve;
- force the box onto the sheet until a vacuum is observed;
- examine the seam through the viewing window for a period of approximately 20 seconds for the occurrence of air bubbles;
- remove the assembly and continue the process over the entire length of the seam; and
- record the location of any leaks.

Appendix C contains a summary of the nondestructive tests performed for the textured geomembrane seams. It includes nondestructive seam test results for primary and secondary liner in Cell 1B. If nondestructive testing indicated that repairs were necessary, repairs were made in accordance with procedures presented in Section 5.3.5. All repairs were tested using the vacuum-box test procedure.

5.3.4 Destructive Seam Sample Testing

5.3.4.1 Scope

In accordance with the CQA Documents, CQA personnel identified and collected geomembrane seam samples for destructive testing. The samples were tested by the CQA personnel in the on-site geosynthetics laboratory.

For a destructive seam sample to be considered as passing, the seam strength criteria described in Section 5.3.2.3 had to be met for at least four out of the five test specimens obtained from the sample. In addition, if one non-FTB failure was observed, the average of the five test specimens had to meet the specified strength criterion.

5.3.4.2 Sampling Procedures

Prior to the removal of the full seam sample, two geomembrane test strips were taken by the installer from either end of the proposed destructive sample. Each strip was peel-tested in the field. If the peel samples exhibited passing results, the adjacent destructive seam sample was removed and tested. At each destructive seam sample location, a test sample measuring approximately 12 in. across the seam and 42 in. along the seam, was obtained. The sample was divided into three pieces and distributed to: (i) the on-site geosynthetics laboratory for testing, (ii) the installer, and (iii) the owner as an archive sample.

5.3.4.3 Test Results

On-site laboratory testing of geomembrane seam samples was performed in accordance with the CQA Documents. At the on-site geosynthetics laboratory, five 1-in wide test specimens were removed from the destructive seam sample using a die press. On a calibrated tensiometer, five test specimens were peel-tested for adhesion strength. For fusion seams, peel tests were performed on both the bottom (inside track) and top (outside track) peels. Additionally, five specimens were tested for shear strength. The seam acceptance/rejection criteria described in Sections 5.3.2.3 and 5.3.4.1 were used to evaluate the destructive seam samples.

The destructive seam test results are summarized in Table 5-1. The destructive seam test results for primary and secondary liners installed in Cell 1B are presented in Tables 5-1A and 5-1B, respectively. For primary liner installed in Cell 1B, 32 destructive seam samples were tested for a total seam length of 14,500 ft (approx.). This corresponds to an approximate sample frequency of 1 per 450 lf of seam. For secondary liner installed in Cell 1B, 34 destructive seam samples were tested for a total seam length of 14,300 ft (approx.). This corresponds to an approximate sample frequency of 1 per 420 lf of seam. The destructive seam test frequencies met or exceeded the minimum frequency of 1 per 500 lf of production seams required by the CQA Documents.

As part of destructive seam testing of geomembranes during CQA, a total of 66 destruct samples were tested. Out of all the seam samples tested destructively, only 1 sample failed to meet the required criteria. For the failed samples, additional test strips were taken from the seam at locations approximately 10 ft from each side of the failing sample location. If the additional test strips had passing results, full destructive seam sample was collected. If the samples did not pass, test strips were obtained at another location approximately 10 ft further from the failure and the procedure was repeated until passing samples were obtained and the failing area was localized. These destructive seam samples were tested in accordance with procedures described previously in this section. Once the limits of the failing seam were evaluated, the entire seam length between the passing samples was repaired by the procedures described in Section 5.3.5.

5.3.5 Geomembrane Repairs

The repair procedures presented in this subsection were used by the installer to patch holes and tears, spot-extrude impact damage or other minor defects, and for grinding and extrusion welding small sections of failed fusion seams (if the exposed edge was accessible). In the cases where patches or caps were used to repair the damaged geomembrane (i.e., small holes, tears, or on seams which failed nondestructive or destructive testing), an approximately 12-in. wide capping strip was used.

During the repair or panel tie-in operations, the following procedures were implemented:

- technicians and seaming equipments used were required to pass trial welds;
- patches or caps extended at least 6 in. beyond the edge of the defect and all corners were rounded; and
- repairs were tested using vacuum box and visually observed for continuity.

Seam and panel repair logs prepared by GeoSyntec during CQA are not included in the report but are available upon request. Record drawings illustrating layout of panels and the location of seams and repairs are included in Appendix A.

5.4 CQA of Smooth Geomembrane

A 60-mil smooth geomembrane was used only to construct the four flexible storage containers in the leachate storage area. The 60-mil smooth geomembrane, HDE 060A000, used to construct the flexible storage containers was supplied by GSE. Conformance samples for smooth geomembrane were collected (from the rolls produced for the project) by TRI at GSE's manufacturing plant in Houston Texas. TRI also performed the CQA conformance testing on the samples of the smooth geomembrane collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The results of the MQC and CQA conformance tests performed for 60-mil smooth geomembrane were presented in the Certification Report 1 (GeoSyntec, January 2004). A total of 3 CQA conformance samples were tested for approximately 202,000 ft^2 of smooth geomembrane delivered to the site for use in the construction of the four flexible storage containers in the leachate storage area. The CQA test frequency of 1 test per 67,000 ft^2 (approx.) of smooth geomembrane exceeded the minimum frequency of 1 test per 100,000 ft^2 required by the CQA Documents.

All smooth geomembrane seams were nondestructively tested using the air pressure or the vacuum-box test procedure as discussed in Section 5.3.3. The results of nondestructive tests performed for the bottom geomembrane of the bladders of the flexible storage containers were presented in the Certification Report 1 (GeoSyntec, January 2004). The results of nondestructive tests performed for the top geomembrane of the bladders of the flexible storage containers are included in Appendix C. It is noted that some of the nondestructive seam test results for the top bladders were originally presented in the Certification Report 1 (GeoSyntec, January 2004) and are repeated in Appendix C

for completeness. If nondestructive testing indicated that repairs were necessary, repairs were made in accordance with procedures presented in Section 5.3.5. All repairs were tested using the vacuum-box test procedure.

The destructive seam tests for the smooth geomembrane were performed in accordance with Section 5.3.4 and are summarized in Table 5-2. As noted, 17 destructive seam samples were tested for a total seam length of 8,150 ft (approx.). This corresponds to an approximate sample frequency of 1 per 480 lf of seam, which exceeds the minimum sample frequency of 1 per 500 lf of production seams required by the CQA Documents. It is noted that destructive seam test results for the bottom bladders (DSB-1 through DSB-10) were originally presented in the Certification Report 1 (GeoSyntec, January 2004) and are repeated in Table 5-2 for completeness.

5.5 CQA of Primary Geocomposite

5.5.1 Conformance Testing and Documentation

A tri-planar geocomposite was used as the primary drainage geocomposite in the double composite liner system in Cell 1B. The primary geocomposite used was Tendrain 7100-2 manufactured by the Tenax Corporation (Tenax) in Baltimore, Maryland. The primary geocomposite conformance samples were collected (from the rolls produced for the project) by TRI at the Tenax's manufacturing plant in Evergreen, Alabama. TRI also performed the CQA conformance testing on the samples of primary geocomposite collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The MQC and CQA conformance tests results for 358 rolls (approximately 895,000 ft^2) of primary geocomposite were presented in the Certification Report #1 (GeoSyntec, January 2004). During construction of Cell 1B, 46 additional rolls of the primary geocomposite were delivered to the site to complete construction.

The MQC and CQA conformance tests results for the 46 additional rolls of the primary geocomposite are summarized in Tables 5-3A, 5-3B, and 5-3C. Table 5-3A presents the CQA and MQC test results for the additional rolls of the primary geocomposite. Table 5-3B presents the MQC test results for the geotextile rolls used to manufacture the additional rolls of the primary geocomposite. Table 5-3C presents the MQC test results for the geonet rolls used to manufacture the additional rolls of the primary geocomposite.

Table 5-3A presents the CQA and MQC test results for the primary geocomposite rolls and CQA test results for the geotextile component of the primary geocomposite. Table 5-3A also indicates the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents. One CQA conformance samples was tested for approximately 120,000 ft^2 of additional primary geocomposite received to complete construction of Cell 1B. The CQA test frequency of 1 test per 120,000 ft^2 (approx.) of the primary geocomposite exceeded the minimum frequency of 1 test per 200,000 ft^2 required by the CQA Documents. As noted in Table 5-3A, the 46 additional rolls of the primary geocomposite were from the same lot.

It is noted that during CQA and MQC testing, the transmissivity of the primary geocomposite was measured under compressive stresses of 500 psf and 13,500 psf for 100 hours. The tests were performed with the primary geocomposite sandwiched between 60-mil textured geomembrane and the soil actually used in the liner protective layer. The transmissivity of the primary geocomposite reported in Table 5-3A is the minimum transmissivity measured during the 100-hour test.

Table 5-3B presents the MQC test results for the geotextile component of the primary geocomposite rolls approved for the project. Several rolls of primary geocomposite were manufactured from the same roll of geotextile. Approximately 239,000 ft^2 of geotextile was used to manufacture the 46 additional rolls of the primary geocomposite. As part of the MQC testing, 4 geotextile rolls were tested for mass per unit area, grab strength, trapezoidal tear strength, and puncture strength. Apparent opening size and permittivity tests were also performed on 1 of these 4 geotextile samples. The approximate MQC test frequency of 1 test per 60,000 ft^2 (or 239,000 ft^2) for the geotextile component of the primary geocomposite exceeded the minimum frequency of 1 test per 100,000 ft^2 (or 250,000 ft^2) required by the CQA Documents for the respective tests.

Table 5-3C presents the MQC test results for the geonet component of the 46 additional primary geocomposite rolls. Several rolls of primary geocomposite were manufactured from the same roll of geonet. Three geonet rolls were tested for approximately 119,600 ft^2 of geonet used to manufacture the 46 additional rolls of the primary geocomposite. The MQC test frequency of 1 test per 40,000 ft^2 (approx.) for the geonet component of the additional primary geocomposite rolls exceeded the minimum frequency of 1 test per 100,000 ft^2 required by the CQA Documents.

5.5.2 Field Monitoring Activities

5.5.2.1 Delivery and On-Site Storage

Upon delivery to the site, primary geocomposite rolls were stored in an area located east of the Cell 1A construction area (i.e., in future Cell 2 footprint) and stacked on HDPE perforated pipes. The rolls were typically transported by a tractor with a special lifting attachment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the primary geocomposite rolls delivered to the manufacturer's bill of lading. An inventory of the rolls delivered for the project was maintained by the CQA personnel and is available upon request. This inventory also includes the rolls that were approved for installation based on MQC and CQA test results and the rolls that were used during construction. Only approved rolls were incorporated into the work.

5.5.2.2 Deployment

CQA personnel monitored the deployment of the primary geocomposite for manufacturing defects, damage that may have occurred during shipment, storage, or handling, and damage resulting from installation activities. If the materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the CQA Documents. CQA personnel periodically monitored the deployment of the primary geocomposite, as well as its condition after installation, to confirm that the installer took measures to:

- securely anchor the geonet composite in the anchor trench or ballast it with sand bags;
- unroll the geonet composite down the slope (i.e., rolls were aligned perpendicular to the slope contours) in a manner that kept the panel in sufficient tension to avoid excessive wrinkling;
- avoid entrapment of dust, stones, or other objects that would damage or clog the geonet composite;
- avoid damaging the underlying geomembrane during deployment;
- secure the geonet composite panels with nylon fasteners, installed on a maximum 5-ft spacing laterally and at 1-ft spacing on end seams; and

- overlap and continuously sew the upper geotextile edges.

Any observed holes in the geotextile component of the primary geocomposite were repaired by placing a patch of non-woven geotextile over the hole that extended at least one foot beyond the edge of the hole. These patches were continuously thermally bonded to the undamaged portion of the geocomposite. This method was also used along the tie-in at the toe of the slope and along trimmed panels. Any observed holes or tears in the geonet component of the composite were repaired by the installer by placing a patch of the same material over or under the hole or tear, at least 2-ft beyond the edges of the hole or tear. These patches were secured using nylon fasteners, followed by thermal bonding of the uppermost geotextile of the patch to the undamaged portion of the geocomposite.

5.6 CQA of Secondary Geocomposite

5.6.1 Conformance Testing and Documentation

A bi-planar geocomposite was used as secondary drainage geocomposite in the double composite liner system in Cell 1B. The secondary geocomposite used was Fabrinet HS geocomposite manufactured by GSE in Kingstree, South Carolina. The secondary geocomposite conformance samples were collected (from the rolls produced for the project) by TRI at GSE's manufacturing plant in Kingstree, South Carolina. TRI also performed the CQA conformance testing on the samples of the secondary geocomposite collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The MQC and CQA conformance tests results for 360 rolls (887,400 ft^2) of secondary geocomposite were presented in the Certification Report 1 (GeoSyntec, January 2004). During construction of Cell 1B, 12 additional rolls of the secondary geocomposite were delivered to the site to complete construction.

The MQC and CQA conformance tests results for the 12 additional rolls of the secondary geocomposite are summarized in Tables 5-4A, 5-4B, and 5-4C. Table 5-4A presents the CQA and MQC test results for the additional rolls of the secondary geocomposite. Table 5-4B presents the MQC test results for the geotextile rolls used to manufacture the additional rolls of the secondary geocomposite. Table 5-4C presents the MQC test results for the geonet rolls used to manufacture the additional rolls of the secondary geocomposite.

Table 5-4A presents the CQA and MQC test results for the secondary geocomposite rolls and CQA test results for the geotextile component of the secondary geocomposite.

Table 5-4A also indicates the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents. One CQA conformance samples was tested for approximately 30,000 ft^2 of additional secondary geocomposite received to complete construction of Cell 1B. The CQA test frequency of 1 test per 30,000 ft^2 (approx.) of the secondary geocomposite exceeded the minimum frequency of 1 test per 200,000 ft^2 required by the CQA Documents. As noted in Table 5-4A, the 12 additional rolls of the secondary geocomposite were from the same lot.

It is noted that during CQA and MQC testing, the transmissivity of the secondary geocomposite was measured under compressive stresses of 500 psf and 13,500 psf for 100 hours. The tests were performed with the secondary geocomposite sandwiched between a GCL and a 60-mil textured geomembrane. The transmissivity of the secondary geocomposite reported in Table 5-4A is the minimum transmissivity measured during the 100-hour test.

Table 5-4B presents the MQC test results for the geotextile component of the secondary geocomposite rolls approved for the project. Several rolls of secondary geocomposite were manufactured from the same roll of geotextile. Approximately 59,000 ft^2 of geotextile was used to manufacture the 12 additional rolls of the secondary geocomposite. As part of the MQC testing, 3 geotextile rolls were tested for mass per unit area, grab strength, trapezoidal tear strength, puncture strength, burst strength, apparent opening size, and permittivity. The approximate MQC test frequency of 1 test per 59,000 ft^2 for the geotextile component of the secondary geocomposite exceeded the minimum frequency of 1 test per 100,000 ft^2 (or 250,000 ft^2) required by the CQA Documents.

Table 5-4C presents the MQC test results for the geonet component of the 12 additional secondary geocomposite rolls. Several rolls of secondary geocomposite were manufactured from the same roll of geonet. Two geonet rolls were tested for approximately 30,000 ft^2 of geonet used to manufacture the 12 additional rolls of the secondary geocomposite. The MQC test frequency of 1 test per 15,000 ft^2 (approx.) for the geonet component of the additional secondary geocomposite rolls exceeded the minimum frequency of 1 test per 100,000 ft^2 required by the CQA Documents.

5.6.2 Field Monitoring Activities

5.6.2.1 Delivery and On-Site Storage

Upon delivery to the site, secondary geocomposite rolls were stored in an area located east of the Cell 1A construction area (i.e., in future Cell 2 footprint) and stacked on HDPE perforated pipes. The rolls were typically transported by a tractor with a special

lifting attachment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the secondary geocomposite rolls delivered to the manufacturer's bill of lading. An inventory of the rolls delivered for the project was maintained by the CQA personnel and is available upon request. This inventory also includes the rolls that were approved for installation based on MQC and CQA test results and the rolls that were used during construction of Cell 1A. Only approved rolls were incorporated into the work.

5.6.2.2 Deployment

CQA personnel monitored the deployment of the secondary geocomposite for manufacturing defects, damage that may have occurred during shipment, storage, or handling, and damage resulting from installation activities. If the materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the CQA Documents. CQA personnel periodically monitored the deployment of the secondary geocomposite, as well as its condition after installation, to confirm that the installer took measures to:

- securely anchor the geonet composite in the anchor trench or ballast it with sand bags;
- unroll the geonet composite down the slope (i.e., rolls were aligned perpendicular to the slope contours) in a manner that kept the panel in sufficient tension to avoid excessive wrinkling;
- avoid entrapment of dust, stones, or other objects that would damage or clog the geonet composite;
- avoid damaging the underlying geomembrane during deployment;
- secure the geonet composite panels with nylon fasteners, installed on a maximum 5-ft spacing laterally and at 1-ft spacing on end seams; and
- overlap and continuously sew the upper geotextile edges.

Any observed holes in the geotextile component of the secondary geocomposite were repaired by placing a patch of non-woven geotextile over the hole that extended at least one foot beyond the edge of the hole. These patches were continuously thermally bonded to the undamaged portion of the geocomposite. This method was also used along the tie-in at the toe of the slope and along trimmed panels. Any observed holes or tears in the

geonet component of the composite were repaired by the installer by placing a patch of the same material over or under the hole or tear, at least 2-ft beyond the edges of the hole or tear. These patches were secured using nylon fasteners, followed by thermal bonding of the uppermost geotextile of the patch to the undamaged portion of the geocomposite.

5.7 CQA of Non-Woven Geotextile

5.7.1 Conformance Testing and Documentation

A non-woven geotextile was used as filter/separator fabric to surround the aggregate in the leachate collection system in Cell 1B. The 8-oz/yd^2, needle-punched, non-woven geotextile (GE 00808002) was manufactured by GSE in Kingstree, South Carolina. The CQA conformance samples for the non-woven geotextile were collected by GeoSyntec on-site and shipped to TRI. TRI performed the CQA conformance testing on the samples of the non-woven geotextile collected.

The MQC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The results of the MQC and CQA conformance tests performed for the non-woven geotextile were presented in the Certification Report 1 (GeoSyntec, January 2004). One CQA conformance samples was tested for approximately 36,000 ft^2 of the non-woven geotextile delivered to the site for installation in Cell 1A, Cell 1B, and the leachate storage area. The CQA test frequency of 1 test per 36,000 ft^2 of non-woven geotextile exceeded the minimum testing frequency of 1 test per 200,000 ft^2 required by the CQA Documents.

5.7.2 Field Monitoring Activities

5.7.2.1 Delivery and On-Site Storage

Upon delivery to the site, secondary geocomposite rolls were stored in an area located east of the Cell 1A construction area (i.e., in future Cell 2 footprint) and stacked on HDPE perforated pipes. The rolls were typically transported by a tractor with a special lifting attachment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner.

5.7.2.2 Deployment

CQA personnel monitored the deployment of the non-woven geotextile rolls for manufacturing defects; damage that may have occurred during shipment, storage, and

handling; and damage resulting from installation activities. If any materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the requirements of the CQA Documents.

After deployment of the geotextile, CQA personnel observed that the installer overlapped geotextile panels end-to-end a minimum of 24-in. and laterally a minimum of 6-in.

5.8 Interface Friction Testing

As discussed in Section 2, the liner system in Cell 1B consists (from top to bottom) of the liner protective layer, primary geocomposite, primary liner, primary GCL, secondary geocomposite, secondary liner, secondary GCL and prepared subbase. Tests were performed in accordance with the CQA Documents to evaluate the interface shear strength for the various components of the liner system and the internal strength of the GCL. All tests for interface shear strength and the internal strength of the GCL were performed by SGI Testing Services, LLC, (SGI) in Norcross, Georgia.

Tests were performed using samples of geosynthetics collected from rolls that were actually installed in Cell 1B. The soils for liner protective layer and liner subbase were obtained from the on-site borrow source, Borrow Area A, and were similar to the sandy soils used in construction of these two soil components of the liner system. The following rolls of geosynthetics were used in the interface friction tests:

- GCL – Roll #87879 (Lot #23101509);
- Textured geomembrane –Roll #108102299 (Lot #8230914);
- Tri-Planar geocomposite – Roll #3506719 (Lot #35041); and
- Bi-Planar geocomposite – Roll #131132618 (Lot #RPG120091).

The 6 different interfaces between the various components of the liner system and the internal strength of the GCL were tested at normal stresses of 5,000, 10,000, and 15,000 psf. Peak (at small displacement) and residual (at large displacements) shear strengths were measured at each normal stress. The interface shear tests were conducted under wetted conditions. GCL was soaked and consolidated prior to testing. The following liner system interfaces were tested (from top to bottom):

(1) Liner protective layer soil / Tri-planar geocomposite;
(2) Tri-planar geocomposite / Textured geomembrane;
(3) Textured geomembrane / GCL (non-heat treated side);
(4) GCL (heat treated side) / Bi-planar geocomposite;

(5) Bi-planar geocomposite / Textured geomembrane;
(6) GCL (heat treated side) / Subbase soil; and
(7) Internal strength of the GCL.

The minimum shear strengths required by the CQA Documents are presented in Table 5-5A. The measured peak and residual shear strengths are summarized in Table 5-5B and are presented in Figures 5-1 and 5-2, respectively. As noted, the measured peak and residual shear strengths exceeded the minimum specification requirements.

Table 5-1A

DESTRUCTIVE SEAM TEST RESULTS FOR PRIMARY LINER INSTALLED IN CELL 1B

Sample No.	Panel No.	Weld Type [1]	Peel Strength [2] (lb/in)										Shear Strength [3] (lb/in)					Failure Type [4]	Pass/Fail (P/F)
			Bottom Peel (inside)					Top Peel (outside)											
DSP-1	P17-P18	F	143	136	137	133	134	145	139	143	141	144	194	195	191	204	194	FTB	P
DSP-2	P1-P24	F	132	127	126	125	124	135	133	128	138	137	212	205	200	203	203	FTB	P
DSP-3	P24-P25	F	127	121	128	126	129	134	128	142	133	140	201	200	200	204	202	FTB	P
DSP-4	P10-P1	F	151	140	140	141	147	159	154	150	152	158	194	192	184	181	181	FTB	P
DSP-5	P25-P26	F	125	138	128	127	129	141	142	140	132	147	201	201	196	211	196	FTB	P
DSP-6	P26-P27	F	131	131	136	135	131	134	135	137	139	138	204	206	202	203	205	FTB	P
DSP-7	P27-P28	F	132	124	125	129	129	145	132	139	131	136	203	205	208	204	203	FTB	P
DSP-8	P28-P29	F	132	128	130	129	133	140	135	144	143	144	200	203	202	203	203	FTB	P
DSP-9	P29-P30	F	126	137	132	130	131	138	141	140	140	141	198	195	197	198	196	FTB	P
DSP-10	P30-P31	F	127	120	120	127	127	130	130	128	139	131	200	198	201	199	196	FTB	P
DSP-11	P31-P32	F	125	129	129	125	127	129	131	135	129	130	198	199	196	198	197	FTB	P
DSP-12	P32-P33	F	126	134	131	135	133	143	141	144	141	142	192	195	196	196	198	FTB	P
DSP-13	P33-P34	F	134	141	133	134	131	141	145	144	151	141	196	197	197	201	195	FTB	P
DSP-14	P34-P35	F	128	120	134	126	129	147	130	140	138	142	204	208	202	203	204	FTB	P
DSP-15	P35-P36	F	135	139	139	140	137	150	152	151	153	150	196	201	202	195	205	FTB	P
DSP-16	P36-P37	F	128	123	135	134	133	151	137	143	137	136	202	209	209	203	209	FTB	P
DSP-17	P37-P38	F	132	134	133	134	134	142	141	142	144	142	202	206	205	206	203	FTB	P
DSP-18	P38-P39	F	124	133	131	132	134	133	142	144	141	142	197	188	190	190	200	FTB	P
DSP-19	P39-TI	F	125	132	131	129	130	141	140	137	141	140	192	194	194	192	194	FTB	P
DSP-20	P48-P49	F	130	130	125	126	129	138	133	145	141	143	193	194	196	195	194	FTB	P
DSP-21	P40-P53	F	122	128	132	128	131	133	137	134	133	131	192	197	193	194	194	FTB	P
DSP-22	P54-P55	F	117	123	120	128	125	128	127	128	126	126	189	187	192	189	190	FTB	P
DSP-23	P56-P58	F	127	125	126	127	129	129	133	129	131	135	180	189	188	186	188	FTB	P
DSP-24	P43-P40	F	134	134	142	139	142	144	138	149	141	144	175	179	176	183	176	FTB	P
DSP-25	P27-P57	F	142	142	143	135	146	147	141	145	137	151	172	187	179	178	179	FTB	P

Notes:

[1] "F" is fusion and "E" is extrusion weld.

[2] Specified peel strength: 78 lb/in for fusion and 70 lb/in for extrusion

[3] Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion

[4] "FTB" is Film Tear Bond (with maximum 10 percent seam separation) and "AD" is adhesion failure (Non-FTB).

Table 5-1A (continued)

DESTRUCTIVE SEAM TEST RESULTS FOR PRIMARY LINER INSTALLED IN CELL 1B

Sample No.	Panel No.	Weld Type [1]	Peel Strength [2] (lb/in)										Shear Strength [3] (lb/in)					Failure Type [4]	Pass/Fail (P/F)
			Bottom Peel (inside)					Top Peel (outside)											
DSP-26	P60-P61	F	128	122	125	124	123	149	136	137	133	135	189	188	189	190	189	FTB	P
DSP-27	P63-P64	F	121	125	121	124	130	135	136	134	146	137	193	195	196	195	199	FTB	P
DSP-28	P66-P67	F	137	119	128	134	124	142	128	129	148	134	194	184	180	188	192	FTB	P
DSP-29	P68-P69	F	144	136	129	131	137	163	160	150	156	161	170	175	174	176	180	FTB	P
DSP-30	P29-P59	F	146	143	135	145	146	152	148	140	144	146	175	179	179	179	179	FTB	P
DSP-31	P71-P72	F	123	124	124	122	123	124	135	131	131	135	192	179	189	191	191	FTB	P
DSP-32	P74-1A	F	122	132	125	131	131	137	133	134	132	132	186	186	190	187	191	FTB	P

Notes:

[1] "F" is fusion and "E" is extrusion weld.

[2] Specified peel strength: 78 lb/in for fusion and 70 lb/in for extrusion

[3] Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion

[4] "FTB" is Film Tear Bond (with maximum 10 percent seam separation) and "AD" is adhesion failure (Non-FTB).

Table 5-1B

DESTRUCTIVE SEAM TEST RESULTS FOR SECONDARY LINER INSTALLED IN CELL 1B

Sample No.	Panel No.	Weld Type [1]	Peel Strength [2] (lb/in)										Shear Strength [3] (lb/in)					Failure Type [4]	Pass/Fail (P/F)	Retest No.
			Bottom Peel (inside)					Top Peel (outside)												
DSS-01	S17-S18	F	116	131	122	127	131	133	119	118	127	131	177	178	172	187	177	FTB	P	
DSS-02	S24-S25	F	144	142	131	136	135	146	141	135	138	140	184	176	186	178	176	FTB	P	
DSS-03	S25-S26	F	138	128	129	128	128	142	152	149	141	143	173	172	177	171	175	FTB	P	
DSS-04	S26-S27	F	128	132	126	123	127	140	141	136	139	136	175	176	167	173	164	FTB	P	
DSS-05	S27-S28	F	121	119	119	119	118	135	134	131	131	133	164	158	164	168	163	FTB	P	
DSS-06	S28-S29	F	131	130	136	139	138	130	134	130	128	135	167	167	173	166	163	FTB	P	
DSS-07	S29-S30	F	134	128	129	130	135	131	128	128	125	126	180	174	174	171	176	FTB	P	
DSS-08	S30-S31	F	131	128	127	128	129	135	133	136	134	134	201	204	206	202	203	FTB	P	
DSS-09	S31-S32	F	121	125	123	124	123	131	137	136	132	135	201	202	201	203	202	FTB	P	
DSS-10	S32-S33	F	126	127	123	133	121	143	146	139	140	140	205	196	197	200	198	FTB	P	
DSS-11	S33-S34	F	124	123	125	126	125	161	147	139	143	141	207	208	211	208	210	FTB	P	
DSS-12	S34-S35	F	126	134	133	127	135	135	134	138	139	141	207	209	211	210	211	FTB	P	
DSS-13	S35-S36	F	135	131	134	129	132	140	134	141	151	139	204	208	210	207	205	FTB	P	
DSS-14	S36-S37	F	127	131	126	127	127	142	145	141	142	143	209	206	210	208	209	FTB	P	
DSS-15	S37-S38	F	121	129	123	126	125	140	138	141	140	137	195	210	196	200	199	FTB	P	
DSS-16	S38-S39	F	133	125	127	124	126	139	126	131	130	132	211	206	207	210	208	FTB	P	
DSS-17	S39-S40	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	F [5]	17A, 17B
DSS-17A	S39-S40	F	149	144	135	138	140	160	161	160	157	155	209	213	209	215	210	FTB	P	
DSS-17B	S39-S40	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	F [5]	17B1
DSS-17B1	S39-S40	F	143	146	141	141	142	145	158	148	152	155	204	202	205	208	200	FTB	P	
DSS-18	S40-T1	F	129	125	124	122	122	141	130	130	128	128	207	206	207	205	201	FTB	P	
DSS-19	S47-S48	F	132	128	128	120	127	139	131	138	127	129	205	201	206	206	206	FTB	P	
DSS-20	S41-S53	F	128	134	130	136	133	134	142	149	137	142	206	204	207	204	206	FTB	P	

Notes:

[1] "F" is fusion and "E" is extrusion weld.

[2] Specified peel strength: 78 lb/in for fusion and 70 lb/in for extrusion

[3] Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion

[4] "FTB" is Film Tear Bond (with maximum 10 percent seam separation) and "AD" is adhesion failure (Non-FTB).

[5] Sample failed in field testing and were, therefore, not tested in the laboratory.

Table 5-1B (continued)

DESTRUCTIVE SEAM TEST RESULTS FOR SECONDARY LINER INSTALLED IN CELL 1B

Sample No.	Panel No.	Weld Type [1]	Peel Strength [2] (lb/in)										Shear Strength [3] (lb/in)					Failure Type [4]	Pass/Fail (P/F)	Retest No.
			Bottom Peel (inside)					Top Peel (outside)												
DSS-21	S53-S54	F	123	133	131	134	133	149	144	142	142	145	198	201	202	202	203	FTB	P	
DSS-22	S54-S56	F	133	127	129	132	130	135	142	141	144	141	202	199	204	206	203	FTB	P	
DSS-23	S56-S57	F	126	128	124	124	128	133	132	125	129	133	203	200	204	204	203	FTB	P	
DSS-24	S57-S58	F	128	126	125	122	126	139	136	129	130	140	200	193	198	196	203	FTB	P	
DSS-25	S60-S61	F	132	139	143	148	153	153	147	151	148	156	194	194	197	204	201	FTB	P	
DSS-26	S62-S63	F	134	128	131	135	135	138	145	142	139	144	206	206	215	207	207	FTB	P	
DSS-27	S64-S65	F	132	130	129	149	126	147	152	157	155	148	189	191	190	187	186	FTB	P	
DSS-28	S66-S67	F	125	127	124	126	124	139	138	139	145	143	197	191	197	194	197	FTB	P	
DSS-29	S68-S70	F	132	131	134	130	134	137	137	134	138	141	201	200	200	199	199	FTB	P	
DSS-30	S70-S71	F	131	125	131	122	122	139	137	134	138	139	188	191	196	193	190	FTB	P	
DSS-31	S72-S73	F	129	132	128	131	131	144	142	134	140	132	172	168	170	170	174	FTB	P	
DSS-32	S72-S74	F	129	134	129	124	131	136	138	149	133	137	173	183	174	180	176	FTB	P	
DSS-33	S74-T1	F	125	113	122	126	127	146	141	137	139	136	169	168	167	166	171	FTB	P	
DSS-34	S36-S69	F	126	111	109	120	115	135	132	137	126	142	172	171	178	174	175	FTB	P	

Notes:

[1] "F" is fusion and "E" is extrusion weld.

[2] Specified peel strength: 78 lb/in for fusion and 70 lb/in for extrusion

[3] Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion

[4] "FTB" is Film Tear Bond (with maximum 10 percent seam separation) and "AD" is adhesion failure (Non-FTB).

[5] Sample failed in field testing and were, therefore, not tested in the laboratory.

Table 5-2

DESTRUCTIVE SEAM TEST RESULTS FOR SMOOTH GEOMEMBRANE IN FLEXIBLE STORAGE CONTAINERS

Sample No. [5]	Panel No.	Weld Type [1]	Peel Strength [2] (lb/in)										Shear Strength [3] (lb/in)					Failure Type [4]	Pass/Fail (P/F)
			Bottom Peel (inside)					Top Peel (outside)											
DSB-1	BB7-BB18	F	121	123	124	126	124	120	116	122	123	124	180	177	173	172	175	FTB	P
DSB-2	BB6-BB14	F	120	118	124	122	129	118	116	122	122	121	181	173	170	168	173	FTB	P
DSB-3	BB20-BB21	F	131	127	125	124	127	127	126	123	123	124	169	173	172	170	170	FTB	P
DSB-4	BB32-BB21	F	130	128	126	125	127	128	128	125	125	126	180	182	182	185	183	FTB	P
DSB-5	BB32-BB31	F	120	126	129	133	131	118	117	122	119	118	177	173	168	170	171	FTB	P
DSB-6	BB36-BB38	F	133	126	129	123	126	120	120	121	122	125	168	173	158	163	160	FTB	P
DSB-7	BB48-BB49	F	140	135	129	138	130	136	127	125	131	131	164	170	165	163	166	FTB	P
DSB-8	BB60-BB61	F	133	131	148	136	128	130	126	131	132	133	166	164	160	161	169	FTB	P
DSB-9	BB55-BB54	F	136	124	129	121	136	130	124	120	128	127	173	169	170	170	172	FTB	P
DSB-10	BB70-BB71	F	126	129	129	130	129	118	126	134	130	117	168	168	173	170	170	FTB	P
DSB-11	BB47-BB50	F	134	129	139	132	130	129	137	143	130	142	181	170	181	173	170	FTB	P
DSBT-1	BT1-BT12	F	122	118	126	122	115	118	117	121	120	123	166	160	162	155	158	FTB	P
DSBT-2	BT1-BT2	F	124	125	126	123	124	120	122	121	120	124	160	154	159	162	168	FTB	P
DSBT-3	BT24-BT25	F	129	121	133	137	122	130	126	131	130	132	168	162	160	164	168	FTB	P
DSBT-4	BT25-BT26	F	133	138	126	135	128	131	136	130	129	122	172	175	177	169	169	FTB	P
DSBT-5	BT74-BT75	F	140	128	130	126	122	130	132	122	120	122	165	160	163	154	166	FTB	P
DSBT-6	BT75-BT76	F	126	133	127	119	130	124	129	121	132	121	160	155	150	150	152	FTB	P

Notes:

[1] "F" is fusion and "E" is extrusion weld.

[2] Specified peel strength: 78 lb/in for fusion and 70 lb/in for extrusion

[3] Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion

[4] "FTB" is Film Tear Bond (with maximum 10 percent seam separation) and "AD" is adhesion failure (Non-FTB).

[5] DSB and DSBT represent destructive seam tests performed for bottom and top bladders, respectively.

Table 5-3A

CQA AND MQC TEST RESULTS FOR 46 ADDITIONAL ROLLS OF PRIMARY GEOCOMPOSITE (TENAX)

	CONSTRUCTION QUALITY ASSURANCE (CQA)							MANUFACTURING QUALITY CONTROL (MQC)	
	GEOTEXTILE					GEOCOMPOSITE		GEOCOMPOSITE	
PROPERTY	Mass per Unit Area (oz/yd^2)	Grab Strength [1] (lb)	Trapezoidal Tear Strength [1] (lb)	Apparent Opening Size (mm)	Permittivity (sec^{-1})	Transmissivity (m^2/sec)	Peel Strength [2] (lb/in)	Transmissivity (m^2/sec)	Peel Strength [2] (lb/in)
TEST STANDARD	ASTM D 5261	ASTM D 4632	ASTM D 4533	ASTM D 4751	ASTM D 4491	ASTM D 4716	ASTM F 904	ASTM D 4716	GRI GC7
PROJECT SPECS.	≥ 8	≥ 180	≥ 75	≤ 0.21	≥ 0.5	≥ $7.8x10^{-3}$ at 500 psf; ≥ $2.6x10^{-3}$ at 13,500 psf	≥ 1	≥ $7.8x10^{-3}$ at 500 psf; ≥ $2.6x10^{-3}$ at 13,500 psf	≥ 1
TESTING FREQUENCY	1 per 200,000 ft^2 [3]			1 per 500,000 ft^2 [3]		1 per 200,000 ft^2 [3]		1 per 100,000 ft^2 [3]	

GEOCOMPOSITE ROLL NUMBER	LOT NO.	CQA SAMPLE ID	CQA TEST RESULTS								MQC TEST RESULTS			PASS/FAIL (P/F)	
														CQA	MQC
400230	EQUX 631561	PGC-5	9.05	321	109	0.141	0.97	$8.6x10^{-3}$	$4.8x10^{-3}$	3.7	$1.1x10^{-2}$	$6.8x10^{-3}$	1.54	P	P

Notes:

[1] Smaller value in machine and cross-machine directions.

[2] Smaller of top and bottom peel strength.

[3] A minimum of 1 test per lot was required.

Average Roll Area (200 ft x 13 ft):	2,600	ft^2
Total No. of Rolls:	46	
Total Area of Rolls:	119,600	ft^2

Table 5-3B

MQC TEST RESULTS FOR GEOTEXTILE USED TO MANUFACTURE 46 ADDITIONAL ROLLS OF PRIMARY GEOCOMPOSITE (TENAX)

PROPERTY	Mass per Unit Area (oz/yd^2)	Grab Strength [1] (lb)	Trapezoidal Tear Strength [1] (lb)	Puncture Strength (lb)	Apparent Opening Size (mm)	Permittivity (sec^{-1})
TEST STANDARD	ASTM D 5261	ASTM D 4632	ASTM D 4533	ASTM D 4833	ASTM D 4751	ASTM D 4491
PROJECT SPECS.	≥ 8	≥ 180	≥ 75	≥ 75	≤ 0.21	≥ 0.5
TESTING FREQUENCY	1 per 100,000 ft^2				1 per 250,000 ft^2	

GEOTEXTILE ROLL NUMBER	LOT NO.	TEST RESULTS						PASS/FAIL (P/F)
3017725	EQUX 631561	8.5	365	164	167			P
3017737		8.7	357	160	154	0.08	1.2	P
3017785		8.6	316					P
3017805		8.6	332	174	146			P
3017817		8.5	336	171	158			P

Note:
[1] Smaller value in machine and cross-machine directions.

Total Area of Geotextile Rolls:		239,200	ft^2
No. of Geotextile Rolls Tested:		4 / 1	
Test Frequency:	1 per	59,800 / 239,200	ft^2

Table 5-3C

MQC TEST RESULTS FOR GEONET USED TO MANUFACTURE 46 ADDITIONAL ROLLS OF PRIMARY GEOCOMPOSITE (TENAX)

PROPERTY	Polymer Density (g/cm^3)	Carbon Black Content (%)	Thickness (mil)
TEST STANDARD	ASTM D 1505	ASTM D 1603	ASTM D 5199
PROJECT SPECS.	≥ 0.93	2 to 3	≥ 200
TESTING FREQUENCY	1 per 100,000 ft^2		

GEONET ROLL NUMBER	LOT NO.	TEST RESULTS			PASS/FAIL (P/F)
400013	EQUX 631561	0.952	2.6	348	P
400016		0.953	2.7	356	P
400018		0.952	2.8	346	P

Area of Geonet Rolls:		119,600	ft^2
No. of Geonet Rolls Tested:		3	
Test Frequency:	1 per	39,867	ft^2

Table 5-4A

CQA AND MQC TEST RESULTS FOR 12 ADDITIONAL ROLLS OF SECONDARY GEOCOMPOSITE (GSE)

	CONSTRUCTION QUALITY ASSURANCE (CQA)							MANUFACTURING QUALITY CONTROL (MQC)	
	GEOTEXTILE					GEOCOMPOSITE		GEOCOMPOSITE	
PROPERTY	Mass per Unit Area (oz/yd^2)	Grab Strength [1] (lb)	Trapezoidal Tear Strength [1] (lb)	Apparent Opening Size (mm)	Permittivity (sec^{-1})	Transmissivity (m^2/sec)	Peel Strength [2] (lb/in)	Transmissivity (m^2/sec)	Peel Strength [2] (lb/in)
TEST STANDARD	ASTM D 5261	ASTM D 4632	ASTM D 4533	ASTM D 4751	ASTM D 4491	ASTM D 4716	ASTM F 904	ASTM D 4716	GRI GC7
PROJECT SPECS.	≥ 8	≥ 180	≥ 75	≤ 0.21	≥ 0.5	≥ $5.0x10^{-4}$ at 500 psf; ≥ $1.5x10^{-4}$ at 13,500 psf	≥ 1	≥ $5.0x10^{-4}$ at 500 psf; ≥ $1.5x10^{-4}$ at 13,500 psf	≥ 1
TESTING FREQUENCY	1 per 200,000 ft^2 [3]			1 per 500,000 ft^2 [3]		1 per 200,000 ft^2 [3]		1 per 100,000 ft^2 [3]	

GEOCOMPOSITE ROLL NUMBER	LOT NO.	CQA SAMPLE ID	TEST RESULTS								TEST RESULTS			PASS/FAIL (P/F)	
														CQA	MQC
131142225	CB24012403	SGC-6	9.8	298	96.0	0.12	1.1	$3.9x10^{-3}$	$3.6x10^{-4}$	3.2	$3.9x10^{-3}$	$7.9x10^{-4}$	1.7	P	P
131142226													1.3		P

Notes:

[1] Smaller value in machine and cross-machine directions.

[2] Smaller of top and bottom peel strength.

[3] A minimum of 1 test per lot was required.

Average Roll Area (170 ft x 14.5 ft):	2,465	ft^2
Total No. of Rolls:	12	
Total Area of Rolls:	29,580	ft^2

Table 5-4B

MQC TEST RESULTS FOR GEOTEXTILE USED TO MANUFACTURE 12 ADDITIONAL ROLLS OF SECONDARY GEOCOMPOSITE (GSE)

PROPERTY	Mass per Unit Area (oz/yd^2)	Grab Strength [1] (lb)	Trapezoidal Tear Strength [1] (lb)	Puncture Strength (lb)	Burst Strength (lb/in^2)	Apparent Opening Size (mm)	Permittivity (sec^{-1})
TEST STANDARD	ASTM D 5261	ASTM D 4632	ASTM D 4533	ASTM D 4833	ASTM D 3786	ASTM D 4751	ASTM D 4491
PROJECT SPECS.	≥ 8	≥ 180	≥ 75	≥ 75	≥ 350	≤ 0.21	≥ 0.5
TESTING FREQUENCY	1 per 100,000 ft^2					1 per 250,000 ft^2	

GEOTEXTILE ROLL NUMBER	TEST RESULTS							PASS/FAIL (P/F)
130159319	8.2	282	135	148	512	0.18	1.9	P
130159326	8.4	267	119	159	464	0.18	1.9	P
130162569	8.5	254	122	141	392	0.18	2.0	P

Note:
[1] Smaller value in machine and cross-machine directions.

Total Area of Geotextile Rolls:		59,160	ft^2
No. of Geotextile Rolls Tested:		3	
Test Frequency:	1 per	19,720	ft^2

Table 5-4C

MQC TEST RESULTS FOR GEONET USED TO MANUFACTURE 12 ADDITIONAL ROLLS OF SECONDARY GEOCOMPOSITE (GSE)

PROPERTY	Polymer Density (g/cm^3)	Carbon Black Content (%)	Thickness (mil)
TEST STANDARD	ASTM D 1505	ASTM D 1603	ASTM D 5199
PROJECT SPECS.	≥ 0.93	2 to 3	≥ 200
TESTING FREQUENCY	1 per 100,000 ft^2		

GEONET ROLL NUMBER	LOT NO.	TEST RESULTS			PASS/FAIL (P/F)
131142225	CB24012403	0.961	2.3	289	P
131142226		0.96	2.5	307	P

Area of Geonet Rolls:		29,580	ft^2
No. of Geonet Rolls Tested:		2	
Test Frequency:	1 per	14,790	ft^2

Table 5-5A

MINIMUM INTERFACE SHEAR STRENGTHS REQUIRED BY THE CQA DOCUMENTS

Normal Stress (psf)	Shear Strength (psf)
2,005	429
5,013	787
10,025	1,143
15,038	1,594

Table 5-5B

INTERFACE SHEAR STRENGTHS FROM CQA TESTING

	(1) Protective Layer Soil / Tri-Planar Geocomposite		(2) Tri-Planar / Textured Geomembrane		(3) Textured Geomembrane / GCL		(4) GCL / Bi-Planar Geocomposite		(5) Bi-Planar / Textured Geomembrane		(6) GCL / Subbase Soil		(7) GCL Internal Strength	
Normal Stress (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)
5,000	3,922	3,475	3,220	1,932	2,939	1,461	3,349	2,079	2,797	1,677	3,142	2,598	3,783	1,130
10,000	7,356	6,806	5,464	3,139	4,440	1,832	4,863	1,780	5,456	3,170	4,644	2,288	5,507	1,787
15,000	10,344	9,744	7,730	4,650	5,644	2,237	6,151	1,968	7,891	4,660	6,142	2,118	6,967	2,486

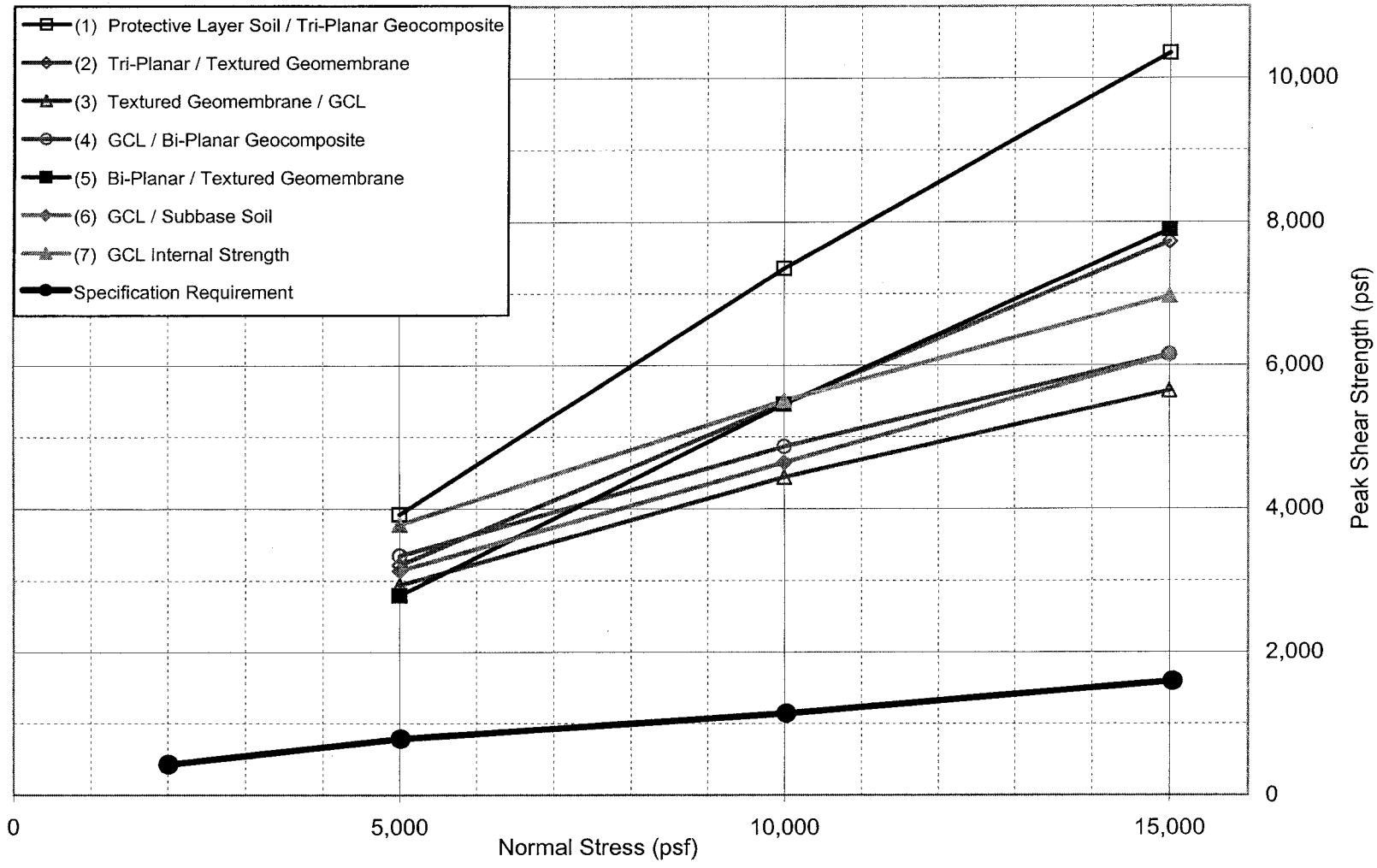


Figure 5-1: Peak Shear Strengths from Interface Friction Tests

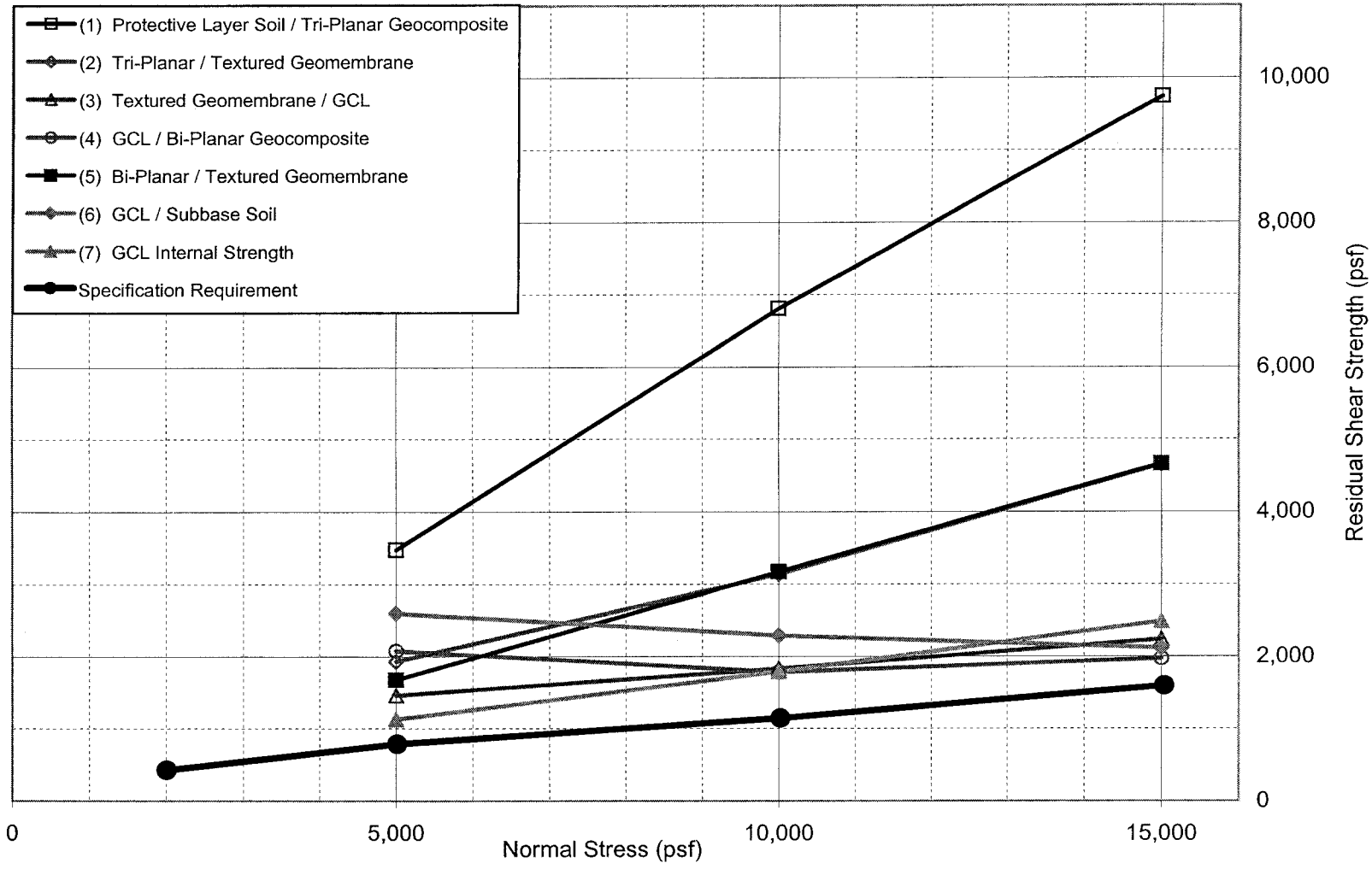


Figure 5-2: Residual Shear Strengths from Interface Friction Tests

6. CONSTRUCTION QUALITY ASSURANCE -- LEACHATE COLLECTION SYSTEM IN CELL 1B

6.1 General

The leachate management system is comprised of the leachate collection, transmission, and storage systems. The construction of the initial leachate management system for Phase 1 development of the OHDF landfill included construction of the leachate collection system in Cells 1A and 1B, Cell 1 sump, leachate transmission system for Phase 1, and the initial leachate storage area. The construction of leachate collection system in Cell 1A, Cell 1 sump, leachate transmission system for Phase 1, and the initial leachate storage area was discussed in the Certification Report 1 (GeoSyntec, January 2004). The construction of leachate collection system in Cell 1B is discussed herein.

The leachate collection system in Cell 1B consists of a primary and a secondary leachate collection systems. The primary leachate collection system included 6-in diameter SDR 11 HDPE perforated leachate collection pipe surrounded by gravel aggregate and geotextile filter fabric at the toe of the perimeter berm on west side of Cell 1B. The leachate collection pipe was provided with two rows of ½-in perforations in the bottom 1/3 of the pipe section. Granular drainage materials meeting the requirements of #57 stone (per ASTM D 448) were used as the gravel aggregate. An 8-oz/yd^2 needle-punched, non-woven geotextile was used as the filter fabric. One cleanout was installed along the inside slope of the perimeter dike in Cell 1B to maintain the leachate collection system piping. The cleanout was constructed using 6-in diameter SDR 11 HDPE pipe and was finished with a blind flange. The secondary leachate collection system included an additional 6-ft wide secondary geocomposite layer at the toe of the perimeter berm on the west side of Cell 1B.

The leachate collection system in Cell 1B has not been connected to the leachate collection system in Cell 1A at this time. The leachate collection system in Cell 1A extends into Cell 1B through the temporary inner cell berm between Cells 1A and 1B. Prior to beginning waste disposal in Cell 1B, the existing inner cell berm (and rain flap) will be removed and the leachate collection systems in Cells 1A and 1B will be tied together.

GeoSyntec's CQA personnel monitored the construction of the leachate collection system in Cell 1B. The field monitoring and testing activities performed by the CQA personnel during construction of the leachate collection system in Cell 1B are discussed below.

6.2 HDPE Pipe

The HDPE pipes used in construction of the leachate collection system in Cell 1B were SDR 11. The MQC certificates for the HDPE pipes were reviewed by the CQA personnel and were found to be in compliance with the requirements of the CQA Documents.

HDPE pipe sections were joined using butt-fusion welding techniques. CQA personnel periodically monitored the butt-fusion welding techniques to ensure that industry-accepted procedures were used during construction. CQA personnel also verified the diameter of and perforation details (size, number of rows, orientation) for the HDPE pipes used in construction of the leachate collection system in Cell 1B and periodically monitored the installation of the pipes to ensure compliance with the requirements of the CQA Documents.

6.3 Granular Drainage Materials

Granular drainage materials meeting the requirements of #57 stone (per ASTM D 448) were used in the leachate collection system in Cell 1B. The #57 stone was supplied by Martin Marietta in Shorters, Alabama.

The QC certificates and test results and the CQA conformance test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The QC and CQA conformance tests results were presented in the Certification Report 1 (GeoSyntec, January 2004).

CQA personnel periodically monitored the placement of the granular drainage material to ensure (i) the underlying geosynthetics were not damaged; (ii) the perforated pipes were properly surrounded by the drainage materials; and (iii) the drainage materials were placed in accordance with the requirements of the CQA Documents.

7. CONSTRUCTION QUALITY ASSURANCE - MISCELLANEOUS ACTIVITIES

Miscellaneous activities performed at the OHDF landfill included construction of the check dams, wetlands restoration, and placement of limerock along the perimeter maintenance road. Five check dams were constructed along the Bull Creek as indicated in the CQA Documents. Wetland restoration is being performed along the site access road in accordance with the CQA Documents. Limerock was placed, graded, and compacted as base course along the perimeter maintenance road on north and west sides of Cell 1.

8. CONCLUSIONS

Observation of the construction of Cell 1B and miscellaneous activities at the OHDF was performed by GeoSyntec during the period of 21 October 2003 to 25 April 2004. During this time, CQA personnel monitored the following construction activities:

- earthwork (Cell 1B subgrade, 6-inch liner subbase, and intercell berms);
- geosynthetics in Cell 1B;
- leachate collection system in Cell 1B;
- miscellaneous activities including construction of check dams and limerock placement along the perimeter maintenance road around Cell 1.

During construction of the above components, CQA personnel verified that performance and conformance testing was performed at the frequencies required by the CQA Documents and that the installation met or exceeded the requirements of the CQA Documents. CQA personnel also verified that conditions or materials identified as not conforming to the CQA Plan were replaced, repaired, and/or retested, as described in the report.

The results of the CQA activities undertaken by GeoSyntec as described in this report indicate that Cell 1B and the miscellaneous activities at the OHDF landfill were constructed in accordance with the CQA Documents and the solid waste permit.

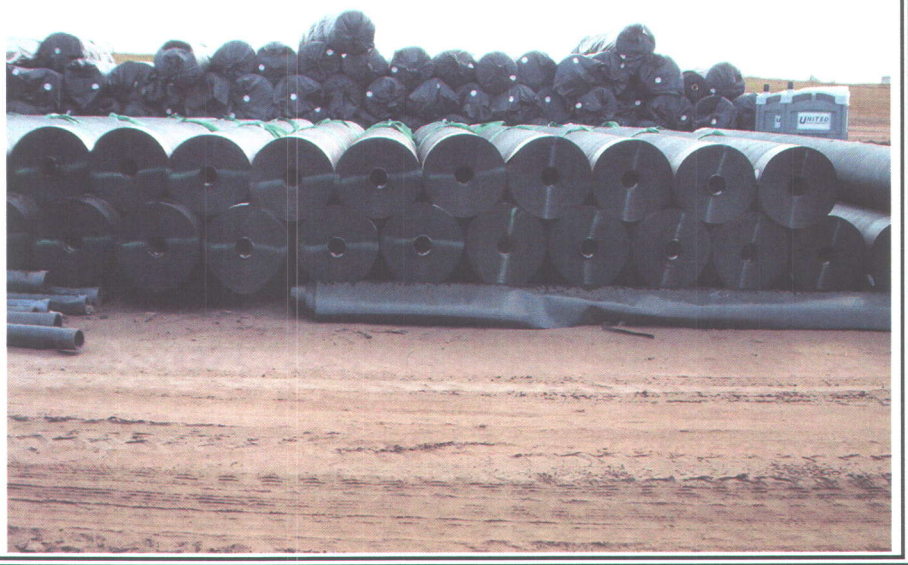
Kirk Wills
Field Services Manager

Kenneth W. Cargill, P.E.
Project Manager, CQA Engineer-of-Record

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 1 Date: February 25, 2004 Comments: Placement and compaction of materials in Cell 1B.	
Photograph 2 Date: February 27, 2004 Comments: Smooth drum compacting subrade in Cell 1B.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 3 Date: February 24, 2004 Comments: Subgrade in Cell 1B.	
Photograph 4 Date: March 5, 2004 Comments: Liner and geocomposite (at the back) stored.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 5 Date: March 5, 2004 Comments: GCL stored.	
Photograph 6 Date: March 10, 2004 Comments: Inatallation of secondary GCL over subbase in Cell 1B.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 7 Date: March 10, 2004 Comments: Installation of secondary GCL in Cell 1B.	
Photograph 8 Date: March 10, 2004 Comments: Installation of secondary liner over GCL in Cell 1B.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 9 Date: March 10, 2004 Comments: Deployment of secondary liner over GCL in Cell 1B.	
Photograph 10 Date: March 10, 2004 Comments: Deployment of secondary liner over GCL in Cell 1B.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 11 Date: March 17, 2004 Comments: As-built survey of liner by CQA personnel.	
Photograph 12 Date: April 1, 2004 Comments: Deploying tri-planar geocomposite.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 13 Date: April 13, 2004 Comments: Geosynthetics installation in Cell 1B.	
Photograph 14 Date: April 13, 2004 Comments: Tying geonet for tri-planar geocomposite.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 15 Date: April 13, 2004 Comments: Sewing seams for tri-planar geocomposite.	
Photograph 16 Date: April 13, 2004 Comments: Extrusion welding at the anchor trench.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 17 Date: April 13, 2004 Comments: Air pressure test for fusion weld.	
Photograph 18 Date: March 17, 2004 Comments: Check Dam # 1.	

GeoSyntec Consultants Photographic Record		
Client: Omni Waste of Osceola County, LLC	Project Number:	FX 0521
Project Name: Oak Hammock Disposal Facility – Cell 1B		
Project Location: Near Holopaw in Osceola County, Florida		

Photograph 19	
Date: April 19, 2004	
Comments: Perimeter maintenance road with base material.	

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/12/2004	11:10	75-40	RZ	F	2-5-6-0-29	29	RH	0-29' FSAT	30/30, 1445-1450	JG	P	ATOK	RH
3/12/2004	11:15	75-52	JR	F	2-7-8-0-30	30	RH	0-30' FSAT	30/30, 1437-1442	JG	P	ATOK	RH
3/12/2004	11:18	75-40	RZ	F	2-6-7-0-29	29	RH	0-29' FSAT	34/33-1453-1458	JG	P	ATOK	RH
3/12/2004	11:26	75-52	JR	F	2-8-9-0-30	30	RH	0-30' FSAT	30/29, 1432-1437	JG	P	ATOK	RH
3/12/2004	11:30	75-52	JR	F	2-9-10-0-30	30	RH	0-30' FSAT	30/30, 1430-1435	JG	P	ATOK	RH
3/12/2004	11:37	75-10	AA	F	2-01-02-0-28	28	RH	0-28' FEAT	31/29, 1501-1506	JG	P	ATOK	RH
3/12/2004	11:38	75-40	RZ	F	2-04-05-0-29	29	RH	0-29' FSAT	32/32 1512-1517	JG	P	ATOK	RH
3/12/2004	11:40	75-52	JR	F	2-10-11-0-31	31	RH	0-31' FSAT	30/30, 1425-1430	JG	P	ATOK	RH
3/12/2004	11:45	75-52	JR	F	2-11-12-0-30	30	RH	0-30' FSAT	32/32, 1420-1425	JG	P	ATOK	RH
3/12/2004	11:46	75-40	RZ	F	2-15-16-0-31	31	RH	0-31' FSAT	32/31 1401-1406	JG	P	ATOK	RH
3/12/2004	12:02	75-10	AA	F	2-2-4-0-31	31	RH	6-37'	30/30, 1504-1509	JG	P	ATOK	RH
3/12/2004	12:45	75-52	JR	F	2-12-13-0-31	31	RH	0-31' FEAT	32/32 1413-1418	JG	P	ATOK	RH
3/12/2004	12:50	75-40	RZ	F	2-22-23-0-33	33	RH	0-33' FSAT	30/30, 1319-1324	JG	P	ATOK	RH
3/12/2004	13:00	75-52	JR	F	2-13-14-0-31	31	RH	0-31' FSAT	30/29, 1410-1415	JG	P	ATOK	RH
3/12/2004	13:00	75-40	RZ	F	2-21-22-0-33	33	RH	0-33' FSAT	30/29 1323-1328	JG	P	ATOK	RH
3/12/2004	13:05	75-52	JR	F	2-14-15-0-31	31	RH	0-31' FSAT	30/30, 1408-1413	JG	P	ATOK	RH

GeoSyntec Consultants

Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/12/2004	13:10	75-40	RZ	F	2-20-21-0-33	33	RH	0-33' FSAT	31/31, 1325-1330	JG	P	ATOK	RH
3/12/2004	13:15	75-52	JR	F	2-16-17-0-32	32	RH	0-32' FSAT	30/30, 1356-1401	JG	P	ATOK	RH
3/12/2004	13:22	75-40	RZ	F	2-19-20-0-33	33	RH	0-33' FSAT	30/30, 1346-1351	JG	P	ATOK	RH
3/12/2004	13:25	75-52	JR	F	2-17-18-0-32	32	RH	0-32' FSAT	30/30, 1403-1408	JR	P	ATOK	RH
3/12/2004	13:28	75-40	RZ	F	2-18-19-0-32	32	RH	0-32' FSAT	30/30,1353-1358	JG	P	ATOK	RH
3/12/2004	13:45	75-52	JR	F	2-01-24-0-460	460	RH	0-460' FEAT	31/31 1552-1557	JG	P	ATOK	RH
3/12/2004	14:05	75-40	RZ	F	2-24-25-0-464	464	RH	0-460' FEAT	31/31 1550-1555	JG	P	ATOK	RH
3/12/2004	14:55	75-52	JR	F	2-25-26-0-457	457	RH	0-455' FEAT	31/31 1615-1620	JG	P	ATOK	RH
3/12/2004	15:18	75-40	RZ	F	2-26-27-0-456	456	RH	0-456' FEAT	31/31 1717-1722	JG	P	ATOK	RH
3/12/2004	15:55	75-52	JR	F	2-27-28-0-457	457	RH	0-456' FEAT	31/30 1600-1605	JG	P	ATOK	RH
3/12/2004	16:20	75-40	RZ	F	2-28-29-0-456	456	RH	0-456' FEAT	32/31 0830-0835	JG	P	ATOK	RH
3/12/2004	16:25	75-10	AA	F	2-23-01-437-458	22	RH	437-458' FEAT	32/32 1130-1135	JG	P	ATOK	RH
3/12/2004	16:30	75-10	AA	F	2-22-01-414-437	22	RH	414-437' FEAT	31/30 1212-1217	JG	P	ATOK	RH
3/12/2004	16:35	75-10	AA	F	2-21-01-392-414	22	RH	392-414'	30/30 1154-11 59	JG	P	ATOK	RH
3/12/2004	16:40	75-10	AA	F	2-20-01-360-382	22	RH	360-382' FEAT	30/30 1124-1129	JG	P	ATOK	RH
3/12/2004	16:45	75-10	AA	F	2-19-01-346-369	23	RH	346-369' FEAT	30/30 1110-1115	JG	P	ATOK	RH

GeoSyntec Consultants

Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/12/2004	16:50	75-10	AA	F	2-18-01-324-346	22	RH	324-346' FEAT	30/30 1104-1109	JG	P	ATOK	RH
3/12/2004	16:55	75-10	AA	F	2-17-01-302-324	22	RH	302-324' FEAT	32/32 1103-1108	JG	P	ATOK	RH
3/12/2004	17:00	75-10	AA	F	2-16-01-279-301	23	RH	279-302' FEAT	30/29 1032-1037	JG	P	ATOK	RH
3/12/2004	17:05	75-10	AA	F	2-15-01-257-279	22	RH	257-279' FEAT	30/30 10:34-10:39	JG	P	ATOK	RH
3/12/2004	17:10	75-10	AA	F	2-14-01-234-257	23	RH	234-257' FEAT	30/30 0957-1002	JG	P	ATOK	RH
3/12/2004	17:15	75-10	AA	F	2-13-01-211-234	23	RH	211-234' FEAT	30/30 0956-1001	JG	P	ATOK	RH
3/12/2004	17:20	75-10	AA	F	2-12-01-189-211	22	RH	189-211' FEAT	30/29 0939-0944	JG	P	ATOK	RH
3/12/2004	17:20	75-40	RZ	F	2-8-1-98-121	23	RH	98-121 FEAT	30/30 0805-0810	JG	P	ATOK	RH
3/12/2004	17:24	75-40	RZ	F	2-7-1-75-98	23	RH	75-98' FEAT	31/31 0820-0825	JG	P	ATOK	RH
3/12/2004	17:25	75-10	AA	F	2-11-01-166-189	23	RH	166-189' FEAT	31/31 0934-0939	JG	P	ATOK	RH
3/12/2004	17:29	75-40	RZ	F	2-6-1-53-75	22	RH	53-75' FEAT	30/30 0833-0838	JG	P	ATOK	RH
3/12/2004	17:30	75-10	AA	F	2-10-01-143-166	23	RH	143-166' FEAT	30/30 0916-0921	JG	P	ATOK	RH
3/12/2004	17:30	75-40	RZ	F	2-5-1-28-53	23	RH	28'-53' FEAT	30/30 0840-0845	JG	P	ATOK	RH
3/12/2004	17:35	75-10	AA	F	2-9-1-121-143	22	RH	121-143' FEAT	31/31 0906-0911	JG	P	ATOK	RH
3/13/2004	9:00	75-52	JR	F	2-29-30-0-458	458	RH	0-457' FEAT	38/38 1150-1155	JG	P	ATOK	RH
3/15/2004	9:05	75-40	RZ	F	2-30-31-0-460	463	RH	0-460' FEAT	30/30 1315-1320	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/15/2004	9:25	75-52	JR	F	2-33-34-0-457	457	RH	0-457	30/30 1123-1128	JG	P	ATOK	RH
3/15/2004	9:30	75-52	JR	F	2-31-32-0-460	460	RH	0-457' FEAT	30/30 1305-1310	JG	P	ATOK	RH
3/15/2004	10:05	75-40	RZ	F	2-32-33-0-458	458	RH	0-455' FEAT	30/30 1345-1350	JG	P	ATOK	RH
3/18/2004	13:05	75-52	JR	F	2-34-35-0-460	460	RH	0-460'	34/34, 1620-1625	JG	P	ATOK	RH
3/18/2004	13:12	75-10	AA	F	2-35-36-0-460	460	RH	0-460'	33/33, 1609-1614	JG	P	ATOK	RH
3/18/2004	14:10	75-52	JR	F	2-36-37-0-460	460	RH	0-460'	34/35, 1623-1628	JG	P	ATOK	RH
3/18/2004	14:25	75-10	AA	F	2-37-38-0-460	460	RH	0-460'	34/34, 1628-1623	JG	P	ATOK	RH
3/18/2004	16:25	75-10	RZ	F	2-38-39-0-460	460	RH	0-460'	30/30, 0803-0808	JG	P	ATOK	RH
3/18/2004	16:25	75-52	JR	F	2-39-Cell1A-0-460	460	RH	0-460'	34/33, 0737-0742	JG	P	ATOK	RH
3/27/2004	13:55	75-52	JR	F	2-23-41-0-34	34	RC	0-34' FSAT	30/30 08:24-08:29	AR	P	ATOK	RC
3/27/2004	14:09	75-52	JR	F	2-41-42-0-34	34	RC	0-35' FSAT	32/32 08:14-08:19	JG	P	ATOK	RC
3/27/2004	14:18	75-52	JR	F	2-42-43-0-34	34	RC	0-35' FSAT	30/30 08:09-08:14	AR	P	ATOK	RC
3/27/2004	14:25	75-52	JR	F	2-43-44-0-35	35	RC	0-35' FSAT	30/28 08:06-08:11	AR	P	ATOK	RC
3/27/2004	14:35	75-52	JR	F	2-44-45-0-35	35	RC	0-35' FSAT	34/34 08:05-08:10	AR	P	ATOK	RC
3/27/2004	14:48	75-52	JR	F	2-45-46-0-35	35	RC	0-35' FSAT	32/30 08:06-08:11	JG	P	ATOK	RC
3/27/2004	14:55	75-10	RZ	F	2-40-53-0-263	263	RC	0-263' FWAT	34/33 08:44-08:49	AR	P	ATOK	RC

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/27/2004	14:55	75-52	JR	F	2-46-47-0-35	35	RC	0-35' FSAT	34/32 07:46-07:51	JG	P	ATOK	RC
3/27/2004	15:05	75-52	JR	F	2-47-48-0-35	35	RC	0-35' FSAT	34/34 08:02-08:07	JG	P	ATOK	RC
3/27/2004	15:15	75-40	JR	F	2-52-40-0-54	54	RC	0-54' FWAT	32/32 08:33-08:38	AR	P	ATOK	RC
3/27/2004	15:17	75-52	JR	F	2-48-49-0-35	35	RC	0-35' FSAT	34/32 07:41-07:46	JG	P	ATOK	RC
3/27/2004	15:25	75-52	JR	F	2-49-50-0-35	35	RC	0-35' FSAT	30/30 07:40-07:45	JG	P	ATOK	RC
3/27/2004	15:30	75-40	JR	F	2-51-52-0-34	34	RC	0-34' FWAT	34/34 08:30-08:35	AR	P	ATOK	RC
3/27/2004	15:40	75-10	RZ	F	2-53-54-0-263	263	RC	0-263' FWAT	32/32 08:46-08:51	AR	P	ATOK	RC
3/27/2004	15:40	75-52	JR	F	2-54-55-0-264	264	RC	0-264' FWAT	34/34 08:48-08:53	AR	P	ATOK	RC
3/27/2004	16:00	75-40	JR	F	2-56-57-0-22	22	RC	0-22 182' FWAT	34/33 09:01-09:06	AR	P	ATOK	RC
3/27/2004	16:10	75-40	JR	F	2-55-56-182	182	RC	0-182' FWAT	32/32 09:04-09:09	AR	P	ATOK	RC
3/27/2004	16:10	75-40	JR	F	2-55-57-182-266	84	RC	182-266' FWAT	32/32	AR	P	ATOK	RC
3/27/2004	16:25	75-10	RZ	F	2-56-58-0-182	182	RC	0-182' FWAT	32/30 09:15-09:20	JG	P	ATOK	RC
3/27/2004	16:25	75-10	RZ	F	2-57-58-182-266	84	RC	182-266' FWAT	32/32 09:05-09:10	JG	P	ATOK	RC
3/27/2004	16:30	75-52	JR	F	2-59-60-0-22	22	RC	0-22' North 2-58	30/30 09:27-09:32	JG	P	ATOK	RC
3/27/2004	16:38	75-52	JR	F	2-58-60-0-179	179	RC	0-179' FWAT	31/31 09:25-09:30	AR	P	ATOK	RC
3/27/2004	16:40	75-29	JR	F	2-58-59-179-267	88	RC	179-267' FWAT	32/31 09:23-09:28	AR	P	ATOK	RC

GeoSyntec Consultants

Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/29/2004	9:13	75-10	AA	F	2-50-51-0-14	14	RC	0-14' FSAT	32/32 09:52-09:57	JG	P	ATOK	RC
3/29/2004	9:30	75-10	AA	F	2-23-40-0-22	22	RC	53-263' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:30	75-10	AA	F	2-49-40-60-82	22	RC	60-82' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:30	75-10	AA	F	2-50-40-54-60	6	RC	54-60' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:40	75-10	AA	F	2-48-40-82-105	22	RC	82-105' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:45	75-10	AA	F	2-47-40-105-127	22	RC	105-127' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:50	75-10	AA	F	2-46-40-127-149	22	RC	127-149' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	9:55	75-10	AA	F	2-45-40-149-171	22	RC	149-171' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	10:00	75-10	AA	F	2-44-40-171-193	22	RC	171-193' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	10:05	75-10	AA	F	2-43-40-193-216	22	RC	193-216' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	10:10	75-10	AA	F	2-42-40-216-239	22	RC	216-239' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	10:15	75-10	AA	F	2-41-40-239-262	22	RC	239-262' FWAT	33/33 10:27-10:32	AA	P	ATOK	RC
3/29/2004	11:27	75-10	JR	F	2-1-40-34-56	22	RH	34-56 FSAT	31/31 1437-1442	AR	P	ATOK	RH
3/29/2004	11:27	75-10	AA	F	2-24-53-56-78	22	RH	53-78 FSAT	32/32 1429-1434	AR	P	ATOK	RH
3/29/2004	11:49	75-10	AA	F	2-25-54-79-101	22	RH	79-101 FSAT	30/30 1427-1432	JG	P	ATOK	RH
3/29/2004	11:54	75-10	AA	F	2-26-55-101-123	22	RH	101-123 FSAT	30/29 1429-1434	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/29/2004	11:59	75-10	AA	F	2-27-57-123-145	22	RH	123-145 FSAT	31/31 1405-1410	JG	P	ATOK	RH
3/29/2004	12:05	75-10	AA	F	2-28-58-145-167	22	RH	145-167 FSAT	30/30 1440-1445	JG	P	ATOK	RH
3/29/2004	16:28	75-10	AA	F	2-30-61-188-210	22	RH	188-210 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	11:08	75-40	RZ	F	2-61-59-179-264	85	RC	179-264' FWAT	32/32 1429-1434	JG	P	ATOK	RC
3/30/2004	11:08	75-40	RZ	F	2-61-60-0-179	179	RC	0-179' FWAT	32/32 1432-1437	JG	P	ATOK	RH
3/30/2004	11:20	75-52	JR	F	2-63-62-0-22	22	RC	22' North of 2-61	30/29 1440-1445	JG	P	ATOK	RC
3/30/2004	11:22	75-10	AA	F	2-63-64-0-172	172	RC	0-172' FWAT	34/34 1418-1423	JG	P	ATOK	RC
3/30/2004	11:22	75-10	AA	F	2-64-62-172-268	96	RC	172-268' FWAT	30/30 1420-1425	JG	P	ATOK	RC
3/30/2004	11:30	75-52	JR	F	2-61-63-0-172	172	RC	0-172' FWAT	30/30 1414-1419	JG	P	ATOK	RC
3/30/2004	12:45	75-40	RZ	F	2-65-66-0-22	22	RH	177' FWAT	32/32 1454-1459	JG	P	ATOK	RH
3/30/2004	13:00	75-10	AA	F	2-66-67-0-182	182	RH	0-182 FWAT	30/30 1506-1511	JG	P	ATOK	RH
3/30/2004	13:02	75-40	RZ	F	2-64-66-0-180	182	RH	0-182 FWAT	30/30 1453-1458	JG	P	ATOK	RH
3/30/2004	13:18	75-52	JR	F	2-65-67-177-264	87	RH	177-264 FWAT	34/34 1508-1513	JG	P	ATOK	RH
3/30/2004	13:24	75-52	JR	F	2-68-69-0-22	22	RH	0-22 C/S	34/32 1530-1535	JG	P	ATOK	RH
3/30/2004	13:25	75-40	RZ	F	2-64-65-177-264	87	RH	177-264 FWAT	32/32 1450-1455	JG	P	ATOK	RH
3/30/2004	13:35	75-52	JR	F	2-67-69-0-180	180	RH	0-180 FWAT	32/32 1612-1617	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/30/2004	13:47	75-10	AA	F	2-69-70-0-171	171	RH	0-171 FWAT	32/32 1551-1556	JG	P	ATOK	RH
3/30/2004	14:04	75-10	AA	F	2-68-70-171-264	93	RH	171-264 FWAT	30/29 1541-1546	JG	P	ATOK	RH
3/30/2004	14:12	75-52	JR	F	2-68-67-170-264	94	RC	170-264 FWAT	34/34 1538-1543	JG	P	ATOK	RH
3/30/2004	16:21	75-10	AA	F	2-29-59-166-188	22	RH	166188 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	16:25	75-10	AA	F	2-31-62-210-233	22	RH	210-233 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	16:41	75-10	AA	F	2-32-64-233-255	22	RH	233-255 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	16:45	75-52	JR	F	2-70-71-0-264	264	RH	0-264 FWAT	32/32 0830-0835	JG	P	ATOK	RH
3/30/2004	16:46	75-10	AA	F	2-33-65-255-278	22	RH	255-278 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	16:51	75-10	AA	F	2-34-67-278-301	23	RH	278-301 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	16:56	75-10	AA	F	2-35-68-301-323	22	RH	301-323 FSAT	34/34 846-851	JG	P	ATOK	RH
3/30/2004	17:02	75-10	AA	F	2-36-70-323-345	22	RH	323-345 FSAT	34/34 846-851	JG	P	ATOK	RH
3/31/2004	0:17	75-10	AA	F	2-74-39 1A-129-150	21	RH	129-150 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	9:20	75-52	JR	F	2-72-73-0-22	22	RH	75' FWAT	30/30 1123-1128	JG	P	ATOK	RH
3/31/2004	9:40	75-52	JR	F	2-73-74-0-85	85	RH	0-85 FWAT	34/34 1132-1137	JG	P	ATOK	RH
3/31/2004	9:41	75-10	AA	F	2-74-441A-0-61	58	RH	0-58 FWAT	32/32 1107-112	JG	P	ATOK	RH
3/31/2004	9:45	75-40	RZ	F	2-72-71-85-264	179	RH	85-264 FWAT	32/30 1114-1119	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/31/2004	9:46	75-52	JR	F	2-71-73-0-85	85	RH	0-85 FWAT	34/33 1113-1118	JG	P	ATOK	RH
3/31/2004	9:55	75-52	JR	F	2-72-74-85-264	179	RH	85-264 FWAT	34/34 1135-1140	JG	P	ATOK	RH
3/31/2004	10:20	75-10	AA	F	2-74-431A-61-84	23	RH	61-84 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:23	75-10	AA	F	2-74-35 1A-151-174	23	RH	151-174 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:26	75-10	AA	F	2-74-41 1A-84-106	22	RH	84-106 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:28	75-10	AA	F	2-74-34 1A-174-196	22	RH	174-196 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:32	75-10	AA	F	2-74-33 1A-196-219	23	RH	196-219 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:41	75-10	AA	F	2-74-32 1A-219-241	22	RH	219-241 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	10:46	75-10	AA	F	2-74-27 1A-241-265	24	RH	241-265FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	11:01	75-10	AA	F	2-74-40 1A-106-129	23	RH	106-129 FWAT	32/32 1107-1112	JG	P	ATOK	RH
3/31/2004	11:35	75-10	AA	F	2-38-72-358-380	22	RH	264' FWAT		JG	P	ATOK	RH
3/31/2004	11:37	75-10	AA	F	2-72-38-366-388	22	RH	366-388 FSAT	34/34 1321-1326	JG	P	ATOK	RH
3/31/2004	11:57	75-10	AA	F	2-39-74-388-410	22	RH	388-410 FSAT	30/30 1320-1325	JG	P	ATOK	RH
3/31/2004	0:00	75-10	AA	F	2-71-37-336-358	22	RH	336-358	32/32 1322-1327	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*

Total Length Fusion: 14508 Total Length Extrusion: 0

Comments: 2-01-02-0-28:East Slope; 2-01-24-0-460:South Floor; 2-04-05-0-29:South Floor; 2-10-01-143-166:South tie in; 2-10-11-0-31:South slope; 2-11-01-166-189:South tie in; 2-11-12-0-30:South slope; 2-12-01-189-211:South tie in; 2-13-01-211-234:South tie in; 2-13-14-0-31:South slope; 2-1-40-34-56:Center Cell tie in seam; 2-14-15-0-31:South slope; 2-15-01-257-279:South tie in; 2-15-16-0-31:South slope; 2-16-01-279-301:South tie in; 2-16-17-0-32:South slope; 2-17-01-302-324:South tie in; 2-17-18-0-32:South slope; 2-18-01-324-346:South tie in; 2-18-19-0-32:South slope; 2-19-01-346-369:South tie in; 2-19-20-0-33:South slope; 2-20-01-360-382:South tie in; 2-20-21-0-33:South slope; 2-21-01-392-414:South tie in; 2-21-22-0-33:South slope; 2-22-01-414-437:South tie in; 2-22-23-0-33:South slope; 2-23-01-437-458:South Tie in; 2-23-40-0-22:South slop tie-in; 2-23-41-0-34:South slope ; 2-2-4-0-31:South slope; 2-24-25-0-464:South Floor; 2-24-53-56-78:Center Cell tie in seam; 2-25-26-0-457:Cell Floor; 2-25-54-79-101:Center Cell tie in seam; 2-26-27-0-456:Cell Floor; 2-26-55-101-123:Center Cell tie in seam; 2-27-28-0-457:Cell Floor; 2-27-57-123-145:Center Cell tie in seam; 2-28-29-0-456:Cell Floor; 2-28-58-145-167:Center Cell tie in seam; 2-29-30-0-458:Cell Floor; 2-29-59-166-188:Center Cell tie in seam; 2-30-31-0-460:Cell Floor; 2-30-61-188-210:Center Cell tie in seam; 2-31-32-0-460:Cell Floor; 2-31-62-210-233:Center Cell tie in seam; 2-32-33-0-458:East Slope; 2-32-64-233-255:Center Cell tie in seam; 2-33-34-0-457:Cell Floor; 2-33-65-255-278:Center Cell tie in seam; 2-34-67-278-301:Center Cell tie in seam; 2-35-68-301-323:Center Cell tie in seam; 2-36-70-323-345:Center Cell tie in seam; 2-38-72-358-380:Center Cell tie in seam; 2-39-74-388-410:Center Cell tie in seam; 2-40-53-0-263:Cell floor; 2-41-40-239-262:South slop tie-in; 2-41-42-0-34:South slope ; 2-42-40-216-239:South slop tie-in; 2-42-43-0-34:South slope ; 2-43-40-193-216:South slop tie-in; 2-43-44-0-35:South slope ; 2-44-40-171-193:South slop tie-in; 2-44-45-0-35:South slope ; 2-45-40-149-171:South slop tie-in; 2-45-46-0-35:South slope ; 2-46-40-127-149:South slop tie-in; 2-46-47-0-35:South slope ; 2-47-40-105-127:South slop tie-in; 2-47-48-0-35:South slope ; 2-48-40-82-105:South slop tie-in; 2-48-49-0-35:South slope ; 2-49-40-60-82:South slop tie-in; 2-49-50-0-35:South slope ; 2-50-40-54-60:South slop tie-in; 2-50-51-0-14:South slope; 2-5-1-28-53:South tie in; 2-51-52-0-34:Southwest corner ; 2-52-40-0-54:Cell floor; 2-53-54-0-263:Cell floor; 2-54-55-0-264:Cell floor; 2-55-56-182:Cell floor; 2-55-57-182-266:Cell floor; 2-5-6-0-29:South slope; 2-56-57-0-22:Cell floor ; 2-56-58-0-182:Cell floor; 2-57-58-182-266:Cell floor; 2-58-59-179-267:Cell floor; 2-58-60-0-179:Cell floor; 2-59-60-0-22:Cell floor; 2-6-1-53-75:South tie in; 2-61-59-179-264:Cell floor; 2-61-60-0-179:Cell floor; 2-61-63-0-172:Cell floor; 2-63-62-0-22:Cell floor; 2-63-64-0-172:Cell floor; 2-64-62-172-268:Cell floor; 2-64-65-177-264:Cell Floor; 2-64-66-0-180:Cell Floor; 2-65-66-0-22:Cell Floor; 2-65-67-177-264:Cell Floor; 2-66-67-0-182:Cell Floor; 2-6-7-0-29:South slope; 2-67-69-0-180:Cell Floor; 2-68-67-170-264:Cell Floor; 2-68-69-0-22:Cell Floor; 2-68-70-171-264:Cell Floor; 2-69-70-0-171:Anchor trech; 2-70-71-0-264:Cell Floor; 2-71-37-336-358:Center Cell tie in seam; 2-71-73-0-85:Cell Floor; 2-7-1-75-98:South tie in; 2-72-38-366-388:Center Cell tie in seam; 2-72-71-85-264:Center Cell tie in seam; 2-72-73-0-22:Cell Floor;

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Primary Series: 2

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*

2-72-74-85-264:Cell Floor; 2-73-74-0-85:Cell Floor; 2-74-27 1A-241-265:Nortern tie in/Cell 1A; 2-74-32 1A-219-241:Nortern tie in/Cell 1A; 2-74-33 1A-196-219:Nortern tie in/Cell 1A; 2-74-34 1A-174-196:Nortern tie in/Cell 1A; 2-74-35 1A-151-174:Nortern tie in/Cell 1A; 2-74-39 1A-129-150:Nortern tie in/Cell 1A; 2-74-40 1A-106-129:Nortern tie in/Cell 1A; 2-74-41 1A-84-106:Nortern tie in/Cell 1A; 2-74-431A-61-84:Cell Floor; 2-74-441A-0-61:Nortern tie in/Cell 1A; 2-7-8-0-30:South slope; 2-8-1-98-121:South tie in; 2-8-9-0-30:South slope; 2-9-10-0-30:South slope; 2-9-1-121-143:South tie in

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type: gml : 1
Specifications:
Seam Pressure: 25-30psi<2psi-5min
Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary
Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/8/2004	11:15	74-35	JH	E	1-02-04-0-9	9	RH	0-9' FSAT	VTOK	EPM	P	VTOK	RH
3/8/2004	15:25	75-52	JR	F	1-10-11-0-31	31	RH	0-31' FSAT	30/30 0820-0825	JG	P	ATOK	RH
3/8/2004	16:00	75-52	JR	F	1-13-14-0-31	31	RH	0-31' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	16:10	75-52	JR	F	1-12-13-0-31	31	RH	0-31' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	16:20	75-52	JR	F	1-11-12-0-31	31	RH	0-31' FSAT	30/30 1522-1527	JG	P	ATOK	RH
3/8/2004	16:35	75-40	RZ	F	1-01-05-0-29	29	RH	0-29' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	16:35	75-52	JR	F	1-10-09-0-32	32	RH	0-32' FSAT	30/30 905-0910	JG	P	ATOK	RH
3/8/2004	16:45	75-52	JR	F	1-14-15-0-30	30	RH	0-30' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	16:50	75-52	JR	F	1-15-16-0-32	32	RH	0-32' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	16:55	75-52	JR	F	1-16-17-0-32	32	RH	0-32' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	17:05	75-40	RZ	F	1-07-08-0-30	30	RH	0-30' FSAT	30/30 1117-1122	JG	P	ATOK	RH
3/8/2004	17:10	75-52	JR	F	1-17-18-0-32	32	RH	0-32' FSAT	30/30	JG	P	ATOK	RH
3/8/2004	17:15	75-40	RZ	F	1-08-09-0-31	31	RH	0-31 FSAT	30/30 1223-1228	JG	P	ATOK	RH
3/8/2004	17:20	75-52	JR	F	1-18-19-0-32	32	RH	0-32' FSAT	30/30	JR	P	ATOK	RH
3/8/2004	17:23	75-40	JR	F	1-19-20-0-32	32	RH	0-32' FSAT	30/30	JG	P	ATOK	RH
3/9/2004	8:29	75-10	AA	F	1-20-21-0-30	30	RH	0-30' FSAT	31/30 1145-1150	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/9/2004	8:40	75-10	AA	F	1-21-22-0-30	30	RH	0-30' FSAT	30/30 1535-1540	JG	P	ATOK	RH
3/9/2004	9:00	75-10	AA	F	1-22-23-0-32	32	RH	0-32' FSAT	34/33 1605-1610	JG	P	ATOK	RH
3/9/2004	10:38	75-10	AA	F	1-22-24-420-443	23	RH	420-443' FEAT	30/30 1612-1617	JG	P	ATOK	RH
3/9/2004	10:38	75-10	AA	F	1-24-25-0-461	461	RH	461' FEAT	31/31 1620-1625	JG	P	ATOK	RH
3/9/2004	11:06	75-40	RZ	F	1-21-24-398-420	22	RH	398-420' FEAT	30/30 1555-1600	JG	P	ATOK	RH
3/9/2004	11:12	75-40	RZ	F	1-20-24-376-398	22	RH	376-398' FEAT	30/30 1513-1518	JG	P	ATOK	RH
3/9/2004	11:15	74-35	JH	E	1-03-04-0-8	8	RH	0-8' FEAT	VTOK	EPM	P	ATOK	RH
3/9/2004	11:18	75-40	RZ	F	1-19-24-356-375	19	RH	356-375' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:23	75-40	RZ	F	1-18-24-331-342	11	RH	331-342' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:35	75-40	RZ	F	1-17-24-309-331	22	RH	309-331' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:40	75-40	RZ	F	1-16-24-286-309	23	RH	286-309' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:46	75-40	RZ	F	1-15-24-264-286	22	RH	264-286' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:52	75-40	RZ	F	1-14-24-241-264	23	RH	241-264' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	11:55	75-40	RZ	F	1-13-24-219-241	22	RH	South Floor TI	30/30 1445-1450	JG	P	ATOK	RH
3/9/2004	12:00	75-40	RZ	F	1-12-24-197-219	22	RH	197-219' FEAT	30/30	JG	P	ATOK	RH
3/9/2004	12:14	75-40	RZ	F	1-09-24-140-162	22	RH	140-162' FEAT	30/30 1332-1337	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/9/2004	12:20	75-40	RZ	F	1-08-24-117-140	23	RH	117-140 FEAT	30/30 1310-1315	JG	P	ATOK	RH
3/9/2004	12:24	75-40	RZ	F	1-07-24-95-117	22	RH	95-117' FEAT	30/30 1045-1050	JG	P	ATOK	RH
3/9/2004	12:29	75-40	RZ	F	1-06-24-72-95	23	RH	72-95' FEAT	30/30 0940-0945	JG	P	ATOK	RH
3/9/2004	12:30	75-52	JR	F	1-25-26-0-460	460	RH	0-460 FEAT	30/30 1631-1636	JG	P	ATOK	RH
3/9/2004	12:34	75-40	RZ	F	1-05-24-50-72	22	RH	50-72' FEAT	32/31	JG	P	ATOK	RH
3/9/2004	12:39	75-40	RZ	F	1-01-24-28-50	22	RH	28-50' FEAT	30/30 0755-0800	JG	P	ATOK	RH
3/9/2004	12:43	75-40	RZ	F	1-03-24-25	25	RH	0-25' FEAT	30-29 1434-1439	JG	P	ATOK	RH
3/9/2004	13:26	75-10	AA	F	1-26-27-0-457	457	RH	0-457'	30/30 1640-1645	JG	P	ATOK	RH
3/9/2004	14:05	75-40	RZ	F	1-11-24-174-197	23	RH	174-197' FEAT	30/30 1510-1515	JG	P	ATOK	RH
3/9/2004	14:10	75-40	RZ	F	1-10-24-162-174	22	RH	162-174' FEAT	30/30 0822-0827	JG	P	ATOK	RH
3/9/2004	14:15	75-52	JR	F	1-27-28-0-460	460	RH	0-460	30/30 0820-0825	JG	P	ATOK	RH
3/9/2004	14:47	75-10	AA	F	1-28-29-0-460	460	RH	0-460 FEAT	30/30 0910-0915	JG	P	ATOK	RH
3/9/2004	15:35	75-52	JR	F	1-29-30-0-457	457	RH	0-457 FEAT	30/30 1010-1015	JG	P	ATOK	RH
3/9/2004	16:00	75-40	RZ	F	1-01-02-0-29	29	RH	0-29' FSAT	30/30 0745-0750	JG	P	ATOK	RH
3/9/2004	16:07	75-10	AA	F	1-30-31-0-458	458	RH	0-458 FEAT	30/30 1023-1028	JG	P	ATOK	RH
3/9/2004	16:45	75-40	RZ	F	1-05-06-0-30	30	RH	0-30' FSAT	30/30 0921-0926	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/9/2004	16:55	75-40	RZ	F	1-06-07-0-30	30	RH	0-30' FSAT	30/30 1021-1026	JG	P	ATOK	RH
3/10/2004		75-52	JR	F	1-31-32-0-456	456		0-456'			P		
3/10/2004	9:05	75-10	AA	F	1-32-33-0-457	457	RH	0-457 FEAT	30/30 1320-1325	JG	P	ATOK	RH
3/10/2004	9:40	75-40	RZ	F	1-33-34-0-456	456	RH	0-457' FEAT	30/30 1335-1340	JG	P	ATOK	RH
3/10/2004	10:05	75-52	JR	F	1-34-35-0-456	456	RH	0-460' FEAT	30/30 1410-1415	JG	P	ATOK	RH
3/10/2004	10:50	75-10	AA	F	1-35-36-0-456	456	RH	0-458'FEAT	30/30 1425-1430	JG	P	ATOK	RH
3/10/2004	11:32	75-40	RZ	F	1-36-37-0-456	456	RH	0-458' FEAT	30/30 1445-1450	JG	P	ATOK	RH
3/10/2004	12:59	75-52	JR	F	1-37-38-0-456	456	RH	0-457' FEAT	30/30 1505-1510	JG	P	ATOK	RH
3/10/2004	14:25	75-52	JR	F	1-38-39-0-456	456	RH	0-457' FEAT	30/30 1600-1605	JG	P	ATOK	RH
3/10/2004	14:55	75-40	RZ	F	1-40-1A-0-459	459	RH	0-458' FEAT	30/30, 1413-1418	JG	P	ATOK	RH
3/10/2004	16:28	75-40	RZ	F	1-39-40-0-457	457	RH	0-457' FEAT	30/30 0905-0910	JG	P	ATOK	RH
3/23/2004	11:25	75-29	RZ	F	1-42-43-0-33	33	RH	0-33 FSAT	30/30 1609-1614	JG	P	ATOK	RH
3/23/2004	13:30	75-29	RZ	F	1-23-42-0-33	33	RH	0-33' FSAT	30/30 1615-1620	JG	P	ATOK	RH
3/23/2004	13:48	75-29	RZ	F	1-43-44-0-34	34	RH	0-34' FSAT	30/30 1605-1610	JG	P	ATOK	RH
3/23/2004	14:00	75-29	RZ	F	1-44-45-0-34	34	RH	0-34 FSAT	30/30 1617-1622	JG	P	ATOK	RH
3/23/2004	14:03	75-10	AA	F	1-41-53-0-264	264	RH	0-264 FWAT	30/30 1612-1617	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/23/2004	14:15	75-29	RZ	F	1-45-46-0-34	34	RH	0-34 FSAT	32/30 1625-1630	JG	P	ATOK	RH
3/23/2004	14:23	75-29	RZ	F	1-47-48-0-34	34	RH	0-34 FSAT	32/30 1633-1638	JG	P	ATOK	RH
3/23/2004	14:28	75-29	RZ	F	1-46-47-0-34	34	RH	0-34 FSAT	30/30 1630-1635	JG	P	ATOK	RH
3/23/2004	14:45	75-10	AA	F	1-53-54-0-265	265	RH	0-265 FWAT	30/28 0845-0850	JG	P	ATOK	RH
3/23/2004	14:55	75-29	RZ	F	1-48-49-0-34	34	RH	0-34 FSAT	30/30 1639-1644	JG	P	ATOK	RH
3/23/2004	15:14	75-29	RZ	F	1-49-50-0-34	34	RH	0-34 FSAT	30/30 16:45-16:50	JG	P	ATOK	RH
3/23/2004	15:30	75-29	RZ	F	1-50-51-0-25	25	RH	0-25 FWAT	30/29 0735-0740	JG	P	ATOK	RH
3/23/2004	15:40	75-10	AA	F	1-54-56-0-265	265	RH	0-265 FWAT	32/32 0847-0852	JG	P	ATOK	RH
3/23/2004	15:45	75-29	RZ	F	1-55-41-0-50	50	RH	FWAT	30/29 0810-0815	JG	P	ATOK	RH
3/23/2004	16:09	75-52	JR	F	1-56-57-0-265	265	RH	0-265 FWAT	30/30 0859-0904	JG	P	ATOK	RH
3/23/2004	16:27	75-29	RZ	F	1-50-55-26-44	18	RH	FSAT	30/30 0756-0801	JG	P	ATOK	RH
3/23/2004	16:27	75-29	RZ	F	1-51-55-15-26	11	RH	15-26 FSAT	34/34 0754-0759	JG	P	ATOK	RH
3/23/2004	16:34	75-29	RZ	F	1-51-52-0-15	15	RH	0-15 FSAT	32/31 0802-0807	JG	P	ATOK	RH
3/24/2004		75-40	RZ	F	1-58-61-0-95	95		0-95'					
3/24/2004	8:48	75-10	AA	F	1-50-41-50-63	13	RH	50-63 FWAT	30/30 1432-1437	JG	P	ATOK	RH
3/24/2004	8:53	75-10	AA	F	1-49-41-63-85	22	RH	63-85 FWAT	30/30 1433-1438	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/24/2004	8:56	75-10	AA	F	1-48-41-85-107	22	RH	85-107 FWAT	30/28 1437-1442	JG	P	ATOK	RH
3/24/2004	9:02	75-10	AA	F	1-47-41-107-129	22	RH	107-129 FWAT	34/34 1445-1450	JG	P	ATOK	RH
3/24/2004	9:07	75-10	AA	F	1-46-41-129-152	23	RH	129-153 FWAT	30/28 1451-1456	JG	P	ATOK	RH
3/24/2004	9:12	75-10	AA	F	1-45-41-153-175	22	RH	153-175 FWAT	30/30 1457-1502	JG	P	ATOK	RH
3/24/2004	9:17	75-10	AA	F	1-44-41-175-197	22	RH	175-197 FWAT	30/30 1504-1509	JG	P	ATOK	RH
3/24/2004	9:22	75-10	AA	F	1-43-41-197-220	23	RH	197-220 FWAT	32/32 1505-1510	JG	P	ATOK	RH
3/24/2004	9:27	75-10	AA	F	1-42-41-220-242	22	RH	220-242 FWAT	30/29 1512-1517	JG	P	ATOK	RH
3/24/2004	9:32	75-10	AA	F	1-23-41-242-257	15	RH	242-257' FWAT	30/28 1511-1516	JG	P	ATOK	RH
3/24/2004	9:56	75-40	RZ	F	1-57-58-0-180	180	RH	0-180 FWAT	30/30 1056-1101	JG	P	ATOK	RH
3/24/2004	10:03	75-10	AA	F	1-59-58-0-22	22	RH	180 FWAT-CS	30/30 1020-1025	JG	P	ATOK	RH
3/24/2004	10:20	75-10	AA	F	1-60-61-0-22	22	RH	95 FWAT	30/29 0936-0941	JG	P	ATOK	RH
3/24/2004	10:29	75-40	RZ	F	1-57-59-180-265	85	RH	180-265 FWAT	30/30 1057-1102	JG	P	ATOK	RH
3/24/2004	10:42	75-10	AA	F	1-61-62-0-95	95	RH	0-95 FWAT	30/30 1310-1315	JG	P	ATOK	RH
3/24/2004	10:52	75-40	RZ	F	1-58-60-95-180	85	RH	95-180 FWAT	30/30 1423-1428	JG	P	ATOK	RH
3/24/2004	10:55	75-10	AA	F	1-60-62-95-265	170	RH	95-265 FWAT	30/30 1304-1309	JG	P	ATOK	RH
3/24/2004	11:14	75-40	RZ	F	1-59-60-180-265	85	RH	180-265 FWAT	30/30 1345-1350	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/24/2004	12:40	75-10	AA	F	1-62-63-0-265	265	RH	0-265' FWAT	30/30 1339-134	JG	P	ATOK	RH
3/24/2004	13:05	75-52	JR	F	1-64-65-0-22	22	RH	0-22'	30/28 1323-1328	JG	P	ATOK	RH
3/24/2004	13:10	75-40	RZ	F	1-63-64-0-182	182	RH	0-182' FWAT	30/30 1401-1406	JG	P	ATOK	RH
3/24/2004	13:35	75-10	AA	F	1-63-65-182-265	83	RH	182-265' FWAT	30/30 1406-1411	JG	P	ATOK	RH
3/24/2004	14:00	75-10	AA	F	1-24-41-32-53	21	RH	32-53' FSAT	32/32 1520-1525	JG	P	ATOK	RH
3/24/2004	14:05	75-10	AA	F	1-25-41-53-54	1	RH	53-54' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:06	75-10	AA	F	1-25-53-54-75	21	RH	54-75' FSAT	30/29 1527-1532	JG	P	ATOK	RH
3/24/2004	14:10	75-10	AA	F	1-26-53-75-76	1	RH	75-76' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:11	75-10	AA	F	1-26-54-76-97	21	RH	76-97' FSAT	34/32 1535-1540	JG	P	ATOK	RH
3/24/2004	14:15	75-10	AA	F	1-27-54-97-98	1	RH	97-98' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:16	75-10	AA	F	1-27-56-98-119	21	RH	98-119' FSAT	32/31 1536-1541	JG	P	ATOK	RH
3/24/2004	14:20	75-10	AA	F	1-28-56-119-121	2	RH	119-121'	Patched	EPM	P	VTOK	RH
3/24/2004	14:22	75-10	AA	F	1-28-57-121-140	20	RH	122-140'	30/30 1541-1546	JG	P	ATOK	RH
3/24/2004	14:26	75-10	AA	F	1-28-57-140-160	20	RH	140-160' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:28	75-10	AA	F	1-29-57-160-162	2	RH	160-162' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:33	75-10	AA	F	1-29-59-162-182	20	RH	162-182' FSAT	30/30 1547-1552	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/24/2004	14:35	75-10	AA	F	1-30-59-182-184	2	RH	182-184' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:37	75-10	AA	F	1-30-60-184-204	20	RH	184-204' FSAT	34/33 1555-1600	JG	P	ATOK	RH
3/24/2004	14:39	75-10	AA	F	1-31-60-204-206	2	RH	204-206' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:42	75-10	AA	F	1-31-62-206-226	20	RH	206-226' FSAT	32/32 1556-1601	JG	P	ATOK	RH
3/24/2004	14:44	75-10	AA	F	1-32-62-226-228	2	RH	226-228' FSAT	Patched	EPM	P	VTOK	RH
3/24/2004	14:47	75-10	AA	F	1-32-63-228-248	20	RH	228-248' FSAT	30/30 1604-1609	JG	P	ATOK	RH
3/25/2004		75-10	JR	F	1-65-66-182-265	83		182-265'					
3/25/2004	10:02	75-10	AA	F	1-66-67-0-263	263	RH	0-263 FWAT	35/34 1536-1541	JG	P	ATOK	RH
3/25/2004	10:50	75-10	AA	F	1-68-69-0-22	22	RH	180' FWAT C/S	32/30 1545-1550	JG	P	ATOK	RH
3/25/2004	10:52	75-40	RZ	F	1-67-68-0-179	179	RH	0-263 FWAT	31/30 1540-1545	JG	P	ATOK	RH
3/25/2004	11:05	75-10	AA	F	1-68-70-0-179	179	RH	0-264 FWAT	32/30 1548-1553	JG	P	ATOK	RH
3/25/2004	11:15	75-40	RZ	F	1-69-67-180-263	83	RH	180-263 FWAT	30/29 1543-1548	JG	P	ATOK	RH
3/25/2004	11:30	75-10	AA	F	1-70-69-180-263	83	RH	180-263 FWAT	32/30 1550-1555	JG	P	ATOK	RH
3/25/2004	13:40	75-40	RZ	F	1-70-71-0-263	263	RH	0-263 FWAT	31/31 1555-1600	JG	P	ATOK	RH
3/25/2004	15:25	75-40	RZ	F	1-71-72-0-178	178	RH	0-178 FWAT	31/31 1621-1626	JG	P	ATOK	RH
3/25/2004	15:40	75-52	JR	F	1-72-74-0-178	178	RH	0-178 FWAT	30/30 1703-1708	JG	P	ATOK	RH

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Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/25/2004	15:45	75-10	AA	F	1-71-73-178-270	92	RH	178-270 FWAT	30/30 1623-1628	JG	P	ATOK	RH
3/25/2004	15:55	75-52	JR	F	1-73-74-178-270	92	RH	178-270 FWAT	31/30 1715-1720	JG	P	ATOK	RH
3/26/2004	8:49	75-10	AA	F	1-74-57A-0-58	58	RH	0-58' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:00	75-52	JR	F	1-65-33-0-20	22	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:02	75-10	AA	F	1-74-Cell1A-58-81	23	RH	58-81' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:05	75-52	JR	F	1-34-65-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:10	75-52	JR	F	1-34-66-0-20	20	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:11	75-52	JR	F	1-35-66-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:12	75-52	JR	F	1-35-67-0-20	20	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:12	75-10	AA	F	1-74-Cell 1A-81-104	23	RH	81-104' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:13	75-52	JR	F	1-36-67-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:14	75-52	JR	F	1-36-69-0-20	20	RH	263' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:17	75-10	AA	F	1-74-Cell 1A-104-127	23	RH	104-127' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:20	75-52	JR	F	1-37-70-0-20	20	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:21	75-52	JR	F	1-37-69-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:22	75-10	AA	F	1-74-Cell 1A-127-150	23	RH	127-150' FWAT	33/33 1041-1046	JG	P	ATOK	RH

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Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida
Description: Cell 1B Geosynthetics
ProjNo: FX 0521
TaskNo: 1

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
3/26/2004	9:24	75-52	JR	F	1-38-70-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:25	75-52	JR	F	1-38-71-0-20	20	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:27	75-10	AA	F	1-74-Cell 1A-150-172	22	RH	150-172' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:29	75-52	JR	F	1-39-71-0-2	2	RH	264' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:30	75-52	JR	F	1-39-73-0-20	20	RH	265' FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:32	75-10	AA	F	1-74-Cell1A-172-194	22	RH	172-194' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:33	7510	AA	F	1-74-40-0-22	22	RH	263' FWAT	34/33 1031-1036	AA	P	ATOK	RH
3/26/2004	9:34	75-52	JR	F	1-40-73-0-2	2	RH	265'FWAT	30/30 1017-1022	JG	P	ATOK	RH
3/26/2004	9:37	75-10	AA	F	1-74-Cell 1A-194-217	23	RH	194-217' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:42	75-10	AA	F	1-74-Cell 1A-217-239	22	RH	217-239' FWAT	33/33 1041-1046	JG	P	ATOK	RH
3/26/2004	9:47	75-10	AA	F	1-74-1A-239-264	25	RH	239-264' FWAT	33/33 1041-1046	JG	P	ATOK	RH

GeoSyntec Consultants

Omni Waste

Production Seam Log

Project: Oak Hammock
Location: Osceola County, Florida ProjNo: FX 0521 TaskNo: 1
Description: Cell 1B Geosynthetics

Material Type gml : 1 Specifications: Seam Pressure: 25-30psi<2psi-5min Vacuum Box: 5psi-10sec

Primary / Secondary: Secondary Series: 1

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*

Total Length Fusion: 14296 Total Length Extrusion: 17

Comments: 1-52-55-0-34:West slope; 1-23-41-242-257:South tie in; 1-23-42-0-33:South slope; 1-24-41-32-53:Center Cell tie in seam; 1-25-41-53-54:Center Cell tie in seam; 1-25-53-54-75:Center Cell tie in seam; 1-26-53-75-76:Center Cell tie in seam; 1-26-54-76-97:Center Cell tie in seam; 1-27-54-97-98:Center Cell tie in seam; 1-27-56-98-119:Center Cell tie in seam; 1-28-56-119-121:Center Cell tie in seam; 1-28-57-121-140:Center Cell tie in seam; 1-28-57-140-160:Center Cell tie in seam; 1-29-57-160-162:Center Cell tie in seam; 1-29-59-162-182:Center Cell tie in seam; 1-30-59-182-184:Center Cell tie in seam; 1-30-60-184-204:Center Cell tie in seam; 1-31-60-204-206:Center Cell tie in seam; 1-31-62-206-226:Center Cell tie in seam; 1-32-33-0-457:Cell Floor; 1-32-62-226-228:Center Cell tie in seam; 1-32-63-228-248:Center Cell tie in seam; 1-33-34-0-456:Cell Floor; 1-34-35-0-456:Cell Floor; 1-34-65-0-2:Center Cell tie in seam; 1-34-66-0-20:Center Cell tie in seam; 1-35-36-0-456:Cell Floor; 1-35-66-0-2:Center Cell tie in seam; 1-35-67-0-20:Center Cell tie in seam; 1-36-37-0-456:Cell Floor; 1-36-67-0-2:Center Cell tie in seam; 1-36-69-0-20:Center Cell tie in seam; 1-37-38-0-456:Cell Floor; 1-37-69-0-2:Center Cell tie in seam; 1-37-70-0-20:Center Cell tie in seam; 1-38-39-0-456:Cell Floor; 1-38-70-0-2:Center Cell tie in seam; 1-38-71-0-20:Center Cell tie in seam; 1-39-40-0-457:Cell Floor; 1-39-71-0-2:Center Cell tie in seam; 1-39-73-0-20:Center Cell tie in seam; 1-40-1A-0-459:Cell Floor; 1-40-73-0-2:Center Cell tie in seam; 1-41-53-0-264:FWAT; 1-42-41-220-242:South tie in; 1-42-43-0-33:South slope; 1-43-41-197-220:South tie in; 1-43-44-0-34:South slope; 1-44-41-175-197:South tie in; 1-44-45-0-34:South slope; 1-45-41-153-175:South tie in; 1-45-46-0-34:South slope; 1-46-41-129-152:South tie in; 1-46-47-0-34:South slope; 1-47-41-107-129:South tie in; 1-47-48-0-34:South slope; 1-48-41-85-107:South tie in; 1-48-49-0-34:South slope; 1-49-41-63-85:South tie in; 1-49-50-0-34:South slope; 1-50-41-50-63:South tie in; 1-50-51-0-25:West slope; 1-50-55-26-44:South slope; 1-51-52-0-15:South slope; 1-51-55-15-26:South slope; 1-53-54-0-265:West slope; 1-54-56-0-265:West slope; 1-55-41-0-50:West slope; 1-56-57-0-265:West slope; 1-57-58-0-180:Cell Floor; 1-57-59-180-265:Cell Floor; 1-58-60-95-180:Cell Floor; 1-59-58-0-22:Cell Floor; 1-59-60-180-265:Cell Floor; 1-60-61-0-22:Cell Floor; 1-60-62-95-265:Cell Floor; 1-61-62-0-95:West slope; 1-62-63-0-265:Cell Floor; 1-63-64-0-182:Cell Floor; 1-63-65-182-265:Cell Floor; 1-64-65-0-22:Cell Floor; 1-65-33-0-20:Center Cell tie in seam; 1-66-67-0-263:Cell Floor; 1-67-68-0-179:Cell Floor; 1-68-69-0-22:Cell Floor; 1-68-70-0-179:Cell Floor; 1-69-67-180-263:Cell Floor; 1-70-69-180-263:Cell Floor; 1-70-71-0-263:Cell Floor; 1-71-72-0-178:Cell Floor; 1-71-73-178-270:Cell Floor; 1-72-74-0-178:Cell Floor; 1-73-74-178-270:Cell Floor; 1-74-1A-239-264:Nortern tie in/Cell 1A; 1-74-40-0-22:Center Cell tie in seam; 1-74-57A-0-58:Nortern tie in/Cell 1A; 1-74-Cell 1A-104-127:Nortern tie in/Cell 1A; 1-74-Cell 1A-127-150:Nortern tie in/Cell 1A; 1-74-Cell 1A-150-172:Nortern tie in/Cell 1A; 1-74-Cell 1A-194-217:Nortern tie in/Cell 1A; 1-74-Cell 1A-217-239:Nortern tie in/Cell 1A; 1-74-Cell 1A-81-104:Nortern tie in/Cell 1A; 1-74-Cell1A-172-194:Nortern tie in/Cell 1A; 1-74-Cell1A-58-81:Northern tie in/Cell 1A

NONDESTRUCTIVE SEAM TEST RESULTS FOR TOP BLADDERS IN FLEXIBLE STORAGE CONTAINERS

Panel No.[1]	Seam Length (ft)	Vacuum Box [2] Pass/Fail (P/F)	Air Pressure		
			Applied Pressure (psi)	Loss of Pressure [3] (psi)	Pass/Fail (P/F)
BT1-BT2	149	-	33	0	P
BT2-BT3	26	-	32	0	P
BT2-BT5	22	-	30	0	P
BT3-BT4	24	-	30	0	P
BT3-BT5	7	-	30	0	P
BT4-BT5	27	-	30	0	P
BT5-BT6	34	-	30	0	P
BT6-BT2	22	-	30	0	P
BT6-BT7	34	-	30	0	P
BT7-BT2	23	-	30	0	P
BT7-BT8	34	-	30	0	P
BT8-BT11	11	-	31	0	P
BT8-BT2	22	-	30	0	P
BT8-BT9	21	-	31	0	P
BT9-BT10	15	-	31	0	P
BT9-BT11	20	-	31	0	P
BT10-BT11	11	-	31	0	P
BT11-BT12	149	-	33	0	P
BT11-BT2	27	-	30	0	P
BT13-BT12	26	-	30	0	P
BT13-BT14	18	-	30	0	P
BT13-BT15	14	-	31	0	P
BT13-BT16	14	-	33	0	P
BT14-BT15	21	-	31	0	P
BT15-BT16	25	-	30	0	P
BT16-BT12	22	-	32	0	P
BT16-BT17	39	-	31	0	P
BT17-BT12	23	-	32	0	P
BT17-BT18	39	-	30	0	P
BT18-BT12	23	-	30	0	P
BT19-BT12	21	-	33	0	P
BT19-BT18	39	-	32	0	P
BT23-BT24	24	-	32	0	P
BT23-BT44	30	-	31	0	P
BT25-BT24	144	-	33	0	P
BT25-BT26	144	-	33	0	P
BT26-BT27	37	-	32	0	P
BT27-BT28	36	-	31	0	p
BT27-BT31	25	-	31	0	P
BT28-BT29	20	-	31	0	P
BT28-BT30	11	-	31	0	P
BT29-BT30	20	-	31	0	P
BT30-BT31	22	-	32	0	P
BT31-BT26	24	-	30	0	P

Notes:

1 "BB" and "BT" represent bottom and top of bladders, respectively.

2 Using 5 psi gauge suction in the box.

3 Acceptance criterion: Loss of pressure does not exceed 3 psi for at least 5 minutes.

NONDESTRUCTIVE SEAM TEST RESULTS FOR TOP BLADDERS IN FLEXIBLE STORAGE CONTAINERS

Panel No. [1]	Seam Length (ft)	Vacuum Box [2] Pass/Fail (P/F)	Air Pressure		
			Applied Pressure (psi)	Loss of Pressure [3] (psi)	Pass/Fail (P/F)
BT31-BT32	48	-	31	0	P
BT32-BT26	21	-	31	0	P
BT32-BT33	49	-	31	0	P
BT33-BT26	23	-	32	0	P
BT33-BT34	22	-	31	0	P
BT34-BT35	18	-	30	0	P
BT34-BT36	15	-	30	0	P
BT34-BT37	12	-	31	0	P
BT35-BT36	19	-	31	0	P
BT37-BT26	44	-	31	0	P
BT37-BT33	44	-	31	0	P
BT37-BT36	28	-	31	0	P
BT40-BT24	21	-	30	0	P
BT40-BT44	27	-	30	0	P
BT41-BT24	23	-	32	0	P
BT41-BT40	27	-	31	0	P
BT42-BT24	21	-	32	0	P
BT42-BT41	27	-	30	0	P
BT43-BT24	24	-	30	0	P
BT43-BT42	27	-	30	0	P
BT43-BT44	28	-	31	0	P
BT45-BT51	22	-	30	0	P
BT45-BT52	22	-	31	0	P
BT45-BT55	29	-	30	0	P
BT45-BT56	142	-	31	0	P
BT46-BT45	23	-	30	0	P
BT46-BT47	26	-	32	0	P
BT47-BT48	30	-	31	0	P
BT48-BT49	20	-	30	0	P
BT49-BT45	22	-	30	0	P
BT49-BT50	48	-	31	0	P
BT50-BT45	22	-	30	0	P
BT50-BT51	48	-	31	0	P
BT51-BT52	48	-	32	0	P
BT52-BT53	25	-	30	0	P
BT52-BT55	22	-	30	0	P
BT53-BT54	20	-	30	0	P
BT54-BT55	29	-	31	0	P
BT56-BT57	115	-	33	0	P
BT57-BT58	22	-	32	0	P
BT57-BT61	22	-	32	0	P
BT58-BT56	29	-	32	0	P
BT58-BT59	27	-	30	0	P
BT59-BT60	31	-	30	0	P

Notes:

1 "BB" and "BT" represent bottom and top of bladders, respectively.

2 Using 5 psi gauge suction in the box.

3 Acceptance criterion: Loss of pressure does not exceed 3 psi for at least 5 minutes.

NONDESTRUCTIVE SEAM TEST RESULTS FOR TOP BLADDERS IN FLEXIBLE STORAGE CONTAINERS

Panel No. [1]	Seam Length (ft)	Vacuum Box [2] Pass/Fail (P/F)	Air Pressure		
			Applied Pressure (psi)	Loss of Pressure [3] (psi)	Pass/Fail (P/F)
BT60-BT61	28	-	30	0	P
BT61-BT62	28	-	32	0	P
BT62-BT63	28	-	31	0	P
BT63-BT52	23	-	31	0	P
BT67-BT68	38	-	30	0	P
BT67-BT74	24	-	30	0	P
BT68-BT57	22	-	30	0	P
BT68-BT69	38	-	30	0	P
BT68-BT74	23	-	30	0	P
BT69-BT70	38	-	30	0	P
BT69-BT74	19	-	30	0	P
BT70-BT71	38	-	30	0	P
BT70-BT74	25	-	30	0	P
BT71-BT72	14	-	30	0	P
BT72-BT73	12	-	30	0	P
BT73-BT74	26	-	31	0	P
BT74-BT75	142	-	32	0	P
BT74-BT86	27	-	30	0	P
BT75-BT76	142	-	32	0	P
BT76-BT77	27	-	30	0	P
BT77-BT78	32	-	30	0	P
BT78-BT79	36	-	30	0	P
BT79-BT76	22	-	30	0	P
BT79-BT80	37	-	30	0	P
BT80-BT76	22	-	30	0	P
BT80-BT81	37	-	31	0	P
BT81-BT76	22	-	30	0	P
BT81-BT82	38	-	32	0	P
BT82-BT77	22	-	30	0	P
BT85-BT76	26	-	30	0	P
BT86-BT87 A	12	-	30	0	P
BT86-BT87 B	27	-	30	0	P
BT87-BT64	50	-	31	0	P
BT88-BT67	38	-	31	0	P
BT88-BT87	13	-	30	1	P

Notes:

[1] "BB" and "BT" represent bottom and top of bladders, respectively.

[2] Using 5 psi gauge suction in the box.

[3] Acceptance criterion: Loss of pressure does not exceed 3 psi for at least 5 minutes.

LARGE NUMBER

OF MAPS

SCANNED

SEPARATELY