



Submitted to
Florida Department of
Environmental Protection

CERTIFICATION REPORT CONSTRUCTION OF CELL 4

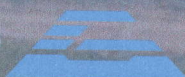
Oak Hammock Disposal Facility
Osceola County, Florida

for

ni Waste

of Osceola County, LLC
Way
orida

Prepared by



GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637

per FQ0691



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 11, 2005

Lenny Marion, General Manager
(lm Marion@wasteservicesinc.com)
Omni Waste
1501 Omni Way
St. Cloud, Florida 34773

OCD-SW-05-0218

Osceola County SW
Oak Hammock Disposal Facility
Certification of Construction Completion

Dear Mr. Marion:

This will acknowledge receipt of the *Certification of Construction Completion of a Solid Waste Management Facility*, dated, May 10, 2005, by Kenneth W. Cargill, P.E. of GeoSyntec Consultants, addressing Cell 4.

Based upon my inspection on May 11, 2005, construction of the Cell 4, 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 4 for disposal.

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

Sincerely,

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

/jnb

cc: Mr. Timothy J. Salopek, President (tjsomni@aol.com)
Kenneth Cargill, P.E., GeoSyntec Consultants (kcargill@geosyntec.com)



10 May 2005

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 4
Oak Hammock Disposal Facility
Omni Waste of Osceola County, LLC
Permit Application No. SC49-0199726-001

RECEIVED
[Signature] MAY 11 2005
Central Dist. - DEP

Dear Mr. Bradner:

Submitted herewith is one (1) copy of the certification report (including Record Drawings) for Cell 4 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*, duly 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



Submitted to:



Florida Department of
Environmental Protection

CERTIFICATION REPORT CONSTRUCTION OF CELL 4

Oak Hammock Disposal Facility
Osceola County, Florida

Prepared for



Omni Waste of Osceola County, LLC
1501 Omni Way
St. Cloud, Florida

Prepared by



GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637

Project Number FQ0691
May 2005



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, LLC

Name of Engineer: GEOSYNTEC CONSULTANTS

Type of Project: CONSTRUCTION OF CELL 4

Cost: Estimate \$ _____ Actual \$ _____

Site Design: Quantity: 1,700 ton/day Site Acreage: CELL 4, APPROX. 11 Acres

Deviations from Plans and Application Approved by DEP: _____

NO SIGNIFICANT DEVIATIONS FROM THE APPROVED PLANS
AND APPLICATION.

Address and Telephone No. of Site: 1501 OMNI WAY, ST. CLOUD, FLORIDA 34773
PHONE: (407) 891-3720

Name(s) of Site Supervisor: LEONARD MARION (OMNI)

Date Site inspection is requested: 11 MAY 2005

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: 10 MAY 2005

[Signature]
Signature of Professional Engineer

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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 4 at the Oak Hammock Disposal Facility (OHDF), a Class I landfill, in Osceola County, Florida. The CQA activities performed by GeoSyntec included monitoring of:

- (i) earthwork construction;
- (ii) geosynthetics installation;
- (iii) leachate collection system construction; and
- (iv) miscellaneous activities associated with development and ongoing operation 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).

Cell 4 was constructed in accordance with the above mentioned permit and associated permit drawings. The only modification included the realignment of approximately 1,000 lineal foot section of the site haul road.

This certification report was prepared for Mr. Leonard Marion of Omni Waste of Osceola County, LLC (Omni). The report 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 4 only. The construction of the leachate transmission line and the leachate storage area were 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 construction of Cell 1A and the leachate storage area is referred to as Cell 1A Certification Report. With the exception of the realignment of an approximate 1,000 lineal foot section of the site haul road, no other modifications were made to the existing landfill or storm water features.

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 4 is provided in Section 4;
- A description of the CQA monitoring and testing activities performed during the geosynthetics installation in Cell 4 is provided in Section 5;
- A description of the CQA monitoring and testing activities performed during construction of the leachate collection system in Cell 4 is provided in Section 6;
- A description of the CQA monitoring and testing performed during miscellaneous activities associated with development and ongoing operation 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.

The nuclear moisture/density logs are included in Appendix A. The geomembrane field logs are provided in Appendix B. Record drawings for the top of the liner subbase, top of low permeability soil in sump, and the primary and secondary geomembrane panel layouts are included in Appendix C. A photographic log of major construction activities is included in Appendix D 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 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.

Cell 1 (in Phase 1) was constructed in two parts. The construction of Cell 1A and 1B were completed in January 2004 and May 2004, respectively. It is noted that Cell 4 is the next cell to be constructed as part of Phase 1 development of the OHDF. Cells 2 and 3 will be constructed after Cell 4.

2.2 Construction Activities

This certification report pertains to CQA monitoring and testing activities performed for construction of Cell 4 only. The construction of Cell 4 included earthwork, liner system installation, and leachate collection system construction as indicated in the construction drawings prepared for the construction of Cell 4. The CQA monitoring and testing activities performed for construction of the leachate transmission line and leachate storage area were discussed in the Cell 1A Certification Report (GeoSyntec, January 2004).

The Cell 4 design incorporates a double-composite liner system and other engineering controls that meet or exceed the requirements of Chapter 62-701, FAC. The Cell 4 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 an internally reinforced composite, composed of granular sodium bentonite encapsulated between a needle-punched non-woven geotextile and a 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 an internally reinforced composite, composed of granular sodium bentonite encapsulated between a needle-punched non-woven geotextile and a woven geotextile; and
- minimum 6-in (152-mm) thick prepared subbase.

The Cell 4 leachate collection system consists of the following components:

- a 6-in. diameter HDPE 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 construction of Cell 4 at the OHDF included review of documents, field CQA operations, and preparation of this 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 Cell 4 at the OHDF is included in Section 3.5 of this report.

The earthwork for construction of Cell 4 commenced on 23 January 2005. The installation of the liner system in Cell 4 commenced on 23 March 2005. The placement of the liner protective layer in Cell 4 commenced on 23 April 2005. Construction of Cell 4 (described in this certification report) was completed 9 May 2005.

3.2 Related Documents

As previously noted, this certification report summarizes the CQA activities performed by GeoSyntec during construction of Cell 4 at 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; and
- construction drawings entitled "*Oak Hammock Disposal Facility, (J.E.D. Solid Waste Management Facility), Cell 4 Construction*" and Project Manual containing Technical Specifications, dated December 2004, prepared by GeoSyntec of Tampa, Florida.

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

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 4 for testing at an off-site geotechnical laboratory;
- collecting samples of soils used in the liner protective layer for testing at the 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 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, 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 4 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 collection 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 4.

Miscellaneous Activities:

- monitoring placement, grading, and compaction of soils and recycled concrete aggregate for the realignment of approximately 1,000 lineal foot section of the haul road to accommodate the construction of Cell 4 as required by the CQA Documents;
- monitoring restoration of landfill perimeter berm outer slopes as required by the CQA Documents; and
- monitoring placement, grading, and compaction of limerock base course along the perimeter maintenance road located on the west side of Cell 4.

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 4 liner subbase, top of low permeability layer in sump, primary liner, and secondary liner and this CQA certification report were prepared as the final task of the CQA program for construction of Cell 4. The record drawings are included in Appendix C of this report. This certification report summarizes the CQA monitoring, testing, and documentation activities performed by GeoSyntec.

During construction of Cell 4, 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 geosynthetics 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 satisfactory performance of Cell 4 at 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

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

Owner:

Omni Waste of Osceola County, LLC

- 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, Construction Manager
- Rick Hastie, Site CQA Manager

General Contractor:

Comanco Environmental Corporation, Tampa, Florida

- Dave Petty, Regional Project Manager
- Mike Daniels, Project Manager

Earthwork Subcontractor:

Bul-Hed, Mulberry, Florida

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

Geosynthetics Installer:

Comanco Environmental Corporation, Tampa, Florida

- Priscilliano Segura, Site Superintendent

Surveyor:

Hartman & Associates, Inc., Orlando, Florida

- Lawrence E. Jenkins, 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:

Golder Associates Inc., Atlanta, Georgia

- Barry Sigmon, P.G., 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 4 at the OHDF. Earthwork activities in Cell 4 included construction of subgrade, 6-inch thick liner subbase, intercell berms (between Cell 4 and future Cell 3 on the east side and between Cell 4 and future Cell 5 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 4 is discussed in this section. Earthwork related to the landfill perimeter berm (on west side of Cell 4); intercell berm between Cell 1B and Cell 4; and the low-permeability soil layer in sump area were discussed in the Cell 1A Certification Report. It is noted that the low permeability soil layer in the sump area was initially over-built to shed water. This layer was graded to the required shape (in accordance with the Construction Drawings) during Cell 4 construction.

The materials used to construct Cell 4 included general fill and liner protective layer soils. General fill was used to construct the subgrade of Cell 4, intercell berms, 6-inch thick liner subbase, and anchorage of the geosynthetics. The liner protective layer soils were used to place a minimum 2-ft thick liner protective layer in Cell 4.

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. During construction, geotechnical soil tests were performed either on-site by GeoSyntec personnel or at one of the 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 the Bronsons property (Bronsons Borrow Pit) located west of Cell 4. 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, SP-SM, 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 4 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. It is noted that soils with higher fines content (SP-SM or SM) were accepted provided that they met the specified hydraulic conductivity requirements.

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 4 of the OHDF. Depending on the specific test, testing was performed on-site by GeoSyntec personnel or at one of the two off-site laboratories (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 drive cylinder method (ASTM D 2937) 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;
- 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 three nuclear gauges (Troxler Model #3111B Serial #10979, and Troxler Model #3430 Serials #26567 and #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 drive cylinder method (ASTM D 2937) were performed periodically and compared with the density test results obtained using the nuclear gauge to ensure that the gauges were functioning properly.

4.4 General Fill

CQA personnel monitored the excavation (from the Bronsons Borrow Pit), placement, and compaction of general fill, which was used to construct the Cell 4 base, intercell berms, 6-inch thick liner subbase, and anchorage of geosynthetics. Earthwork in Cell 4 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, Bronsons Borrow Pit, using scraper pans;
- placing and spreading general fill in relatively thin lifts using scraper pans and bulldozers;
- compacting general fill using scraper pans and/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 the top of the liner subbase layer is included in Appendix C).

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 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.

Eleven standard Proctor tests were performed during construction for approximately 200,000 cyd of compacted general fill placed in Cell 4. The actual CQA test frequency of 1 test per 18,000 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 97.8 to 107.0 pounds per cubic foot (pcf) and the optimum moisture content varied from 13.6 to 17.4 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 200,000 cyd of general fill was used to construct Cell 4 (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 4 are presented in Appendix A. A total of 748 nuclear moisture/density tests were performed, which correspond to a CQA test frequency of 1 test per 267 cyd (approx.) of compacted general fill. As noted, areas corresponding to the failing test (i.e. 38 tests) 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 4. 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.

Twenty two grain-size distribution analyses and USCS classification were performed for approximately 200,000 cyd of compacted general fill used to construct Cell 4. The actual CQA test frequency of 1 test per 9,091 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 4-2. As noted, the general fill materials used to construct Cell 4 classified as SP, SP-SM and SM in accordance with the USCS classification.

4.4.4 Drive Cylinder Tests

In-situ moisture/densities were measured using the drive cylinder method (ASTM D 2937) periodically to verify the moisture/density tests results obtained using the nuclear gauge. A total of 31 moisture/densities were measured using the drive cylinder method for the general fill used to construct Cell 4 and are summarized in Table 4-3. A drive cylinder was collected for approximately every 24 nuclear density tests, performed, which exceeded the minimum testing frequency required by the CQA Documents. 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 4) and the intercell berms between Cell 4 and future Cell 3 (on east side) and Cell 4 and future Cell 5 (on south side). Along the north side of Cell 4, each layer of geosynthetics was tied to the respective layer of geosynthetics from Cell 1B. 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 depending upon the material, across the bottom of the anchor trench and ballasted with sandbags; and
- the anchor trench was backfilled with general fill.

4.5 Liner Protective Layer Soils

Liner protective soil layer was used to cover the geosynthetic components of the liner system in Cell 4. The minimum thickness of the liner protective layer atop the geosynthetic components of the liner system in Cell 4 was 2 feet.

Sandy soils from the Bronsons Borrow Pit, were used as liner protective layer soils. CQA personnel periodically monitored the placement of the liner protective layer soils in Cell 4. The construction sequence of liner protective layer was as follows:

- articulated dump trucks hauled the sandy soils from Bronsons Borrow Pit to Cell 4; and
- the sandy soils were placed and spread using low ground pressure bulldozers.

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 3-ft thick layer of sandy soils was maintained where the articulated off-road dump trucks operated.

Grain-size distribution analyses (ASTM D 422 and ASTM C 136), soil classification in accordance with USCS (ASTM D 2487), and hydraulic conductivity (ASTM D 2434) tests were performed on samples of liner protective layer soils 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 36,000 cyd (approx.) of liner protective soil were placed in Cell 4. Eighteen grain-size distribution analyses (and USCS classification) and 12 hydraulic conductivity tests were performed on the liner protective layer soils placed in Cell 4. The laboratory test results are presented in Table 4-4. The actual CQA test frequencies of 1 test per 2,000 cyd (approx.) for grain-size distribution analyses (and USCS classification) and 1 test per 3,000 cyd (approx.) for hydraulic conductivity, met 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. It is noted that soils with fines content greater than 5 percent were accepted since the measured hydraulic conductivities exceeded the project requirements.

Table 4-1

STANDARD PROCTOR TEST RESULTS FOR GENERAL FILL USED TO CONSTRUCT CELL 4

SAMPLE ID	SOIL DESCRIPTION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)
C4-PR-1 ¹	Gray sand with trace of silt and organics	16.2	97.8
C4-PR-2 ¹	Brown gray sand with trace of silt and organics	15.7	100.1
C4-PR-3 ¹	Brown gray sand with trace of silt and organics	16.0	98.3
C4-PR-4 ¹	Reddish brown sand with trace of silt	14.3	105.7
C4-PR-5 ¹	Brown and gray sand with trace of silt and organics	13.6	105.3
C4-PR-6 ¹	Brown sand with trace of silt and organics	13.6	103.3
C4-PR-7 ²	Sand with silts	15.7	106.3
C4-PR-8 ²	Sand with silts	17.4	102.4
C4-PR-9 ²	Sand with silts	14.6	106.4
C4-PR-10 ²	Sand with silts	14.1	101.5
C4-PR-11 ²	Sand with silts	15.5	107.0
¹ Samples tested by Atlantic Testing Laboratories, Inc.			
² Samples tested by Excel Geotechnical Testing.			

Table 4-2

**GRAIN SIZE DISTRIBUTION ANALYSES AND USCS CLASSIFICATION RESULTS FOR
GENERAL FILL USED TO CONSTRUCT CELL 4**

	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.	Percent Passing by Weight Through U.S. Standard Sieve					Classification ³	Pass/Fail (P/F)
	No. 10	No. 40	No. 60	No. 80	No. 200		
C4-S-1 ¹	100.0	97.9	83.4	46.5	1.9	SP	P
C4-S-2 ¹	100.0	97.7	83.7	47.3	3.2	SP	P
C4-S-3 ¹	100.0	97.8	81.9	45.3	1.6	SP	P
C4-S-4 ¹	100.0	95.6	80.9	50.7	2.3	SP	P
C4-S-5 ¹	100.0	97.5	82.7	46.4	4.6	SP	P
C4-S-6 ¹	100.0	97.3	83.1	48.2	3.6	SP	P
C4-S-7 ²	100.0	97.6	81.8	63.0	13.8	SM	P
C4-S-8 ²	99.7	97.4	79.5	55.0	10.4	SP-SM	P
C4-S-9 ²	100.0	98.2	85.2	57.0	6.4	SP-SM	P
C4-S-10 ²	99.9	97.1	79.0	57.0	11.8	SP-SM	P
C4-S-11 ²	100.0	98.3	86.9	63.0	12.7	SM	P
C4-S-12 ²	100.0	98.2	84.1	63.0	4.8	SP	P
C4-S-13 ²	100.0	95.4	67.4	44.0	6.5	SP-SM	P
C4-S-14 ²	99.9	93.4	69.2	50.0	7.8	SP-SM	P
C4-S-15 ²	100.0	97.9	85.3	65.0	11.0	SP-SM	P
C4-S-16 ²	100.0	98.3	85.5	60.0	18.7	SM	P
C4-S-17 ²	100.0	98.3	86.5	60.0	3.9	SP	P
C4-S-18 ²	100.0	95.3	64.7	45.0	6.4	SP-SM	P
C4-S-19 ²	100.0	98.1	86.3	63.0	7.8	SP-SM	P
C4-S-20 ²	100.0	97.8	81.8	57.0	9.9	SP-SM	P
C4-S-21 ²	100.0	98.4	87.0	64.0	15.6	SM	P
C4-S-22 ²	100.0	98.9	88.1	60.0	5.1	SP-SM	P
Notes:							
1 Samples tested by Atlantic Testing Laboratories, Inc.							
2 Samples tested by Excel Geotechnical Testing.							
3 General fill material was required to classify as SW, SP, SP-SM, or SM.							

Table 4-3

**COMPARISON BETWEEN DRIVE CYLINDER AND NUCLEAR GAUGE TEST RESULTS
FOR GENERAL FILL USED TO CONSTRUCT CELL 4**

DRIVE CYLINDER			NUCLEAR GAUGE			DIFFERENCE (Drive Cylinder - Nuclear Gauge)	
Test No.	Dry Unit Weight (pcf)	Moisture Content (%)	Test No.	Dry Unit Weight (pcf)	Moisture Content (%)	Dry Unit Weight (pcf)	Moisture Content (%)
	ASTM D 2937	ASTM D 2216		ASTM D 2922	ASTM D 3017		
DR-1	99.9	8.8	C4-28	101.2	9.2	-1.3	-0.4
DR-2	101.0	10.9	C4-48	101.4	9.5	-0.4	1.4
DR-3	95.4	10.2	C4-91	96.3	9.5	-0.9	0.7
DR-4	97.8	8.6	C4-118	97.8	7.8	0.0	0.8
DR-5	99.5	9.3	C4-140	100.7	7.8	-1.2	1.5
DR-6	101.0	10.5	C4-148	101.3	9.8	-0.3	0.7
DR-7	94.5	8.5	C4-176	95.4	7.3	-0.9	1.2
DR-8	102.4	11.6	C4-199	103.2	7.9	-0.8	3.7
DR-9	99.1	10.7	C4-242	100.0	8.8	-0.9	1.9
DR-10	99.6	11.1	C4-239	96.5	11.8	3.1	-0.7
DR-11 *	109.3	9.5	C4-PR-5	104.9	7.6	4.4	1.9
DR-12 *	103.7	11.4	C4-PR-2	106.2	7.6	-2.5	3.8
DR-13	99.2	12.4	C4-273	97.2	11.6	2.0	0.8
DR-14	101.4	14.5	C4-290	100.4	14.0	1.0	0.5
DR-15	107.2	13.9	C4-303	100.5	10.8	6.7	3.1
DR-16 *	98.5	12.6	C4-PR-2	110.1	12.4	-11.6	0.2
DR-17	99.2	12.4	C4-273	97.2	11.6	2.0	0.8
DR-18	103.9	11.1	C4-329	105.4	11.0	-1.5	0.1
DR-19	102.4	10.4	C4-345	101.7	11.9	0.7	-1.5
DR-20	95.8	12.9	C4-370	96.2	12.3	-0.4	0.6
DR-21	95.8	3.5	C4-389	95.6	2.3	0.2	1.2
DR-22	98.8	6.5	C4-414	96.2	5.1	2.6	1.4
DR-23	103.9	7.3	C4-439	102.9	5.8	1.0	1.5
DR-24	98.1	17.0	C4-463	99.5	16.5	-1.4	0.5
DR-25	104.1	10.2	C4-488	103.9	9.7	0.2	0.5
DR-26	99.2	12.4	C4-273	97.2	11.6	2.0	0.8
DR-27 *	103.7	11.4	C4-PR-2	106.2	7.6	-2.5	3.8
DR-28	104.9	10.7	C4-495	101.9	10.1	3.0	0.6
DR-29	103.2	6.6	C4-515	102.7	6.5	0.5	0.1
DR-30	100.5	7.6	C4-535	101.0	5.8	-0.5	1.8
DR-31	97.4	7.8	C4-560	100.5	6.6	-3.1	1.2
DR-32	102.6	6.0	C4-597	105.9	4.8	-3.3	1.2
DR-33	99.1	6.1	C4-626	99.0	5.2	0.1	0.9
DR-34	105.0	12.3	C4-673	106.4	11.6	-1.4	0.7
DR-35	99.2	12.1	C4-776	97.3	11.7	1.9	0.4

* Drive cylinder tests performed along the haul road.

Table 4-4

LABORATORY TEST RESULTS FOR LINER PROTECTIVE LAYER SOILS USED TO CONSTRUCT CELL 4

	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, 3} (cm/sec)	Pass/Fail ⁴ (P/F)
C4-PC-1	4.2	SP	1.4x10 ⁻²	P
C4-PC-2	6.8	SP-SM		P
C4-PC-3	13.8	SM	1.0x10 ⁻²	P
C4-PC-4	14.7	SM		P
C4-PC-5	6.9	SP-SM	1.8x10 ⁻²	P
C4-PC-6	9.8	SP-SM	1.7x10 ⁻²	P
C4-PC-7	9.4	SP-SM	1.9x10 ⁻²	P
C4-PC-8	7.8	SP-SM	9.2x10 ⁻³	P
C4-PC-9	11.5	SP-SM	1.7x10 ⁻²	P
C4-PC-10	10.4	SP-SM	1.5x10 ⁻²	P
C4-PC-11	7.3	SP-SM	1.0x10 ⁻²	P
C4-PC-12	9.8	SP-SM	1.0x10 ⁻²	P
C4-PC-13	10.4	SP-SM	1.4x10 ⁻²	P
C4-PC-14	10.5	SP-SM		P
C4-PC-15	12.5	SM	6.8x10 ⁻³	P
C4-PC-16	9.1	SP-SM		P
C4-PC-17	11.4	SP-SM	--	P
C4-PC-18	10.9	SP-SM	--	P
Notes: ¹ Liner protective layer soils were required to classify as SW or SP. ² Required hydraulic conductivity was no less than 1.0x10 ⁻³ cm/sec. ³ As noted, some of the hydraulic conductivity test results are for composite samples. ⁴ Soil with higher fines content were accepted provided they met the specified hydraulic conductivity requirements.				

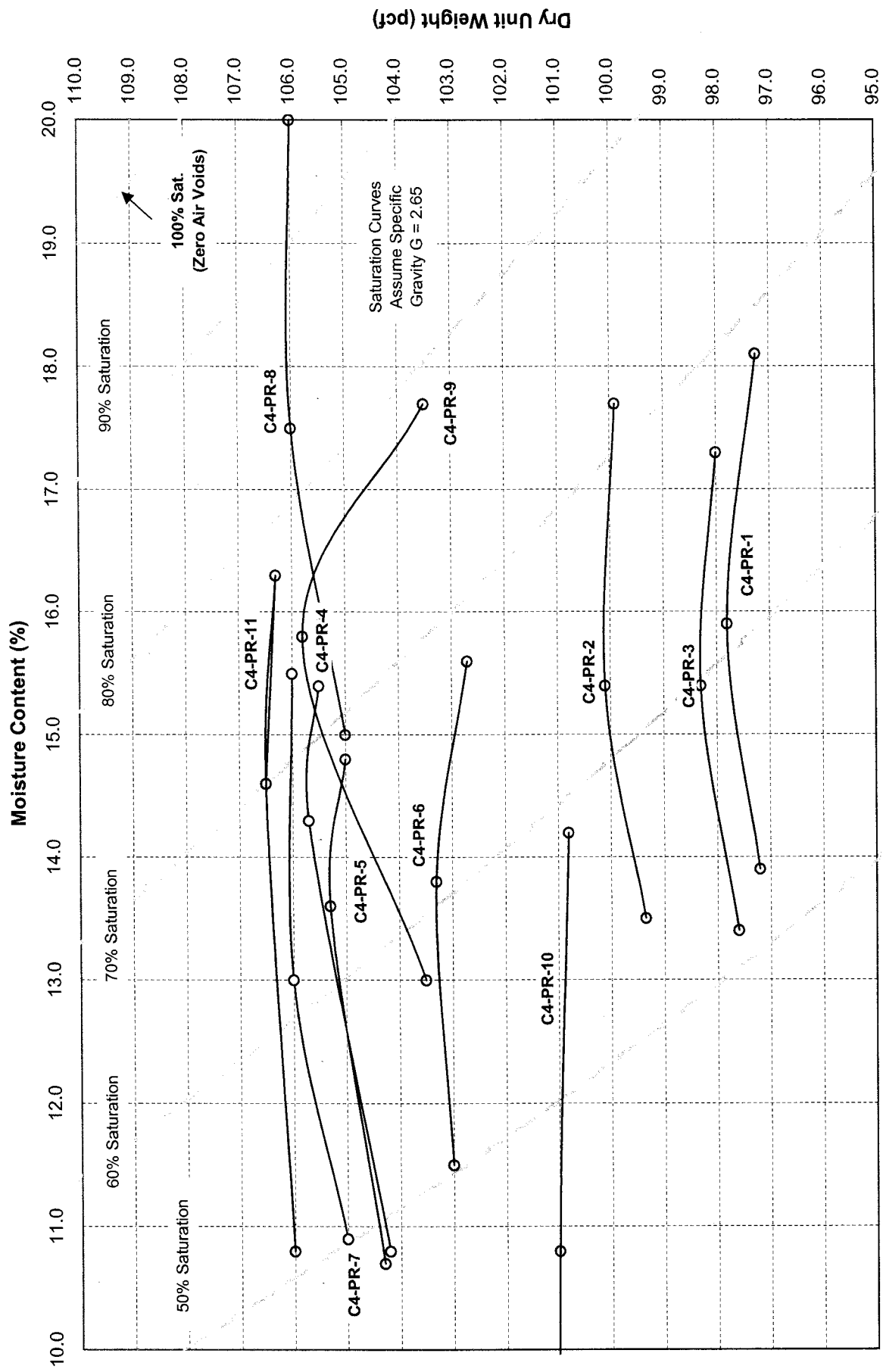


Figure 4-1: Standard Proctor Test Results for General Fill in Cell 4

5. CONSTRUCTION QUALITY ASSURANCE - GEOSYNTHETICS

5.1 General

GeoSyntec monitored the installation of the geosynthetic components of the double composite liner system in Cell 4, as described in Section 2. At times, several liner system installation operations were conducted simultaneously during Cell 4 construction. When this occurred, the on-site CQA personnel monitored the operations that were considered most critical to the performance of the liner system.

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 4. Bentomat ST GCL used was manufactured by CETCO Lining Technologies (CETCO) in Arlington Heights, Illinois. The GCL conformance samples were collected, from the rolls produced for the project, by Golder Associates Inc. (Golder) (an independent contractor authorized to collect samples for CQA testing). Golder coordinated with the manufacturer to collect the CQA samples at CETCO's manufacturing plant in Lovell, Wyoming. Golder 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 are summarized in Table 5-1. Table 5-1 also indicates the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents.

It is noted that Table 5-1 is organized with respect to the GCL lot numbers and indicates the roll numbers in each lot of GCL that were sampled and tested as part of the MQC and CQA conformance testing. Each sheet of Table 5-1 also presents the total number of rolls (and square footage) of the GCL received from the respective lot number and also the cumulative number of rolls (and square footage) of the GCL received for the project (to evaluate the MQC and CQA test frequencies for each lot and for the project).

A total of 7 CQA conformance samples were tested for approximately 1,084,000 square feet (ft²) of GCL delivered to the site for installation in Cell 4. The actual CQA test frequency of 1 test per 154,800 ft² of GCL exceeded the minimum testing frequency of 1 test per 200,000 ft² 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, samples from Rolls #454 and #461 (Lot # 200503LO) were tested using deionized water and leachate collected from the OHDF as permeant fluids during MQC testing. The measured hydraulic conductivity of GCL using leachate as the permeant fluid was less than the measured hydraulic conductivity of GCL using deionized water as the permeant fluid, i.e., it is conservative to measure the hydraulic conductivity of GCL using deionized water. 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 south of the Cell 4 construction area (i.e., in future Cell 5 footprint), stacked on a 1.5-ft high berm, and covered with a plastic tarps. The rolls were typically transported on site by an off-road forklift equipped with a stinger bar. 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 stinger bar attached to an off-road forklift. The rolls were deployed by inserting a spreader bar attached to low-ground pressure, track-mounted vehicle and unrolled. Panels were re-positioned as necessary using laborers.

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 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 along the width of panels and repaired 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. Granular bentonite was added around the damaged area prior to overlaying the patch material. 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 4. The 60-mil textured geomembrane, MicrospikeTM HDPE, was supplied by Agru America in Georgetown, South Carolina. Conformance samples of textured geomembrane were collected (from the rolls produced for the project) by Golder, which coordinated with the manufacturer to collect the CQA samples at Agru America's manufacturing plant. Golder 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 are summarized in Tables 5-2A, 5-2B, and 5-2C. Table 5-2A presents the MQC and CQA test results for the textured geomembrane. Table 5-2B presents the results for MQC resin properties for the geomembrane lots and welding rods used for the project. Table 5-2C presents MQC geomembrane properties for low temperature brittleness, dimensional stability, and notched constant tensile load. Tables 5-2A, 5-2B, and 5-2C indicate the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents.

It is noted that Table 5-2A is organized with respect to the resin lot numbers and indicates the roll numbers from each resin lot that were sampled and tested as part of the MQC and CQA conformance testing. Each sheet of Table 5-2A also presents the total number of rolls (and square footage) of the textured geomembrane received from the respective resin lot number and the cumulative number of rolls (and square footage) of the textured geomembrane received for the project (to evaluate the MQC and CQA test frequencies for each lot and for the project).

A total of 11 CQA conformance samples were tested for approximately 1,090,000 ft² of textured geomembrane delivered to the site for installation in Cell 4. The actual CQA test frequency of 1 test per 99,070 ft² for the textured geomembrane exceeded the minimum frequency of 1 test per 100,000 ft² 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 south of the Cell 4 construction area (i.e., future Cell 5 footprint) and stacked on an elevated platform. The rolls were typically transported by an off-road forklift with a spreader bar attachment or using the nylon slings which were attached to each roll. 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 an off-road forklift. 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.

5.3.2.3 Trial Seams

Prior to production seaming, the installer prepared geomembrane trial seams for each piece of seaming equipment to be used. Additional trial seams were prepared approximately every five hours or when field conditions changed. 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.

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 included in Appendix B of this report.

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 included in Appendix B of this report.

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.

Nondestructive seam test results for primary and secondary liner in Cell 4 are presented in Appendix B. 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 5-3. The destructive seam test results for primary and secondary liners installed in Cell 4 are presented in Tables 5-3A and 5-3B, respectively. For primary liner installed in Cell 4, 48 destructive seam samples were tested for a total seam length of 22,982 ft (approx.). This corresponds to an approximate sample frequency of 1 per 479 lf of seam. For secondary liner installed in Cell 4, 53 destructive seam samples were tested for a total seam length of 21,563 ft (approx.). This corresponds to an approximate sample frequency of 1 per 407 lf of seam. The actual destructive seam test frequencies 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 101 destructive seam samples were tested. All liner seam samples tested destructively during construction of Cell 4 met the strength criteria noted in Section 5.3.2.3.

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 equipment 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 included in Appendix B of this report. Record drawings illustrating layout of panels and the location of seams and repairs are included in Appendix C.

5.4 CQA of Primary Geocomposite

5.4.1 Conformance Testing and Documentation

A tri-planar geocomposite was used as the primary drainage geocomposite in the double composite liner system in Cell 4. The primary geocomposite used was Tendrain 7100-2 manufactured by the Tenax Corporation (Tenax) in Baltimore, Maryland. The primary geocomposite conformance samples were collected by Golder, which coordinated with the manufacturer to collect the CQA samples at the Tenax's manufacturing plant in Evergreen, Alabama. Golder 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 results of the MQC and CQA conformance tests for 218 rolls (547,800 ft²) of primary geocomposite are summarized in Tables 5-4A, 5-4B, and 5-4C. Table 5-4A presents the CQA and MQC test results for the primary geocomposite rolls produced for the project. Table 5-4B presents the MQC test results for the geotextile rolls used to manufacture the primary geocomposite rolls produced for the project. Table 5-4C presents the MQC test results for the geonet rolls used to manufacture the primary geocomposite rolls for the project.

Table 5-4A 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 5-4A also indicates the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents. A total of 3 CQA conformance samples were tested for 547,800 ft² of primary geocomposite approved for installation in Cell 4. The actual CQA test frequency of 1 test per 182,600 ft² (approx.) of the primary geocomposite exceeded the minimum frequency of 1 test per 200,000 ft² required by the CQA Documents. As noted in Table 5-4A, a minimum of one conformance sample was tested during CQA from each geocomposite 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 as part of the liner protective layer. The transmissivity of the primary 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 primary geocomposite rolls approved for the project. Several rolls of primary geocomposite were manufactured from the same roll of geotextile. Approximately 1,095,600 ft² of geotextile was used to manufacture the primary geocomposite rolls for the project. As part of the MQC testing, 11 geotextile rolls were tested for mass per unit area, grab strength, trapezoidal tear strength, puncture strength, and burst strength. Apparent opening size and permittivity tests were performed on 5 geotextile samples. The approximate MQC test frequency of 1 test per 99,600 ft² (or 219,100 ft²) for the geotextile component of the primary geocomposite meet the minimum frequency of 1 test per 100,000 ft² (or 250,000 ft²) required by the CQA Documents for the respective tests.

Table 5-4C presents the MQC test results for the geonet component of the primary geocomposite rolls approved for the project. Several rolls of primary geocomposite were manufactured from the same roll of geonet. Twenty geonet rolls were tested for 547,800 ft² of geonet used to manufacture the primary geocomposite for the project. The MQC test frequency of 1 test per 27,400 ft² (approx.) for the geonet component of the primary geocomposite rolls exceeded the minimum frequency of 1 test per 100,000 ft² required by the CQA Documents.

5.4.2 Field Monitoring Activities

5.4.2.1 Delivery and On-Site Storage

Upon delivery to the site, primary geocomposite rolls were stored in an area located south of the Cell 4 construction area (i.e., future Cell 5 footprint) and stacked on an elevated platform. The rolls were typically transported by an off-road forklift. 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.

5.4.2.2 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;
- overlap the bottom geotextile edges;
- 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.

5.5 CQA of Secondary Geocomposite

5.5.1 Conformance Testing and Documentation

A bi-planar geocomposite was used as secondary drainage geocomposite in the double composite liner system in Cell 4. The secondary geocomposite used was Transnet 270-2-8 geocomposite manufactured by SKAPS Industries in Commerce, Georgia. The secondary geocomposite conformance samples were collected (from the rolls produced for the project) by Golder, which coordinated with the manufacturer to collect the CQA samples at the SKAPS' manufacturing plant in Commerce, Georgia. Golder 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 results of the MQC and CQA conformance tests results for 197 rolls (551,600 ft²) are summarized in Tables 5-5A, 5-5B, and 5-5C. Table 5-5A presents the CQA and MQC test results for the secondary geocomposite rolls produced for the project. Table 5-5B presents the MQC test results for the geotextile rolls used to manufacture the secondary geocomposite rolls for the project. Table 5-5C presents the MQC test results for the geonet rolls used to manufacture the secondary geocomposite rolls for the project.

Table 5-5A presents the CQA and MQC test results for the secondary geocomposite rolls and CQA test results for the geotextile component of the secondary geocomposite. It includes the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents. A total of 3 CQA conformance samples were tested for approximately 551,600 ft² of secondary geocomposite delivered to the site for installation in Cell 4. The actual CQA test frequency of 1 test per 184,000 ft² (approx.) of the secondary geocomposite exceeded the minimum frequency of 1 test per 200,000 ft² required by the CQA Documents. As noted in Table 5-5A, all the geonet used in the manufacture of the secondary geocomposite belonged to a single 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 5-5A is the minimum transmissivity measured during the 100-hour test.

Table 5-5B 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. 20 geotextile rolls were tested for approximately 1,103,200 ft² of geotextile used to manufacture the secondary geocomposite rolls for the project. The MQC test frequency of 1 test per 55,200 ft² (approx.) for the geotextile component of the secondary geocomposite exceeded the minimum frequency of 1 test per 100,000 ft² required by the CQA Documents.

Table 5-5C presents the MQC test results for the geonet component of the secondary geocomposite rolls approved for the project. Several rolls of secondary geocomposite were manufactured from the same roll of geonet. 20 geonet rolls were tested for 551,600 ft² of geonet used to manufacture the secondary geocomposite rolls delivered for the project. The MQC test frequency of 1 test per 28,000 ft² (approx.) for the geonet component of the secondary geocomposite exceeded the minimum frequency of 1 test per 100,000 ft² 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, secondary geocomposite rolls were stored in an area located south of the Cell 4 construction area (i.e., future Cell 5 footprint) and stacked on an elevated platform. The rolls were typically transported by an off-road forklift. 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 4. Only approved rolls were incorporated into the work.

5.5.2.2 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;
- overlap the bottom geotextile edges;
- 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.

5.6 CQA of Non-Woven Geotextile

5.6.1 Conformance Testing and Documentation

A non-woven geotextile was used as filter fabric to surround the aggregate in the leachate collection system and as a separator in the leachate sump in Cell 4. The 8-oz/yd², needle-punched, non-woven geotextile (GT-180) was manufactured by SKAPS Industries in Commerce, Georgia. The CQA conformance samples for the non-woven geotextile were collected by GeoSyntec on-site and shipped to Golder. Golder 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 are summarized in Table 5-6. Table 5-6 also indicates the tests that were conducted, the required test frequencies, and the acceptance criteria in accordance with the CQA Documents.

A CQA conformance samples was tested for approximately 27,000 ft² of the non-woven geotextile delivered to the site for installation in Cell 4. The actual CQA test frequency of 1 test per 27,000 ft² of non-woven geotextile exceeded the minimum testing frequency of 1 test per 200,000 ft² 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, non-woven geotextile rolls were stored in an area located south of the Cell 4 construction area (i.e., future Cell 5 footprint) and stacked on an elevated platform. The rolls were typically transported by an off-road forklift. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner.

5.6.2.2 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 either heat tacked the geotextile or continuously sewed the 6-in overlap.

5.7 Interface Friction Testing

As discussed in Section 2, the liner system in Cell 4 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.

The interface shear and the internal strength tests were performed as part of CQA and MQC testing. The CQA tests were performed using samples of geosynthetics collected from rolls that were actually installed in Cell 4. The MQC tests were performed on rolls of similar geosynthetics (as used for this project) as part of material approval. The soils for liner protective layer and liner subbase were obtained from the Bronsons Borrow Pit and were similar to the sandy soils used in construction. The following rolls of geosynthetics were used for the CQA interface shear and the internal strength tests:

- GCL – Roll #1566 (Lot #200510LO);
- Textured geomembrane – Roll #107217 (Lot #7141685);
- Tri-Planar geocomposite – Roll #5500131 (Lot #55004); and
- Bi-Planar geocomposite – Roll #1524103 (Lot #11021).

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/saturated 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 (woven side);
- (4) GCL (non-woven side) / Bi-planar geocomposite;
- (5) Bi-planar geocomposite / Textured geomembrane;
- (6) GCL (non-woven side) / Subbase soil; and
- (7) Internal strength of the GCL.

It is noted that the GCL was installed with the non-woven geotextile down in accordance with Manufacturer's recommendation. However, CQA interface friction tests were also conducted for the following conditions:

- (1) Textured geomembrane / GCL (non-woven side);
- (2) GCL (woven side) / Bi-planar geocomposite; and
- (3) GCL (woven side) / Subbase soil.

The minimum shear strengths required by the CQA Documents are presented in Table 5-7A. The measured peak and residual shear strengths for all the CQA and MQC tests performed are summarized in Table 5-7B. Figures 5-1 and 5-2 present the peak and residual shear strengths, respectively, for CQA interface shear and the internal strength tests performed. As noted, the measured peak and residual shear strengths exceeded the minimum specification requirements.

Table 5-1

CQA AND MQC TEST RESULTS FOR GEOSYNTHETIC CLAY LINER (CETCO)

LOT NO. 200503LO

CONSTRUCTION QUALITY ASSURANCE (CQA)		MANUFACTURING QUALITY CONTROL (MQC)					
PROPERTY	Hydraulic Conductivity (cm/s)	Bentonite Content (lb/ft ²)	Grab Strength (lb)	Peel Strength (lb)	Bentonite Free Swell (ml)	Bentonite Moisture Content (%)	Hydraulic Conductivity (cm/s)
TEST STANDARD	ASTM D 5887	ASTM D 5993	ASTM D 4632	ASTM D 4632	ASTM D 5890	ASTM D 2216	ASTM D 5887
PROJECT SPECS.	$\leq 5.0 \times 10^{-9}$	≥ 0.75	≥ 150	≥ 15	≥ 24	≤ 25	$\leq 5.0 \times 10^{-9}$
TESTING FREQUENCY	1 per 200,000 ft ² (2)		1 per 40,000 ft ² (2)		1 per 50 ton (1, 2)		1 per 100,000 ft ² (2)

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS						PASS/FAIL (P/F)	
								CQA	MQC
454 (3)							4.36x10 ⁻¹⁰ (w/ De-Aired Water) 3.22x10 ⁻¹⁰ (w/ Leachate)		P
461 (4, 5)						31.1	7.66x10 ⁻¹⁰ (w/ De-Aired Water) 6.86x10 ⁻¹⁰ (w/ Leachate)		P
Notes: 1 Manufacturer's testing frequency was accepted for these properties. 2 A minimum of 1 test per lot was required. 3 GCL Roll #454 was not used in Cell 4. However, hydraulic conductivity tests (w/ de-aired water & leachate) were performed as part of material approval. 4 No hydraulic conductivity test was performed as part of CQA because hydraulic conductivity tests were performed on two rolls from this lot as part of MQC. 5 Test properties were obtained for Roll #457 from this lot. Test results for Roll #457 were applied to Roll #461.									
Roll Area (150 ft x 15 ft):		2,250	ft ²						
No. of Rolls in Lot:		1							
Area in Lot:		2,250	ft ²						
				SHEET NO.		1	of	5	
				CUMULATIVE NUMBER OF ROLLS:		1			
				CUMULATIVE AREA:		2,250			ft ²

Table 5-1 (continued)

CQA AND MQC TEST RESULTS FOR GEOSYNTHETIC CLAY LINER (CETCO)

LOT NO. 200509LO

	MANUFACTURING QUALITY CONTROL (MQC)						
	CONSTRUCTION QUALITY ASSURANCE (CQA)						
PROPERTY	Hydraulic Conductivity (cm/s)	Bentonite Content (lb/ft ²)	Grab Strength (lb)	Peel Strength (lb)	Bentonite Free Swell (ml)	Bentonite Moisture Content (%)	Hydraulic Conductivity (cm/s)
TEST STANDARD	ASTM D 5887	ASTM D 5993	ASTM D 4632	ASTM D 4632	ASTM D 5890	ASTM D 2216	ASTM D 5887
PROJECT SPECS.	$\leq 5.0 \times 10^{-9}$	≥ 0.75	≥ 150	≥ 15	≥ 24	≤ 25	$\leq 5.0 \times 10^{-9}$
TESTING FREQUENCY	1 per 200,000 ft ² (2)	1 per 40,000 ft ² (2)		1 per 50 ton (1, 2)		1 per 100,000 ft ² (2)	

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS							PASS/FAIL (P/F)	
									CQA	MQC
1232			181.2	31.3	26.0	10.4	5.70×10^{-10}			P
1251			181.2	28.9	26.0	10.0				P
1271			181.2	27.7						P
1281							6.48×10^{-10}			
1290			181.2	29.7						P
1299	C4-GCL-1	2.8×10^{-9}							P	
1309			181.2	34.3						P
1328			296.9	28.7						P
1330							4.5×10^{-10}			P
1346			260.1	30.7						P
1365			260.1	24.9						P
1379							5.1×10^{-10}			P
1384			260.1	27.0						P
1390	C4-GCL-2	3.2×10^{-9}							P	
1403			260.1	24.5						P
1422			260.1	32.2	26.0	9.2				P

Notes:

1 Manufacturer's testing frequency was accepted for these properties.

2 A minimum of 1 test per lot was required.

Average Roll Area (135 ft x 15 ft):

2,025 ft²

No. of Rolls in Lot:

197

Area in Lot:

398,925 ft²

SHEET NO.

2

of

198

CUMULATIVE NUMBER OF ROLLS:

401,175

ft²

CUMULATIVE AREA:

Table 5-1 (continued)

CQA AND MQC TEST RESULTS FOR GEOSYNTHETIC CLAY LINER (CETCO)

LOT NO. 200510LO

MANUFACTURING QUALITY CONTROL (MQC)							
CONSTRUCTION QUALITY ASSURANCE (CQA)	Hydraulic Conductivity (cm/s)	Bentonite Content (lb/ft ²)	Grab Strength (lb)	Peel Strength (lb)	Bentonite Free Swell (ml)	Bentonite Moisture Content (%)	Hydraulic Conductivity (cm/s)
PROPERTY							
TEST STANDARD	ASTM D 5887	ASTM D 5993	ASTM D 4632	ASTM D 4632	ASTM D 5890	ASTM D 2216	ASTM D 5887
PROJECT SPECS.	≤5.0x10 ⁻⁹	≥0.75	≥150	≥15	≥24	≤25	≤5.0x10 ⁻⁹
TESTING FREQUENCY	1 per 200,000 ft ² (2)	1 per 40,000 ft ² (2)			1 per 50 ton (1, 2)		1 per 100,000 ft ² (2)

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS							PASS/FAIL (P/F)	
									CQA	MQC
1515			0.79	261.3	47.4	26.0	10.0			P
1535			0.90	261.3	37.1	26.0	10.4			P
1541										P
1554			0.84	261.3	34.0	26.0	10.4			P
1566 (3)	C4-GCL-3	3.0x10 ⁻⁹							P	
1573			0.80	261.3	34.1					P
1592			0.86	261.3	32.2			8.31x10 ⁻¹⁰		P

Notes:

¹ Manufacturer's testing frequency was accepted for these properties.² A minimum of 1 test per lot was required.³ This roll was used to perform interface friction tests.

Average Roll Area (135 ft x 15 ft):	2,025	ft ²	SHEET NO.	3	of	5
No. of Rolls in Lot:	95		CUMULATIVE NUMBER OF ROLLS:			
Area in Lot:	192,375	ft ²	CUMULATIVE AREA:			
			293			
			593,550			
			ft ²			

Table 5-1 (continued)

CQA AND MQC TEST RESULTS FOR GEOSYNTHETIC CLAY LINER (CETCO)
LOT NO. 200512LO

	MANUFACTURING QUALITY CONTROL (MQC)						
	CONSTRUCTION QUALITY ASSURANCE (CQA)						
PROPERTY	Hydraulic Conductivity (cm/s)	Bentonite Content (lb/ft ²)	Grab Strength (lb)	Peel Strength (lb)	Bentonite Free Swell (ml)	Bentonite Moisture Content (%)	Hydraulic Conductivity (cm/s)
TEST STANDARD	ASTM D 5887	ASTM D 5993	ASTM D 4632	ASTM D 4632	ASTM D 5890	ASTM D 2216	ASTM D 5887
PROJECT SPECS.	≤5.0x10 ⁻⁹	≥0.75	≥150	≥15	≥24	≤25	≤5.0x10 ⁻⁹
TESTING FREQUENCY	1 per 200,000 ft ² (2)		1 per 40,000 ft ² (2)		1 per 50 ton (1, 2)		1 per 100,000 ft ² (2)

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS										PASS/FAIL (P/F)	
												CQA	MQC
1816				1.02	262.1	36.0	24.0	8.8			2.28x10 ⁻¹⁰		P
1835				0.92	262.1	39.5							P
1854				0.88	262.1	43.0							P
1864	C4-GCL-4	4.1x10 ⁻⁹											P
1873				0.82	262.1	44.0	24.0	10.0			8.75x10 ⁻¹⁰		P
1892				0.90	262.1	29.8	24.0	10.0					P
2048				0.85	246.2	44.0	26.0	9.2			9.31x10 ⁻¹⁰		P
2065	C4-GCL-5	2.9x10 ⁻⁹											P
2067				0.85	246.2	38.2	26.0	9.2					P
2086				0.80	246.2	29.5							P
2097											9.8x10 ⁻¹⁰		P
2105				0.90	246.2	26.5							P
2124				0.88	210.5	27.9	26.0	11.6					P
2143				0.95	210.5	29.3							P
2146											2.77x10 ⁻¹⁰		P
2153	C4-GCL-6	3.4x10 ⁻⁹											P
2162				0.84	210.5	34.7	26.0	10.0					P
2182				0.86	210.5	30.8							P

Notes:

¹ Manufacturer's testing frequency was accepted for these properties.² A minimum of 1 test per lot was required.

Average Roll Area (135 ft x 15 ft)	2,025	ft ²	SHEET NO.		4	of	5
No. of Rolls in Lot:	229		CUMULATIVE NUMBER OF ROLLS:				522
Area in Lot:	463,725	ft ²	CUMULATIVE AREA:				1,057,275
							ft ²

Table 5-1 (continued)

CQA AND MQC TEST RESULTS FOR GEOSYNTHETIC CLAY LINER (CETCO)

LOT NO. 200516LO

PROPERTY	MANUFACTURING QUALITY CONTROL (MQC)							CONSTRUCTION QUALITY ASSURANCE (CQA)
	Hydraulic Conductivity (cm/s)	Bentonite Content (lb/ft ²)	Grab Strength (lb)	Peel Strength (lb)	Bentonite Free Swell (ml)	Bentonite Moisture Content (%)	Hydraulic Conductivity (cm/s)	
TEST STANDARD	ASTM D 5887	ASTM D 5993	ASTM D 4632	ASTM D 4632	ASTM D 5890	ASTM D 2216	ASTM D 5887	
PROJECT SPECS.	$\leq 5.0 \times 10^{-9}$	≥ 0.75	≥ 150	≥ 15	≥ 24	≤ 25	$\leq 5.0 \times 10^{-9}$	
TESTING FREQUENCY	1 per 200,000 ft ² (2)		1 per 40,000 ft ² (2)		1 per 50 ton (1, 2)		1 per 100,000 ft ² (2)	

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS					PASS/FAIL (P/F)	
							CQA	MQC
3997 (3)	C4-GCL-7	2.8×10^{-9}	0.86	278.6	40.3	25.0	10.8	--
Notes: 1 Manufacturer's testing frequency was accepted for these properties. 2 A minimum of 1 test per lot was required. 3 Test properties were obtained for Roll #3988 from this lot. Test results for Roll #3988 were applied to Roll #3997.								
Average Roll Area (135 ft x 15 ft):		2,025	ft ²	SHEET NO.		5	of	5
No. of Rolls in Lot:		13		CUMULATIVE NUMBER OF ROLLS:		535		
Area in Lot:		26,325	ft ²	CUMULATIVE AREA:		1,083,600		ft ²

Table 5-2A

CQA AND MQC TEST RESULTS FOR 60-mil TEXTURED GEOMEMBRANE (AGRU AMERICA)
RESIN LOT NO. 7141677

CONSTRUCTION QUALITY ASSURANCE (CQA)										MANUFACTURING QUALITY CONTROL (MQC)								
PROPERTY	Thickness (mil)	Density (g/cm ³)	Carbon Black Content (%)	Carbon Black Dispersion	Yield Strength ² (lb/in)	Break Strength ² (lb/in)	Yield Elongation ² (%)	Break Elongation ² (%)	Thickness ¹ (mil)	Density (g/cm ³)	Carbon Black Content (%)	Carbon Black Dispersion	Yield Strength ² (psi)	Break Strength ² (psi)	Yield Elongation ² (%)	Break Elongation ² (%)	Tear Resistance ² (lb)	Puncture Resistance (lb)
TEST STANDARD	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 1004	ASTM D 4833
PROJECT SPECS.	≥60 / 54 ⁵	≥0.94	2 to 3	See Note 3	≥130	≥72	≥12	≥100	≥60 / 54 ⁽⁶⁾	≥0.94	2 to 3	See Note 3	≥2170 (130 ppi)	≥1200 (72 ppi)	≥12	≥100	≥40	≥80
TESTING FREQUENCY	1 per 100,000 ft ² 4								1 per 50,000 ft ² 4									

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS										TEST RESULTS										PASS/FAIL (P/F)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Notes:

1 Thickness was measured for every roll.

2 Minimum property value in machine direction (MD) and transverse direction (TD).

3 Project requirements for carbon black dispersion are: 8 of 10 in Category 1 or 2 and all in Category 1, 2, or 3. Results are for Category 1 or 2.

4 A minimum of 1 test per lot was required.

5 Average / Minimum thickness.

Average Roll Area (460 ft x 23 ft): 10,580 ft²

No. of Rolls in Lot: 17

Area in Lot: 179,860 ft²

SHEET NO. 1

OF 3

CUMULATIVE NUMBER OF ROLLS: 17

CUMULATIVE AREA: 179,860 ft²

CCQA AND MQC TEST RESULTS FOR 60-mil TEXTURED GEOMEMBRANE (AGRU AMERICA)
RESIN LOT NO. 7141685

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS										TEST RESULTS										PASS/FAIL (P/F)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

Average Roll Area (460 ft x 23 ft):	10,580	ft ²
No. of Rolls in Lot:	62	
Area in Lot:	655,960	ft ²

SHEET NO.	2	OF
CUMULATIVE NUMBER OF ROLLS:	79	
CUMULATIVE AREA:	835.820	ft ²

Table 5-2A (continued)

CQA AND MQC TEST RESULTS FOR 60-mil TEXTURED GEOMEMBRANE (AGRU AMERICA)
RESIN LOT NO. 7141684

CONSTRUCTION QUALITY ASSURANCE (CQA)										MANUFACTURING QUALITY CONTROL (MQC)								
PROPERTY	Thickness (mil)	Density (g/cm ³)	Carbon Black Content (%)	Carbon Black Dispersion	Yield Strength ² (lb/in)	Break Strength ² (lb/in)	Yield Elongation ² (%)	Break Elongation ² (%)	Thickness ¹ (mil)	Density (g/cm ³)	Carbon Black Content (%)	Carbon Black Dispersion	Yield Strength ² (psi)	Break Strength ² (psi)	Yield Elongation ² (%)	Break Elongation ² (%)	Tear Resistance ² (lb)	Puncture Resistance (lb)
TEST STANDARD	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 6693	ASTM D 1004	ASTM D 4833
PROJECT SPECS.	≥60 / 54 ⁵	≥0.94	2 to 3	See Note 3	≥130	≥72	≥12	≥100	≥60 / 54 ⁽⁵⁾	≥0.94	2 to 3	See Note 3	≥2170 (130 ppi)	≥1200 (72 ppi)	≥12	≥100	≥40	≥80
TESTING FREQUENCY	1 per 100,000 ft ² 4								1 per 50,000 ft ² 4									

ROLL NUMBER	CQA SAMPLE ID	TEST RESULTS										TEST RESULTS							PASS/FAIL (P/F)	
		62.5 / 58.0	0.945	2.49	10	142.6	174	14.1	414.0	63 / 58	0.943	2.53	10	2266	2883	13	477	42	138	P
107225	C4-GMT-9											2.37								P
107228										61 / 58	0.945	2.45	10	2388	2793	12	443	44	135	P
107230												2.42								P
107332										63 / 59	0.946	2.38	10	2194	2774	14	451	44	146	P
107334	C4-GMT-10	63.0 / 58.9	0.944	2.48	10	148.4	186.4	13.8	470.6	62 / 58	0.946	2.52	10	2290	2840	14	473	44	137	P
107340																				P
107341	C4-GMT-11	61.7 / 58.7	0.945	2.71	10	144.5	181	13.7	476	63 / 60	0.947	2.37	10	2305	2788	14	442	44	141	P
107343										63 / 60	0.946	2.48	10	2267	3238	14	456	46	139	P
107345																				P

Notes:

1 Thickness was measured for every roll.

2 Minimum property value in machine direction (MD) and transverse direction (TD).

3 Project requirements for carbon black dispersion are: 8 of 10 in Category 1 or 2 and all in Category 1, 2, or 3. Results are for Category 1 or 2.

4 A minimum of 1 test per lot was required.

5 Average / Minimum thickness.

Average Roll Area (460 ft x 23 ft): 10,580 ft²
 No. of Rolls in Lot: 24
 Area in Lot: 253,920 ft²

SHEET NO. 3 OF 3
 CUMULATIVE NUMBER OF ROLLS: 103
 CUMULATIVE AREA: 1,089,740 ft²

Table 5-2B

**MQC TEST RESULTS FOR RESIN USED TO MANUFACTURE TEXTURED
GEOMEMBRANE AND WELDING RODS**

	Product Name	Supplier Name	Density (g/cm ³)	Melt Index (g/10 min)	Percent of Reclaimed Polymer
TEST STANDARD			ASTM D1505	ASTM D 1238	
PROJECT SPECS.			≥0.932	≤1.0	0%
TESTING FREQUENCY			1 per Lot		

Geomembrane Lot Number	TEST RESULTS					PASS/FAIL (P/F)
7141677	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.936	0.20	0%	P
7141685	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.937	0.23	0%	P
7141684	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.936	0.22	0%	P

Welding Rods	TEST RESULTS					PASS/FAIL (P/F)
7141679	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.936	0.21	0%	P
7141685	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.937	0.23	0%	P
8241416	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.939	0.28	0%	P
8150194	Marlex Polyethylene K307 Bulk	Chevron Phillips	0.937	0.26	0%	P

Table 5-2C

MISCELLANEOUS MQC TEST RESULTS FOR 60-mil TEXTURED GEOMEMBRANE (AGRU AMERICA)

	Low Temperature Brittleness (°C)	Dimensional Stability (%)	Notched Constant Tensile Load (hrs)
TEST STANDARD	ASTM D 746	ASTM D 1204	ASTM D 5397
PROJECT SPECS.	≤-60	≤± 2	≥200
TESTING FREQUENCY	1 per Lot	1 per Lot	1 per 40,000

Geomembrane Roll Number	TEST RESULTS			PASS/FAIL (P/F)
106465	Pass	-0.95	405	P
106582	Pass	-0.73	325	P
106718	--	--	234	P
107225	Pass	-0.72	234	P

Table 5-3A

**DESTRUCTIVE SEAM TEST RESULTS FOR PRIMARY LINER
INSTALLED IN CELL 4**

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)																	
			143	136	137	133	134	145	139	143	141	144	194	195	191	204	194	FTB	P									
DSP-1	P17-P18	F	132	127	126	125	124	135	133	128	138	137	212	205	200	203	203	FTB	P									
DSP-2	P1-P24	F	127	121	128	126	129	134	128	142	133	140	201	200	200	204	202	FTB	P									
DSP-3	P24-P25	F	151	140	140	141	147	159	154	150	152	158	194	192	184	181	181	FTB	P									
DSP-4	P10-P1	F	125	138	128	127	129	141	142	140	132	147	201	201	196	211	196	FTB	P									
DSP-5	P25-P26	F	131	131	136	135	131	134	135	137	139	138	204	206	202	203	205	FTB	P									
DSP-6	P26-P27	F	132	124	125	129	129	145	132	139	131	136	203	205	208	204	203	FTB	P									
DSP-7	P27-P28	F	132	128	130	129	133	140	135	144	143	144	200	203	202	203	203	FTB	P									
DSP-8	P28-P29	F	126	137	132	130	131	138	141	140	140	141	198	195	197	198	196	FTB	P									
DSP-9	P29-P30	F	127	120	120	127	127	130	130	128	139	131	200	198	201	199	196	FTB	P									
DSP-10	P30-P31	F	125	129	129	125	127	129	131	135	129	130	198	199	196	198	197	FTB	P									
DSP-11	P31-P32	F	126	134	131	135	133	143	141	144	141	142	192	195	196	196	198	FTB	P									
DSP-12	P32-P33	F	134	141	133	134	131	141	145	144	151	141	196	197	197	201	195	FTB	P									
DSP-13	P33-P34	F	128	120	134	126	129	147	130	140	138	142	204	208	202	203	204	FTB	P									
DSP-14	P34-P35	F	135	139	139	140	137	150	152	151	153	150	196	201	202	195	205	FTB	P									
DSP-15	P35-P36	F	128	123	135	134	133	151	137	143	137	136	202	209	209	203	209	FTB	P									
DSP-16	P36-P37	F	132	134	133	134	134	142	141	142	144	142	202	206	205	206	203	FTB	P									
DSP-17	P37-P38	F	124	133	131	132	134	133	142	144	141	142	197	188	190	190	200	FTB	P									
DSP-18	P38-P39	F	125	132	131	129	130	141	140	137	141	140	192	194	194	192	194	FTB	P									
DSP-19	P39-T1	F	130	130	125	126	129	138	133	145	141	143	193	194	196	195	194	FTB	P									
DSP-20	P48-P49	F	122	128	132	128	131	133	137	134	133	131	192	197	193	194	194	FTB	P									
DSP-21	P40-P53	F	117	123	120	128	125	128	127	128	126	126	189	187	192	189	190	FTB	P									
DSP-22	P54-P55	F	127	125	126	127	129	129	133	129	131	135	180	189	188	186	188	FTB	P									
DSP-23	P56-P58	F	134	134	142	139	142	144	138	149	141	144	175	179	176	183	176	FTB	P									
DSP-24	P43-P40	F	142	142	143	135	146	147	141	145	137	151	172	187	179	178	179	FTB	P									
DSP-25	P27-P57	F																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 extrusion³ Specified shear strength: 120 lb/in for fusion and 108 lb/in for extrusion⁴ "FTB" is Film Tear Bond (with maximum 10 percent seam separation).

Table 5-3A (continued)
DESTRUCTIVE SEAM TEST RESULTS FOR PRIMARY LINER
INSTALLED IN CELL 4

Sample No.	Panel No.	Weld Type ¹	Peel Strength ²																Shear Strength ³ (lb/in)					Failure Type ⁴	Pass/Fail (P/F)
			Bottom Peel (inside)								Top Peel (outside)														
			148	123	120	119	116	115	120	124	122	122	122	124	122	122	200	198	169	211	195				
DSP-26	P45-P46	F																							P
DSP-27	P62-P46	F	125	135	137	113	133	123	112	154	145	135			184	193	185	203	186						P
DSP-28	P68-P69	F	135	145	113	127	125	130	149	128	123	126			200	201	202	209	192						P
DSP-29	P48-P49	F	148	134	146	115	137	136	117	130	122	145			189	173	173	162	149						P
DSP-30	P37-P70	F	109	114	130	108	120	139	106	114	124	130			162	167	170	169	178						P
DSP-31	P70-P71	F	113	118	120	104	128	112	112	103	110	114			166	170	176	160	164						P
DSP-32	P71-P72	F	123	129	101	112	108	104	100	120	125	116			159	166	172	170	164						P
DSP-33	P73-P74	F	123	104	101	120	110	118	118	121	114	112			177	170	166	169	160						P
DSP-34	P78-P79	F	134	97	100	137	128	89	123	128	124	116			196	190	199	192	191						P
DSP-35	P79-P81	F	112	102	117	124	108	114	118	118	115	106			191	201	196	200	184						P
DSP-36	P81-P82	F	121	121	99	118	118	125	129	118	126	128			200	205	206	203	201						P
DSP-37	P82-P83	F	112	125	126	114	112	107	116	118	109	114			206	205	196	204	205						P
DSP-38	P83-P84	F	118	117	144	112	114	114	117	103	106	109			197	197	194	206	195						P
DSP-39	P84-P85	F	128	108	108	116	107	123	113	119	119	124			183	184	183	186	183						P
DSP-40	P86-P87	F	110	121	106	106	102	113	110	124	110	121			198	191	189	191	191						P
DSP-41	P87-P93	F	125	131	121	114	120	144	122	132	114	122			184	186	180	188	174						P
DSP-42	P89-P90	F	100	129	160	120	119	112	136	130	126	116			193	189	190	187	188						P
DSP-43	P106-P107	F	115	130	124	118	109	117	119	116	114	99			190	187	185	188	176						P
DSP-44	P84-CELL 1	E	127	123	115	129	131	N/A	N/A	N/A	N/A	N/A			165	175	177	178	169						P
DSP-45	P114-P115	F	115	123	122	131	120	123	124	113	115	120			177	167	168	173	170						P
DSP-46	P75-P119	F	126	128	126	122	115	113	117	118	119	122			180	181	169	171	177						P
DSP-47	P118-P119	F	119	116	115	111	105	109	106	110	114	120			169	180	172	175	173						P
DSP-48	P124-P122	F	123	127	132	128	122	121	117	118	121	117			168	167	178	169	170						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).

Table 5-3B

**DESTRUCTIVE SEAM TEST RESULTS FOR SECONDARY LINER
INSTALLED IN CELL 4**

Sample No.	Panel No.	Weld Type ¹	Peel Strength ²														Shear Strength ³ (lb/in)					Failure Type ⁴	Pass/Fail (P/F)	Retest No.
			Bottom Peel (inside)							Top Peel (outside)														
			135	119	136	99	149	112	117	142	114	146	213	190	207	164	224							
DSS-1	S1-S2	F	112	115	116	119	123	127	133	137	119	112	167	180	168	190	187	FTB	P					
DSS-2	S2-S3	F	127	115	96	113	101	127	120	110	110	95	149	181	170	165	151	FTB	P					
DSS-3	S3-S4	F	112	124	102	138	124	120	122	104	123	121	179	156	172	181	174	FTB	P					
DSS-4	S4-S5	F	131	130	124	122	134	136	136	138	132	129	178	173	170	176	174	FTB	P					
DSS-5	S5-S6	F	125	133	132	140	135	119	118	132	123	119	181	168	176	170	172	FTB	P					
DSS-6	S27-S28	F	116	114	110	121	123	121	120	130	117	118	173	171	176	175	181	FTB	P					
DSS-7	S28-S29	F	111	116	115	110	108	120	119	121	123	125	167	163	170	165	162	FTB	P					
DSS-8	S29-S30	F	117	115	113	112	119	115	117	121	115	114	159	162	166	161	165	FTB	P					
DSS-9	S30-S31	F	124	124	133	135	121	131	126	138	121	126	159	166	161	167	172	FTB	P					
DSS-10	S31-S32	F	127	129	123	132	134	133	137	141	127	131	173	170	175	177	171	FTB	P					
DSS-11	S32-S33	F	123	126	116	123	116	132	126	129	141	126	171	175	177	177	170	FTB	P					
DSS-12	S33-S34	F	125	131	119	126	123	132	121	131	140	125	186	182	176	178	181	FTB	P					
DSS-13	S34-S35	F	135	137	127	129	128	123	128	129	138	129	181	169	173	175	183	FTB	P					
DSS-14	S35-S36	F	127	133	128	118	127	127	140	128	137	129	183	180	171	169	188	FTB	P					
DSS-15	S37-S38	F	123	128	138	137	126	134	139	131	147	138	165	164	168	193	167	FTB	P					
DSS-16	S38-S39	F	120	122	124	130	126	132	125	123	124	132	174	166	212	186	161	FTB	P					
DSS-17	S39-S40	F	114	109	128	133	124	113	105	109	129	115	169	177	150	162	174	FTB	P					
DSS-18	S40-S41	F	127	119	123	122	131	121	114	124	130	132	170	180	191	188	151	FTB	P					
DSS-19	S41-S42	F	107	115	110	112	120	109	118	113	120	115	143	150	142	161	142	FTB	P					
DSS-20	S42-S43	F	123	113	110	115	120	133	122	131	108	115	174	182	180	181	184	FTB	P					
DSS-21	S43-S44	F	136	120	106	124	107	129	102	102	120	105	157	158	171	175	149	FTB	P					
DSS-22	S45-S46	F	109	121	123	136	134	128	122	116	109	111	166	167	172	177	182	FTB	P					
DSS-23	S45-S46	F																						

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).

Table 5-3B (continued)

**DESTRUCTIVE SEAM TEST RESULTS FOR SECONDARY LINER
INSTALLED IN CELL 4**

Sample No.	Panel No.	Weld Type ¹	Peel Strength ²																		Failure Type ⁴	Pass/Fail (P/F)	Retest No.
			Bottom Peel (inside)									Top Peel (outside)											
			123	133	131	134	133	117	124	122	123	133	176	177	177	173	175						
DSS-24	S46-S47	F	133	127	129	132	130	139	142	133	122	137	180	186	182	176	181	FTB	P				
DSS-25	S65-S47	F	126	128	124	124	128	133	132	125	129	133	183	184	183	180	177	FTB	P				
DSS-26	S57-S58	F	128	126	125	122	126	133	136	129	130	138	176	173	171	173	175	FTB	P				
DSS-27	S62-S63	F	134	141	130	132	140	141	137	122	136	137	181	188	182	174	186	FTB	P				
DSS-28	S67-S68	F	114	134	137	143	144	NA	NA	NA	NA	NA	176	184	188	179	181	FTB	P				
DSS-29	S67-S1	E	133	133	131	137	128	127	127	128	137	119	169	176	177	170	181	FTB	P				
DSS-30	S26-S72	F	137	116	130	121	118	133	141	123	132	119	158	179	171	181	169	FTB	P				
DSS-31	S72-S73	F	131	116	126	128	124	138	140	122	133	123	165	175	165	180	172	FTB	P				
DSS-32	S73-S74	F	116	127	125	133	123	137	114	128	138	126	180	174	163	187	175	FTB	P				
DSS-33	S74-S75	F	119	128	132	138	131	138	117	128	140	139	172	172	174	184	180	FTB	P				
DSS-34	S75-S76	F	118	124	122	144	125	126	129	133	137	128	186	188	182	197	186	FTB	P				
DSS-35	S76-S77	F	178	153	155	151	152	154	162	162	161	167	208	196	208	204	208	FTB	P				
DSS-36	S85-S88	F	130	131	131	134	119	141	135	135	144	120	204	197	208	229	205	FTB	P				
DSS-37	S71-S86	F	153	162	164	155	174	180	165	161	167	154	191	190	198	201	196	FTB	P				
DSS-38	S82-S83	F	142	141	134	138	159	155	143	146	159	150	207	202	199	206	207	FTB	P				
DSS-39	S78-S79	F	106	113	116	108	129	124	127	129	131	123	200	199	198	201	208	FTB	P				
DSS-40	S89-S90	F	121	112	108	112	117	117	110	118	125	121	200	210	212	206	201	FTB	P				
DSS-41	S90-S91	F	121	130	144	135	130	121	136	127	131	121	206	203	205	201	200	FTB	P				
DSS-42	S91-S92	F	91	137	144	120	133	130	118	137	136	150	210	206	215	206	215	FTB	P				
DSS-43	S100-S101	F	122	119	114	121	136	129	140	121	112	126	210	212	206	216	208	FTB	P				
DSS-44	S107-S108	F	115	118	130	139	127	136	142	122	128	141	198	200	201	204	191	FTB	P				
DSS-45	S109-S92	F	113	126	120	121	115	106	108	101	118	106	189	191	198	186	188	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).

Table 5-3B (continued)

**DESTRUCTIVE SEAM TEST RESULTS FOR SECONDARY LINER
INSTALLED IN CELL 4**

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)														
			134	122	118	114	102	125	120	120	109	129	193	212	200	164	194							
DSS-47	S78-S15	F	134	122	118	114	102	125	120	120	109	129	193	212	200	164	194	FTB	P					
DSS-48	S116-S117	F	152	146	140	147	167	152	144	134	137	147	151	151	148	182	159	FTB	P					
DSS-49	S121-S122	F	140	120	122	115	125	118	139	118	139	138	157	153	179	172	170	FTB	P					
DSS-50	S126-S118	E	138	160	163	162	169	N/A	N/A	N/A	N/A	N/A	182	198	181	182	185	FTB	P					
DSS-51	S128-S127	E	92	94	88	100	105	N/A	N/A	N/A	N/A	N/A	165	160	157	168	172	FTB	P					
DSS-52	S132-S133	F	136	111	120	107	135	107	119	116	99	118	159	183	152	163	152	FTB	P					
DSS-53	S82-S1	E	140	158	160	165	140	N/A	N/A	N/A	N/A	N/A	175	150	164	150	151	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).

Table 5-4A
CQA AND MQC TEST RESULTS FOR PRIMARY GEOCOMPOSITE (TENAX)

	CONSTRUCTION QUALITY ASSURANCE (CQA)							MANUFACTURING QUALITY CONTROL (MQC)			
PROPERTY	GEOTEXTILE					GEOCOMPOSITE		GEOCOMPOSITE			
	Mass per Unit Area ¹ (oz/yd ²)	Grab Strength ² (lb)	Trapezoidal Tear Strength ² (lb)	Apparent Opening Size (mm)	Permittivity (sec ⁻¹)	Transmissivity (m ² /sec)	Peel Strength ³ (lb/in)	Transmissivity (m ² /sec)	Peel Strength ³ (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	≥1.0	≥7.8x10 ⁻³ at 500 psf	≥2.6x10 ⁻³ at 13,500 psf	≥1.0
TESTING FREQUENCY	1 per 200,000 ft ² ⁴			1 per 500,000 ft ² ⁴		1 per 200,000 ft ² ⁴		1 per 100,000 ft ² ⁴			

GEOCOMPOSITE ROLL NUMBER	LOT NO.	CQA SAMPLE ID	CQA TEST RESULTS								MQC TEST RESULTS			PASS/FAIL (P/F)	
														CQA	MQC
200506208	35014										14.60x10 ⁻³	5.29x10 ⁻³	2.9		P
200506231		C4-PGC-1	8.4	270.4	89.1	0.091	1.42	1.0x10 ⁻²	2.6x10 ⁻³	3.70				P	
5500046	55004										1.3x10 ⁻²	3.3x10 ⁻³	2.2		P
5500084											1.4x10 ⁻²	4.8x10 ⁻³	3.41		P
5500122											1.4x10 ⁻²	4.0x10 ⁻³	1.63		P
5500131 ⁵		C4-PGC-2	8.2	281.2	95.1	0.075	1.08	9.8x10 ⁻³	3.4x10 ⁻³	1.10				P	
5500163											1.5x10 ⁻²	3.1x10 ⁻³	1.05		P
5500202											1.4x10 ⁻²	3.6x10 ⁻³	2.91		P
5500224		C4-PGC-3	8.8	314	111.7	0.09	1.05	1.02x10 ⁻²	3.4x10 ⁻³	1.20				P	
Notes: 1 Smaller of top and bottom average mass per unit area 2 Smaller of average value in machine or cross-machine direction. 3 Smaller of top and bottom average peel strength. 4 A minimum of 1 test per lot was required. 5 This roll was used to perform interface friction tests.															
Average Roll Area (200 ft x 12 ft):			2,400 ft ²												
Total No. of Rolls:			218												
Total Area of Rolls:			547,800 ft ²												

Table 5-4B

**MQC TEST RESULTS FOR GEOTEXTILE USED TO MANUFACTURE
PRIMARY GEOCOMPOSITE (TENAX)**

PROPERTY	Mass per Unit Area (oz/yd ²)	Grab Strength ¹ (lb)	Trapezoidal Tear Strength ¹ (lb)	Puncture Strength (lb)	Mullen Burst Strength, (psi) or CBR 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 3786 (Burst Strength)	ASTM D 6241 (CBR)	ASTM D 4751	ASTM D 4491
PROJECT SPECS.	≥8	≥180	≥75	≥75	≥350	≥449	≤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)
3005113	30034						792.3			P
3005122							580.2			P
3005190							604.5			P
3005194		8.2	303.1	102.5	166.1	471.6		0.10	1.50	P
3005360		8.7	330.8	110.4	172.8					P
3006597	30049						727.4			P
3006612		8.4	248.1	136.2	154.1		762.3	0.10	1.63	P
3006726							718.6			P
3006751							725.8			P
3006761							711.4			P
3006770		8.5	271.8	122.7	148.1	445.0	700.2	0.10	1.62	P
6006791							640.5			P
3006796							684.0			P
3006617	30050						775.1			P
3006618							767.4			P
3006621							772.4			P
3006627							695.2			P
5000017	50001	8.6	323.6	109.0	144.7					P
5000021		8.5	323.0	108.5	141.5					P
5000024		8.6	320.2	103.0	140.2		816.5	0.10	1.21	P
5000028		9.1	324.8	111.5	141.0					P
5000032		8.8	347.4	158.6	144.9					P
5000035		8.4	352.3	203.8	153.6		861.1	0.099	1.19	P
5000039		8.7	328.8	186.8	145.3					P

Note:

1 Smaller value in machine and cross-machine directions.

Total Area of Geotextile Rolls: 1,095,600 ft²

No. of Geotextile Rolls Tested: 11 / 5

Test Frequency: 1 per 99,600 / 219,100 ft²

Table 5-4C

**MQC TEST RESULTS FOR GEONET USED TO MANUFACTURE
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)
3300972	33026	0.942	2.85	310.3	P
3300968		0.942	2.58	313.2	P
3300970		0.942	2.57	310.5	P
3300974		0.947	2.81	323.7	P
3300978		0.951	2.78	335.0	P
3300982		0.943	2.57	317.5	P
3300960		0.952	2.46	337.0	P
3300954		0.952	2.55	310.7	P
5300014	53004	0.952	2.57	320.7	P
5300016		0.952	2.68	322.7	P
5300018		0.952	2.67	314.7	P
5300020		0.952	2.38	334.8	P
5300022		0.952	2.58	327.0	P
5300024		0.950	2.52	347.9	P
5300026		0.950	2.61	322.4	P
5300028		0.950	2.50	328.7	P
5300030		0.950	3.00	324.7	P
5300032		0.950	2.20	341.5	P
5300034		0.950	2.27	339.8	P
5300036		0.950	2.08	339.1	P
Area of Geonet Rolls:		547,800	ft ²		
No. of Geonet Rolls Tested:		20			
Test Frequency: 1 per		27,390	ft ²		

Table 5-5A

CQA AND MQC TEST RESULTS FOR SECONDARY GEOCOMPOSITE (SKAPS)

	CONSTRUCTION QUALITY ASSURANCE (CQA)							MANUFACTURING QUALITY CONTROL (MQC)			
PROPERTY	GEOTEXTILE					GEOCOMPOSITE		GEOCOMPOSITE			
	Mass per Unit Area ¹ (oz/yd ²)	Grab Strength ² (lb)	Trapezoidal Tear Strength ² (lb)	Apparent Opening Size (mm)	Permittivity (sec ⁻¹)	Transmissivity (m ² /sec)		Peel Strength ³ (lb/in)	Transmissivity (m ² /sec)	Peel Strength ³ (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	≥1.0	≥5.0x10 ⁻⁴ at 500 psf	≥1.5x10 ⁻⁴ at 13,500 psf	≥1.0
TESTING FREQUENCY	1 per 200,000 ft ² ⁴			1 per 500,000 ft ² ⁴		1 per 200,000 ft ² ⁴		1 per 100,000 ft ² ⁴			

GEOCOMPOSITE ROLL NUMBER	LOT NO.	CQA SAMPLE ID	TEST RESULTS								TEST RESULTS			PASS/FAIL (P/F)		
														CQA	MQC	
1524001	11021										2.0x10 ⁻³	1.0x10 ⁻³	1.29		P	
1524009		C4-SGC-1	8.9	241	102.6	0.114	1.14	2.3x10 ⁻³	1.2x10 ⁻³	2.3				P		
1524010													1.76		P	
1524020													1.43		P	
1524030													1.57		P	
1524035											1.9x10 ⁻³	1.2x10 ⁻³			P	
1524040													1.30		P	
1524050													1.62		P	
1524060													1.47		P	
1524070											2.1x10 ⁻³	1.0x10 ⁻³	1.82		P	
1524080													1.70		P	
1524090													1.79		P	
1524100													1.25		P	
1524103 ⁵			C4-SGC-2	9.0	232	89.9	0.106	1.00	2.7x10 ⁻³	1.2x10 ⁻³	2.5				P	
1524105												1.9x10 ⁻³	1.1x10 ⁻³			P
1524110														1.42		P
1524120														1.36		P
1524130														1.50		P
1524140												1.9x10 ⁻³	1.2x10 ⁻³	1.28		P
1524150														1.46		P
1524160														1.32		P
1524170														1.78		P
1524175												2.0x10 ⁻³	1.0x10 ⁻³			P
1524180														1.64		P
1524182			C4-SGC-3	8.8	231	91.6	0.11	1.06	3.8x10 ⁻³	1.5x10 ⁻³	1.5				P	
1524190														1.85		P

Notes:

- 1 Smaller of top and bottom average mass per unit area.
- 2 Smaller of average value in machine or cross-machine direction.
- 3 Smaller of top and bottom peel strength.
- 4 A minimum of 1 test per lot was required.
- 5 This roll was used to perform interface friction tests.

Average Roll Area: 2,800 ft²
 Total No. of Rolls: 197
 Total Area of Rolls: 551,600 ft²

Table 5-5B

**MQC TEST RESULTS FOR GEOTEXTILE USED TO MANUFACTURE
SECONDARY GEOCOMPOSITE (SKAPS)**

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)
1524.001	8.6	232	107	143	441	0.18	1.34	P
1524.005	8.4	227	99	137	443			P
1524.010	8.5	235	104	140	438			P
1524.015	8.3	225	101	145	430			P
1524.020	8.8	231	110	139	442	0.18	1.38	P
1524.025	8.4	226	106	142	435			P
1524.030	8.7	234	108	135	445			P
1524.035	8.3	230	98	144	437			P
1524.040	8.5	233	100	136	440	0.18	1.35	P
1524.045	8.4	228	102	141	431			P
1524.050	8.6	231	105	138	443			P
1524.055	8.5	225	99	143	433			P
1524.060	8.7	234	103	140	444	0.18	1.39	P
1524.065	8.3	229	101	145	439			P
1524.070	8.6	234	109	137	442			P
1524.075	8.5	225	104	142	436			P
1524.080	8.8	230	107	139	445	0.18	1.36	P
1524.085	8.4	228	98	144	430			P
1524.100	8.8	233	110	136	437	0.18	1.37	P
1524.105	8.5	229	106	138	431			P

Note:

¹ Smaller value in machine or cross-machine direction.

Table 5-5C

**MQC TEST RESULTS FOR GEONET USED TO MANUFACTURE
SECONDARY GEOCOMPOSITE (SKAPS)**

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)
1524001	11021	0.955	2.29	269	P
1524010		0.955	2.62	271	P
1524020		0.955	2.57	265	P
1524030		0.955	2.31	276	P
1524040		0.955	2.46	268	P
1524050		0.955	2.27	274	P
1524060		0.955	2.39	266	P
1524070		0.955	2.24	278	P
1524080		0.955	2.63	264	P
1524090		0.955	2.50	275	P
1524100		0.955	2.34	267	P
1524110		0.955	2.59	272	P
1524120		0.953	2.42	277	P
1524130		0.955	2.61	270	P
1524140		0.955	2.38	273	P
1524150		0.955	2.64	265	P
1524160		0.955	2.30	274	P
1524170		0.955	2.56	268	P
1524180		0.955	2.44	278	P
1524190		0.955	2.52	271	P
Area of Geonet Rolls:		551,600	ft ²		
No. of Geonet Rolls Tested:		20			
Test Frequency:		1 per	27,580	ft ²	

Table 5-6

CQA AND MQC TEST RESULTS FOR NON-WOVEN GEOTEXTILE (SKAPS GT-180)

	CONSTRUCTION QUALITY ASSURANCE (CQA)							MANUFACTURING QUALITY CONTROL (MQC)							
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)	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 3786	ASTM D 4751	ASTM D 4491	ASTM D 5261	ASTM D 4632	ASTM D 4533	ASTM D 4833	ASTM D 4751	ASTM D 4491		
PROJECT SPECS.	≥8	≥180	≥75	≥75	≥350	≤0.21	≥0.5	≥8	≥180	≥75	≥75	≤0.21	≥0.5		
TESTING FREQUENCY	1 per 200,000 ft ²							1 per 100,000 ft ²							1 per 250,000 ft ²

ROLL NUMBER	CQA SAMPLE ID	CQA TEST RESULTS						MQC TEST RESULTS						PASS/FAIL (P/F)	
		7.80	262	94	123.5	385	0.12	1.40						CQA	MQC
GT180-15	C4-GF-1													P	
1.80091									8.00	210	86	138	0.18		P
1.80111									8.02	212	86	133	0.18		P
1.80164									8.05	209	89	136	0.18		P
1.80168									8.05	209	89	136	0.18		P
1.80169									8.05	209	89	136	0.18		P
1.80183									8.01	210	87	139	0.18		P
Note: 1 Smaller value in machine or cross-machine direction.															
Total No. of Rolls:		13													
Total Area of Rolls:		27,000 ft ²													

Table 5-7A

MINIMUM INTERFACE SHEAR STRENGTHS REQUIRED BY THE CQA DOCUMENTS

Normal Stress (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)
2,000	429	356
5,000	783	579
10,000	1,139	699
15,000	1,603	786

Table 5-7B

INTERFACE AND INTERNAL SHEAR STRENGTH RESULTS FROM CQA AND MQC TESTS

	(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	
	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength Liner / Woven GCL	Residual Shear Strength Liner / Woven GCL	Peak Shear Strength Non-woven GCL / Geom.	Residual Shear Strength Non-woven GCL / Geom.	Peak Shear Strength (psf)	Residual Shear Strength (psf)	Peak Shear Strength Woven GCL / Subbase	Residual Shear Strength Non-woven GCL / Subbase	Peak Shear Strength (psf)	Residual Shear Strength (psf)
MQC	5,000	3,725	3,579	1,715	2,637	1,541	2,531	1,152	2,889	1,522	2,268	1,633	3,219	1,307
	10,000	7,256	6,690	2,720	4,223	2,159	4,100	1,940	5,435	2,761	3,845	2,835	5,106	2,295
	15,000	10,358	9,965	3,799	5,574	2,663	5,519	2,750	7,926	4,080	5,295	3,989	7,056	3,216
CQA	5,000	3,300	3,109	1,843	2,126	1,165	1,937	1,212	2,658	1,485	2,533	1,866	3,069	1,119
	10,000	6,545	6,015	3,096	3,629	1,780	3,674	1,856	5,190	2,647	4,108	3,055	4,928	2,087
	15,000	9,453	8,943	4,257	4,985	2,375	5,274	2,505	7,719	3,989	5,685	4,200	6,780	2,987

Figure 5-1

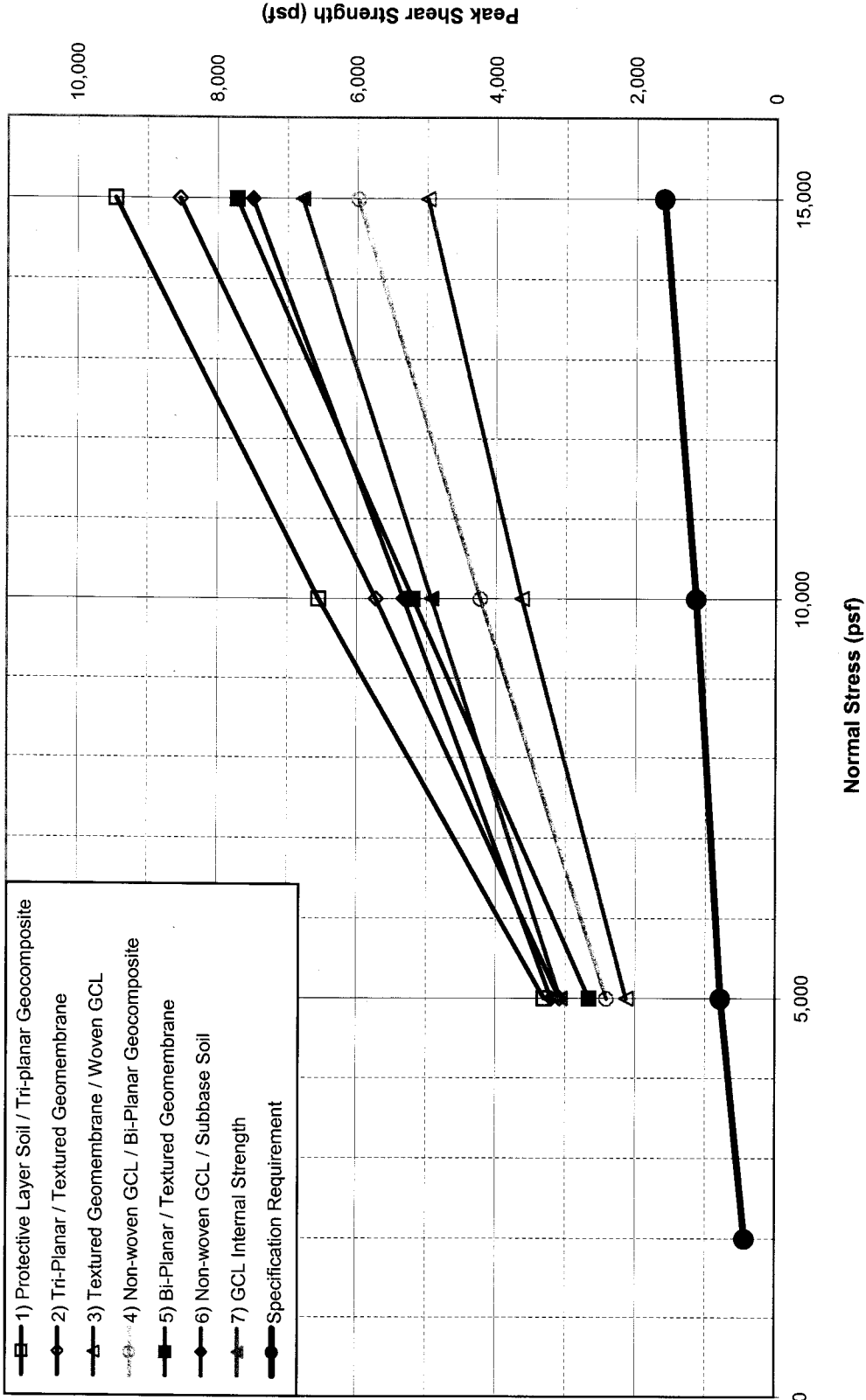


Figure 5-2



Residual Shear Strength (psf)

6. CONSTRUCTION QUALITY ASSURANCE -- LEACHATE COLLECTION SYSTEM

6.1 General

The leachate management system is comprised of the leachate collection, transmission, and storage systems. The construction of the initial leachate transmission and storage systems for Phase 1 development of the OHDF landfill was detailed in Cell 1A Certification Report. This section only includes CQA activities performed during construction of the leachate collection system in Cell 4.

The leachate collection system in Cell 4 consists of a primary and a secondary leachate collection system. 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 intercell berms on the north and west sides of Cell 4. The leachate collection pipe was provided with two rows of 1/2-in perforations in the bottom 1/3 of the pipe section. Granular drainage materials meeting the requirements of #4 stone (per ASTM D 448) was used as the gravel aggregate. An 8-oz/yd² needle-punched, non-woven geotextile was used as the filter fabric. Three cleanouts were installed along the inside slope of the perimeter dike in Cell 4 to maintain the leachate collection system piping. The cleanouts were constructed using 6-in diameter SDR 11 HDPE pipe and were 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 north and west sides of Cell 4.

The Cell 4 sump included gravel beds covered with geotextile separator fabric and three sump risers. The gravel beds for the primary and secondary sumps were separated by the primary liner system. Granular drainage materials meeting the requirements for #4 stone (per ASTM D 448) were used in the 1.5-ft to 3-ft thick drainage beds. The drainage beds were separated from the overlying liner protective layer by an 8-oz/yd² needle-punched, non-woven geotextile separator fabric. Two primary and one secondary sump risers were installed in the Cell 4 sump. The sump risers were constructed using 48-in diameter SDR 32.5 HDPE pipe and included a 2-in thick base plate and a bolted flanged top lid. Each sump riser was provided with perforations in the bottom 1-ft and a 20-ft long, 8-in diameter, SDR 11 HDPE perforated collection pipe. The primary sump risers were connected to the secondary sump riser using a 3-in diameter SDR 11 HDPE overflow pipe with a 3-in gate valve in accordance with the CQA Documents.

The Cell 4 sump area included a 2-ft thick compacted low permeability soil layer below the geosynthetic layers. The low permeability soil layer was placed, compacted, and tested during the construction of the landfill perimeter berms as part of the Cell 1 construction as discussed in Cell 1A Certification Report. The top surface of the low permeability soil layer was initially over-built to shed water. The top surface of the low

permeability layer was only graded as part of the Cell 4 construction. The geosynthetics in the sump area were installed as discussed in Section 5.

Leachate from Cell 4 will be collected in the leachate collection system at the toe of the perimeter dike and will gravity flow to the Cell 4 sump. Leachate will be pumped from the sump risers through the leachate transmission line to the leachate storage area. To control the pumping and transfer of leachate, a sump control panel was installed as part of the leachate system in Cell 4.

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

6.2 HDPE Pipe

All pipes used in the construction of the leachate collection system were SDR 11 HDPE pipes except for the sump risers, which were constructed using SDR 32.5 HDPE pipes. 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 and electro fusion coupler 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 different pipes used in the leachate collection system.

6.3 Granular Drainage Materials

Granular drainage materials meeting the requirements of #4 stone (per ASTM D 448) were used in Cell 4 leachate collection system and the leachate sump. The #4 stone was supplied by Martin Marietta, Alabama.

The QC certificates and test results were reviewed by CQA personnel and were found to be in compliance with the CQA Documents. The hydraulic conductivity (per ASTM D 2434) of the #4 stone was measured to be 73 cm/sec, which exceeded the CQA Documents requirement of 10 cm/sec. A carbonate content test (per ASTM D 3042) was also performed on the #4 stone granular drainage materials during the QC testing. The #4 stone used in construction of the leachate collection system was found to be almost insoluble to 6N hydrochloric acid used in the test.

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 the geotextile; and (iii) the

drainage materials were placed in accordance with the requirements of the CQA Documents.

6.4 Pressure Testing

The leachate transmission line between the Cell 4 sump and leachate transmission manhole no. 4 was pressure tested to detect any leaks or defective pipe joints.

The hydrostatic pressure testing was performed by pressurizing the pipe using the sump pump. The leachate transmission line segment was filled with water and pressurized. The hydrostatic pressure was maintained for at least 12 hours. No drop in the hydrostatic pressure was observed.

6.5 Sump Pumps and Control Panel

Leachate collected in the leachate sumps will be extracted and pumped to the leachate storage area by two 7.5-hp electric Tsurumi dewatering pumps located in the primary sump risers and one 2-hp electric Tsurumi dewatering pump located in the secondary sump riser. The pumps are controlled by a control panel located at the Cell 4 sump near the top of the sump risers. The sump pumps and the associated control panel were provided by Lucas Technologies (Lucas), Ormond Beach, Florida.

The following tests were performed after installation of the pumps and control system at the Cell 4 sump area to confirm proper operation of the pumps and pump control panel.

- Sump pumps were tested in place by flooding the Cell 4 sump. Each pump was connected to a piping assembly containing a pressure gauge, meter valve, and a flow meter. The pumps were turned on and the pressure and flow rate of each pump was recorded. The pressure and flow rate data for each pump was compared to the pump curves provided by Lucas; and
- Float switches in each of the sump risers were activated by hand to confirm that the switches were activating the correct pumps and alarms.

7. CONSTRUCTION QUALITY ASSURANCE - OTHER CONSTRUCTION ACTIVITIES

7.1 Overview

GeoSyntec provided CQA monitoring, testing and documentation for miscellaneous activities associated with the development and ongoing operation of the OHDF. The CQA activities included monitoring of:

- realignment of the existing haul road;
- restoration of the exterior landfill perimeter berm slopes; and
- construction of Cell 4 maintenance road.

The results of the density tests for the restoration of the perimeter berm slope, subgrade and base course materials used in the construction of the existing haul road and Cell 4 maintenance road are not included in this certification report but will be made available upon request.

7.2 Realignment of Existing Haul Road

To accommodate the construction of Cell 4, approximately 1,000 lineal foot section of the existing haul road was realigned. General fill from Bronsons Borrow Pit was used to construct the subgrade to the lines and grades shown on the Cell 4 Construction Drawings. A 12-in thick layer of recycled concrete aggregate (RCA) was placed as the base course atop the compacted subgrade.

The RCA material for the project was supplied by Independent Recycling of Florida, Orlando, Florida. CQA personnel periodically monitored the placement and compaction of the RCA base course and ensured compliance with the CQA Documents. The RCA was placed on the realigned section in two lifts and compacted in accordance with the CQA Documents. CQA personnel measured the density and percent compaction of the RCA base course at a frequency of one test per 200 linear feet per lane per lift in accordance with the CQA Documents.

7.3 Restoration of the Exterior Landfill Perimeter Berm Slopes

The vegetation on exterior slopes of the landfill perimeter berm was ineffective in controlling erosion. As part of the Cell 4 contract, the exterior slopes were restored and sodded. Restoration activities included: locating the leachate transmission line; pushing material from the toe of the slopes back up onto the slope; filling and compacting in eroded areas; and sodding the slopes. CQA personnel monitored the grading of the slopes and performed density tests for soils placed and compacted in deeply eroded areas.

7.4 Construction of Cell 4 Maintenance Road

Limerock was placed as the base course for the Cell 4 maintenance road. A 10-inch thick layer of limerock base course was placed and compacted on top of the landfill perimeter berm on the west side of Cell 4.

The limerock for the project was supplied by Rinker in Orlando, Florida. CQA personnel periodically monitored the placement and compaction of the limerock base course and ensured compliance with the CQA Documents. The limerock was placed in two lifts and compacted in accordance with the CQA Documents. CQA personnel measured the density and percent compaction of the limerock base course at a frequency of one test per 200 linear feet per lift in accordance with the CQA Documents.

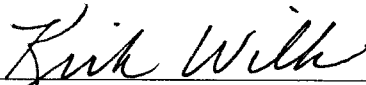
8. CONCLUSIONS

Observation of the construction of Cell 4 at the OHDF was performed by GeoSyntec during the period of 17 January 2005 to 9 May 2005. During this time, CQA personnel monitored the installation of the following components of Cell 4:

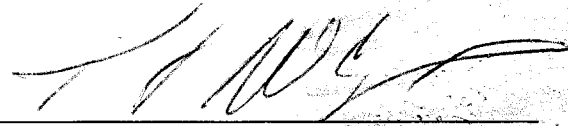
- earthwork (landfill perimeter berm restoration, Cell 4 subgrade, liner subbase, intercell berms, sump area, grading of low permeability soil layer in sump, liner protective layer, and realignment of landfill haul road);
- geosynthetics in Cell 4;
- leachate collection system (Cell 4 leachate collection system and leachate sump)

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 this report.

The results of the CQA activities undertaken by GeoSyntec as described in this report indicate that Cell 4 was constructed in accordance with the CQA Documents and the solid waste permit issued for the OHDF.



Kirk Wills
Construction Manager



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



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ 0691	TASK NO.:	01
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CELL 4 CONSTRUCTION

DATE:	28	Day	JANUARY	Month	2005	Year
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SPECIFICATION REQUIREMENTS: ASTM D 698	95% COMPACTION	MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED	8-in
--	----------------	----------------	-----	--------------------------	------

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	GR.SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3111B	GAUGE SERIAL	QA ID	RH
			10979	

[illegible]

COMMENTS:



GeoSyntec Consultants

OMNI WASTE.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.: FQ 0691 TASK NO.: 1

DESCRIPTION

CELL 4 CONSTRUCTION

DATE: 29 Day JANUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: West Borrow Area

MATERIAL TYPE

GR. SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3111B

GAUGE SERIAL 16709

QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 5	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.4	110.6	99.2	101.4%	PASS				
C4 6	EAST CELL 4	8	1	C4PR-1	16.2	97.8	18	111.3	98.5	100.7%		FAIL	C4-7	PASS	
C4 7	EAST CELL 4	8	1	C4PR-1	16.2	97.8	17.2	107.4	98.5	100.7%	PASS				
C4 8	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.5	100.7	98.0	100.2%	PASS				
C4 9	EAST CELL 4	8	1	C4PR-1	16.2	97.8	15.9	101.6	98.7	100.9%	PASS				
C4 10	EAST CELL 4	8	1	C4PR-1	16.2	97.8	15.7	110.4	99.7	101.9%	PASS				
C4 11	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.3	107.5	98.9	101.1%	PASS				
C4 12	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.9	101.4	99.5	101.7%	PASS				
C4 13	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.7	102.2	98.0	100.2%	PASS				
C4 14	EAST CELL 4	8	1	C4PR-1	16.2	97.8	18.9	109.4	98.1	100.3%		FAIL	C4-19	PASS	
C4 15	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.4	113	98.1	100.3%	PASS				
C4 16	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.5	111.2	98.3	100.5%	PASS				
C4 17	EAST CELL 4	8	1	C4PR-1	16.2	97.8	15.9	101.1	99.0	101.2%	PASS				
C4 18	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.8	100.7	98.4	100.6%	PASS				
C4 19	EAST CELL 4	8	1	C4PR-1	16.2	97.8	16.4	106.3	98.8	101.0%	PASS				

COMMENTS: C4-06 AND C4-14 FAILS DUE TO "PUMPING" AND EXCESSIVE MOISTURES



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION: OSCEOLA COUNTY, FLORIDA

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ 0691	TASK NO.:	1
--------------	---------	-----------	---

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:	31	Day	JANUARY	Month	2005	Year
-------	----	-----	---------	-------	------	------

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR $Y =$

N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657
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OA ID	RH
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
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75	1
76	1
77	1
78	1
79	1
80	1
81	1
82	1
83	1
84	1
85	1
86	1
87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

[illegible]

COMMENTS: DRIVE CYLINDER TAKEN ON C4-28



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.: FQ 0691 TASK NO.: 1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE: 31 Day JANUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE Troxler 3430

GAUGE SERIAL 27657

QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 31	WEST CELL 4	8	1	C4PR-3	16.0	98.3	10.3	109.9	99.6	101.4%	PASS				
C4 32	WEST CELL 4	8	1	C4PR-3	16.0	98.3	11.3	112.1	100.7	102.5%	PASS				
C4 33	WEST CELL 4	8	1	C4PR-3	16.0	98.3	10.6	110.6	100.0	101.7%	PASS				
C4 34	WEST CELL 4	8	1	C4PR-2	15.7	100.1	12.6	112.1	99.6	99.5%	PASS				
C4 35	WEST CELL 4	8	1	C4PR-3	16.0	98.3	10.8	111.9	101.0	102.7%	PASS				
C4 36	WEST CELL 4	8	1	C4PR-3	16.0	98.3	11.5	110.8	99.4	101.1%	PASS				
C4 37	WEST CELL 4	8	1	C4PR-2	15.7	100.1	12	110.6	98.8	98.7%	PASS				
C4 38	WEST CELL 4	8	1	C4PR-2	15.7	100.1	11.1	110.8	99.7	99.6%	PASS				
C4 39	WEST CELL 4	8	1	C4PR-2	15.7	100.1	13.3	112.1	98.9	98.8%	PASS				
C4 40	WEST CELL 4	8	1	C4PR-2	15.7	100.1	12.7	112.7	100.0	99.9%	PASS				
C4 41	WEST CELL 4	8	1	C4PR-2	15.7	100.1	11.2	110.1	99.0	98.9%	PASS				

COMMENTS:



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ 0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 1 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 42	SOUTH CELL 4	8	1	C4PR-3	16.0	98.3	9.9	109.9	100.0	101.7%	PASS				
C4 43	SOUTH CELL 4	8	1	C4PR-3	16.0	98.3	12.7	112.1	99.5	101.2%	PASS				
C4 44	SOUTH CELL 4	8	1	C4PR-3	16.0	98.3	11.6	110.6	99.1	100.8%	PASS				
C4 45	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	13	112.1	99.2	99.1%	PASS				
C4 46	SOUTH CELL 4	8	1	C4PR-3	16.0	98.3	113.2	111.9	100.5	102.2%	PASS				
C4 47	SOUTH CELL 4	8	1	C4PR-3	16.0	98.3	112.1	110.8	99.6	101.3%	PASS				
C4 48	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	9.5	111	101.4	101.3%	PASS				
C4 49	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	11.1	110.8	99.7	99.6%	PASS				
C4 50	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	12.8	112.1	99.4	99.3%	PASS				
C4 51	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	13.3	112.7	99.5	99.4%	PASS				
C4 52	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	12.1	110.1	98.2	98.1%	PASS				
C4 53	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	13.6	113.7	100.1	100.0%	PASS				
C4 54	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	14	113.2	99.3	99.2%	PASS				
C4 55	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	13.3	111.5	98.4	98.3%	PASS				
C4 56	SOUTH CELL 4	8	1	C4PR-2	15.7	100.1	12.6	111.0	98.6	98.5%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN C4-48



(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

1

05 Year

LIFT THICKNESS COMPACTED 8-in

CORRECTION FACTOR $Y =$

QA ID RH

COMMENTS:



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 2 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE BRN SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 26567 QA ID MW

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 66	EAST CELL 4	8	2	C4PR2	15.7	100.1	5.9	107.6	101.6	101.5%	PASS			
C4 67	EAST CELL 4	8	2	C4PR2	15.7	100.1	11	106	95.5	95.4%	PASS			
C4 68	EAST CELL 4	8	2	C4PR2	15.7	100.1	12.8	108.4	96.1	96.0%	PASS			
C4 69	EAST CELL 4	8	2	C4PR2	15.7	100.1	8.2	103	95.2	95.1%	PASS			
C4 70	EAST CELL 4	8	2	C4PR2	15.7	100.1	16.8	112.4	96.2	96.1%	PASS			
C4 71	EAST CELL 4	8	2	C4PR2	15.7	100.1	13.2	108.7	96.0	95.9%	PASS			
C4 72	EAST CELL 4	8	2	C4PR2	15.7	100.1	11.8	110.2	98.6	98.5%	PASS			
C4 73	EAST CELL 4	8	2	C4PR2	15.7	100.1	11.5	108.5	97.3	97.2%	PASS			
C4 74	EAST CELL 4	8	2	C4PR2	15.7	100.1	11.6	110	98.6	98.5%	PASS			
C4 75	EAST CELL 4	8	2	C4PR2	15.7	100.1	4.3	100	95.9	95.8%	PASS			
C4 76	EAST CELL 4	8	2	C4PR2	15.7	100.1	14.9	115.1	100.2	100.1%	PASS			
C4 77	EAST CELL 4	8	2	C4PR2	15.7	100.1	13.1	117.2	103.6	103.5%	PASS			
C4 78	EAST CELL 4	8	2	C4PR2	15.7	100.1	8.7	105.2	96.8	96.7%	PASS			
C4 79	EAST CELL 4	8	2	C4PR2	15.7	100.1	6.3	102.6	96.5	96.4%	PASS			

COMMENTS:



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

DESCRIPTION:

CELL 4 CONSTRUCTION

PROJECT NO.: FQ0691

TASK NO.: 1

DATE: 3 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: W. BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE Troxler 3430

GAUGE SERIAL 27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 80	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	17.2	115.2	98.3		98.2%	PASS		
C4 81	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	8.9	105.8	97.2		97.1%	PASS		
C4 82	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	8.5	105.7	97.4		97.3%	PASS		
C4 83	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	10.3	108.3	98.2		98.1%	PASS		
C4 84	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	9.5	105.3	96.2		96.1%	PASS		
C4 85	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	13.6	113.9	100.3		100.2%	PASS		
C4 86	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	6.0	102.1	96.3		96.2%	PASS		
C4 87	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	6.9	105.9	99.1		99.0%	PASS		
C4 88	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	4.0	100.4	96.5		96.4%	PASS		
C4 89	SOUTHWEST CELL 4	8	2	C4PR-2	15.7	100.1	6.5	104.3	97.9		97.8%	PASS		
C4 90	SOUTHWEST CELL 4	8	2	C4PR-2	15.7	100.1	15.8	116.3	100.4		100.3%	PASS		
C4 91	SOUTHWEST CELL 4	8	2	C4PR-2	15.7	100.1	9.5	105.5	96.3		96.3%	PASS		
C4 92	WEST CELL 4	8	2	C4PR-2	15.7	100.1	16.7	113.7	97.4		97.3%	PASS		
C4 93	WEST CELL 4	8	2	C4PR-2	15.7	100.1	12.0	108.1	96.5		96.4%	PASS		
C4 94	WEST CELL 4	8	2	C4PR-2	15.7	100.1	12.5	110.1	97.9		97.8%	PASS		

COMMENTS: AREAS IN ON NORTHERN SIDE OF CELL 4 NOT TESTED AS AREA WAS OBSERVED AS "PUMPING" AND RUTTING DEEPLY



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION: OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ0691	TASK NO.:	1
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DESCRIPTION:	CELL 4 CONSTRUCTION	DATE:	3	Day	FEBRUARY	Month	2005	Year
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	N/A	MOISTURE RANGE	LIFT THICKNESS	8-in COMPACTED
SPECIFICATION REQUIREMENTS:	ASTM D 698	95%	COMPACTION	

MATERIAL SOURCE: W. BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A
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NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	QA ID	RH
		27657		

[illegible]

COMMENTS:	AREAS IN ON NORTHERN SIDE OF CELL 4 NOT TESTED AS "PUMPING" AND RUTTING DEEPLY



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.: FQ0691 TASK NO.: 1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE: 4 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: W. BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 103	EAST CELL 4	8	2	C4PR-2	15.7	100.1	4.5	100.6	96.3		96.2%	PASS		
C4 104	EAST CELL 4	8	2	C4PR-2	15.7	100.1	9.5	109.2	99.7		99.6%	PASS		
C4 105	EAST CELL 4	8	2	C4PR-2	15.7	100.1	10.2	112.1	101.7		101.6%	PASS		
C4 106	EAST CELL 4	8	2	C4PR-2	15.7	100.1	9.9	110.6	100.6		100.5%	PASS		
C4 107	EAST CELL 4	8	2	C4PR-2	15.7	100.1	12.1	113.9	101.6		101.5%	PASS		
C4 108	EAST CELL 4	8	2	C4PR-2	15.7	100.1	11.3	114.8	103.1		103.0%	PASS		
C4 109	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	7.5	108.7	101.1		101.0%	PASS		
C4 110	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	8.8	109.9	101.0		100.9%	PASS		
C4 111	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	9.1	105.9	97.1		97.0%	PASS		
C4 112	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	11.3	111.2	99.9		99.8%	PASS		
C4 113	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	5.7	106.7	100.9		100.8%	PASS		
C4 114	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	7.4	105.8	98.5		98.4%	PASS		
C4 115	SOUTH CELL 4	8	2	C4PR-2	15.7	100.1	11.9	114.6	102.4		102.3%	PASS		
C4 116	SOUTHEAST CELL 4	8	2	C4PR-2	15.7	100.1	11.4	106.4	95.5		95.4%	PASS		
C4 117	EAST CELL 4	8	2	C4PR-2	15.7	100.1	12.4	114.5	101.9		101.8%	PASS		

COMMENTS:



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:

FQ0691

TASK NO.:

1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:

4

Day

FEBRUARY

Month

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: W. BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 118	EAST CELL 4	8	2	C4PR-2	15.7	100.1	7.8	105.4	97.8	97.7%	PASS			
C4 119	NORTH CELL 4	8	2	C4PR-2	15.7	100.1	3.3	94.1	91.1	91.0%		FAIL	C4-121	PASS
C4 120	NORTH CELL 4	8	2	C4PR-2	15.7	100.1	10.0	109.8	99.8	99.7%	PASS			
C4 121	NORTH CELL 4	8	2	C4PR-2	15.7	100.1	4.9	100.1	95.4	95.3%	PASS			
C4 122	NORTH CELL 4	8	2	C4PR-2	15.7	100.1	7.7	109.1	101.3	101.2%	PASS			
C4 123	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	2.0	98.6	96.7	96.6%	PASS			
C4 124	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	9.5	108.7	99.3	99.2%	PASS			
C4 125	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	8.6	108.9	100.3	100.2%	PASS			
C4 126	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	4.6	104.3	99.7	99.6%	PASS			
C4 127	SOUTH CELL 4	8	3	C4PR-2	15.7	100.1	6.5	104.4	98.0	97.9%	PASS			
C4 128	SOUTH CELL 4	8	3	C4PR-2	15.7	100.1	4.1	95.6	91.8	91.7%	PASS	FAIL	C4-130	PASS
C4 129	SOUTH CELL 4	8	3	C4PR-2	15.7	100.1	2.2	98.6	96.5	96.4%	PASS			
C4 130	SOUTH CELL 4	8	3	C4PR-2	15.7	100.1	4.9	100.6	95.9	95.8%	PASS			

COMMENTS: AREAS THAT WERE EXTREMELY WET WERE THIN LIFTED WITH DRY WHITE SAND FROM BORROW AREA AND STABILIZED, TRACKED IN WITH D6 DOZERS

DRIVE CYLINDER TAKEN C4-118



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:

FQ 0691

TASK NO.:

1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:

5

Day

FEBRUARY

Month

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE:

BORROW AREA

MATERIAL TYPE

GENERAL FILL

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 131	SOUTH WEST CELL 4	8	3	C4PR-2	15.7	100.1	6.7	105.6	99.0	99.0%	PASS				
C4 132	SOUTH WEST CELL 4	8	3	C4PR-2	15.7	100.1	8.1	107.5	99.4	99.0%	PASS				
C4 133	SOUTH WEST CELL 4	8	3	C4PR-2	15.7	100.1	10.1	110.7	100.5	100.4%	PASS				
C4 134	WEST CELL 4	8	3	C4PR-2	15.7	100.1	8.8	105.7	97.2	97.1%	PASS				
C4 135	WEST CELL 4	8	3	C4PR-2	15.7	100.1	4.3	101.1	96.9	96.8%	PASS				
C4 136	NORTH WEST CELL 4	8	3	C4PR-2	15.7	100.1	3.7	99.4	95.9	95.8%	PASS				
C4 137	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	3.9	99.9	96.2	96.1%	PASS				
C4 138	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	3.9	98.8	95.1	95.0%	PASS				
C4 139	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	2.8	97.7	95.0	95.0%	PASS				
C4 140	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	7.8	108.6	100.7	100.6%	PASS				
C4 141	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	3.3	98.9	95.7	95.6%	PASS				
C4 142	NORTH CELL 4	8	3	C4PR-2	15.7	100.1	5.6	102.8	97.3	97.3%	PASS				
C4 143	NORTH CORNER CELL 4	8	3	C4PR-2	15.7	100.1	10.7	112.0	101.2	101.1%	PASS				
C4 144	NORTH CORNER CELL 4	8	3	C4PR-2	15.7	100.1	5.5	103.6	98.2	98.1%	PASS				
C4 145	NORTH CORNER CELL 4	8	3	C4PR-2	15.7	100.1	7.5	104.8	97.5	97.4%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON C4-140



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION: OSCEOLA COUNTY, FLORIDA

PROJECT NO.: FQ0691 TASK NO.: 1

DESCRIPTION: CELL 4 CONSTRUCTION DATE: 5 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: West Borrow Area

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE Troxler 3430

GAUGE SERIAL 26567

QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 146	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	11.5	113.9	102.2	102.1%	PASS				
C4 147	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.9	111.6	101.5	101.4%	PASS				
C4 148	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.8	111.2	101.3	101.2%	PASS				
C4 149	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.9	108.8	99.0	98.9%	PASS				
C4 150	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.7	105.5	95.3	95.2%	PASS				
C4 151	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.9	110.2	99.4	99.3%	PASS				
C4 152	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	8.9	103.7	95.2	95.1%	PASS				
C4 153	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.4	106.4	97.3	97.2%	PASS				
C4 154	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.5	108.1	97.8	97.7%	PASS				
C4 155	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.8	111.4	100.5	100.4%	PASS				
C4 156	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.9	112.2	102.1	102.0%	PASS				
C4 157	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.5	105.1	95.1	95.0%	PASS				
C4 158	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	10.8	107.3	96.8	96.7%	PASS				
C4 159	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	9.4	107.3	98.1	98.0%	PASS				
C4 160	CENTER CELL 4	8	3	C4PR-2	15.7	100.1	11.2	110.9	99.7	99.6%	PASS				

COMMENTS: C4-148 (DRIVE CYLINDER TAKEN)



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

DESCRIPTION:

CELL 4 CONSTRUCTION

PROJECT NO.:

FQ0691

TASK NO.:

1

DATE:

5

Day

FEBRUARY

Month

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

BRN SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

26567

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST PASS FAIL
C4 161	CENTER CELL 4	8	3	C4PR2	15.7	100.1	5.9	107.6	101.6	101.5%	PASS			
C4 162	CENTER CELL 4	8	3	C4PR2	15.7	100.1	11	106	95.5	95.4%	PASS			
C4 163	CENTER CELL 4	8	3	C4PR2	15.7	100.1	12.8	108.4	96.1	96.0%	PASS			
C4 164	CENTER CELL 4	8	3	C4PR2	15.7	100.1	8.2	103	95.2	95.1%	PASS			
C4 165	CENTER CELL 4	8	3	C4PR2	15.7	100.1	16.8	112.4	96.2	96.1%	PASS			
C4 166	CENTER CELL 4	8	3	C4PR2	15.7	100.1	13.2	108.7	96.0	95.9%	PASS			
C4 167	CENTER CELL 4	8	3	C4PR2	15.7	100.1	11.8	110.2	98.6	98.5%	PASS			
C4 168	CENTER CELL 4	8	3	C4PR2	15.7	100.1	11.5	108.5	97.3	97.2%	PASS			
C4 169	CENTER CELL 4	8	3	C4PR2	15.7	100.1	11.6	110	98.6	98.5%	PASS			
C4 170	CENTER CELL 4	8	3	C4PR2	15.7	100.1	4.3	100	95.9	95.8%	PASS			
C4 171	CENTER CELL 4	8	3	C4PR2	15.7	100.1	14.9	115.1	100.2	100.1%	PASS			
C4 172	SOUTH CELL 4	8	3	C4PR2	15.7	100.1	13.1	117.2	103.6	103.5%	PASS			
C4 173	SOUTH CELL 4	8	3	C4PR2	15.7	100.1	8.7	105.2	96.8	96.7%	PASS			
C4 174	SOUTH CELL 4	8	3	C4PR2	15.7	100.1	6.3	102.6	96.5	96.4%	PASS			
C4 175	SOUTH CELL 4	8	3	C4PR2	15.7	100.1	10.0	108.5	98.6	98.5%	PASS			

COMMENTS: DRIVE CYLINDER TAKEN ON C4-173



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 7 Day FEBRUARY Month 2005 Year
SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in
MATERIAL SOURCE: BORROW AREA MATERIAL TYPE BRN SILTY SAND CORRECTION FACTOR Y = N/A
NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 26567 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 176	SOUTH EAST CORNER	8	4	C4PR2	15.7	100.1	7.3	102.4	95.4	95.3%	PASS				
C4 177	SOUTH EAST CELL 4	8	4	C4PR2	15.7	100.1	7.1	105.6	98.6	98.5%	PASS				
C4 178	EAST CELL 4	8	4	C4PR2	15.7	100.1	7.3	109	101.6	101.5%	PASS				
C4 179	EAST CELL 4	8	4	C4PR2	15.7	100.1	5.8	108.1	102.2	102.1%	PASS				
C4 180	EAST CELL 4	8	4	C4PR2	15.7	100.1	7.5	112.9	105.0	104.9%	PASS				
C4 181	EAST CELL 4	8	4	C4PR2	15.7	100.1	7.8	108.4	100.6	100.5%	PASS				
C4 182	EAST CELL 4	8	4	C4PR2	15.7	100.1	6.6	110	103.2	103.1%	PASS				
C4 183	EAST CELL 4	8	4	C4PR2	15.7	100.1	5.3	96.7	91.8	91.7%		FAIL	C4184	PASS	
C4 184	EAST CELL 4	8	4	C4PR2	15.7	100.1	7.7	110.9	103.0	102.9%	PASS				
C4 185	EAST CELL 4	8	4	C4PR2	15.7	100.1	10.3	114.8	104.1	104.0%	PASS				
C4 186	EAST CELL 4	8	4	C4PR2	15.7	100.1	9.9	110.1	100.2	100.1%	PASS				
C4 187	NORTH EAST CELL 4	8	4	C4PR2	15.7	100.1	7.5	106.9	99.4	99.3%	PASS				
C4 188	NORTH EAST CELL 4	8	4	C4PR2	15.7	100.1	12.4	105.2	93.6	93.5%		FAIL	C4189	PASS	
C4 189	NORTH EAST CELL 4	8	4	C4PR2	15.7	100.1	8.4	105.9	97.7	97.6%	PASS				
C4 190	NORTH EAST CELL 4	8	4	C4PR2	15.7	100.1	11.1	114.0	102.6	102.5%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON C4-176



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 7 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE BRN SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 26567 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 191	NORTH CELL 4	8	4	C4PR2	15.7	100.1	8.6	105.7	97.3	97.2%	PASS				
C4 192	NORTH CELL 4	8	4	C4PR2	15.7	100.1	13.6	103.3	90.9	90.8%		FAIL	C4193	FAIL	
C4 193	NORTH CELL 4	8	4	C4PR2	15.7	100.1	8.1	102.5	94.8	94.7%		FAIL	C4220	PASS	
C4 194	NORTH CELL 4	8	4	C4PR2	15.7	100.1	7.6	102.6	95.4	95.3%	PASS				
C4 195	CENTER CELL 4	8	4	C4PR2	15.7	100.1	7.5	109.3	101.7	101.6%	PASS				
C4 196	CENTER CELL 4	8	4	C4PR2	15.7	100.1	7.9	105.3	97.6	97.5%	PASS				
C4 197	CENTER CELL 4	8	4	C4PR2	15.7	100.1	8.2	107.7	99.5	99.4%	PASS				
C4 198	CENTER CELL 4	8	4	C4PR2	15.7	100.1	8	108.8	100.7	100.6%		FAIL	C4199	PASS	
C4 199	CENTER CELL 4	8	4	C4PR2	15.7	100.1	7.9	111.4	103.2	103.1%	PASS				
C4 200	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	7.4	111.3	103.6	103.5%	PASS				
C4 201	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	6.8	105.5	98.8	98.7%	PASS				
C4 202	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	7.4	109.8	102.2	102.1%	PASS				
C4 203	EAST OF HAUL ROAD	8	1	C4PR2	15.7	100.1	5.9	105.1	99.2	99.1%		FAIL	C4204	PASS	
C4 204	EAST OF HAUL ROAD	8	1	C4PR2	15.7	100.1	7.9	103.9	96.3	96.2%	PASS				
C4 205	EAST OF HAUL ROAD	8	1	C4PR2	15.7	100.1	11.9	111.2	99.4	99.3%	PASS				

COMMENTS: AREA EAST OF HAUL ROAD IS ELEV. 81, AREA WEST OF HAUL ROAD IS AT ELEV 84
DENSITY TESTS C4-198 AND DENSITY TEST C4 203 FAIL DUE TO "PUMPING" AND EXCESSIVE MOISTURE



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 7 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE BRN SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 26567 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 206	EAST OF HAUL ROAD	8	4	C4PR2	15.7	100.1	8.1	102.8	95.1	95.0%	PASS				
C4 207	EAST OF HAUL ROAD	8	4	C4PR2	15.7	100.1	7	101.9	95.2	95.1%	PASS				
C4 208	EAST OF HAUL ROAD	8	4	C4PR4	14.3	105.7	7	112.5	105.1	99.5%	PASS				
C4 209	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	7.9	110.6	102.5	102.4%	PASS				
C4 210	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	5.6	105.6	100.0	99.9%	PASS				
C4 211	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	9	111.1	101.9	101.8%	PASS				
C4 212	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	5.8	103.8	98.1	98.0%	PASS				
C4 213	CENTER CELL 4	8	4	C4PR2	15.7	100.1	15.7	111.5	96.4	96.3%	PASS				
C4 214	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	10.2	103.5	93.9	93.8%		FAIL	C4-215	PASS	
C4 215	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	10	109.6	99.6	99.5%	PASS				
C4 216	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	15.9	113.5	97.9	97.8%	PASS				
C4 217	SOUTH CELL 4	8	4	C4PR2	15.7	100.1	7.9	111.1	103.0	102.9%	PASS				
C4 218	CENTER CELL 4	8	1	C4PR2	15.7	100.1	14.1	111.5	97.7	97.6%	PASS				
C4 219	CENTER CELL 4	8	1	C4PR2	15.7	100.1	7.6	106.8	99.3	99.2%	PASS				
C4 220	NORTH CELL 4	8	1	C4PR2	15.7	100.1	7.6	105.2	97.8	97.7%	PASS				

COMMENTS: AREA EAST OF HAUL ROAD IS ELEV. 81, AREA WEST OF HAUL ROAD IS AT ELEV 84



OMNI WASTE

(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

PROJECT NO.:	FO0691	TASK NO.:
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Month	2005	Year
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LIFT THICKNESS COMPACTED 8-in

CORRECTION FACTOR $V =$

TEST/NOT

CA IN PH

QA ID KFI

[illegible]

COMMENTS:	AREA EAST OF HAUL ROAD IS ELEV. 81. AREA WEST OF HAUL ROAD IS AT ELEV 84
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OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT				OAK HAMMOCK DISPOSAL FACILITY			
LOCATION:		OSCEOLA COUNTY, FLORIDA		PROJECT NO.:		FQ0691	
DESCRIPTION:		CELL 4 CONSTRUCTION		DATE:		8 Day	
				TASK NO.:		1	
				FEBRUARY		Month	
				2005		Year	

SPECIFICATION REQUIREMENTS: ASTM D 698	95%	COMPACTION	MOISTURE RANGE	LIFT THICKNESS	8-in
COMPACTED					

MATERIAL SOURCE:	West Borrow Area	MATERIAL TYPE	BRN SILTY SAND	CORRECTION FACTOR Y =	N/A
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NUCLEAR GAUGE TYPE	Troxler 3340	GAUGE SERIAL	QA ID	RH
			26657	

[illegible]

COMMENTS:



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ 0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 9 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: West Borrow Area MATERIAL TYPE brn silty sand CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS		FILED TEST RESULTS							RETEST		
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 231	EAST SIDE CELL 4	8	3	C4PR2	15.7	100.1	12.5	105	93.3	93.2%		FAIL	C4232	PASS	
C4 232	EAST SIDE CELL 4	8	3	C4PR2	15.7	100.1	16	113.5	97.8	97.7%	PASS				
C4 233	EAST SIDE CELL 4	8	3	C4PR2	15.7	100.1	9.9	113.2	103.0	102.9%	PASS				
C4 234	EAST SIDE CELL 4	8	3	C4PR2	15.7	100.1	12.9	110.2	97.6	97.5%	PASS				
C4 235	SW CORNER CELL 4	8	4	C4PR2	15.7	100.1	8.5	109.9	101.3	101.2%	PASS				
C4 236	SW CORNER CELL 4	8	4	C4PR2	15.7	100.1	7.6	99.4	92.4	92.3%		FAIL	C4237	PASS	
C4 237	SW SIDE CELL 4	8	4	C4PR2	15.7	100.1	8	104.9	97.1	97.0%	PASS				
C4 238	WEST SIDE CELL 4	8	4	C4PR2	15.7	100.1	5.4	97.9	92.9	92.8%		FAIL	C4239	PASS	
C4 239	WEST SIDE CELL 4	8	4	C4PR2	15.7	100.1	11.8	107.9	96.5	96.4%	PASS				
C4 240	WEST SIDE CELL 4	8	4	C4PR2	15.7	100.1	6.2	105.7	99.5	99.4%	PASS				
C4 241	NORTH CELL 4	8	4	C4PR2	15.7	100.1	14.1	117.6	103.1	103.0%	PASS				
C4 242	NORTH CORNER CELL 4	8	4	C4PR2	15.7	100.1	8.8	108.8	100.0	99.9%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLES C4-239 AND C4 242.



GEO SYNTec CONSULTANTS

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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ 0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 10 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: WEST BORROW MATERIAL TYPE GR SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 243	EAST OF HAUL ROAD	8	5	C4PR-2	15.7	100.1	16.5	117.3	100.7	100.6%	PASS				
C4 244	EAST OF HAUL ROAD	8	5	C4PR-2	15.7	100.1	8.8	108.8	100.0	99.9%	PASS				
C4 245	EAST OF HAUL ROAD	8	5	C4PR-2	15.7	100.1	7.6	101.7	94.5	94.4%		FAIL	C4246	PASS	
C4 246	EAST OF HAUL ROAD	8	5	C4PR-2	15.7	100.1	10.6	111.5	100.8	100.7%	PASS				
C4 247	SOUTH EAST CELL 4	8	5	C4PR-2	15.7	100.1	13.8	116.1	102.0	101.9%	PASS				
C4 248	SOUTH EAST CELL 4	8	5	C4PR-2	15.7	100.1	17.5	118.8	101.1	101.0%	PASS				
C4 249	SOUTH EAST CELL 4	8	5	C4PR-2	15.7	100.1	6.1	99.7	94.0	93.9%		FAIL	C4250	PASS	
C4 250	SOUTH EAST CELL 4	8	5	C4PR-2	15.7	100.1	9.9	108.4	98.6	98.5%	PASS				
C4 251	EAST CELL 4	8	5	C4PR-2	15.7	100.1	8.7	108.6	99.9	99.8%	PASS				
C4 252	EAST CELL 4	8	5	C4PR-2	15.7	100.1	13.9	115.7	101.6	101.5%	PASS				
C4 253	EAST CELL 4	8	5	C4PR-2	15.7	100.1	9.3	103.6	94.8	94.7%		FAIL	C4254	PASS	
C4 254	EAST CELL 4	8	5	C4PR-2	15.7	100.1	5.8	103	97.4	97.3%	PASS				
C4 255	EAST CELL 4	8	5	C4PR-2	15.7	100.1	11.6	117.2	105.0	104.9%	PASS				
C4 256	EAST CELL 4	8	5	C4PR-2	15.7	100.1	5.2	99.2	94.3	94.2%		FAIL	C4257	PASS	
C4 257	EAST CELL 4	8	5	C4PR-2	15.7	100.1	9.4	106.1	97.0	96.9%	PASS				

COMMENTS: FAILURES WERE REWORKED AND RETESTED
DRIVE CYLINDER TAKEN ON C4-257



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ 0691	TASK NO.:
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TASK NO.:	1
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DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:	10	Day	FEBRUARY	Month	2005	Year
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SPECIFICATION REQUIREMENTS: ASTM D 698	95% COMPACTION	N/A	MOISTURE RANGE	8-in
			LIFT THICKNESS	COMPACTED

MATERIAL SOURCE:	WEST BORROW	MATERIAL TYPE	GR SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	QA ID	RH
			27657	

[illegible]

COMMENTS:	FAILURES WERE REWORKED AND RETESTED:



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION: OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ 0691	TASK NO.:	1
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DESCRIPTION:	CELL 4 CONSTRUCTION	DATE:	11	Day	FEBRUARY	Month	2005	Year
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8-in	8-in	MOISTURE RANGE	MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED
		95%	95%	ASTM D 698	

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	QA ID	RH
			27657	

[illegible]

COMMENTS:



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ-0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 12 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 273	EAST HAUL ROAD C4	8	5	C4PR2	15.7	100.1	11.6	108.5	97.2	97.1%	PASS				
C4 274	EAST HAUL ROAD C4	8	5	C4PR2	15.7	100.1	7	109.1	102.0	101.9%	PASS				
C4 275	EAST HAUL ROAD C4	8	5	C4PR2	15.7	100.1	7	106.4	99.4	99.3%	PASS				
C4 276	EAST HAUL ROAD C4	8	5	C4PR2	15.7	100.1	8.5	104.1	95.9	95.8%	PASS				
C4 277	SOUTH CELL 4	8	5	C4PR5	13.6	105.3	8.4	113.9	105.1	99.8%	PASS				
C4 278	SOUTH CELL 4	8	5	C4PR5	13.6	105.3	11.4	116.7	104.8	99.5%	PASS				
C4 279	CENTER CELL 4	8	5	C4PR2	15.7	100.1	10.2	108.1	98.1	98.0%	PASS				
C4 280	CENTER CELL 4	8	5	C4PR2	15.7	100.1	9.8	108.4	98.7	98.6%	PASS				
C4 281	CENTER CELL 4	8	5	C4PR6	13.6	103.3	10.7	113.4	102.4	99.2%	PASS				
C4 282	CENTER CELL 4	8	5	C4PR6	13.6	103.3	9	111	101.8	98.6%	PASS				
C4 283	CENTER CELL 4	8	5	C4PR2	15.7	100.1	9.9	108.1	98.4	98.3%	PASS				
C4 284	NORTH CELL 4	8	5	C4PR2	15.7	100.1	5.6	102.2	96.8	96.7%	PASS				
C4 285	NORTH CELL 4	8	5	C4PR2	15.7	100.1	8.6	103.5	95.3	95.2%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLE C4-273
ALL TESTS ARE ON ELEV. 85



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT		OAK HAMMOCK DISPOSAL FACILITY						
LOCATION:	OSCEOLA COUNTY, FLORIDA	PROJECT NO.:	FQ 0691	TASK NO.:	1			
DESCRIPTION:	CELL 4 CONSTRUCTION	DATE:	14	Day	FEBRUARY	Month	2005	Year
SPECIFICATION REQUIREMENTS: ASTM D 698		95% COMPACTION	MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED	8-in		
MATERIAL SOURCE:		BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A		
NUCLEAR GAUGE TYPE		Troxler 3430	GAUGE SERIAL	27657	QA ID	RH		

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST	
													PASS	FAIL
C4 286	SOUTH CELL 4	8	5	C4PR2	15.7	100.1	13.4	111.1	98.0	97.9%	PASS			
C4 287	SOUTH CELL 4	8	5	C4PR4	14.3	105.7	7.5	112.5	104.7	99.0%	PASS			
C4 288	SOUTH CELL 4	8	5	C4PR4	14.3	105.7	13.4	117.6	103.7	98.1%	PASS			
C4 289	SOUTH CELL 4	8	5	C4PR2	15.7	100.1	13.8	114.7	100.8	100.7%	PASS			
C4 290	SOUTH CELL 4	8	5	C4PR2	15.7	100.1	14	114.5	100.4	100.3%	PASS			
C4 291	CENTER CELL 4	8	5	C4PR4	14.3	105.7	11.1	116.6	105.0	99.3%	PASS			
C4 292	CENTER CELL 4	8	5	C4PR2	15.7	100.1	9.8	109.9	100.1	100.0%	PASS			
C4 293	CENTER CELL 4	8	5	C4PR4	14.3	105.7	8.8	110.8	101.8	96.3%	PASS			
C4 294	CENTER CELL 4	8	5	C4PR4	14.3	105.7	11.4	115.7	103.9	98.3%	PASS			
C4 295	NORTH CELL 4	8	5	C4PR2	15.7	100.1	11.5	111.2	99.7	99.6%	PASS			
C4 296	NORTH CELL 4	8	5	C4PR2	15.7	100.1	9.4	108.7	99.4	99.3%	PASS			
C4 297	NORTH CELL 4	8	5	C4PR2	15.7	100.1	10.1	109	99.0	98.9%	PASS			
C4 298	NORTH CELL 4	8	5	C4PR2	15.7	100.1	10.8	109.2	98.6	98.5%	PASS			
C4 299	NORTH CELL 4	8	5	C4PR2	15.7	100.1	9.6	108.7	99.2	99.1%	PASS			
C4 300	NORTH CELL 4	8	5	C4PR2	15.7	100.1	11.3	110.3	99.1	99.0%	PASS			

COMMENTS:	MATERIAL BEING PLACED IS FROM RIM DITCHES BEING LOWERED IN BORROW AREA, MIXED SILTY SAND HIGHEST PROCTOR USED ON C4287-C4288-C4291-C4293 AND C4 294
	DRIVE CYLINDER TAKEN ON C4 290



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 15 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 301	WEST CELL 4	8	5	C4PR6	13.6	103.3	12.5	116.8	103.8	100.5%	PASS				
C4 302	WEST CELL 4	8	5	C4PR2	15.7	100.1	11.5	104.8	94.0	93.9%		FAIL	C4303	PASS	
C4 303	WEST CELL 4	8	5	C4PR2	15.7	100.1	10.8	111.3	100.5	100.4%	PASS				
C4 304	WEST CELL 4	8	5	C4PR2	15.7	100.1	11.6	109.9	98.5	98.4%	PASS				
C4 305	WEST CELL 4	8	5	C4PR2	15.7	100.1	12.6	113.4	100.7	100.6%	PASS				
C4 306	WEST CELL 4	8	5	C4PR6	13.6	103.3	10.7	112.4	101.5	98.3%	PASS				
C4 307	WEST CELL 4	8	5	C4PR6	13.6	103.3	11.4	113.8	102.2	98.9%	PASS				
C4 308	WEST CELL 4	8	5	C4PR6	13.6	103.3	12.8	115.4	102.3	99.0%	PASS				
C4 309	SOUTH CELL 4	8	5	C4PR6	13.6	103.3	14.4	117.2	102.4	99.2%	PASS				
C4 310	SOUTH CELL 4	8	5	C4PR6	13.6	103.3	13.6	115.4	101.6	98.3%	PASS				
C4 311	SOUTH CELL 4	8	5	C4PR6	13.6	103.3	15.3	118.3	102.6	99.3%	PASS				
C4 312	SOUTH CELL 4	8	5	C4PR6	13.6	103.3	14.1	116.4	102.0	98.8%	PASS				
C4 313	CENTER CELL 4	8	5	C4PR2	15.7	100.1	13.8	114.7	100.8	100.7%	PASS				
C4 314	CENTER CELL 4	8	5	C4PR6	13.6	103.3	12.9	118.2	104.7	101.3%	PASS				
C4 315	NORTH CELL 4	8	5	C4PR6	13.6	103.3	13.0	117.6	104.1	100.7%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLE C4-307 3

C4 PR 6 USED DUE TO MATERIAL BEING HAULED FROM RIM DITCH AT ELEVATION 70



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 15 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 316	NORTH CELL 4	8	6	C4PR6	13.6	103.3	6.1	107.7	101.5	98.3%	PASS			
C4 317	NORTH CELL 4	8	6	C4PR6	13.6	103.3	13.9	101.6	89.2	86.4%		FAIL	C4318	PASS
C4 318	NORTH CELL 4	8	6	C4PR2	15.7	100.1	9	104.6	96.0	95.9%	PASS			
C4 319	NORTH CELL 4	8	6	C4PR6	13.6	103.3	6.7	109.9	103.0	99.7%	PASS			
C4 320	NORTH EAST CELL 4	8	6	C4PR6	13.6	103.3	8.6	116.5	107.3	103.8%	PASS			
C4 321	NORTH EAST CELL 4	8	6	C4PR6	13.6	103.3	7.8	108.6	100.7	97.5%	PASS			
C4 322	NORTH EAST CELL 4	8	6	C4PR6	13.6	103.3	11.3	113.5	102.0	98.7%	PASS			
C4 323	NORTH EAST CELL 4	8	6	C4PR6	13.6	103.3	10.7	116.1	104.9	101.5%	PASS			
C4 324	EAST CELL 4	8	6	C4PR6	13.6	103.3	7.6	114.5	106.4	103.0%	PASS			
C4 325	EAST CELL 4	8	6	C4PR2	15.7	100.1	8.5	104.3	96.1	96.0%	PASS			
C4 326	EAST CELL 4	8	6	C4PR6	13.6	103.3	6.3	107.2	100.8	97.6%	PASS			
C4 327	EAST CELL 4	8	6	C4PR2	15.7	100.1	9.8	104.6	95.3	95.2%	PASS			
C4 328	SOUTH EAST CELL 4	8	6	C4PR6	13.6	103.3	12.4	112	99.6	96.5%	PASS			
C4 329	SOUTH EAST CELL 4	8	6	C4PR6	13.6	103.3	11	117	105.4	102.0%	PASS			
C4 330	SOUTHEAST CELL 4	8	6	C4PR6	13.6	103.3	6.1	112.8	106.3	102.9%	PASS			

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLE C4-302

C4 PR 6 USED DUE TO MATERIAL BEING HAULED FROM RIM DITCH AT ELEVATION 70



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 17 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 331	SOUTH EAST CELL 4	8	6	C4PR6	13.6	103.3	6.1	111.5	105.1	101.7%	PASS				
C4 332	SOUTH EAST CELL 4	8	6	C4PR6	13.6	103.3	7.6	106.5	99.0	95.8%	PASS				
C4 333	EAST CELL 4	8	6	C4PR6	13.6	103.3	6.8	107.1	100.3	97.1%	PASS				
C4 334	EAST CELL 4	8	6	C4PR6	13.6	103.3	4.2	103	98.8	95.7%	PASS				
C4 335	WEST CELL 4	8	6	C4PR6	13.6	103.3	9.4	110.2	100.7	97.5%	PASS				
C4 336	WEST CELL 4	8	6	C4PR6	13.6	103.3	5.9	108.4	102.4	99.1%	PASS				
C4 337	WEST CELL 4	8	6	C4PR6	13.6	103.3	9.3	109	99.7	96.5%	PASS				
C4 338	WEST CELL 4	8	6	C4PR6	13.6	103.3	10.4	115.4	104.5	101.2%	PASS				
C4 339	NORTH WEST CELL 4	8	6	C4PR6	13.6	103.3	12.4	117.5	104.5	101.2%	PASS				
C4 340	NORTH WEST CELL 4	8	6	C4PR6	13.6	103.3	7.4	113.9	106.1	102.7%	PASS				
C4 341	NORTH WEST CELL 4	8	6	C4PR6	13.6	103.3	5.5	106	100.5	97.3%	PASS				
C4 342	NORTH WEST CELL 4	8	6	C4PR6	13.6	103.3	8.5	107.4	99.0	95.8%	PASS				
C4 343	NORTH CELL 4	8	6	C4PR6	13.6	103.3	9.6	110.4	100.7	97.5%	PASS				
C4 344	NORTH CELL 4	8	6	C4PR6	13.6	103.3	17	113.7	97.2	94.1%		FAIL	C4345	PASS	

COMMENTS:



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 18 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 345	WEST CELL 4	8	7	C4PR2	15.7	100.1	10.4	113.1	102.4		102.3%	PASS		
C4 346	WEST CELL 4	8	7	C4PR2	15.7	100.1	8.6	117.1	107.8		107.7%	PASS		
C4 347	WEST CELL 4	8	7	C4PR2	15.7	100.1	15	116.6	101.4		101.3%	PASS		
C4 348	WEST CELL 4	8	7	C4PR2	15.7	100.1	7.7	108.8	101.0		100.9%	PASS		
C4 349	SOUTH CELL 4	8	6	C4PR2	15.7	100.1	3.4	102.9	99.5		99.4%	PASS		
C4 350	SOUTH CELL 4	8	6	C4PR2	15.7	100.1	10.3	113.2	102.6		102.5%	PASS		
C4 351	CENTER CELL 4	8	6	C4PR2	15.7	100.1	8.1	111	102.7		102.6%	PASS		
C4 352	CENTER CELL 4	8	6	C4PR2	15.7	100.1	10.6	113.2	102.4		102.2%	PASS		
C4 353	CENTER CELL 4	8	6	C4PR2	15.7	100.1	12.4	107.6	95.7		95.6%	PASS		
C4 354	CENTER CELL 4	8	6	C4PR2	15.7	100.1	7.6	109	101.3		101.2%	PASS		
C4 355	NORTH CELL 4	8	6	C4PR2	15.7	100.1	9.2	107.9	98.8		98.7%	PASS		
C4 356	NORTH CELL 4	8	6	C4PR2	15.7	100.1	7.5	109.1	101.5		101.4%	PASS		
C4 357	NORTH CELL 4	8	6	C4PR2	15.7	100.1	12.8	110.1	97.6		97.5%	PASS		
C4 358	NORTH CELL 4	8	6	C4PR2	15.7	100.1	13.7	112.8	99.2		99.1%	PASS		
C4 359	NORTH CELL 4	8	6	C4PR2	15.7	100.1	11.7	110.2	98.7		98.6%	PASS		

COMMENTS:



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FO0691	TASK NO.:	1
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DESCRIPTION:

CELL 4 CONSTRUCTION

DATE: 18 Day FEBRUARY Month 2005 Year

	N/A	MOISTURE RANGE	LIFT THICKNESS COMPACTED	8-in
SPECIFICATION REQUIREMENTS:	ASTM D 698	95% COMPACTION		

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657	OA ID	RH
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[illegible]

COMMENTS:



OAK HAMMOCK DISPOSAL FACILITY

(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

PROJECT NO.:	FQ0691	TASK NO.:
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19	Day	FEBRUARY	Month	2005	Year
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N/A	LIFT THICKNESS COMPACTED	8-in

N/A

RH

[illegible]

DRIVE CYLINDER TAKEN ON SAMPLE C4-370 ON NORTH SIDE OF CELL 4



Geosyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA
DESCRIPTION: CELL 4 CONSTRUCTION
PROJECT NO.: FQ0691
TASK NO.: 1
DATE: 21 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION
MOISTURE RANGE: N/A
LIFT THICKNESS COMPACTED: 8-in

MATERIAL SOURCE: BORROW AREA
MATERIAL TYPE: SILTY SAND
CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE: Troxler 3430
GAUGE SERIAL: 27657
QA ID: RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 372	SOUTH CELL 4	8	6	C4PR2	15.7	100.1	10.7	110.5	99.8	99.7%	PASS				
C4 373	SOUTH WEST CELL 4	8	6	C4PR8	15.7	106.3	9.9	117.4	106.8	100.5%	PASS				
C4 374	SOUTH WEST CELL 4	8	6	C4PR2	15.7	100.1	5.1	107.5	102.3	102.2%	PASS				
C4 375	WEST CELL 4	8	6	C4PR2	15.7	100.1	5.1	107.5	102.3	102.2%	PASS				
C4 376	WEST CORNER CELL 4	8	6	C4PR2	15.7	100.1	4.3	104.2	99.9	99.8%	PASS				
C4 377	WEST CELL 4	8	6	C4PR7	15.7	106.3	6.9	110.3	103.2	97.1%	PASS				
C4 378	WEST CELL 4	8	6	C4PR7	15.7	106.3	6.8	112.1	105.0	98.7%	PASS				
C4 379	NORTH CELL 4	8	6	C4PR2	15.7	100.1	7.1	105.2	98.2	98.1%	PASS				
C4 380	NORTH WEST CELL 4	8	6	C4PR7	15.7	106.3	7.2	109.8	102.4	96.4%	PASS				
C4 381	NORTH WEST CELL 4	8	6	C4PR7	15.7	106.3	12.4	116.4	103.6	97.4%	PASS				
C4 382	NORTH CELL 4	8	6	C4PR2	15.7	100.1	12	110.9	99.0	98.9%	PASS				
C4 383	SOUTH EAST CELL 4	8	7	C4PR2	15.7	100.1	11.5	114	102.2	102.1%	PASS				
C4 384	SOUTH EAST CELL 4	8	7	C4PR2	15.7	100.1	7.7	107.3	99.6	99.5%	PASS				
C4 385	S. E. CORNER CELL 4	8	7	C4PR7	15.7	106.3	7.2	109.7	102.3	96.3%	PASS				
C4 386	EAST CELL 4	8	7	C4PR7	15.7	106.3	4	108.1	103.9	97.8%	PASS				

COMMENTS: MATERIAL FROM RIM DITCH CREATES DIFFERENT PROCTOR TO BE USED (C4PR-8)



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:

FQ0691

TASK NO.:

1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:

21

Day

February

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 387	EAST CELL 4	8	7	C4PR2	15.7	100.1	7.4	116.2	108.2	108.1%	PASS				
C4 388	EAST CELL 4	8	7	C4PR7	15.7	106.3	3.9	110.3	106.2	99.9%	PASS				
C4 389	EAST CELL 4	8	7	C4PR2	15.7	100.1	2.3	97.8	95.6	95.5%	PASS				
C4 390	EAST CELL 4	8	7	C4PR2	15.7	100.1	5.6	102.6	97.2	97.1%	PASS				
C4 391	EAST CELL 4	8	7	C4PR2	15.7	100.1	8.7	110.5	101.7	101.6%	PASS				
C4 392	EAST CELL 4	8	7	C4PR7	15.7	106.3	11	113.1	101.9	95.9%	PASS				
C4 393	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	8.5	109.8	101.2	95.2%	PASS				
C4 394	NORTH EAST CELL 4	8	7	C4PR2	15.7	100.1	6.6	105.9	99.3	99.2%	PASS				
C4 395	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	8.8	110.1	101.2	95.2%	PASS				
C4 396	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	9.5	114.5	104.6	98.4%	PASS				
C4 397	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	9.2	113.5	103.9	97.8%	PASS				
C4 398	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	7.9	116.3	107.8	101.4%	PASS				
C4 399	NORTH EAST CELL 4	8	7	C4PR2	15.7	100.1	8.1	107.3	99.3	99.2%	PASS				
C4 400	NORTH EAST CELL 4	8	7	C4PR7	15.7	106.3	10.4	112.2	101.6	95.6%	PASS				

COMMENTS: MATERIAL FROM RIM DITCH CREATES DIFFERENT PROCTOR TO BE USED (C4PR-8)

DRIVE CYLINDER TAKEN FROM SAMPLE C4-389 (DR-18)



Geosyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 22 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 401	SOUTH CELL 4	8	7	C4PR2	15.7	100.1	4.1	102.1	98.1	98.0%	PASS				
C4 402	SOUTH CELL 4	8	7	C4PR2	15.7	100.1	3.5	100.2	96.8	96.7%	PASS				
C4 403	SOUTH CELL 4	8	7	C4PR2	15.7	100.1	5.2	105.5	100.3	100.2%	PASS				
C4 404	SOUTH WEST CELL 4	8	7	C4PR2	15.7	100.1	6.4	107.3	100.8	100.7%	PASS				
C4 405	SOUTH WEST CELL 4	8	7	C4PR2	15.7	100.1	8.7	103.6	95.3	95.2%	PASS				
C4 406	SOUTH WEST CELL 4	8	7	C4PR2	15.7	100.1	6.7	103.1	96.6	96.5%	PASS				
C4 407	CENTER CELL 4	8	7	C4PR2	15.7	100.1	5.3	101.3	96.2	96.1%	PASS				
C4 408	CENTER CELL 4	8	7	C4PR2	15.7	100.1	8.6	104.6	96.3	96.2%	PASS				
C4 409	CENTER CELL 4	8	7	C4PR2	15.7	100.1	6.4	107.2	100.8	100.7%	PASS				
C4 410	CENTER CELL 4	8	7	C4PR2	15.7	100.1	11.7	109.6	98.1	98.0%	PASS				
C4 411	CENTER CELL 4	8	7	C4PR2	15.7	100.1	9.2	110.1	100.8	100.7%	PASS				
C4 412	CENTER CELL 4	8	7	C4PR2	15.7	100.1	7.7	104.4	96.9	96.8%	PASS				
C4 413	CENTER CELL 4	8	7	C4PR2	15.7	100.1	7.3	107.3	100.0	99.9%	PASS				
C4 414	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	5.1	101.1	96.2	96.1%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN FROM SAMPLE C4-414 (DR-22)



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT	OAK HAMMOCK DISPOSAL FACILITY							
LOCATION:	OSCEOLA COUNTY, FLORIDA	PROJECT NO.:	FQ0691	TASK NO.:	1			
DESCRIPTION:	CELL 4 CONSTRUCTION	DATE:	22	Day	FEBRUARY	Month	2005	Year

SPECIFICATION REQUIREMENTS:	ASTM D 698	95% COMPACTION	MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED	8-in
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MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A
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NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657	QA ID	RH
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TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST	
														PASS	FAIL
C4 415	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	5.4	103.5	98.2	98.1%	PASS				
C4 416	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	4.7	104	99.3	99.2%	PASS				
C4 417	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	6	107	100.9	100.8%	PASS				
C4 418	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	6.1	107.3	101.1	101.0%	PASS				
C4 419	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	7.2	102.8	95.9	95.8%	PASS				
C4 420	NORTH WEST CELL 4	8	7	C4PR2	15.7	100.1	6.9	103	96.4	96.3%	PASS				
C4 421	NORTH CELL 4	8	7	C4PR2	15.7	100.1	5.3	102.6	97.4	97.3%	PASS				
C4 422	NORTH CELL 4	8	7	C4PR2	15.7	100.1	8	103	95.4	95.3%	PASS				
C4 423	NORTH CELL 4	8	7	C4PR2	15.7	100.1	6.7	106.4	99.7	99.6%	PASS				
C4 424	NORTH CELL 4	8	7	C4PR2	15.7	100.1	6.3	103.1	97.0	96.9%	PASS				
C4 425	NORTH CELL 4	8	7	C4PR2	15.7	100.1	8.3	105.3	97.2	97.1%	PASS				
C4 426	NORTH CELL 4	8	7	C4PR2	15.7	100.1	7.3	103.6	96.6	96.5%	PASS				
C4 427	NORTH CELL 4	8	7	C4PR2	15.7	100.1	7.3	105.4	98.2	98.1%	PASS				
C4 428	NORTH CELL 4	8	7	C4PR2	15.7	100.1	6.6	102.8	96.4	96.3%	PASS				

COMMENTS:



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 23 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 429	NORTH EAST CELL 4	8	8	C4PR2	15.7	100.1	7.9	108.6	100.6	100.5%	PASS			
C4 430	NORTH EAST CELL 4	8	8	C4PR2	15.7	100.1	5.9	107	101.0	100.9%	PASS			
C4 431	EAST CELL 4	8	8	C4PR2	15.7	100.1	7.8	107.4	99.6	99.5%	PASS			
C4 432	EAST CELL 4	8	8	C4PR2	15.7	100.1	6.5	104.5	98.1	98.0%	PASS			
C4 433	EAST CELL 4	8	8	C4PR2	15.7	100.1	5.9	105.3	99.4	99.3%	PASS			
C4 434	EAST CELL 4	8	8	C4PR2	15.7	100.1	5.5	104.8	99.3	99.2%	PASS			
C4 435	EAST CELL 4	8	8	C4PR2	15.7	100.1	7.7	106.9	99.3	99.2%	PASS			
C4 436	EAST CELL 4	8	8	C4PR2	15.7	100.1	12	112.1	100.1	100.0%	PASS			
C4 437	EAST CELL 4	8	8	C4PR2	15.7	100.1	4.9	108.4	103.3	103.2%	PASS			
C4 438	S.E CORNER CELL 4	8	8	C4PR2	15.7	100.1	4.9	105	100.1	100.0%	PASS			
C4 439	SOUTH EAST CELL 4	8	8	C4PR2	15.7	100.1	5.8	108.9	102.9	102.8%	PASS			
C4 440	SOUTH EAST CELL 4	8	8	C4PR2	15.7	100.1	8.6	108.9	100.3	100.2%	PASS			

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLE C4429



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 24 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID MW

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 441	NORTH CELL 4	8	8	C4PR8	17.4	102.4	8.8	106.5	97.9	95.6%	PASS				
C4 442	NORTH CELL 4	8	8	C4PR8	17.4	102.4	5.9	108.7	102.6	100.2%	PASS				
C4 443	CENTER CELL 4	8	8	C4PR8	17.4	102.4	9.6	109.4	99.8	97.5%	PASS				
C4 444	CENTER CELL 4	8	8	C4PR8	17.4	102.4	9.7	112.6	102.6	100.2%	PASS				
C4 445	CENTER CELL 4	8	8	C4PR8	17.4	102.4	10	113.3	103.0	100.6%	PASS				
C4 446	SOUTH CELL 4	8	8	C4PR8	17.4	102.4	10.5	114	103.2	100.7%	PASS				
C4 447	SOUTH CELL 4	8	8	C4PR8	17.4	102.4	7.3	108.5	101.1	98.7%	PASS				
C4 448	SOUTH CELL 4	8	8	C4PR8	17.4	102.4	8.2	106.2	98.2	95.9%	PASS				
C4 449	CENTER CELL 4	8	8	C4PR8	17.4	102.4	6	109.5	103.3	100.9%	PASS				
C4 450	CENTER CELL 4	8	8	C4PR8	17.4	102.4	7.4	107.4	100.0	97.7%	PASS				
C4 451	CENTER CELL 4	8	8	C4PR8	17.4	102.4	6.6	107.9	101.2	98.8%	PASS				
C4 452	NORTH CELL 4	8	8	C4PR8	17.4	102.4	8.6	109.4	100.7	98.4%	PASS				
C4 453	NORTH CELL 4	8	8	C4PR8	17.4	102.4	9.2	108.7	99.5	97.2%	PASS				
C4 454	NORTH CELL 4	8	8	C4PR8	17.4	102.4	10.9	110	99.2	96.9%	PASS				

COMMENTS:



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT				OAK HAMMOCK DISPOSAL FACILITY			
LOCATION:		OSCEOLA COUNTY, FLORIDA		PROJECT NO.:		FQ0691	
DESCRIPTION:		CELL 4 CONSTRUCTION		DATE:		25 Day FEBRUARY Month 2005 Year	
				TASK NO.:		1	

	N/A	MOISTURE RANGE	LIFT THICKNESS COMPACTED	8-in
SPECIFICATION REQUIREMENTS:	ASTM D 698	95% COMPACTION		

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	QA ID	RH
			27657	

[illegible]COMMENTS:



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 28 Day FEBRUARY Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 463	NORTH EAST CELL 4	8	9	C4PR8	17.4	102.4	16.5	115.9	99.5	97.2%	PASS				
C4 464	NORTH EAST CELL 4	8	9	C4PR8	17.4	102.4	16.6	117.2	100.5	98.2%	PASS				
C4 465	NORTH EAST CELL 4	8	9	C4PR8	17.4	102.4	13.8	117.4	103.2	100.7%	PASS				
C4 466	EAST CELL 4	8	9	C4PR8	17.4	102.4	12.1	118.2	105.4	103.0%	PASS				
C4 467	EAST CELL 4	8	9	C4PR8	17.4	102.4	14.8	117.7	102.5	100.1%	PASS				
C4 468	EAST CELL 4	8	9	C4PR8	17.4	102.4	15.4	120.6	104.5	102.1%	PASS				
C4 469	EAST CELL 4	8	9	C4PR8	17.4	102.4	15.8	119.6	103.3	100.9%	PASS				
C4 470	SOUTH EAST CELL 4	8	9	C4PR8	17.4	102.4	18.4	115.3	97.4	95.1%	PASS				
C4 471	SOUTH EAST CELL 4	8	9	C4PR8	17.4	102.4	14.6	118.2	103.1	100.7%	PASS				
C4 472	SOUTH CELL 4	8	9	C4PR8	17.4	102.4	15.9	121.4	104.7	102.3%	PASS				
C4 473	SOUTH CELL 4	8	9	C4PR8	17.4	102.4	15.9	116.8	100.8	98.4%	PASS				
C4 474	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	16.2	119.2	102.6	100.2%	PASS				
C4 475	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	16.6	114.9	98.5	96.2%	PASS				
C4 476	WEST CELL 4	8	9	C4PR8	17.4	102.4	16.8	113.9	97.5	95.2%	PASS				
C4 477	WEST CELL 4	8	9	C4PR8	17.4	102.4	20.7	113.5	94.0	91.8%		FAIL	C4-478	PASS	

COMMENTS: START OF ELEVATION 89(C4-463)
DRIVE CYLINDER TAKEN ON SAMPLE C4 463



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ0691	TASK NO.:	1
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CELL 4 CONSTRUCTION

28	Day	FEBRUARY	Month	2005	Year
28	Day	FEBRUARY	Month	2005	Year

8-in	MOISTURE RANGE	COMPACTION	8-in
N/A	MOISTURE RANGE	COMPACTION	N/A
8-in	MOISTURE RANGE	COMPACTION	8-in

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	CORRECTION FACTOR Y =	N/A
		SILTY SAND		

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657	QA ID	RH
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[illegible]

COMMENTS:	START OF ELEVATION 89(C4-463)
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OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT				OAK HAMMOCK DISPOSAL FACILITY			
LOCATION:		OSCEOLA COUNTY, FLORIDA		PROJECT NO.:		1	
DESCRIPTION:		CELL 4 CONSTRUCTION		DATE:		1 Day	
				TASK NO.:		FQ0691	
				Month		MARCH	
				Year		2005	

SPECIFICATION REQUIREMENTS: ASTM D 698	95% COMPACTION	MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED	8-in
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MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =	N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657	QA ID	RH
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[illegible]

COMMENTS: C4-479 AND 480 TAKEN ON AREA WHERE EXISTING HAUL ROAD WAS REMOVED ON THE EAST SIDE (LIFT 6, ELEVATION 86)



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OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

DESCRIPTION:

CELL 4 CONSTRUCTION

PROJECT NO.: FQ0691

TASK NO.: 1

DATE: 3 Day

Month

2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 495	SOUTH EAST CELL 4	8	8	C4PR8	17.4	102.4	10.1	112.2	101.9	99.5%	PASS			
C4 496	NORTH EAST CELL 4	8	8	C4PR8	17.4	102.4	13.1	114.4	101.1	98.8%	PASS			
C4 497	EAST CELL 4	8	10	C4PR8	17.4	102.4	12	115.7	103.3	100.9%	PASS			
C4 498	EAST CELL 4	8	10	C4PR8	17.4	102.4	8.5	107.5	99.1	96.8%	PASS			
C4 499	SOUTH EAST CELL 4	8	10	C4PR8	17.4	102.4	9.2	111.8	102.4	100.0%	PASS			
C4 500	SOUTH EAST CELL 4	8	10	C4PR8	17.4	102.4	15.2	119.5	103.7	101.3%	PASS			
C4 501	EAST CELL 4	8	10	C4PR7	15.7	106.3	11.4	118.9	106.7	100.4%	PASS			
C4 502	EAST CELL 4	8	10	C4PR8	17.4	102.4	8.6	113	104.1	101.6%	PASS			
C4 503	EAST CELL 4	8	10	C4PR8	17.4	102.4	9.9	113.7	103.5	101.0%	PASS			
C4 504	NORTH EAST CELL 4	8	10	C4PR8	17.4	102.4	12.8	110	97.5	95.2%	PASS			
C4 505	NORTH CELL 4	8	10	C4PR8	17.4	102.4	12.2	111	98.9	96.6%	PASS			
C4 506	NORTH CELL 4	8	10	C4PR8	17.4	102.4	14.8	119.7	104.3	101.8%	PASS			

COMMENTS: MATERIAL FROM RIM DITCH CREATES DIFFERENT PROCTOR TO BE USED (C4PR-8) (C4PR-7)

DR-28 TAKEN ON SAMPLE C4-495



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

DESCRIPTION:

CELL 4 CONSTRUCTION

PROJECT NO.:

FQ0691

TASK NO.:

1

DATE:

Day

Month

Year

DATE: 4

MARCH

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

MW

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 507	NORTH EAST CELL 4	8	9	C4PR8	17.4	102.4	7.5	105.5	98.1	95.8%	PASS				
C4 508	NORTH EAST CELL 4	8	9	C4PR8	17.4	102.4	6.6	110.1	103.3	100.9%	PASS				
C4 509	EAST CELL 4	8	11	C4PR8	17.4	102.4	5.9	108.7	102.6	100.2%	PASS				
C4 510	EAST CELL 4	8	11	C4PR8	17.4	102.4	8.5	107.3	98.9	96.6%	PASS				
C4 511	EAST CELL 4	8	11	C4PR8	17.4	102.4	7	107.3	100.3	97.9%	PASS				
C4 512	EAST CELL 4	8	11	C4PR8	17.4	102.4	6.6	106.7	100.1	97.7%	PASS				
C4 513	EAST CELL 4	8	11	C4PR8	17.4	102.4	8.8	106.4	97.8	95.5%	PASS				
C4 514	EAST CELL 4	8	11	C4PR8	17.4	102.4	10.1	107.8	97.9	95.6%	PASS				
C4 515	EAST CELL 4	8	11	C4PR8	17.4	102.4	6.5	109.4	102.7	100.3%	PASS				
C4 516	S.E CORNER CELL 4	8	10	C4PR8	17.4	102.4	9.1	109.4	100.3	97.9%	PASS				
C4 517	NORTH EAST CELL 4	8	10	C4PR8	17.4	102.4	8.3	108.5	100.2	97.8%	PASS				
C4 518	SOUTH EAST CELL 4	8	11	C4PR8	17.4	102.4	8.5	107.2	98.8	96.5%	PASS				
C4 519	SOUTH EAST CELL 4	8	11	C4PR8	17.4	102.4	7.9	107.9	100.0	97.7%	PASS				
C4 520	SOUTH EAST CELL 4	8	11	C4PR8	17.4	102.4	7.4	110	102.4	100.0%	PASS				
C4 521	SOUTH EAST CELL 4	8	11	C4PR8	17.4	102.4	7.2	109.3	102.0	99.6%	PASS				

COMMENTS:



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT		OAK HAMMOCK DISPOSAL FACILITY					
LOCATION:	OSCEOLA COUNTY, FLORIDA	PROJECT NO.:	FQ0691	TASK NO.:	1		
DESCRIPTION:	CELL 4 CONSTRUCTION	DATE:	7	Day	MARCH	2005	Year
SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION		MOISTURE RANGE	N/A	LIFT THICKNESS COMPACTED		8-in	
MATERIAL SOURCE: BORROW AREA		MATERIAL TYPE	SILTY SAND	CORRECTION FACTOR Y =		N/A	
NUCLEAR GAUGE TYPE		Troxler 3430	GAUGE SERIAL	27657	QA ID	RH	

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST	
														PASS	FAIL
C4 522	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	10.2	111	100.7	98.4%	PASS				
C4 523	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	11	114.2	102.9	100.5%	PASS				
C4 524	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	9.6	112.2	102.4	100.0%	PASS				
C4 525	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	9.3	110.9	101.5	99.1%	PASS				
C4 526	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	9.4	110.6	101.1	98.7%	PASS				
C4 527	NORTH WEST CELL 4	8	10	C4PR8	17.4	102.4	9	111.1	101.9	99.5%	PASS				
C4 528	WEST CELL 4	8	10	C4PR8	17.4	102.4	5.6	108.2	102.5	100.1%	PASS				
C4 529	WEST CELL 4	8	10	C4PR8	17.4	102.4	5.7	109.1	103.2	100.8%	PASS				
C4 530	WEST CELL 4	8	10	C4PR8	17.4	102.4	8.2	107.5	99.4	97.0%	PASS				
C4 531	WEST CELL 4	8	10	C4PR8	17.4	102.4	9.6	107.8	98.4	96.1%	PASS				
C4 532	WEST CELL 4	8	10	C4PR8	17.4	102.4	10.1	106.9	97.1	94.8%		FAIL	C4533	PASS	
C4 533	WEST CELL 4	8	10	C4PR8	17.4	102.4	9.4	107.1	97.9	95.6%	PASS				
C4 534	SOUTH WEST CELL 4	8	10	C4PR8	17.4	102.4	9.1	109.5	100.4	98.0%	PASS				
C4 535	SOUTH WEST CELL 4	8	10	C4PR8	17.4	102.4	5.8	106.9	101.0	98.7%	PASS				
C4 536	SOUTH WEST CELL 4	8	10	C4PR8	17.4	102.4	10.4	108.4	98.2	95.9%	PASS				

COMMENTS: DRIVE CYLINDER TAKEN ON SAMPLE C4535



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

DESCRIPTION:

CELL 4 CONSTRUCTION

PROJECT NO.:

FQ0691

TASK NO.:

1

DATE:

7 Day

MARCH

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS								RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL	
C4 537	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	9.9	111	101.0	98.6%	PASS					
C4 538	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	8.7	114.2	105.1	102.6%	PASS					
C4 539	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	7.9	112.2	104.0	101.5%	PASS					
C4 540	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	10.1	110.9	100.7	98.4%	PASS					
C4 541	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	11.4	110.6	99.3	97.0%	PASS					
C4 542	NORTH WEST CELL 4	8	11	C4PR8	17.4	102.4	10.5	111.1	100.5	98.2%	PASS					
C4 543	WEST CELL 4	8	11	C4PR8	17.4	102.4	5.6	108.2	102.5	100.1%	PASS					
C4 544	WEST CELL 4	8	11	C4PR8	17.4	102.4	5.7	109.1	103.2	100.8%	PASS					
C4 545	WEST CELL 4	8	11	C4PR8	17.4	102.4	8.2	107.5	99.4	97.0%	PASS					
C4 546	WEST CELL 4	8	11	C4PR8	17.4	102.4	9.6	107.8	98.4	96.1%	PASS					
C4 547	WEST CELL 4	8	11	C4PR8	17.4	102.4	10.1	106.9	97.1	94.8%		FAIL	C4548	PASS		
C4 548	WEST CELL 4	8	11	C4PR8	17.4	102.4	9.4	107.1	97.9	95.6%	PASS					
C4 549	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	9.1	109.5	100.4	98.0%	PASS					
C4 550	NORTH CELL 4	8	11	C4PR2	15.7	100.1	6.5	109.4	102.7	102.6%	PASS					
C4 551	SOUTH WEST CELL 4	8	11	C4PR8	17.4	102.4	10.4	108.4	98.2	95.9%	PASS					

COMMENTS:



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 8 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 552	SOUTH CELL 4	8	12	C4PR10	14.1	101.5	5.9	111.8	105.6	104.0%	PASS				
C4 553	SOUTH CELL 4	8	12	C4PR10	14.1	101.5	4.9	112.9	107.6	106.0%	PASS				
C4 554	SOUTH CELL 4	8	12	C4PR10	14.1	101.5	5.9	110.7	104.5	103.0%	PASS				
C4 555	SOUTH CELL 4	8	12	C4PR10	14.1	101.5	7.6	113.3	105.3	103.7%	PASS				
C4 556	SOUTH CELL 4	8	12	C4PR10	14.1	101.5	6.6	107.5	100.8	99.4%	PASS				
C4 557	SOUTH EAST CELL 4	8	12	C4PR10	14.1	101.5	10.5	111.1	100.5	99.1%	PASS				
C4 558	SOUTH EAST CELL 4	8	12	C4PR10	14.1	101.5	7.1	107	99.9	98.4%	PASS				
C4 559	S.E.CORNER CELL 4	8	12	C4PR10	14.1	101.5	8	109.4	101.3	99.8%	PASS				
C4 560	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	6.6	102.5	96.2	94.7%		FAIL	C4561		FAIL
C4 561	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	6.1	102.1	96.2	94.8%		FAIL	C4562	PASS	
C4 562	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	5.9	105.7	99.8	98.3%	PASS				
C4 563	CENTER CELL 4	8	12	C4PR10	14.1	101.5	6.1	104.1	98.1	96.7%	PASS				
C4 564	CENTER CELL 4	8	12	C4PR10	14.1	101.5	5.4	105.6	100.2	98.7%	PASS				
C4 565	NORTH CELL 4	8	12	C4PR10	14.1	101.5	5.9	103.6	97.8	96.4%	PASS				

COMMENTS: DRIVE CYLINDER (DR-31) TAKEN ON TEST C4-560



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:	FQ0691	TASK NO.:	1
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DESCRIPTION:

CELL 4 CONSTRUCTION

DATE: 9 Day

MARCH Month 20

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR $Y =$

N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657
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QA ID	RH
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
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27	1
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83	1
84	1
85	1
86	1
87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

RH

[illegible]

COMMENTS: ALL TESTS WERE DONE ON GRADED SIDE SLOPES OF SOUTH BERM AND EAST BERM (RETESTS MAY OCCUR IF EROSION OCCURS)



GEOSYNTEC CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

LOCATION:

OSCEOLA COUNTY, FLORIDA

PROJECT NO.:

FQ0691

TASK NO.:

1

DESCRIPTION:

CELL 4 CONSTRUCTION

DATE:

10

Day

MARCH

Month

2005

Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

MOISTURE RANGE

N/A

LIFT THICKNESS COMPACTED

8-in

MATERIAL SOURCE:

BORROW AREA

MATERIAL TYPE

SILTY SAND

CORRECTION FACTOR Y =

N/A

NUCLEAR GAUGE TYPE

Troxler 3430

GAUGE SERIAL

27657

QA ID

RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 577	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	7.6	106.3	98.8	97.3%	PASS				
C4 578	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	10.4	109.1	98.8	97.4%	PASS				
C4 579	SOUTH WEST CELL 4	8	12	C4PR10	14.1	101.5	10.6	113.2	102.4	100.8%	PASS				
C4 580	NORTH EAST CELL 4	8	12	C4PR10	14.1	101.5	8.5	108.2	99.7	98.2%	PASS				
C4 581	NORTH EAST CELL 4	8	12	C4PR10	14.1	101.5	12.5	113.9	101.2	99.7%	PASS				
C4 582	WEST CELL 4	8	12	C4PR10	14.1	101.5	8.2	104.7	96.8	95.3%	PASS				
C4 583	S.E.CORNER CELL 4	8	12	C4PR10	14.1	101.5	8.4	104.7	96.6	95.2%	PASS				
C4 584	NORTH WEST CELL 4	8	12	C4PR10	14.1	101.5	7.8	103.9	96.4	95.0%	PASS				
C4 585	SOUTH CELL 4	8	13	C4PR10	14.1	101.5	9.6	109.2	99.6	98.2%	PASS				
C4 586	SOUTH CELL 4	8	13	C4PR10	14.1	101.5	8.6	111.7	102.9	101.3%	PASS				
C4 587	SOUTH CELL 4	8	13	C4PR10	14.1	101.5	9.4	108	98.7	97.3%	PASS				
C4 588	SOUTH EAST CELL 4	8	13	C4PR10	14.1	101.5	8.2	111	102.6	101.1%	PASS				
C4 589	SOUTH EAST CELL 4	8	13	C4PR10	14.1	101.5	8	104.6	96.9	95.4%	PASS				
C4 590	EAST CELL 4	8	13	C4PR10	14.1	101.5	9	110.5	101.4	99.9%	PASS				
C4 591	EAST CELL 4	8	13	C4PR10	14.1	101.5	8.1	108	99.9	98.4%	PASS				

COMMENTS:



OMNI WASTE

(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

1

Year

8-in

N/A

RH

[illegible]

COMMENTS:



GEO SYNTec CONSULTANTS

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 11 Day MARCH Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 597	SOUTH WEST CELL 4	8	14	C4PR8	17.4	102.4	4.8	111	105.9		103.4%	PASS			
C4 598	SOUTH WEST CELL 4	8	14	C4PR8	17.4	102.4	4	108.3	104.1		101.7%	PASS			
C4 599	SOUTH WEST CELL 4	8	14	C4PR8	17.4	102.4	6	113.5	107.1		104.6%	PASS			
C4 600	NORTH EAST CELL 4	8	14	C4PR8	17.4	102.4	4.6	107.7	103.0		100.6%	PASS			
C4 601	NORTH EAST CELL 4	8	14	C4PR8	17.4	102.4	6.5	106.8	100.3		97.9%	PASS			
C4 602	WEST CELL 4	8	14	C4PR8	17.4	102.4	6.8	105.6	98.9		96.6%	PASS			
C4 603	S.E.CORNER CELL 4	8	14	C4PR8	17.4	102.4	7.3	109.6	102.1		99.7%	PASS			
C4 604	NORTH WEST CELL 4	8	14	C4PR8	17.4	102.4	8	113.7	105.3		102.8%	PASS			
C4 605	SOUTH CELL 4	8	13	C4PR8	17.4	102.4	7.1	107.5	100.4		98.0%	PASS			
C4 606	SOUTH CELL 4	8	13	C4PR8	17.4	102.4	7.2	109.5	102.1		99.8%	PASS			
C4 607	SOUTH CELL 4	8	13	C4PR8	17.4	102.4	6.8	106.2	99.4		97.1%	PASS			
C4 608	SOUTH EAST CELL 4	8	13	C4PR8	17.4	102.4	8.5	107.4	99.0		96.7%	PASS			

COMMENTS: TESTS C4-597-C4604 WERE TAKEN ON INTERIOR BERMS, OTHER TESTS TAKEN ON EAST SIDE RUN OUT BERM AREA
DRIVE CYLINDER TAKEN ON TEST ON C4-597



Geosyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 12 Day MARCH Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 609	SOUTH EAST CELL 4	8	13	C4PR8	17.4	102.4	4.7	103.2	98.6	96.3%	PASS				
C4 610	SOUTH WEST CELL 4	8	13	C4PR8	17.4	102.4	4.7	107.1	102.3	99.9%	PASS				
C4 611	WEST CELL 4	8	13	C4PR8	17.4	102.4	6.7	104.6	98.0	95.7%	PASS				
C4 612	NORTH WEST CELL 4	8	13	C4PR8	17.4	102.4	5.8	107	101.1	98.8%	PASS				
C4 613	EAST CELL 4	8	13	C4PR8	17.4	102.4	4.8	106.7	101.8	99.4%	PASS				
C4 614	NORTH CELL 4	8	13	C4PR8	17.4	102.4	5.6	105.5	99.9	97.6%	PASS				
C4 615	EAST CELL 4	8	15	C4PR8	17.4	102.4	4.9	105.7	100.8	98.4%	PASS				
C4 616	SOUTH EAST CELL 4	8	15	C4PR8	17.4	102.4	4.9	105.8	100.9	98.5%	PASS				
C4 617	NORTH EAST CELL 4	8	15	C4PR7	15.7	106.3	7	109.6	102.4	96.4%	PASS				
C4 618	NORTH CELL 4	8	15	C4PR8	17.4	102.4	5.3	104.5	99.2	96.9%	PASS				
C4 619	SOUTH WEST CELL 4	8	15	C4PR8	17.4	102.4	5.1	104.9	99.8	97.5%	PASS				
C4 620	SOUTH CELL 4	8	15	C4PR7	15.7	106.3	6.2	112.6	106.0	99.7%	PASS				
C4 621	SOUTH CELL 4	8	15	C4PR7	15.7	106.3	6.8	112.6	105.4	99.2%	PASS				
C4 622	SOUTH CELL 4	8	15	C4PR7	15.7	106.3	5.3	109.6	104.1	97.9%	PASS				
C4 623	SOUTH CELL 4	8	15	C4PR7	15.7	106.3	6.3	112.3	105.6	99.4%	PASS				

COMMENTS: C4-615 TO C4-620 TAKEN ON EAST INNER CELL BERM AREA
C4-621 TO C4-623 TAKEN ON SOUTHERN BERM AREA
C4-609-TO C4-614 TAKEN ON WEST SIDE OF EAST INNER CELL BERM



OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT

OAK HAMMOCK DISPOSAL FACILITY

OSCEOLA COUNTY, FLORIDA

TASK NO.: 1

DESCRIPTION:	CELL 4 CONSTRUCTION:
1. The cell is constructed of 1/2" thick concrete blocks, 16" high, 16" wide, and 16" deep. The blocks are laid in a running bond pattern, with the vertical joints staggered. The blocks are set in a 1/2" thick bed of mortar. The mortar is made of 1 part cement, 2 parts sand, and 1 part water. 2. The cell is constructed of 1/2" thick concrete blocks, 16" high, 16" wide, and 16" deep. The blocks are laid in a running bond pattern, with the vertical joints staggered. The blocks are set in a 1/2" thick bed of mortar. The mortar is made of 1 part cement, 2 parts sand, and 1 part water.	1. The cell is constructed of 1/2" thick concrete blocks, 16" high, 16" wide, and 16" deep. The blocks are laid in a running bond pattern, with the vertical joints staggered. The blocks are set in a 1/2" thick bed of mortar. The mortar is made of 1 part cement, 2 parts sand, and 1 part water. 2. The cell is constructed of 1/2" thick concrete blocks, 16" high, 16" wide, and 16" deep. The blocks are laid in a running bond pattern, with the vertical joints staggered. The blocks are set in a 1/2" thick bed of mortar. The mortar is made of 1 part cement, 2 parts sand, and 1 part water.

DATE: 12 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION

LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE:	BORROW AREA	MATERIAL TYPE
		SILTY SAND

CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE	Troxler 3430	GAUGE SERIAL	27657
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QA ID	RH
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
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87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

[illegible]

COMMENTS: TEST C4-624 TO C4-627 TAKEN ON SOUTHERN BERM
DRIVE CYLINDER (DR-33) TAKEN ON TEST C4-626



GeoSyntec Consultants

OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 12 Day MARCH Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 628	NORTH CELL 4	8	16	C4PR8	17.4	102.4	6.3	104.8	98.6	96.3%	PASS				
C4 629	SOUTH EAST CELL 4	8	16	C4PR7	15.7	106.3	5.4	110.2	104.6	98.4%	PASS				
C4 630	SOUTH EAST CELL 4	8	16	C4PR7	15.7	106.3	4.7	112.4	107.4	101.0%	PASS				
C4 631	EAST CELL 4	8	16	C4PR8	17.4	102.4	7.6	107.9	100.3	97.9%	PASS				
C4 632	EAST CELL 4	8	16	C4PR8	17.4	102.4	6.7	108.1	101.3	98.9%	PASS				
C4 633	NORTH EAST CELL 4	8	14	C4PR8	17.4	102.4	5.3	102.5	97.3	95.1%	PASS				
C4 634	SOUTH EAST CELL 4	8	14	C4PR8	17.4	102.4	4.6	104	99.4	97.1%	PASS				
C4 635	SOUTH WEST CELL 4	8	14	C4PR8	17.4	102.4	4.4	104	99.6	97.3%	PASS				
C4 636	WEST CELL 4	8	14	C4PR8	17.4	102.4	6.1	105.7	99.6	97.3%	PASS				
C4 637	NORTH WEST CELL 4	8	14	C4PR7	15.7	106.3	6.4	114.2	107.3	101.0%	PASS				
C4 638	SOUTH WEST CELL 4	8	16	C4PR8	17.4	102.4	5.1	104.9	99.8	97.5%	PASS				
C4 639	SOUTH CELL 4	8	16	C4PR7	15.7	106.3	6.2	112.6	106.0	99.7%	PASS				
C4 640	SOUTH CELL 4	8	16	C4PR7	15.7	106.3	6.8	112.6	105.4	99.2%	PASS				
C4 641	SOUTH EAST CELL 4	8	16	C4PR7	15.7	106.3	5.3	109.6	104.1	97.9%	PASS				
C4 642	S. E. CORNER CELL 4	8	16	C4PR7	15.7	106.3	6.3	112.3	105.6	99.4%	PASS				

COMMENTS: C4-628 TO C4-632 TAKEN ON EAST INNER CELL BERM AREA
C4-638 TO C4-643 TAKEN ON SOUTHERN BERM AREA
C4-633-TO C4-637 TAKEN ON WEST SIDE OF EAST INNER CELL BERM



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 14 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST	
														PASS	FAIL
C4 643	S. E. CORNER CELL 4	8	17	C4PR8	17.4	102.4	5.1	107.3	102.1	99.7%	PASS				
C4 644	SOUTH EAST CELL 4	8	15	C4PR8	17.4	102.4	4.8	103.6	98.9	96.5%	PASS				
C4 645	SOUTH WEST CELL 4	8	15	C4PR8	17.4	102.4	4.7	107.5	102.7	100.3%	PASS				
C4 646	WEST CELL 4	8	15	C4PR8	17.4	102.4	5.1	107.3	102.1	99.7%	PASS				
C4 647	NORTH WEST CELL 4	8	15	C4PR8	17.4	102.4	6.9	103.6	96.9	94.6%		FAIL	C4-648	PASS	
C4 648	NORTH WEST CELL 4	8	15	C4PR8	17.4	102.4	5.1	107.5	102.3	99.9%	PASS				
C4 649	NORTH CELL 4	8	15	C4PR8	17.4	102.4	4.6	106.4	101.7	99.3%	PASS				
C4 650	NORTH CELL 4	8	15	C4PR8	17.4	102.4	5.1	111.3	105.9	103.4%	PASS				
C4 651	EAST CELL 4	8	15	C4PR8	17.4	102.4	4.6	108.4	103.6	101.2%	PASS				
C4 652	SOUTH CELL 4	8	17	C4PR8	17.4	102.4	5.1	107.1	101.9	99.5%	PASS				
C4 653	SOUTH CELL 4	8	17	C4PR8	17.4	102.4	5.3	106.5	101.1	98.8%	PASS				
C4 654	SOUTH WEST CELL 4	8	17	C4PR8	17.4	102.4	4.4	107.3	102.8	100.4%	PASS				
C4 655	S. W. CORNER CELL 4	8	17	C4PR8	17.4	102.4	4.8	108.7	103.7	101.3%	PASS				
C4 656	SOUTH EAST CELL 4	8	17	C4PR8	17.4	102.4	5.1	112	106.6	104.1%	PASS				
C4 657	SOUTH WEST CELL 4	8	17	C4PR8	17.4	102.4	5.4	109.8	104.2	101.7%	PASS				

COMMENTS: C4-644 TO C4-651 TESTS WERE TAKEN ON WEST SIDE OF EAST INNER CELL BERM AREA

C4-643, C4-652 TO C4-655 TESTS WERE TAKEN ON SOUTH BERM IN CELL 4

C4-656 AND C4-657 WAS TAKEN ON SOUTH EAST END OF EAST INNER CELL BERM



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 14 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST	
														PASS	FAIL
C4 658	SOUTH EAST CELL 4	8	14	C4PR8	17.4	102.4	6.1	109.4	103.1	100.7%	PASS				
C4 659	SOUTH WEST CELL 4	8	14	C4PR8	17.4	102.4	4.3	106.8	102.4	100.0%	PASS				
C4 660	EAST CELL 4	8	14	C4PR8	17.4	102.4	5.2	103.5	98.4	96.1%	PASS				
C4 661	EAST CELL 4	8	14	C4PR8	17.4	102.4	5.8	105.9	100.1	97.7%	PASS				
C4 662	EAST CELL 4	8	14	C4PR8	17.4	102.4	5.2	103.2	98.1	95.8%	PASS				
C4 663	EAST CELL 4	8	14	C4PR8	17.4	102.4	6.7	106.8	100.1	97.7%	PASS				
C4 664	NORTH EAST CELL 4	8	14	C4PR8	17.4	102.4	6.4	104.1	97.8	95.5%	PASS				
C4 665	SOUTH EAST CELL 4	8	17	C4PR8	17.4	102.4	4.4	108.9	104.3	101.9%	PASS				
C4 666	SOUTH WEST CELL 4	8	17	C4PR8	17.4	102.4	5.1	104.3	99.2	96.9%	PASS				
C4 667	EAST CELL 4	8	17	C4PR8	17.4	102.4	4.9	107.8	102.8	100.4%	PASS				
C4 668	WEST CELL 4	8	17	C4PR8	17.4	102.4	5.1	106.2	101.0	98.7%	PASS				
C4 669	EAST CELL 4	8	17	C4PR8	17.4	102.4	5.8	107.9	102.0	99.6%	PASS				
C4 670	WEST CELL 4	8	17	C4PR8	17.4	102.4	4.7	107.7	102.9	100.5%	PASS				
C4 671	EAST CELL 4	8	17	C4PR8	17.4	102.4	5.2	109.3	103.9	101.5%	PASS				
C4 672	WEST CELL 4	8	17	C4PR8	17.4	102.4	5.5	109.1	103.4	101.0%	PASS				

COMMENTS: TESTS C4-658 TO C4-664 WERE TAKEN ON EAST RUN OUT BERM AREA IN CELL 4
TESTS C4-665-C4-672 WERE TAKEN ON EAST INNER CELL BERM AREA IN CELL 4



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 14 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 673	SOUTH EAST CELL 4	8	16	C4PR8	17.4	102.4	11.6	118.1	105.8	103.3%	PASS				
C4 674	SOUTH WEST CELL 4	8	16	C4PR8	17.4	102.4	11.6	112.8	101.1	98.7%	PASS				
C4 675	WEST CELL 4	8	16	C4PR8	17.4	102.4	7.7	106.3	98.7	96.4%	PASS				
C4 676	NORTH CELL 4	8	16	C4PR8	17.4	102.4	11.4	110.7	99.4	97.0%	PASS				
C4 677	EAST CELL 4	8	16	C4PR8	17.4	102.4	6.7	105.1	98.5	96.2%	PASS				
C4 678	NORTH WEST CELL 4	8	15	C4PR8	17.4	102.4	6.6	109.2	102.4	100.0%	PASS				
C4 679	NORTH EAST CELL 4	8	15	C4PR8	17.4	102.4	11.2	113.3	101.9	99.5%	PASS				
C4 680	EAST CELL 4	8	15	C4PR8	17.4	102.4	11	113	101.8	99.4%	PASS				
C4 681	WEST CELL 4	8	15	C4PR8	17.4	102.4	10.4	110.9	100.5	98.1%	PASS				
C4 682	SOUTH WEST CELL 4	8	15	C4PR8	17.4	102.4	11.7	117	104.7	102.3%	PASS				
C4 683	SOUTH EAST CELL 4	8	15	C4PR8	17.4	102.4	10.1	112.8	102.5	100.1%	PASS				
C4 684	S. W. CORNER CELL 4	8	15	C4PR8	17.4	102.4	9.9	110.7	100.7	98.4%	PASS				
C4 685	S. E. CORNER CELL 4	8	15	C4PR8	17.4	102.4	14	115.1	101.0	98.6%	PASS				
C4 686	S. E. CORNER CELL 4	8	18	C4PR8	17.4	102.4	12.3	119.1	106.1	103.6%	PASS				
C4 687	SOUTH CELL 4	8	18	C4PR8	17.4	102.4	11.5	110.9	99.5	97.1%	PASS				

COMMENTS: C4-673 TO C4-677 TESTS WERE TAKEN ON WEST SIDE OF EAST INNER CELL BERM AREA
C4-677 TO C4-685 TESTS WERE TAKEN ON EAST SIDE OF INNER CELL BERM
C4-686 AND C4-687 WERE TAKEN ON SOUTH BERM



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT		OAK HAMMOCK DISPOSAL FACILITY	
LOCATION:	OSCEOLA COUNTY, FLORIDA	PROJECT NO.:	FQ0691
DESCRIPTION	CELL 4 CONSTRUCTION	DATE:	15 Day
			MARCH
			2005
			Year
SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION		MOISTURE RANGE	N/A
		LIFT THICKNESS COMPACTED	8-in
MATERIAL SOURCE: BORROW AREA		MATERIAL TYPE	SILTY SAND
		CORRECTION FACTOR Y =	N/A
NUCLEAR GAUGE TYPE		Troxler 3430	GAUGE SERIAL
			27657
		QA ID	RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 688	SOUTH CELL 4	8	18	C4PR9	14.6	106.4	11.2	113.3	101.9	95.8%	PASS				
C4 689	SOUTH CELL 4	8	18	C4PR9	14.6	106.4	11.7	117	104.7	98.4%	PASS				
C4 690	SOUTH CELL 4	8	18	C4PR9	14.6	106.4	8.9	110.7	101.7	95.5%	PASS				
C4 691	SOUTH WEST CELL 4	8	18	C4PR9	14.6	106.4	10	114	103.6	97.4%	PASS				
C4 692	SOUTH WEST CELL 4	8	18	C4PR9	14.6	106.4	10.1	115.8	105.2	98.9%	PASS				
C4 693	SOUTH EAST CELL 4	8	18	C4PR9	14.6	106.4	11.3	113.3	101.8	95.7%	PASS				
C4 694	SOUTH EAST CELL 4	8	18	C4PR9	14.6	106.4	11.8	117.6	105.2	98.9%	PASS				
C4 695	EAST CELL 4	8	18	C4PR9	14.6	106.4	8.6	116.5	107.3	100.8%	PASS				
C4 696	SOUTH WEST CELL 4	8	19	C4PR8	17.4	102.4	8.6	106.5	98.1	95.8%	PASS				
C4 697	SOUTH CELL 4	8	19	C4PR8	17.4	102.4	11.7	109	97.6	95.3%	PASS				
C4 698	SOUTH EAST CELL 4	8	19	C4PR8	17.4	102.4	8.3	109.5	101.1	98.7%	PASS				
C4 699	SOUTH EAST CELL 4	8	19	C4PR8	17.4	102.4	6.9	105.9	99.1	96.7%	PASS				
C4 700	SOUTH EAST CELL 4	8	19	C4PR8	17.4	102.4	7.7	106.3	98.7	96.4%	PASS				
C4 701	NORTH EAST CELL 4	8	18	C4PR8	17.4	102.4	9	108.2	99.3	96.9%	PASS				
C4 702	SOUTH WEST CELL 4	8	18	C4PR8	17.4	102.4	9.5	111.2	101.6	99.2%	PASS				

COMMENTS:	C4-688 TO C4-695 TESTS WERE TAKEN ON SOUTH CELL 4 BERM AREA
	C4-696 TO C4-700 TESTS WERE TAKEN ON EAST INNER CELL BERM
	C4-701 AND C4-702 WERE TAKEN ON WEST SIDE OF EAST INNER CELL BERM BERM



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(ASTM D 3017 AND ASTM D 2922)

OAK HAMMOCK DISPOSAL FACILITY

OSCEOLA COUNTY, FLORIDA

1:

CELL 4 CONSTRUCTION

DATE:	15	Day	MARCH	Month	2005	Year
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LIFT THICKNESS COMPACTED 8-in

N/A

QA ID	RH
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1
31	1
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	1
40	1
41	1
42	1
43	1
44	1
45	1
46	1
47	1
48	1
49	1
50	1
51	1
52	1
53	1
54	1
55	1
56	1
57	1
58	1
59	1
60	1
61	1
62	1
63	1
64	1
65	1
66	1
67	1
68	1
69	1
70	1
71	1
72	1
73	1
74	1
75	1
76	1
77	1
78	1
79	1
80	1
81	1
82	1
83	1
84	1
85	1
86	1
87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 703	WEST CELL 4	8	3	C4PR9	14.6	106.4	7.3	110	102.5	96.3%	PASS				
C4 704	WEST CELL 4	8	3	C4PR9	14.6	106.4	12.1	117.9	105.2	98.8%	PASS				
C4 705	SOUTH WEST CELL 4	8	3	C4PR9	14.6	106.4	12.2	117.9	105.1	98.8%	PASS				
C4 706	SOUTH WEST CELL 4	8	20	C4PR9	14.6	106.4	12.7	117.6	104.3	98.1%	PASS				
C4 707	SOUTH WEST CELL 4	8	20	C4PR9	14.6	106.4	8.2	116.7	107.9	101.4%	PASS				
C4 708	SOUTH EAST CELL 4	8	20	C4PR9	14.6	106.4	7.9	116.3	107.8	101.3%	PASS				
C4 709	SOUTH EAST CELL 4	8	20	C4PR9	14.6	106.4	7.8	114	105.8	99.4%	PASS				
C4 710	SOUTH EAST CELL 4	8	20	C4PR9	14.6	106.4	13	121.2	107.3	100.8%	PASS				
C4 711	SOUTH CELL 4	8	17	C4PR9	14.6	106.4	6	115.1	108.6	102.1%	PASS				
C4 712	SOUTH CELL 4	8	17	C4PR9	14.6	106.4	8.7	115.6	106.3	100.0%	PASS				
C4 713	SOUTH CELL 4	8	17	C4PR9	14.6	106.4	7.8	109.3	101.4	95.3%	PASS				
C4 714	SOUTH CELL 4	8	17	C4PR9	14.6	106.4	12.1	120.1	107.1	100.7%	PASS				
C4 715	SOUTH EAST CELL 4	8	19	C4PR9	14.6	106.4	8.2	114	105.4	99.0%	PASS				
C4 716	SOUTH EAST CELL 4	8	19	C4PR9	14.6	106.4	6	109.1	102.9	96.7%	PASS				
C4 717	EAST CELL 4	8	19	C4PR9	14.6	106.4	7	110	102.8	96.6%	PASS				

C4-706 TESTS WERE TAKEN ON DRAINAGE DITCH ON WEST END OF CELL 4

C4-707 TO C4-710 TESTS WERE TAKEN ON SOUTH CELL 4 BERM

C4-711 TO C4-714 WERE TAKEN ON EAST SIDE OF EAST INNER CELL BERM BERM



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA
DESCRIPTION: CELL 4 CONSTRUCTION
PROJECT NO.: FQ0691
TASK NO.: 1
DATE: 16 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION
MOISTURE RANGE: N/A
LIFT THICKNESS COMPACTED: 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID CJ

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST PASS FAIL
C4 718	EAST CELL 4	8	19	C4PR8	17.4	102.4	10.8	111.2	100.4	98.0%	PASS			
C4 719	EAST CELL 4	8	19	C4PR8	17.4	102.4	6.8	106.4	99.6	97.3%	PASS			
C4 720	EAST CELL 4	8	19	C4PR8	17.4	102.4	5.9	107.1	101.1	98.8%	PASS			
C4 721	NORTH EAST CELL 4	8	19	C4PR8	17.4	102.4	8.4	109.5	101.0	98.6%	PASS			
C4 722	NORTH EAST CELL 4	8	19	C4PR8	17.4	102.4	8.4	108.3	99.9	97.6%	PASS			
C4 723	NORTH CELL 4	8	19	C4PR8	17.4	102.4	9.4	109.5	100.1	97.7%	PASS			
C4 724	NORTH CELL 4	8	19	C4PR8	17.4	102.4	7.5	109.5	101.9	99.5%	PASS			
C4 725	SOUTH WEST CELL 4	8	4	C4PR7	15.7	106.3	8.2	114.7	106.0	99.7%	PASS			
C4 726	SOUTH WEST CELL 4	8	4	C4PR7	15.7	106.3	8	112.2	103.9	97.7%	PASS			
C4 727	SOUTH CELL 4	8	4	C4PR8	17.4	102.4	6.9	108.7	101.7	99.3%	PASS			
C4 728	NORTH CELL 4	8	4	C4PR7	15.7	106.3	8.8	116.2	106.8	100.5%	PASS			
C4 729	SOUTH CELL 4	8	5	C4PR7	15.7	106.3	7.4	111.8	104.1	97.9%		FAIL	C4-747	PASS
C4 730	SOUTH CELL 4	8	5	C4PR8	17.4	102.4	10.4	110.5	100.1	97.7%		FAIL	C4-748	PASS
C4 731	NORTH CELL 4	8	5	C4PR7	15.7	106.3	9.6	116.3	106.1	99.8%		FAIL	C4-749	PASS
C4 732	SOUTH EAST CELL 4	8	21	C4PR7	15.7	106.3	7.8	111.6	103.5	97.4%	PASS			

COMMENTS: C4-718 TO C4-724 WERE TAKEN ON EAST INNER CELL BERM

C4-729 TO C4-731 TESTS WERE TAKEN ON DRAINAGE DITCH ON WEST END OF CELL 4 (Elev. 84 and 85) AREA FAILED DUE TO PUMPING

C4-732 WERE TAKEN ON SOUTH EAST CORNER OF SOUTH BERM



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OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 16 Day MARCH Month 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID CJ

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 733	SOUTH EAST CELL 4	8	21	C4PR7	15.7	106.3	5.9	109.3	103.2	97.1%	PASS				
C4 734	SOUTH EAST CELL 4	8	22	C4PR7	15.7	106.3	8.6	116.5	107.3	100.9%	PASS				
C4 735	SOUTH EAST CELL 4	8	22	C4PR7	15.7	106.3	11.6	119	106.6	100.3%	PASS				
C4 736	SOUTH EAST CELL 4	8	20	C4PR7	15.7	106.3	8.3	112	103.4	97.3%	PASS				
C4 737	EAST CELL 4	8	20	C4PR7	15.7	106.3	8	109.7	101.6	95.6%	PASS				
C4 738	EAST CELL 4	8	20	C4PR7	15.7	106.3	9.8	113.9	103.7	97.6%	PASS				
C4 739	EAST CELL 4	8	20	C4PR7	15.7	106.3	12.3	114.6	102.0	96.0%	PASS				
C4 740	EAST CELL 4	8	20	C4PR7	15.7	106.3	8.9	113.8	104.5	98.3%	PASS				
C4 741	NORTH EAST CELL 4	8	20	C4PR7	15.7	106.3	9.9	113.7	103.5	97.3%	PASS				
C4 742	NORTH EAST CELL 4	8	20	C4PR7	15.7	106.3	9.9	112	101.9	95.9%	PASS				
C4 743	NORTH EAST CELL 4	8	20	C4PR7	15.7	106.3	7.5	112.7	104.8	98.6%	PASS				
C4 744	NORTH CELL 4	8	20	C4PR7	15.7	106.3	8.8	116.3	106.9	100.6%	PASS				
C4 745	NORTH CELL 4	8	20	C4PR7	15.7	106.3	9.9	113.1	102.9	96.8%	PASS				
C4 746	NORTH CELL 4	8	20	C4PR7	15.7	106.3	9.6	111.8	102.0	96.0%	PASS				
C4 747	SOUTH WEST CELL 4	8	5	C4PR7	15.7	106.3	9.5	111.4	101.7	95.7%	PASS				

COMMENTS: C4-733 TO C4-735 WERE TAKEN ON SOUTH BERM

C4-736 TO C4-746 TESTS WERE TAKEN ON EAST INNER CELL BERM

C4-747 WERE TAKEN ON DRAINAGE CHANNEL AREA THAT FAILED ON 3-15-04 DUE TO EXCESSIVE MOISTURE



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OMNI WASTE

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 16 Day MARCH 2005 Month Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID CJ

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	RETEST PASS FAIL
C4 748	SOUTH WEST CELL 4	8	5	C4PR7	15.7	106.3	8.9	114.7	105.3	99.1%	PASS			
C4 749	SOUTH WEST CELL 4	8	5	C4PR7	15.7	106.3	10.2	115.2	104.5	98.3%	PASS			
C4 750	SOUTH EAST CELL 4	8	21	C4PR7	15.7	106.3	7.9	117.8	109.2	102.7%	PASS			
C4 751	SOUTH EAST CELL 4	8	21	C4PR7	15.7	106.3	6.8	112.4	105.2	99.0%	PASS			
C4 752	EAST CELL 4	8	21	C4PR7	15.7	106.3	8.9	111.6	102.5	96.4%	PASS			
C4 753	EAST CELL 4	8	21	C4PR7	15.7	106.3	9.2	110.3	101.0	95.0%	PASS			
C4 754	EAST CELL 4	8	21	C4PR7	15.7	106.3	10.2	115.1	104.4	98.3%	PASS			
C4 755	EAST CELL 4	8	21	C4PR7	15.7	106.3	10.3	113.2	102.6	96.5%	PASS			
C4 756	EAST CELL 4	8	21	C4PR8	17.4	102.4	8.4	105.4	97.2	95.0%	PASS			
C4 757	NORTH EAST CELL 4	8	21	C4PR8	17.4	102.4	11.7	109.4	97.9	95.6%	PASS			
C4 758	NORTH EAST CELL 4	8	21	C4PR8	17.4	102.4	9.8	109.3	99.5	97.2%	PASS			
C4 759	NORTH EAST CELL 4	8	21	C4PR8	17.4	102.4	8.2	110.3	101.9	99.6%	PASS			
C4 760	SOUTH WEST CELL 4	8	6	C4PR8	17.4	102.4	7	109	101.9	99.5%	PASS			
C4 761	SOUTH WEST CELL 4	8	6	C4PR8	17.4	102.4	7	109	101.9	99.5%	PASS			
C4 762	WEST CELL 4	8	6	C4PR8	17.4	102.4	11.6	110.6	99.1	96.8%	PASS			

COMMENTS: C4-748 TO C4-749 WERE RETESTS TAKEN ON DRAINAGE CHANNEL DUE TO EXCESSIVE MOISTURE
C4-750 TO C4-759 TESTS WERE TAKEN ON EAST INNER CELL BERM
C4-760 TO C4-762 WERE TAKEN ON DRAINAGE CHANNEL WEST END OF CELL 4



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: OAK HAMMOCK DISPOSAL FACILITY
LOCATION: OSCEOLA COUNTY, FLORIDA
DESCRIPTION: CELL 4 CONSTRUCTION
PROJECT NO.: FQ0691
TASK NO.: 1
DATE: 16 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION
MOISTURE RANGE: N/A
LIFT THICKNESS COMPACTED: 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID CJ/RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS						RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS
C4 763	SOUTH WEST CELL 4	8	6	C4PR8	17.4	102.4	6.2	106.2	100.0	97.7%	PASS			
C4 764	SOUTH WEST CELL 4	8	6	C4PR8	17.4	102.4	8.2	105.4	97.4	95.1%	PASS			
C4 765	SOUTH EAST CELL 4	8	6	C4PR8	17.4	102.4	9.4	110.9	101.4	99.0%	PASS			
C4 766	SOUTH BERM CELL 4	8	FG	C4PR8	17.4	102.4	10.5	113.8	103.0	100.6%	PASS			
C4 767	SOUTH BERM CELL 4	8	FG	C4PR8	17.4	102.4	12.5	115.8	102.9	100.5%	PASS			
C4 768	SOUTH BERM CELL 4	8	FG	C4PR8	17.4	102.4	9.8	113.9	103.7	101.3%	PASS			
C4 769	SOUTH BERM CELL 4	8	FG	C4PR8	17.4	102.4	12.6	113.5	100.8	98.4%	PASS			
C4 770	SOUTH BERM CELL 4	8	FG	C4PR10	14.1	101.5	11.9	108.1	96.6	95.2%	PASS			
C4 771	SOUTH BERM CELL 4	8	FG	C4PR10	14.1	101.5	8.7	109.1	100.4	98.9%	PASS			
C4 772	SOUTH BERM CELL 4	8	FG	C4PR10	14.1	101.5	8.5	108.2	99.7	98.2%	PASS			

COMMENTS TESTS C4-763 TO C4 765 WERE TAKEN ON DRAINAGE CHANNEL ON WEST END OF CELL 4
TESTS C4-766 TO C4-772 WERE TAKEN ON FINAL GRADE ON SIDE SLOPES OF SOUTH BERM



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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT _____ OAK HAMMOCK DISPOSAL FACILITY
LOCATION: _____ OSCEOLA COUNTY, FLORIDA PROJECT NO.: FQ0691 TASK NO.: 1
DESCRIPTION: CELL 4 CONSTRUCTION DATE: 18 Day MARCH 2005 Year

SPECIFICATION REQUIREMENTS: ASTM D 698 95% COMPACTION MOISTURE RANGE N/A LIFT THICKNESS COMPACTED 8-in

MATERIAL SOURCE: BORROW AREA MATERIAL TYPE SILTY SAND CORRECTION FACTOR Y = N/A

NUCLEAR GAUGE TYPE Troxler 3430 GAUGE SERIAL 27657 QA ID CJ/RH

TEST NO.	TEST LOCATION	PROBE DEPTH	LIFT NO.	LAB RESULTS			FILED TEST RESULTS							RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT	PASS	FAIL	RETEST NO.	PASS	FAIL
C4 773	SOUTH WEST CELL 4	8	7	C4PR8	17.4	102.4	19.5	117.6	98.4	96.1%	PASS				
C4 774	SOUTH WEST CELL 4	8	7	C4PR8	17.4	102.4	20	119.8	99.8	97.5%	PASS				
C4 775	SOUTH EAST CELL 4	8	7	C4PR8	17.4	102.4	20.2	119	99.0	96.7%	PASS				
C4 776	SOUTH BERM CELL 4	8	FG	C4PR8	17.4	102.4	11.7	108.7	97.3	95.0%	PASS				
C4 777	SOUTH EAST CELL 4	8	18	C4PR9	14.1	106.4	12.6	117.6	104.4	98.2%	PASS				
C4 778	SOUTH WEST CELL 4	8	8	C4PR8	17.4	102.4	13.1	110.2	97.4	95.2%	PASS				
C4 779	SOUTH WEST CELL 4	8	8	C4PR8	17.4	102.4	12.6	111.7	99.2	96.9%	PASS				
C4 780	SOUTH WEST CELL 4	8	8	C4PR8	17.4	102.4	13.1	112.8	99.7	97.4%	PASS				
C4 781	WEST CELL 4	8	8	C4PR8	17.4	102.4	12.8	111.5	98.8	96.5%	PASS				
C4 782	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	11.9	110.8	99.0	96.7%	PASS				
C4 783	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	12.2	111.9	99.7	97.4%	PASS				
C4 784	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	12.9	115.2	102.0	99.6%	PASS				
C4 785	SOUTH WEST CELL 4	8	9	C4PR8	17.4	102.4	13.1	113.3	100.2	97.8%	PASS				
C4 786	WEST CELL 4	8	9	C4PR8	17.4	102.4	11.8	113	101.1	98.7%	PASS				

COMMENTS TESTS C4-773 TO C4 776 WERE TAKEN ON DRAINAGE CHANNEL ON WEST END OF CELL 4 (Elevation 87)
TESTS C4-777 WAS TAKEN ON EAST OUTER BERM (Elevation 98)
TESTS C4-778 TO C4-781 WAS TAKEN ON DRAINAGE CHANNEL ON WEST END OF CELL 4 (Elevation 88)

**LARGE NUMBER
OF MAPS
SCANNED
SEPARATELY**