

Haley Griffith (adpce.ad)

Subject: RE: Eco-Vista Class 4, Cell 8A CQA Report - AFIN: 72-00144; Permit 0290-S4-R2

AFIN: 72-00144

PMT#: 0290-S4-R2

Received

By Haley Griffith at 11:41 am, Jun 19, 2023

DOC ID#: 84230

TO: AC>FILE <HG

From: Brad Fureigh [<mailto:bfureigh@promusengineering.com>]

Sent: Thursday, June 15, 2023 9:40 AM

To: Annette Cusher (adpce.ad) <Annette.Cusher@adeq.state.ar.us>; Daniel Cullum (adpce.ad) <Daniel.Cullum@adeq.state.ar.us>

Cc: David Conrad <dconrad@wm.com>; Blake Small <bsmall@wm.com>; 'Simmons, Carl' <CSimmons@wm.com>; 'Reynolds, Jodi' <jreyno10@wm.com>; Tennon, Don <dtenniso@wm.com>; Jonathan King <jking@promusengineering.com>

Subject: Eco-Vista Class 4, Cell 8A CQA Report - AFIN: 72-00144; Permit 0290-S4-R2

Good morning Annette,

Attached is the Eco-Vista Class 4, Cell 8A CQA Report. If you have any questions regarding this submittal, please feel free to contact us at your convenience.

Thanks!

Brad N. Fureigh, PE

Principal Engineer | Promus Engineering, LLC

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CQC AND CQA DOCUMENTATION REPORT

**Cell 8A Construction
Eco-Vista Class 4 Landfill
Springdale, Arkansas**

**June 2023
Promus Project No. 220207**

Prepared for:
Eco-Vista, LLC

Prepared by:



June 15, 2023

Eco-Vista, LLC
A Subsidiary of Waste Management, Inc.
2210 Waste Management Drive
Springdale, Arkansas 72762

Attn: Mr. David Conrad

RE: CQC and CQA Documentation Report
Construction of Cell 8A
Eco-Vista Class 4 Landfill
Springdale, Arkansas

Dear Mr. Conrad:

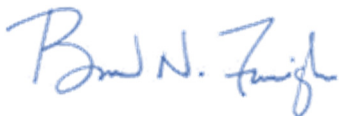
We are pleased to submit the attached report of Construction Quality Control (CQC) and Construction Quality Assurance (CQA) for the construction of Cell 8A at the Eco-Vista Class 4 Landfill in Springdale, Arkansas. This report documents CQC/CQA efforts for the compacted soil liner, geocomposite, and leachate collection system for the Cell 8A waste containment cell construction.

Our technical representative(s) were at the landfill facility during pertinent construction activities to observe and document construction and perform quality control activities for the construction. We have also performed quality assurance evaluations for the documented construction activities.

The site observations, field testing, laboratory testing, and resulting analyses indicate that the prepared subgrade, geosynthetic clay liner, geomembrane liner, geotextile, and leachate collection system were constructed in general accordance with the facility CQA Plan and Arkansas Energy & Environment, Division of Environmental Quality (DEQ) regulations.

We appreciate this opportunity to provide our services on this project. If we can provide any additional information or further assist you in any way, please call on us.

Sincerely,
PROMUS ENGINEERING, LLC



Brad N. Fureigh, P.E.
Principal Engineer

*Distribution: Arkansas Energy & Environment, Division of Environmental Quality (1)
Mr. David Conrad, Waste Management of Arkansas, Inc.*

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- ▶ Table F-1: Laboratory Test Data – LCS Aggregate
- ▶ Laboratory Test Data – LCS Aggregate

Appendix G – Record Drawings



CQC AND CQA DOCUMENTATION REPORT

Cell 8A Construction

Eco-Vista Class 4 Landfill

1. INTRODUCTION

This report documents the Construction Quality Control (CQC) and Construction Quality Assurance (CQA) efforts and activities performed by Promus Engineering, LLC. (Promus), for the bottom liner system and leachate collection system of Cell 8A at the Eco-Vista Class 4 Landfill located near Tontitown, Arkansas. This report documents the CQA and CQC activities performed during the construction of Cell 8A.

1.1. Project Description

The Eco-Vista Class 4 Landfill is a planned solid waste disposal facility operated by Eco-Vista, LLC (Eco-Vista). The facility is a solid waste landfill, permitted, designed, constructed and operated under the Arkansas Pollution Control and Ecology Commission Regulation No. 22, Solid Waste Management Rules (referred to herein as the Regulations), as administered by the Arkansas Energy & Environment, Division of Environmental Quality (DEQ). The facility operates under Solid Waste Permit No. 0290-S4-R2 (AFIN: 72-00144).

Cell 8A is an approximately 5.5-acre Class 4 solid waste disposal cell and it is bordered to the south by the existing Class 4 Landfill and to the north by the renewable natural gas plant. A site layout map is provided in Appendix G that illustrates the approximate location of construction in relation to the other site features. Construction of the Cell 8A bottom liner system and leachate collection system included the following components:

- ▶ An established subgrade;
- ▶ An 18-inch thick compacted clay liner (permeability $\leq 1 \times 10^{-5}$ cm/sec); and
- ▶ A 6-oz/sy (200-mil) double-sided geocomposite drainage layer (cell floor only).

The construction of Cell 8A also consisted of subgrade grading, intercell berm construction, and the construction of a leachate collection system (LCS) to facilitate leachate removal.

1.2. Scope

Promus was retained by Eco-Vista, LLC to provide quality control and assurance services during construction of the cell components as described in the facility CQA/QC Plan (*Construction Quality Assurance & Quality Control Plan, Eco-Vista Landfill*), prepared by Promus Engineering, LLC, June 2022. This report documents the quality assurance activities associated with Cell 8A construction. The scope of services provided by Promus relevant to this report included:

- ▶ visual observation of construction activities addressed in the CQA/QC Plan;
- ▶ documentation of construction material compliance with the CQA/QC Plan;
- ▶ field and laboratory testing to evaluate and document compliance of construction with the CQA/QC Plan; and
- ▶ data analysis, compilation and documentation report preparation.



1.3. Quality Program

The Manufacturing Quality Control (MQC) procedures for this project were set forth by the various MQC and CQC plans developed by various material manufacturers, suppliers, installers, and contractors. The site specific CQC and CQA procedures for this project were established by the CQA/QC Plan, which includes the requirements for material characteristics as well as the minimum frequencies of field and laboratory testing for construction verification. In general, MQC and CQC included extensive quality control observations and testing to ensure material conformity and workmanship compliance with the project plans and specifications. CQA activities included oversight, reviews, audits, observations and testing to verify and support the results of the MQC and CQC programs. Additionally, the CQA program included the compilation of the test program results into this documentation report.

The CQC efforts performed by the field technicians included the field monitoring and testing and laboratory testing activities addressed in the CQA/QC Plan. Promus CQC personnel were on-site essentially full-time during significant construction of the project pertinent to the cell construction.

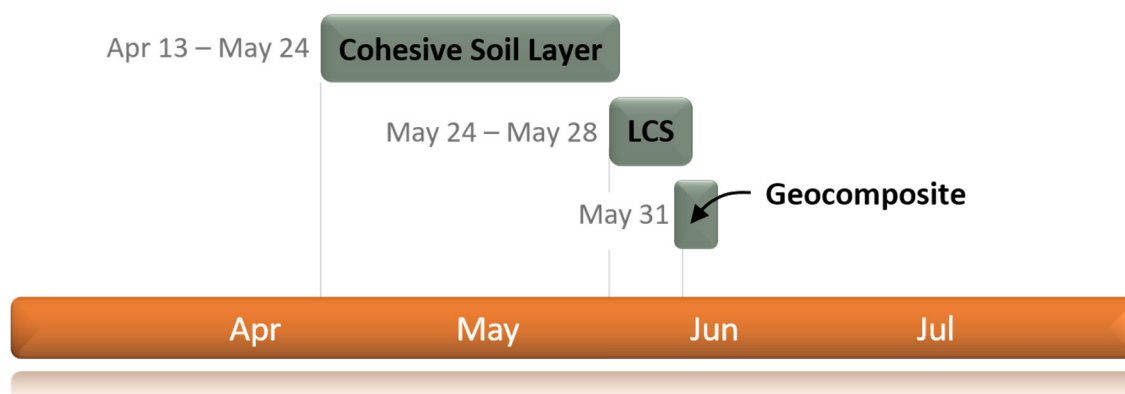
The CQC field technician documented site activities on a daily basis. The observations were summarized in the form of daily field reports (DFRs), which were submitted to Promus CQA staff for review and finalization. DFRs were used to document project information such as weather, contractor's equipment and personnel on-site, site activities, CQC testing and sampling and other pertinent information. These DFRs are presented in Appendix A. Additionally, the CQC representative recorded digital photographs of site construction activities and project progress. Selected photographs are provided in Appendix B as a photographic record of construction.

CQA services performed by Promus included pre-construction materials evaluation, direction of the CQC efforts, review of materials compliance/certification submittals, review of field and laboratory CQC data, and the preparation of this report. Promus CQA personnel communicated with CQC field representatives during the construction progress, reviewed DFRs and field and laboratory test data, performed site visits and attended preconstruction and periodic construction progress meetings.

1.4. Construction Chronology

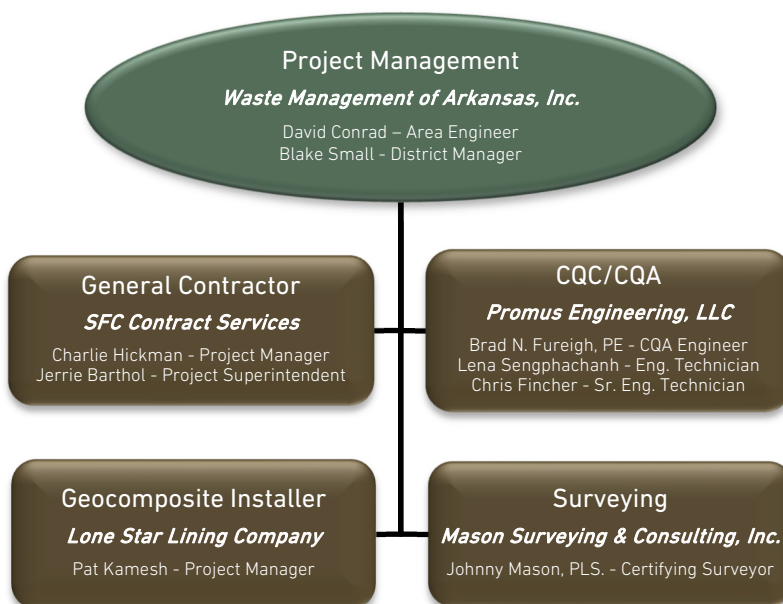
Promus began preconstruction testing of materials for cell construction in November 2022 and the construction of Cell 8A occurred from April through June 2023.

The following chart illustrates the approximate progress of the Cell 8A construction:



1.5. Project Parties

Eco-Vista, LLC contracted SFC Contract Services (SFC) to serve as the General Contractor for the construction of Cell 8A. Surveying services were performed by Mason Surveying & Consulting, Inc. (Mason Surveying), and the Geocomposite drainage layer installation was performed by Lone Star Lining Company (Lone Star). Eco-Vista, LLC also contracted CQC/CQA to Promus Engineering, LLC (Promus) and geosynthetic laboratory services to TRI Environmental, Inc. (TRI). The inset organizational chart illustrates the organizational structure associated with the construction of Cell 8A. Each of these firms contributed to the quality program for the project.



2. COMPACTED CLAY LINER

In general, construction of the compacted clay liner (CCL) was accomplished by hauling, placing, conditioning and compacting clay soil excavated from the future landfill footprint to form a low permeability soil barrier. The clay liner was placed in the approximately 6-inch-thick lifts, compacted to a minimum 90% standard density as determined by laboratory testing to form the minimum 18-inch thick layer. The liner construction quality control and quality assurance activities are discussed in the following sections.

2.1. Construction Quality Control

The compacted clay liner was monitored through materials evaluation, CQC representative visual observation, documentation, field testing, and laboratory testing as prescribed in the CQA/QC Plan. Each of these CQC aspects is discussed in the following sections.

2.1.1. Material Evaluation

In accordance with the CQA/QC Plan, pre-construction testing and evaluation was conducted to select adequate fill materials and develop construction compaction criteria for construction of the compact clay liner.

In summary, representative material of proposed CCL soil was collected from offsite borrow materials that were stockpiled onsite and tested for suitability. The material was transported to the geotechnical laboratory for testing as prescribed by the CQA Engineer. The material was evaluated to determine index and physical properties of the soils. Remolded permeability testing was



performed to develop moisture and density conditions which correlated with a high probability of acceptable permeability. The laboratory test results for the CCL pre-construction testing effort are summarized in Table C-1 in Appendix C. Laboratory test reports are also provided in Appendix C.

The pre-construction test evaluations allowed for development of compaction acceptance criteria for the primary soil type used from the offsite borrow source. The criteria were developed taking into consideration the index properties of the proposed soil. The CCL compaction standards developed of the acceptance criteria included:

- ▶ Compaction to at least 90% maximum dry density (per the Standard Effort Compaction Test – ASTM D698); and
- ▶ Moisture content of at least optimum moisture content (per the Standard Effort Compaction Test – ASTM D698).

2.1.2. Visual Observation

The CQC technician was on-site during the placement, preparation, and compaction of the CCL. Construction observations associated with this activity included material type, moisture content, lift thickness, compaction effort and compacted lift thickness. The CCL was visually inspected for the presence of deleterious material. The field observations for these activities were documented by the CQC technician in the DFRs, which are provided in Appendix A. Photographs of the CCL construction are included in Appendix B.

2.1.3. Laboratory Testing

Laboratory testing of the CCL material included testing samples collected prior to construction and during construction to evaluate material performance and conformance to the requirements of the CQA/QC Plan. The pre-construction testing (discussed in Section 2.1.1) and evaluation was conducted to select adequate fill materials and develop construction compaction criteria. Testing conducted during construction of the CCL was performed to verify the properties of the material maintain compliance with the requirements of the CQA/QC Plan. Undisturbed samples were collected, as required, in the compacted lifts to evaluate hydraulic conductivity of the placed soils. Pre-construction and construction laboratory data is summarized in Tables C-1 and C-2 in Appendix C. Laboratory test reports are also provided in Appendix C.

2.1.4. Field Testing

Field testing of the CCL consisted of performing in-place moisture content and density determinations by nuclear methods (ASTM D 6938) on compacted lifts as necessary to evaluate compaction efforts and moisture conditions. The CQC technician performed compaction testing and recorded the test results while comparing the results to requirements established in the CQA/QC Plan and pre-construction testing. The CQC technician documented the lift number and Northing and Eastings of the field test locations. The CQC technician promptly informed the contractor of the test results. If the results indicated failing conditions, the contractor reworked the area, and the CQC technician then retested the area. This process was repeated until passing conditions were achieved. Table C-3 in Appendix C includes the CCL moisture content and density test results.



Figures C-1 through C-3 in Appendix C illustrate the approximate locations of field compaction tests for the CCL construction.

2.2. Construction Quality Assurance

The CQC observations of the CCL construction, as summarized in the DFRs, were reviewed by CQA staff on a regular basis. The Promus CQA personnel conferred with the CQC technician occasionally to discuss the observations. In some cases, minor changes to the DFRs were made to correct typos, clarify or to further explain various details.

The CQA review of the clay liner CQC field and laboratory tests results required comparison of the testing frequencies to required minimums and comparison of the test results to the requirements of the CQA/QC Plan. Based upon the CQA review of the laboratory data provided in Table D-1 and Table D-2, and the field compaction data provided in Table C-3, in Appendix C, the CCL was constructed in general accordance with the CQA/QC Plan.

Upon completion of the CCL, the clay liner surface was surveyed at the design control points by Mason Surveying. The survey data was compared to the as-built subgrade elevations to determine layer thickness and evaluate conformance. The as-built survey provided by Mason Surveying for Cell 8A is presented in Appendix G. The as-built survey provided indicated that the constructed layer achieved the minimum thickness of 18-inches.

3. DRAINAGE GEOCOMPOSITE

The Leachate Collection System (LCS) consists of a double-sided drainage geocomposite manufactured by SKAPS Industries. The drainage geocomposite is composed of a 200 mil geonet heat bonded between two layers of 6-oz nonwoven geotextile. The geocomposite was installed directly on top of the compacted clay liner on the cell floor to facilitate drainage. The following sections discuss the CQA and CQC activities performed during installation.

3.1. Construction Quality Control

The CQC criteria for geocomposite material acceptance are outlined in the CQA/QC Plan. The geocomposite installation CQC activities generally consisted of observing the deployment and seaming of the geocomposite material. The CQA field technician was present during the deployment and installation of the geocomposite. The installation observations were documented in DFRs and included in Appendix A. Selected photographs of the installation are included in Appendix B. The following list includes the field observations that were typically performed:

- ▶ delivery inventory inspection, noticeable defects, and proper handling/storage;
- ▶ removal of objects on the prepared surface;
- ▶ geocomposite panel overlap and seaming;
- ▶ areas needing repair; and
- ▶ clay liner protection during geocomposite installation;

3.2. Construction Quality Assurance

Promus CQA staff reviewed DFRs and project photos as well as discussed with CQA field personnel the visual observations and findings. In some cases, after discussion with the CQA technician, typos or minor changes to the DFRs were made to clarify or to further explain various details.

The manufacturer's geocomposite testing (MQC data) was reviewed by Promus CQA staff and the results were compared to the project requirements. Additionally, samples of the proposed inventory were collected for CQA conformance testing by TRI. Conformance test results were reviewed and approved prior to the material being sent to the site. A copy of the drainage geocomposite MQC and CQA conformance test results are provided in Appendix D. The data provided indicates that the geocomposite materials placed of the geomembrane satisfy the requires of the project.

4. LEACHATE COLLECTION SYSTEM

A leachate collection system (LCS) consisting of a perforated piping system, contained within a gravel pack and geotextile wrap, was placed along the low flowline of the cell sloped at 1% to the leachate sump. The piping system was designed to route the leachate to the sump located at the east end of the cell floor where it can be pumped from the cell.

One 18-inch diameter sump riser pipe and a 6-inch diameter solid leachate collection cleanout were installed in the sump and up the east slope to a concrete headwall. The sump was filled with gravel and wrapped in 10-oz nonwoven geotextile. The perforated leachate collection pipe was covered with gravel and wrapped with a 10-oz. non-woven geotextile.

The concrete headwall constructed on the east end of Cell 8A contains the leachate riser, cleanout, flowmeter, valves, and control panel. Leachate pumped from the cell is conveyed from the headwall through a 3-inch by 6-inch dual contained HDPE forcemain to onsite storage tanks.

As illustrated on the as-built drawings provided in Appendix G, the bottom of sump elevation is 1237.2 FMSL and the lowest elevation on the bottom liner system is 1239.2 FMSL. Therefore, the point of compliance elevations is approximately 1240.2 FMSL, which is 12-inches higher than the lowest elevation of the bottom liner, not including the sump.

4.1. Construction Quality Control

Construction observations associated with this activity included material consistency, pipe welding operations and monitoring installation of geosynthetics. The LCS piping installation was visually monitored and compared to the design drawings. The field observations were documented by the CQC technician in the DFRs, which are provided in Appendix A. Photographs of the LCS construction are included in Appendix B.

4.1.1. Laboratory Testing

Samples of the LCS aggregate was obtained from an off-site quarry prior to placement and submitted for geotechnical laboratory testing in accordance with the CQA/QC Plan. Also, the geotextile was sampled and tested per the CQA/QC Plan. The LCS washed gravel, and geotextile testing indicated compliance with the CQA/QC Plan requirements. MQC data and CQA conformance results of the geotextile are included in Appendix E. Laboratory testing of the LCS washed gravel is



reported in Table F-1 in Appendix F. Laboratory data results of the LCS gravel are also included in Appendix F.

4.2. Construction Quality Assurance

The Promus CQA staff reviewed DFRs and project photos as well as discussed with CQA field personnel the visual observations and findings. In some cases, after discussion with the CQA technician, typos or minor changes to the DFRs were made to clarify or to further explain various details.

The CQA staff reviewed the material test results and survey data for compliance to the project requirements. The LCS laboratory test results indicated general conformance with the requirements of the CQA/QC Plan.

5. CONCLUSIONS

This report of the CQA activities for the compacted clay liner, geocomposite and leachate collection system for Cell 8A of the Eco-Vista Class 4 Landfill has been prepared in accordance with generally accepted geotechnical and environmental engineering practices for the exclusive use of Eco-Vista, LLC, its agents and/or clients. No warranty either expressed or implied is made.

Our conclusions are based upon site observations and the field and laboratory testing performed during the course of this project. We have assumed that information provided to us by others is correct and true, unless otherwise noted. The information contained within this report is, to the best of our knowledge and belief, true, accurate, and complete. If additional information or changes in previous information become available in the future, we request the opportunity to review and change our recommendations and conclusions, as necessary.

Based on the observations, in-place testing, laboratory testing, and CQA review of testing and documentation performed by the Promus Engineering, LLC representatives, it is our professional judgment that the elements constructed during this project, as documented herein, have been constructed in accordance with the approved permit, and industry accepted procedures and methodologies.

This Construction Quality Control and Construction Quality Assurance Documentation Report was prepared by me and/or the project CQA activities were performed under my direct supervision:



By:

Brad N. Fureigh, PE
Arkansas Professional Engineer No. 14977

June 14, 2023

Date



APPENDIX A

DAILY FIELD REPORTS



DAILY FIELD REPORT



General:

DFR Report No.: 0401323 Date of Field Activity: 4/13/23 Project: Eco Vista Class 4, Cell 8A Tech(s): David Wooten/
Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1800 hrs On-site: 11.00 hrs Travel: 0.25 hrs Mileage: 9

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Volvo Off-Road haul truck, Water truck.

Summary:

SFC placed first lift at the mid-section of the floor. After moisture/density testing and collecting permeability tests, SFC proceeded to place first lift at the south and west section of the floor. Performed more moisture/density and collected permeability tests in south and west section of the floor.

Tests Performed:

(11) moisture/density tests, (4) shelly tubes obtained for permeability testing

Problems Noted:Problem Resolution:

Planned Activities:

Begin placing next lift of clay liner on cell floor

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy PM | Clear | Pt Cldy | Cldy | Rainy | Windy
Temperature Observations: High 75 Low 52 Precip.: in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 0401423 Date of Field Activity: 4/14/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1830 hrs On-site: 11.50 hrs Travel: 0.25 hrs Mileage: 9

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Volvo Off-Road haul truck, Water truck.

Summary:

SFC placed second lift on entire floor. Performed moisture/density tests in 3 sections of the floor. Collected permeability tests at the south and north end of the floor as sections were split from east to west.

Tests Performed:

(9) moisture/density tests, (4) shelby tubes obtained for permeability testing

Problems Noted:Problem Resolution:

Planned Activities:

Begin placing lift at the east end of the south slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 78 Low 53 Precip.:

in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 041523 Date of Field Activity: 4/15/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1100 hrs On-site: 4.00 hrs Travel: 0.25 hrs Mileage: 9

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, Volvo Off-Road haul truck

Summary:

SFC began stockpiling clay liner at the east end of the south floor to resume placing

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

Begin placing lift on slopes

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 74 Low 66 Precip.:

in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 041723 Date of Field Activity: 4/17/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1100 hrs On-site: 4.00 hrs Travel: 0.25 hrs Mileage: 9

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, Tractor w/ Disc

Summary:

SFC placed lift at the east end of the south slope. Moisture content of soils were to high for passing density. SFC worked on processing to reduce moisture.

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

Continue placing and processing clay liner

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 80 Low 53 Precip.:

in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051023 Date of Field Activity: 5/10/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1630 hrs On-site: 9.50 hrs Travel: 0.50 hrs Mileage: 18

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Volvo Off-Road haul truck, Water truck.

Summary:

SFC began spreading clay liner material up the east slope. Water was added to the clay liner soil on the cell floor, processed and then spread up the slope.

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

Begin processing and compacting clay

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 80 Low 63 Precip.:

in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051223 Date of Field Activity: 5/12/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 230053 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Environmental Works, Inc. Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0645 hrs Depart Site: 1845 hrs On-site: 12.00 hrs Travel: 0.50 hrs Mileage: 18

Daily Field Notes:Equipment Operating:

Subcontractor Equipment - Boart Longyear Multipurpose Drill Rig, Takeuchi TL10V2 Skid steer

Summary:

Environmental Works Inc. onsite to abandon existing peizometers located in the Cell 8A footprint. SFC not working today.

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

Continue placing and processing clay liner as weather allows.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 80 Low 69 Precip.:

in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051523 Date of Field Activity: 5/15/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Chris Fincher
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1700 hrs On-site: 10.00 hrs Travel: 0.50 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller.

Summary:

SFC placed the first and second lifts across the east side slope. Two of the dozer operators are pushing the clay material up the side slopes, while another dozer is utilized to assist the CAT 815 compactor up the side slope.

Tests Performed:

(6) moisture/density tests, (0) shelly tubes obtained for permeability testing

Problems Noted:

Water infiltrating the east side slope.

Problem Resolution:

WM Graded area above side slope to properly drain stormwater.

Planned Activities:

Begin placing lifts across the north side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 79 Low 63 Precip.: 0.12 in. Rain Other notes:

DFR by: Chris Fincher

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051623 Date of Field Activity: 5/16/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Chris Fincher
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1700 hrs On-site: 10.00 hrs Travel: 0.50 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Komatsu Excavator, Off-Road Haul Truck.

Summary:

SFC placed the first and second lifts across the east half of the north side slope. Two dozer operators are pushing material up the side slopes. SFC is utilizing one of the dozers to push the CAT 815 compactor up the slope. The smooth drum roller was also used to achieve compaction. The Excavator was used to remove the remaining groundwater well materials from the abandoned well on the south end of the east slope. The material was loaded into an off-road haul truck and transported to the class 4 landfill.

Tests Performed:

(10) moisture/density tests, (2) shelly tubes obtained for permeability testing

Problems Noted:

Water infiltrating the east side slope.

Problem Resolution:

WM Graded area above side slope to properly drain stormwater.

Planned Activities:

Continue placing lifts across the north side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 75 Low 61 Precip.: 0.65 in. Rain Other notes:

DFR by: Chris Fincher

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051723 Date of Field Activity: 5/17/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Chris Fincher
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1700 hrs On-site: 10.00 hrs Travel: 0.50 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT CS56B Smooth Drum Roller, Komatsu Excavator, Volvo Off-Road Haul Truck, Water Truck.

Summary:

SFC finished placing the first and second lifts across the east side slope. Two dozer operators are pushing material up the side slopes. SFC is utilizing one of the dozers to push the CAT 815 compactor up the slope. The smooth drum roller was also used to achieve compaction. SFC also continued to spread and comcompact material along the east half of the north slope.

Tests Performed:

(20) moisture/density tests, (6) shelly tubes obtained for permeability testing

Problems Noted:

Water infiltrating the east side slope.
Airline hit while SFC attempting to re-grade same area.

Problem Resolution:

SFC continued to re-grade area above the east side slope. WM personnel to repair damaged air line.

Planned Activities:

Place final lift across east side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 79 Low 61 Precip.: 0.01 in. Rain Other notes:

DFR by: Chris Fincher

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 051823 Date of Field Activity: 5/18/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Chris Fincher
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 1700 hrs On-site: 10.00 hrs Travel: 0.00 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT CS56B Smooth Drum Roller, Komatsu Excavator, Volvo Off-Road Haul Truck, Water Truck.

Summary:

SFC finished placing the third lift across the east side slope. SFC then moved to place the third lift over the east half of the north slope. Two dozer operators pushed material up the side slopes, utilizing one of the dozers to push the CAT 815 compactor up the slope. The smooth drum roller was also used to achieve compaction. Rain Blanket material arrived onsite.

Tests Performed:

(14) moisture/density tests, (4) shelly tubes obtained for permeability testing

Problems Noted:

Stormwater infiltrating the east side slope.

Problem Resolution:

WM & SFC graded area above side slope to properly drain stormwater.

Planned Activities:

Continue placing lifts across the north side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 78 Low 51 Precip.:

in. Precip Type Other notes:

DFR by: Chris Fincher

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 052023 Date of Field Activity: 5/20/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0700 hrs Depart Site: 0800 hrs On-site: 1.00 hrs Travel: 0.25 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer,

Summary:

SFC began pumping water from the toe of the east slope in the morning. After lunch, dozers began pushing clay onto the west half of the north slope and floor using dozers. No material process or compacted.

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

Continue placing lifts across the north side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 71 Low 51 Precip.: in. Rain Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 052223 Date of Field Activity: 5/22/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0645 hrs Depart Site: 1715 hrs On-site: 10.50 hrs Travel: 0.25 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Water Truck, Komatsu Excavator, Bobcat Mini-X, Bobcat Skidsteer.

Summary:

SFC began compacting lift 1/2 on the west half of the north slope, pumped water then removed the pump when finished. Began dressing the east slope. Recompact east end of south slope and compacted and smooth drum rolled lift 1/2 at center of south slope. Proceeded to put next lift on west half of north slope.

Tests Performed:

(15) moisture/density tests, (4) shelly tubes obtained for permeability testing

Problems Noted:Problem Resolution:

Planned Activities:

Continue placing lifts across the north side slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 77 Low 55 Precip.: in. Rain Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 052323 Date of Field Activity: 5/23/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0645 hrs Depart Site: 1730 hrs On-site: 10.75 hrs Travel: 0.25 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Water Truck, Komatsu Excavator, Bobcat Mini-X, Bobcat Skidsteer

Summary:

SFC began watering the floor, compacting east end of south slope then continued to process the west half of the north slope. Dressed the east half of the north slope and the east half of the floor. Completed one half of the west half of the north slope and south slope.

Tests Performed:

(8) moisture/density tests, (0) shelby tubes obtained for permeability testing

Problems Noted:Problem Resolution:

Planned Activities:

Continue placing lifts on west half of north slope.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 77 Low 57 Precip.:

in. Rain Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 052423 Date of Field Activity: 5/24/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Lena Sengphachanh
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Rep.:

Technician Equipment On-site: Truck ATV Gas Meter Other: Nuclear Density Gauge

Technician Time: Arrive Site: 0645 hrs Depart Site: 1730 hrs On-site: 10.75 hrs Travel: 0.25 hrs Mileage: 15

Daily Field Notes:Equipment Operating:

Komatsu 85PX Dozer, Komatsu 65 Dozer, Komatsu 71PX Dozer, CAT 815F Compactor, CAT Smooth Drum Roller, Water Truck, Komatsu Excavator, Bobcat Mini-X, Bobcat Skidsteer

Summary:

SFC began completing compaction and smooth rolling the north slope. Proceeded to add lifts 1/2 on the west end of the south slope. After processing lifts 1/2 SFC proceeded to add lift 3. SFC installed formwork riser at the east slope for the headwall, backfilled with soil and gravel then framed the base of the concrete headwall and installed rebar.

Tests Performed:

(13) moisture/density tests, (2) shelly tubes obtained for permeability testing

Problems Noted:Problem Resolution:

Planned Activities:

Pour concrete for headwall for Cell 8 and two ponds out back.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 80 Low 64 Precip.: in. Precip Type Other notes:

DFR by: Lena Sengphachanh

DFR Review/Approval by: Brad Fureigh

DAILY FIELD REPORT



General:

DFR Report No.: 053123 Date of Field Activity: 5/31/23 Project: Eco Vista Class 4, Cell 8A Tech(s): Chris Fincher
Promus Project No.: 220207 Client: Eco-Vista, LLC Rep.: Dave Conrad Ref:

Gen. Contractor: SFC Contract Services Rep.: Jerrie "Red" Barthol Subcontractor: Lonestar Lining Rep.: Pat Kamesh

Technician Equipment On-site: Truck ATV Gas Meter Other:

Technician Time: Arrive Site: 1145 hrs Depart Site: 1245 hrs On-site: 1 hrs Travel: 7.00 hrs Mileage: 450

Daily Field Notes:Equipment Operating:

Bobcat Skidsteer

Summary:

The geosynthetics installation crew (Lonestar Lining) installed geocomposite throughout the cell floor, overlapping the seams by at least 12". The geocomposite seams were zip-tied together through the geonet, and the top geotextile layer was leistered prior to being sewn.

Tests Performed:Problems Noted:Problem Resolution:

Planned Activities:

SFC to complete leachate riser headwall. Lonestar to Install Duraskrim R12BV rain blanket for stormwater management.

Weather Conditions:

AM | Clear | Pt Cldy | Cldy | Rainy | Windy

PM | Clear | Pt Cldy | Cldy | Rainy | Windy

Temperature Observations: High 83 Low 64 Precip.:

in. Precip Type Other notes:

DFR by: Chris Fincher

DFR Review/Approval by: Brad Fureigh

APPENDIX B

PHOTOGRAPHIC RECORD



PHOTOGRAPHIC RECORD OF CONSTRUCTION



Photo No. 1

Contractor processing, spreading and compacting clay liner on cell floor and east side slope.

Photo No. 2
Contractor processing, spreading and compacting clay liner on north slope.



Photo No. 3

Contractor processing, spreading and compacting clay liner on south slope.

PHOTOGRAPHIC RECORD OF CONSTRUCTION



Photo No. 4

Looking south during moisture/density of compacted clay liner lift.

Photo No. 5
Contractor installing 3"x6" HDPE dual contained leachate forcemain on the east perimeter of Cell 8.



Photo No. 6

Contractor constructing base of concrete leachate riser headwall.

PHOTOGRAPHIC RECORD OF CONSTRUCTION



Photo No. 7
Contractor installing Geocomposite in the leachate sump.

Photo No. 8
Looking west and installed 18" side slope riser.



Photo No. 9
Contractor installing aggregate in leachate sump along with 6" HDPE cleanout pipe.

PHOTOGRAPHIC RECORD OF CONSTRUCTION



Photo No. 10

Looking west at leachate collection burrito prior to wrapping with non-woven geotextile.

Photo No. 11
Looking west at Geocomposite installed on the cell floor and completed leachate collection corridor



Photo No. 12

Completed leachate riser headwall equipped with automatic controls.

APPENDIX C

COMPACTED CLAY LINER



TABLE C-1

Eco-Vista Class 4 Landfill, Cell 8A CQA

Laboratory Test Data - Compacted Clay Liner Preconstruction Testing

Sample ID	Atterberg Limits			Grain Size % Passing			USCS Classification	Proctor Data		Remolded Perm. (k) (cm/sec)	Remarks
	LL	PL	PI	2-in	No. 4	No. 200		$\gamma_d(\text{max})$ (pcf)	W_{opt} (%)		
1109A	45	20	25	100	99.1	83.9	CL	107.2	18.3	5.5E-07	
1130A	45	20	25	100	100.0	75.5	CL	109.8	17.4	1.1E-07	

Statistical Summary

Minimum	45	20	25	100	99	75.5	-	107.2	17.4	1.1E-07
Maximum	45	20	25	100	100	83.9	-	109.8	18.3	5.5E-07
Average	45	20	25	100	100	79.7	-	108.5	17.9	2.5E-07 ⁽¹⁾
Standard Deviation	0.0	0.0	0.0	0.0	0.6	5.9	-	1.8	0.6	N/A
Requirements	-	-	10.0	100	80.0	30.0	-	-	-	1.00E-05
Number of Tests	2			2			-	2		2
Required Precon. Test Frequency	1/20000 CY			1/20000 CY			1/20000 CY	1/10000 CY		1/20000 CY
Test Frequency	1/6655 CY			1/6655 CY			1/6655 CY	1/6655 CY		1/6655 CY

Notes:

(1) Geometric mean.

(2) Test frequency based on 13310 CY of CSL for the project

TABLE C-2

Eco-Vista Class 4 Landfill, Cell 8A CQA

Laboratory Test Data - Compacted Soil Liner Construction Testing

Sample ID	Atterberg Limits			Grain Size % Passing			USCS Classification	Proctor Data		Permeability (k) (cm/sec)	Remarks
	LL	PL	PI	2-in	No. 4	No. 200		$\gamma_{d(max)}$ (pcf)	W_{opt} (%)		
0110A	48	21	27	100	95.6	85.8	CL	107.2	18.5	7.9E-08	
030623	46	21	25	100	98.5	92.2	CL	104.8	18.2	8.7E-08	
0414E	43	20	23	100	92.0	68.0	CL	108.8	18.0	4.5E-08	
0413A										3.6E-08	
0413B										4.3E-08	
0413C										3.7E-08	
0413D										4.3E-08	
0414A										1.4E-08	
0414B										1.8E-08	
0414C										5.5E-08	
0414D										7.8E-08	
0516A										6.6E-08	
0516B										3.5E-08	
0517A										3.9E-08	
0517B										5.6E-08	
0517C										2.9E-08	
0517D										4.5E-08	
0517E										3.5E-08	
0517F										2.4E-08	
0518A										6.5E-08	
0518B										4.2E-08	
0518C										2.4E-08	
0518D										5.5E-08	
0522A										3.4E-08	
0522B										4.3E-08	
0522C										2.5E-08	
0522D										4.5E-08	
0524A										5.8E-08	
0524B										3.4E-08	

TABLE C-2

Eco-Vista Class 4 Landfill, Cell 8A CQA

Laboratory Test Data - Compacted Soil Liner Construction Testing

Sample ID	Atterberg Limits			Grain Size % Passing			USCS Classification	Proctor Data		Permeability (k) (cm/sec)	Remarks
	LL	PL	PI	2-in	No. 4	No. 200		$\gamma_{d(max)}$ (pcf)	W_{opt} (%)		

Statistical Summary

Minimum	43	20	23	100	92	68.0	-	104.8	18.0	1.4E-08
Maximum	48	21	27	100	99	92.2	-	108.8	18.5	8.7E-08
Average	46	21	25	100	95	82	-	106.9	18.2	4.3E-08 ⁽²⁾
Standard Deviation	3	0.6	2.0	0.0	3.3	12.5	-	2.0	0.3	N/A
Requirements	-	-	10.0	100	80.0	30.0	-	-	-	1.00E-05
Number of Tests	3			3			3	3		26
Required Frequency	1/5000 CY			1/5000 CY			1/5000 CY	1/5000 CY		1/40000 SF
Test Frequency ⁽¹⁾	1/4437 CY			1/4437 CY			1/4437 CY	1/4437 CY		1/27644 SF

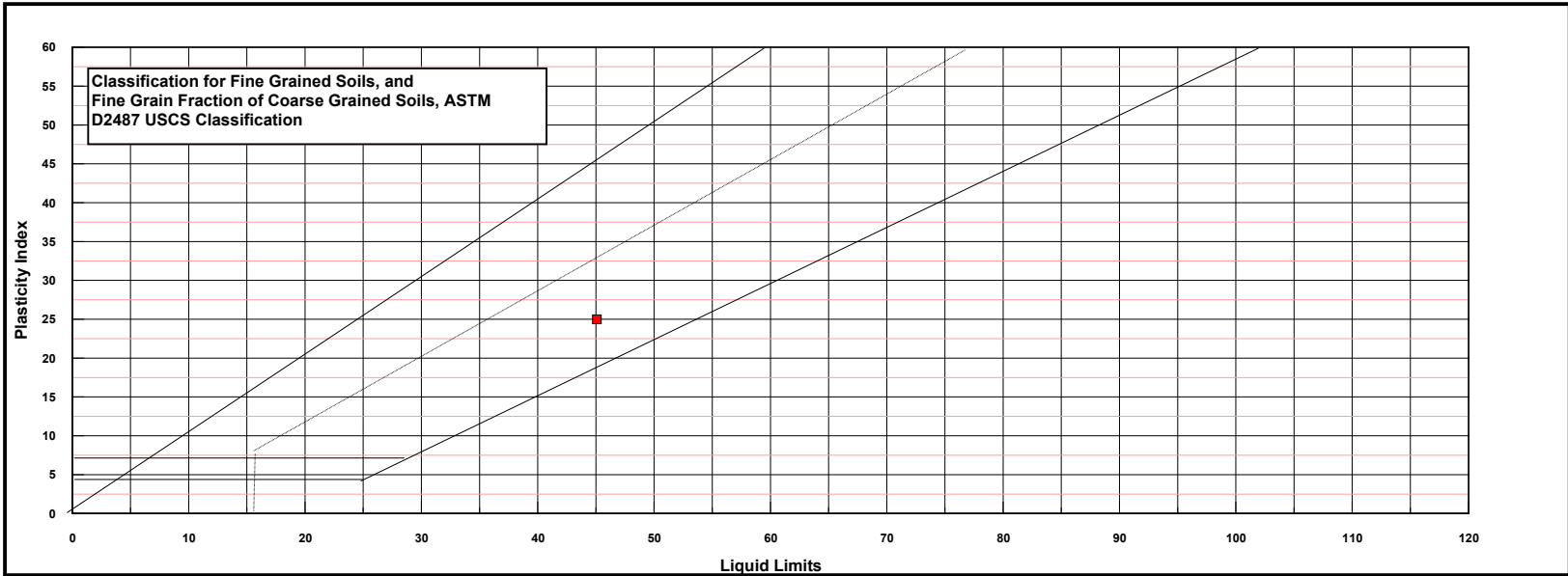
Notes:

(1) Actual test frequencies are approximate and based on 5.5 acres with 13310 CY of CSL placed in 3 lifts across the 5.5-acre cell.

(2) Geometric mean.

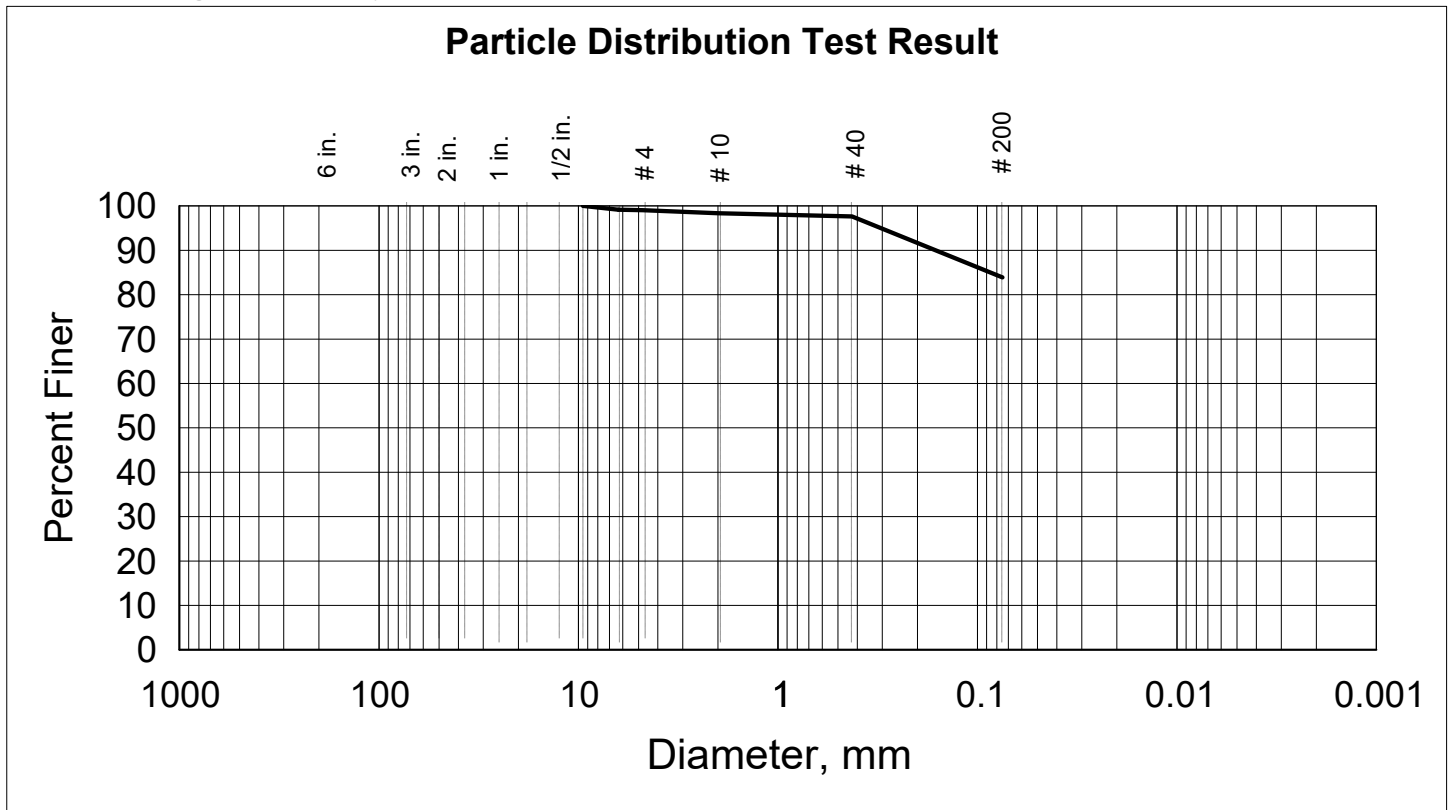
Compacted Clay Liner Laboratory Test Data





Project Name:	Eco-Vista Class 4, Cell 8 A	Client's Project No.	220207.00000	ASTM D2217/AASHTO R-74, Method B, Moist Sample Preparation
Project Number:	2223	Project Location:	Arkansas	ASTM D4318, Method A - or - Method B, Liquid and Plastic Limits
Client:	Eco-Vista, LLC			ASTM D422/D1140 - or - D6913/D7928 - or - C136/C117, Grain Size Analysis

Project Test Count, This Page	Sample Number and Locations	Liquid Limits	Plasticity Index	Percent Gravel	Percent Fines (Minus #200)	Natural Moisture, %	Sample Description/Classification
1	1109 A	45	25	0.9	83.9	20.9	Red/Brow CL, lean clay, with sand
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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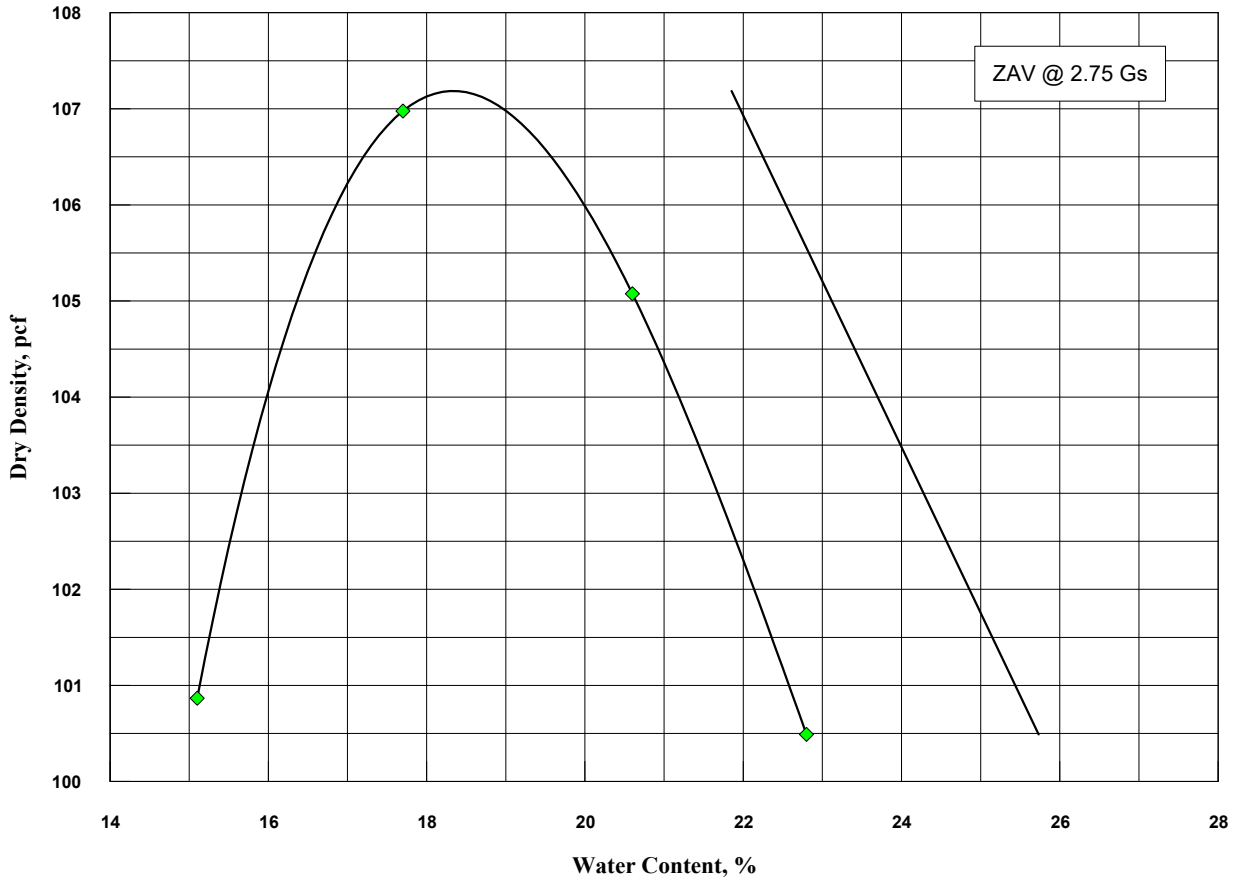


Proj. Name: Eco-Vista Class 4, Cell 8 A	Gravel, % 0.9	Sand, % 15.2	Silt, % 0.0	Clay, % 0.0	LL 45	PI 25
Project No.: 2223	Description and Classification					
Report Date 11.11.2022 Log-in Date 11.10.2022						
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "	2.5 "	3/8 "	100.0		
1109 A Bulk Sample	5 "	2 "	1/4 "	99.1		
Remarks: NMC, % 20.9	4.5 "	1- 1/2 "	# 4	99.1		
Moist Method, ASTM D422	4 "	1 "	# 10	98.4		
Sample split on # 40 sieve	3.5 "	3/4 "	# 40	97.6		
Clay content reported at 0.005mm	3 "	1/2 "	# 200	83.9		

Hygroscopic Moisture Content Data	Hydrometer Specimen Wet wt.	0.00	Traceability Items		
WS+t 0.00	Hydrometer Specimen Dry wt.	ERR	Balance ID	1	2
DS+T 0.00	Assumed Gs	2.75	Therm ID	58981	NA
Tare wt 0.00	Percent <#40 based on complete specimen	97.63	Flask ID	1	NA
Moist Ratio ERR	Calculated biased weight	ERR	Bulb ID	1	152H
	Composite Correction at 20 deg C	-6	Sol Mix, ml	125	NA
	Meniscus Correction only	1	Tested By	JMB	BMG

Hydrometer Reading Data			Temp. Correction, Ct	Corrected Reading, Rc	K	Rm	Effective depth	Diameter, mm	Percent finer
Time, min.	Readings	Temp.							
2	0	0		-6		1	16.13	0.0000	
5	0	0		-6		1	16.13	0.0000	
15	0	0		-6		1	16.13	0.0000	
30	0	0		-6		1	16.13	0.0000	
120	0	0		-6		1	16.13	0.0000	
240	0	0		-6		1	16.13	0.0000	
600	0	0		-6		1	16.13	0.0000	

**Laboratory Compaction Test
ASTM D698, Standard Compaction Test, Mechanical Rammer
Method B, Moist Method**



Report Date: 11.12.2022	Received Date: 11..10.2022	Ran by: JMB	Checked by: BMG
Max. Dry Density, pcf: 107.2		OMC, %: 18.3	
Corrected for Oversize: N/A		Corrected: N/A	

Project: Eco-Vista Class 4 Landfill, Cell 8 A **Client:** Eco-Vista, LLC

Project Number: 2223 **Sample Location:** 1109 A

Sample Description: Red/Brown CL, lean clay, with sand

LL	PL	PI	NMC	Traceability Items			
45	20	25	20.9	Balance ID 1	Hammer ID 1S	Mold ID A	Other
Gravel, %	Sand, %	Clay, %	P-200				
0.9	15.2	N/A	83.9	2	Page ID	1	Compaction

Coefficient of Permeability, Falling Head Method C, ASTM D5084

Client:	Eco-Vista, LLC	Date of Test:	11.15.2022	Technician:	JMB
Project:	Eco-Vista Class 4 Landfill, Cell 8 A	Reviewed by:	BMG		
Project No.:	2223.000				

Sample Id.:	1109 A	Permeant Used:	D/A Water
Sample Description:			
Special Sample Preparations or Special Condition:	Compacted to 95% MDD @ OMC		

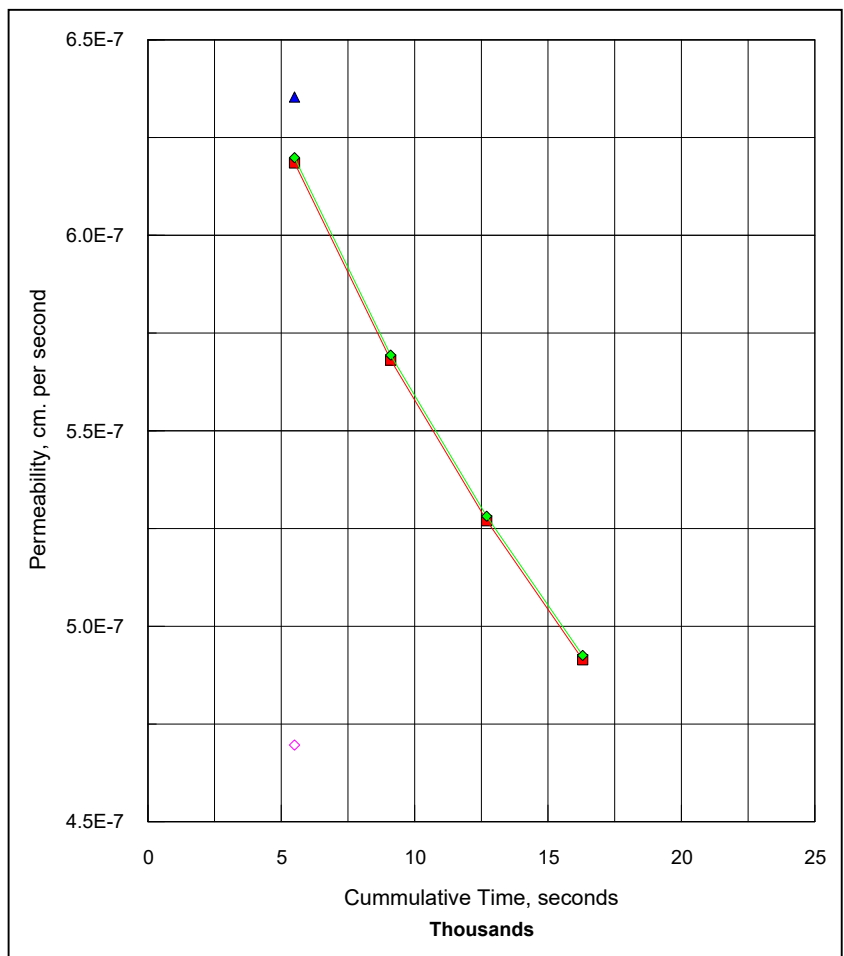
Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Specimen Dia., in.	3.985	3.990	Maximum Dry Density, pcf	107.2	101.8	0.0
Specimen Height, in. (L)	2.000	1.939	Optimum Moisture Content, (%)	18.3	18.3	0.0
Specimen weight, gms	788.9	816.1	Percent Compacted:	95.0	95.0	0.0
Specimen Moist Content	18.3	816.1	Method:	D698		
Specific Gravity, Assumed	2.750					
Percent Saturation, %	73.5	96.5				
Wet Density, pcf	120.5	128.2				
Dry Density, pcf	101.8	104.8				

Unit Areas and Volumes	Initial	Final
Area, ^ 2 in. (A)	12.472	12.504
Volume, ^3 in.	24.945	24.245
Height of Solids, in.	1.183	0.158
Void Ratio	0.690	11.264
Calculated Porosity, %	40.827	91.846
Pore Volume, ^3 in.	23.761	24.086

Traceability Items		
Cell ID:	17	
Station Location:	2-L1,2,3	
Balance Reference:	3	
Thermometer ID:	3	
In Flow Burette Dia., cm^2	0.8311	
Out Flow Burette Dia., cm ^2	0.8311	
L, in cm	5.080	
A, in cm	80.466	

Test Pressures	Backpressure	Cell
	50.00	53.00
Maximum Confining, psi		3.00
Effective Pressure, psf		432

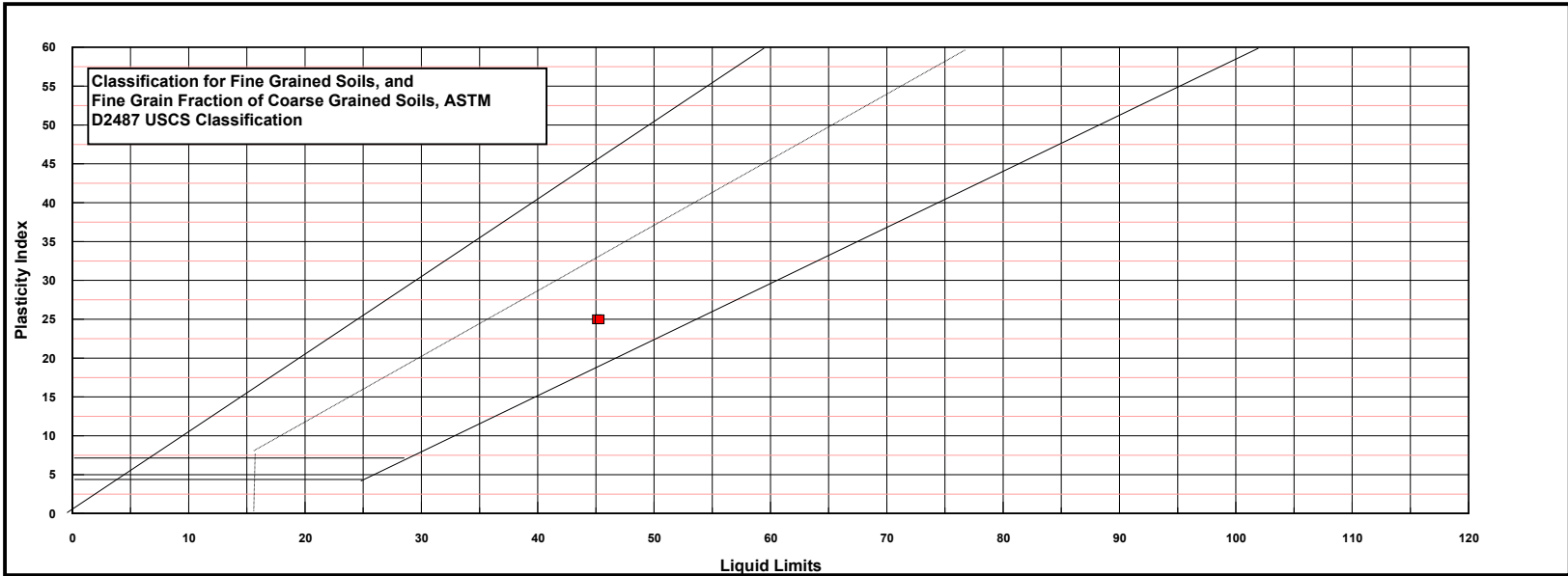
Average k @ 20C	5.5E-007
15% of Mean	8.29E-008
High Steady State	6.35E-007
Low Steady State	4.70E-007



Date of Readings	Elapsed time, sec	aL/2*At	h1	h2	ln h1/h2	D/A Water Temp, C	Uncorrected k	Corrected k @ 20C
11.15.2022	5500	4.77E-006	7.4	6.5	0.130	20.1	6.2E-007	6.2E-007
11.15.2022	3600	7.29E-006	8.0	7.4	0.078	20.1	5.7E-007	5.7E-007
11.15.2022	3600	7.29E-006	8.6	8.0	0.072	20.1	5.3E-007	5.3E-007
11.15.2022	3600	7.29E-006	9.2	8.6	0.067	20.1	4.9E-007	4.9E-007

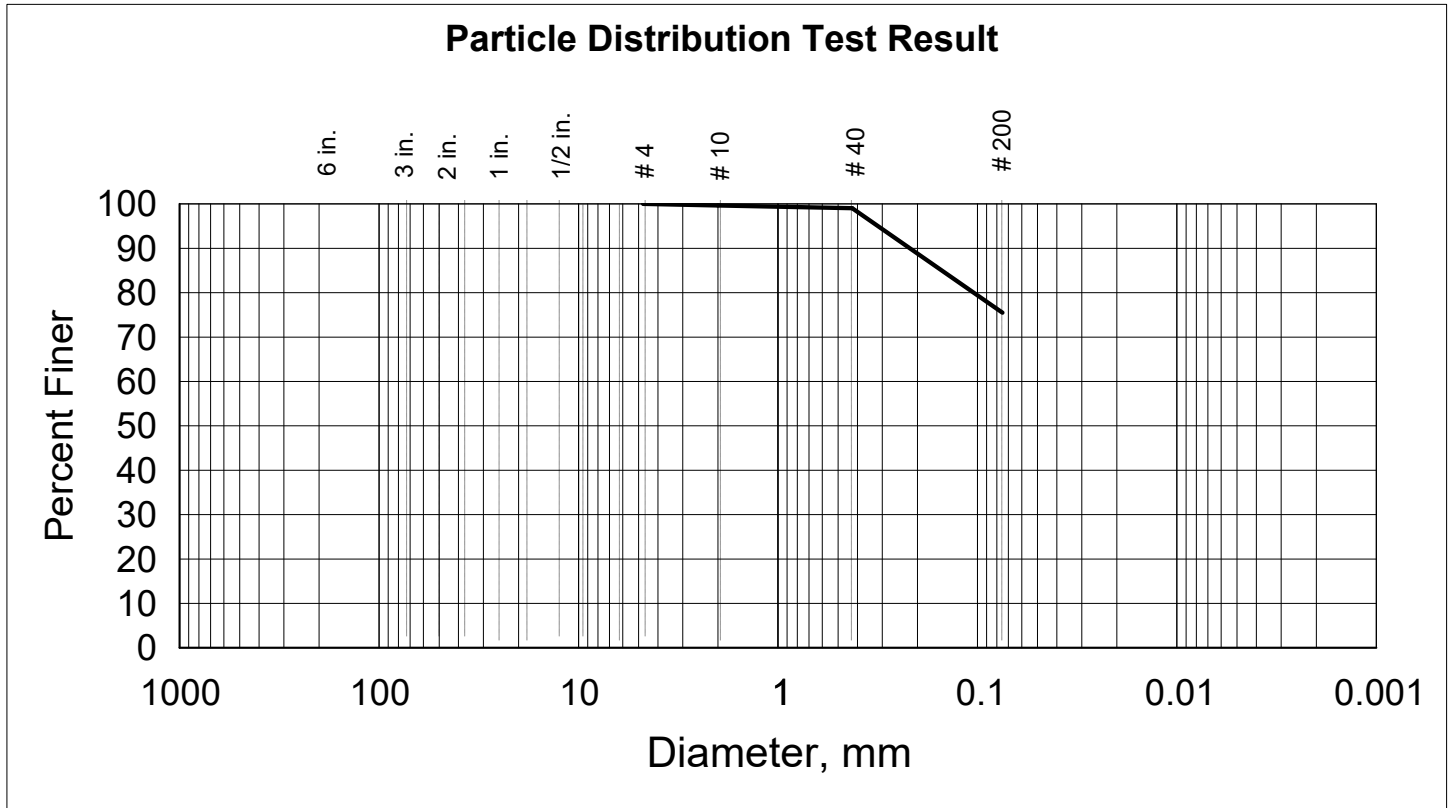
Remarks:

k = aL/2*At ln h1/h2 and Corrected k for temp @ 20 C = k x (-0.02452 x temp. + 1.495)



Project Name:	Eco-Vista Class 4, Cell 8 A	Client's Project No.:	220207.00000	ASTM D2217/AASHTO R-74, Method B, Moist Sample Preparation
Project Number:	2223	Project Location:	Arkansas	ASTM D4318, Method A - or - Method B, Liquid and Plastic Limits
Client:	Eco-Vista, LLC			ASTM D422/D1140 - or - D6913/D7928 - or - C136/C117, Grain Size Analysis

Project Test Count, This Page	Sample Number and Locations	Liquid Limits	Plasticity Index	Percent Gravel	Percent Fines (Minus #200)	Natural Moisture, %	Sample Description/Classification		
1	1109 A	45	25	0.9	83.9	20.9	Red/Brown	CL, lean clay,	with sand
2	1130 A	45	25	0.0	75.5	14.9	Red/Brown	CL, lean clay,	with sand
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

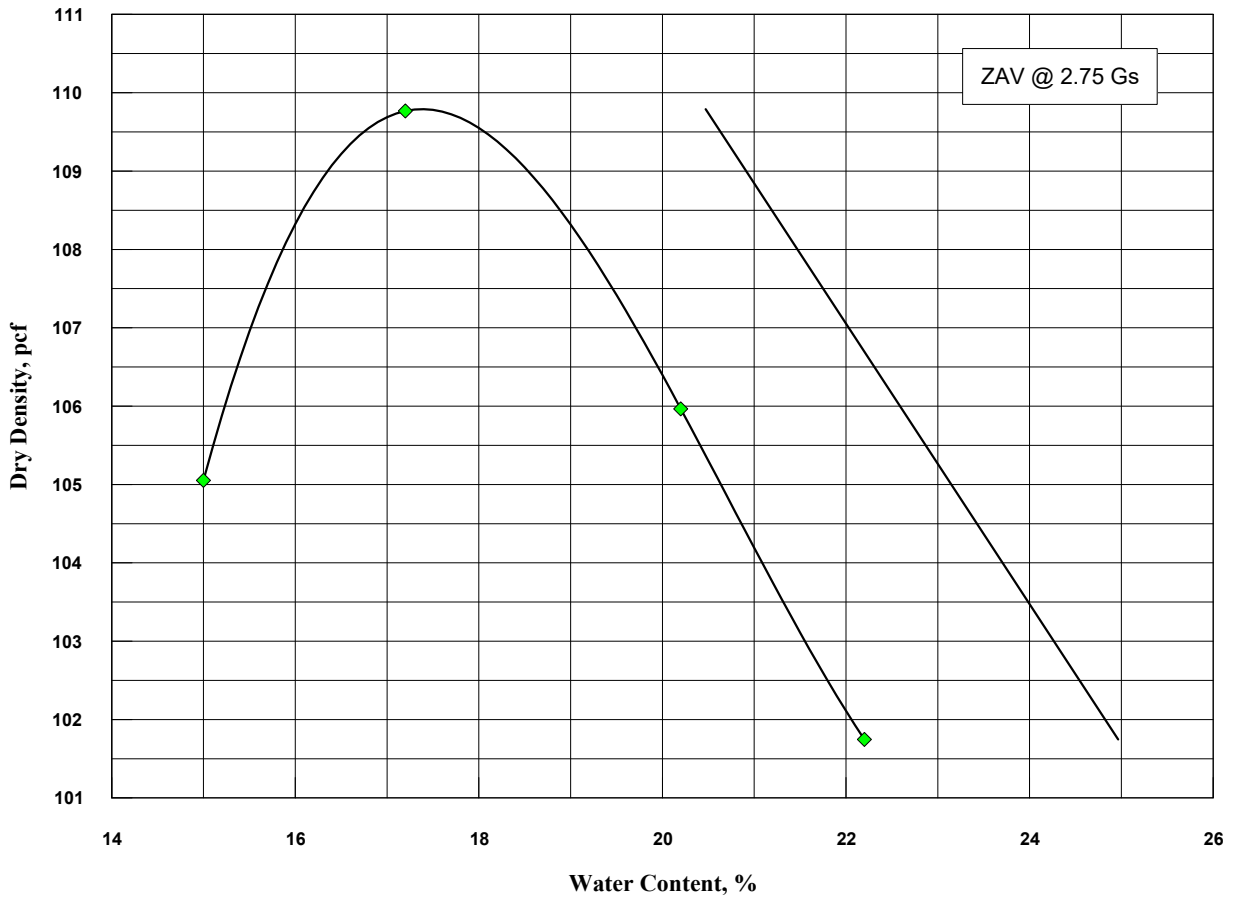


Proj. Name: Eco-Vista Class 4, Cell 8 A	Gravel, % 0.0	Sand, % 24.5	Silt, % 0.0	Clay, % 0.0	LL 45	PI 25
Project No.: 2223	Description and Classification					
Report Date 12.14.2022 Log-in Date 12.12.2022						
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "	2.5 "		3/8 "		
1130 A Bulk Sample	5 "	2 "		1/4 "		
Remarks: NMC, % 14.9	4.5 "	1- 1/2 "		# 4	100.0	
Moist Method, ASTM D422	Bulk	4 "	1 "		# 10	99.6
Sample split on # 40 sieve	Sample wt., kg	3.5 "	3/4 "		# 40	99.0
Clay content reported at 0.005mm	17.10	3 "	1/2 "		# 200	75.5

Hygroscopic Moisture Content Data		Hydrometer Specimen Wet wt.		0.00		Traceability Items	
WS+t	0.00	Hydrometer Specimen Dry wt.		ERR		Balance ID	1 2
DS+T	0.00	Assumed Gs		2.75		Therm ID	58981 NA
Tare wt	0.00	Percent <#40 based on complete specimen		99.04		Flask ID	1 NA
Moist Ratio	ERR	Calculated biased weight		ERR		Bulb ID	1 152H
		Composite Correction at 20 deg C		-6		Sol Mix, ml	125 NA
		Meniscus Correction only		1		Tested By	JMB BMG

Hydrometer Reading Data			Temp.	Corrected	K	Rm	Effective depth	Diameter, mm	Percent finer
Time, min.	Readings	Temp.	Correction, Ct	Reading, Rc					
2	0	0		-6		1	16.13	0.0000	
5	0	0		-6		1	16.13	0.0000	
15	0	0		-6		1	16.13	0.0000	
30	0	0		-6		1	16.13	0.0000	
120	0	0		-6		1	16.13	0.0000	
240	0	0		-6		1	16.13	0.0000	
600	0	0		-6		1	16.13	0.0000	

**Laboratory Compaction Test
ASTM D698, Standard Compaction Test, Mechanical Rammer
Method B, Moist Method**



Report Date: 12.12.2022	Received Date: 12.12.2022	Ran by: JMB	Checked by: BMG
Max. Dry Density, pcf: 109.8		OMC, %: 17.4	
Corrected for Oversize: N/A		Corrected: N/A	

Project: Eco-Vista Class 4 Landfill, Cell 8 A **Client:** Eco-Vista, LLC

Project Number: 2223 **Sample Location:** 1130 A

Sample Description: Red/Brown CL, lean clay, with sand

LL	PL	PI	NMC	Traceability Items			
45	20	25	14.9	Balance ID	Hammer ID	Mold ID	Other
Gravel, %	Sand, %	Clay, %	P-200	1	1S	A	
N/A	24.5	N/A	75.5	2	Page ID	2	Compaction

Results of Falling Head Permeability, ASTM D5084 Recompacted Specimen

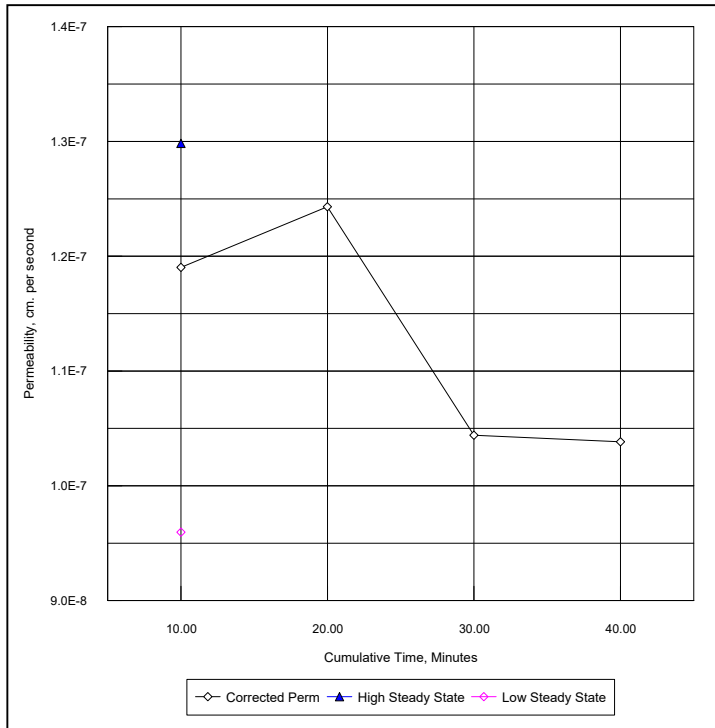
Project Number:	2223	Specimen Received Date:	12.12.2022	Test Date:	12.14.2022
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	12.13.2022	Tested By:	JMB
Client:	Promus Engineering			Reviewed By:	BMG

Sample Id.	1130 A	Location:	N/A	Elevation:	N/A
Specimen Condition:	Before Testing good		After Testing good		

Special Selection or Preparation if Any: Recompacted Specimen	Permeant:	D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	17.4	23.8	Maximum Dry Density, pcf	109.8	104.3	0.0
Percent Saturation	74.2	98.9	Optimum Moisture Content, (%)	17.4	17.4	0.0
Wet Mass Density, (pcf)	122.5	127.8	Percent Compacted:	95.0	95.0	0.0
Dry Mass Density, (pcf)	104.3	103.3				
Height of Solids, (in)	1.215	1.207	Test Pressures During Test			
Void Ratio	0.646	0.662	Backpressure, psi	50		
Calculated Porosity, (%)	39.24	39.84	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final	
Specimen Height, cm	5.08	5.10	
Specimen Diameter, cm	10.12	10.16	
Specimen Area, cm ²	80.45	81.02	
Specimen Mass	Initial	Final	
Initial Wet Mass, gms	801.86	845.4	
Specific Gravity (Assumed):	2.75		
Traceability Items			
Caliper ID	2	Cell ID	T-2
Balance ID	1	CV Hg ID	1
Thermo ID	3		
Constants During Testing and Equipment			
Inflow Buret, (cm ² , ain)		0.7671	
Outflow Buret, (cm ² , aout)		0.0314	
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56	
Manometer, M1, (ain*aout/ain+aout)		0.0302	
Manometer, M2, (1+[aout/ain])		1.041	
Sample, S=(Sample Length/ Sample Area)		0.0631	
Test Constant, C=(M1*S/G)		0.000152	



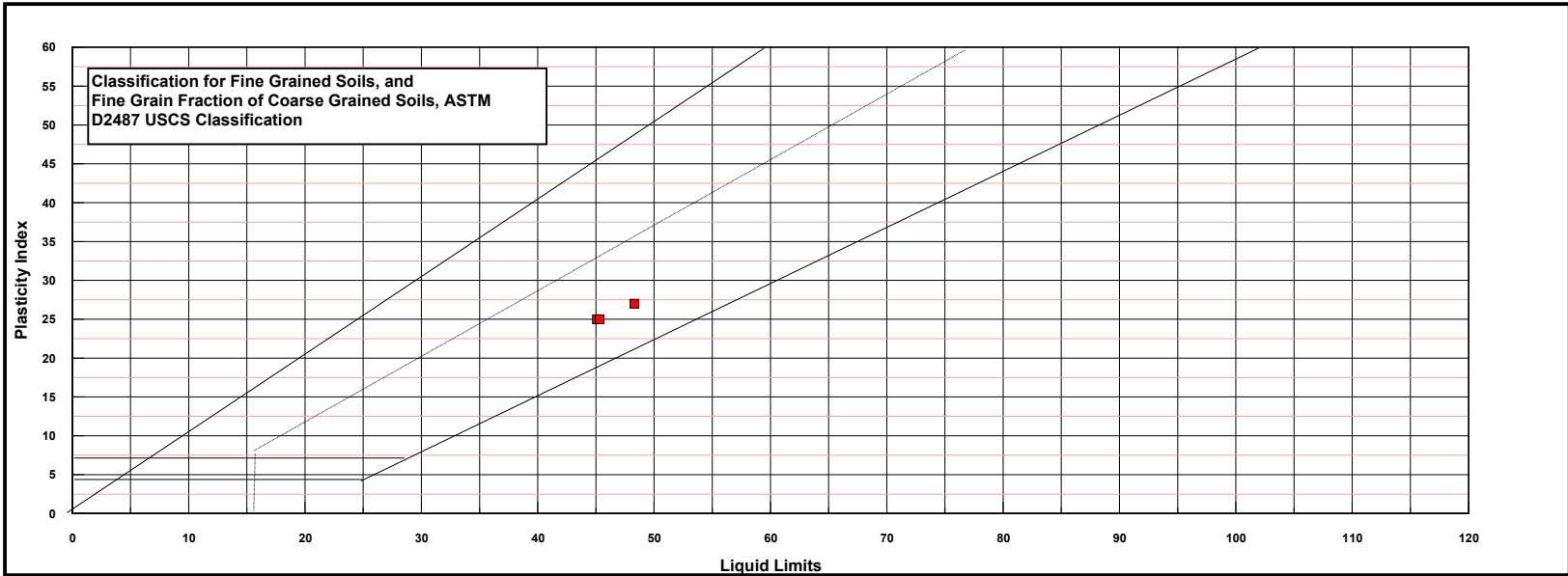
Test		Data	
Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (cm/sec) (Uncorrected)	Corrected k For 20 c (cm/sec)
0	0.00		
10	10.00	1.3E-007	1.2E-007
10	20.00	1.3E-007	1.2E-007
10	30.00	1.1E-007	1.0E-007
10	40.00	1.1E-007	1.0E-007

Average Permeability, Corrected k:	1.1E-007
15% of Average	1.7E-008
High Steady State Limit:	1.3E-007
Low Steady State Limit:	9.6E-008

Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Flow Outflow	Readings			Z out	T	Test Fluid Temp, c
					Gradient During Test	Out/Inflow Ratio				
12.14.2022	12.0000	0	1.400	12.800	30.430				0.091	22.5
12.14.2022	12.1667	600	1.576	8.500	18.482	1.000	4.300		0.150	22.5
12.14.2022	12.3333	600	1.687	5.800	10.980	1.000	2.700		0.253	22.5
12.14.2022	12.5000	600	1.744	4.400	7.090	1.000	1.400		0.392	22.5
12.14.2022	12.6667	600	1.781	3.500	4.589	1.000	0.900		0.605	22.5

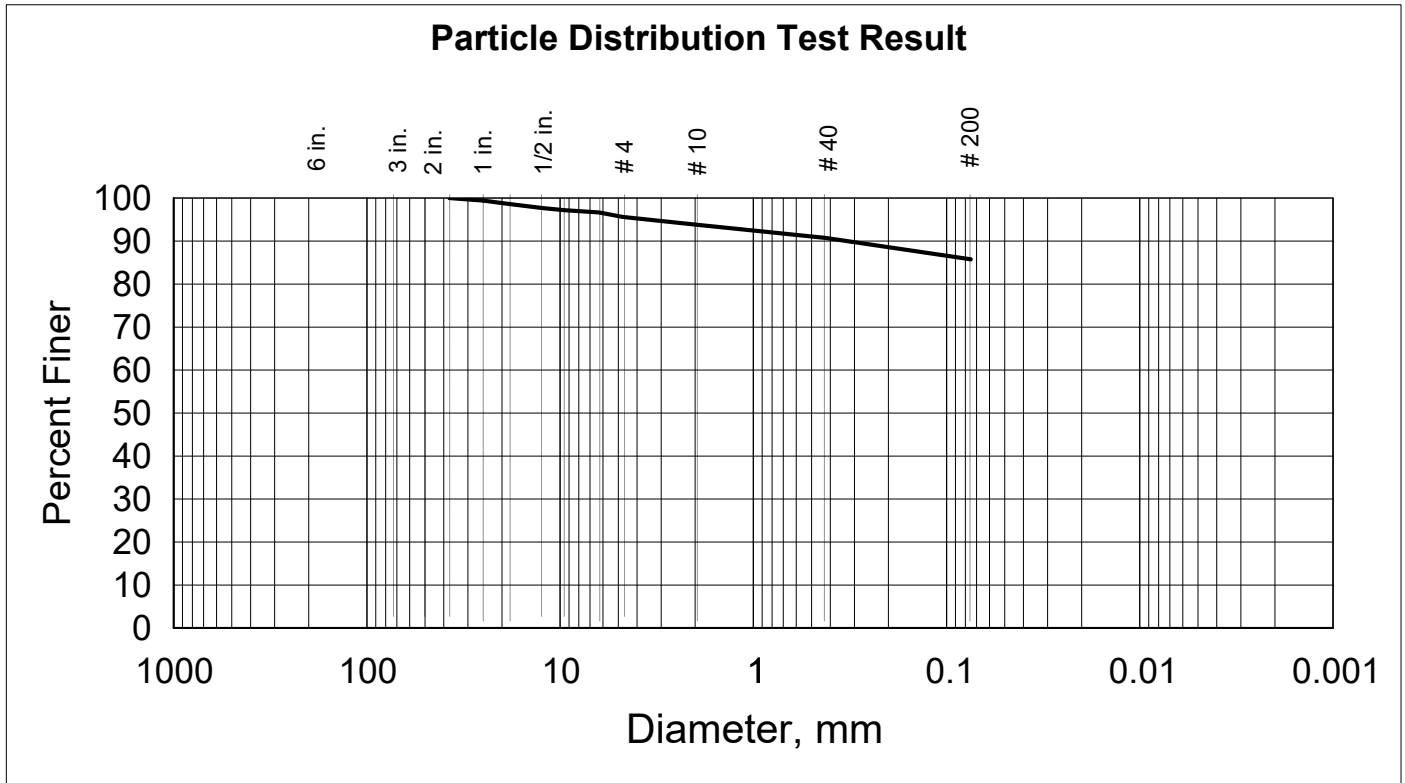
Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	11.24
Unmeasured Flow, cm:	-1.56

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp} + 1.495)$



Project Name:	Eco-Vista Class 4, Cell 8 A	Client's Project No.	220207.00000	ASTM D2217/AASHTO R-74, Method B, Moist Sample Preparation
Project Number:	2223	Project Location:	Arkansas	ASTM D4318, Method A - or - Method B, Liquid and Plastic Limits
Client:	Eco-Vista, LLC			ASTM D422/D1140 - or - D6913/D7928 - or - C136/C117, Grain Size Analysis

Project Test Count, This Page	Sample Number and Locations	Liquid Limits	Plasticity Index	Percent Gravel	Percent Fines (Minus #200)	Natural Moisture, %	Sample Description/Classification	
1	1109 A	45	25	0.9	83.9	20.9	Red/Brown	CL, lean clay, with sand
2	1130 A	45	25	0.0	75.5	14.9	Red/Brown	CL, lean clay, with sand
3	0110 A	48	27	4.4	85.8	18.8	Tan	CL, lean clay,
4								
5								
6								
7								
8								
9								
10								
11								
12								
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18								
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25								

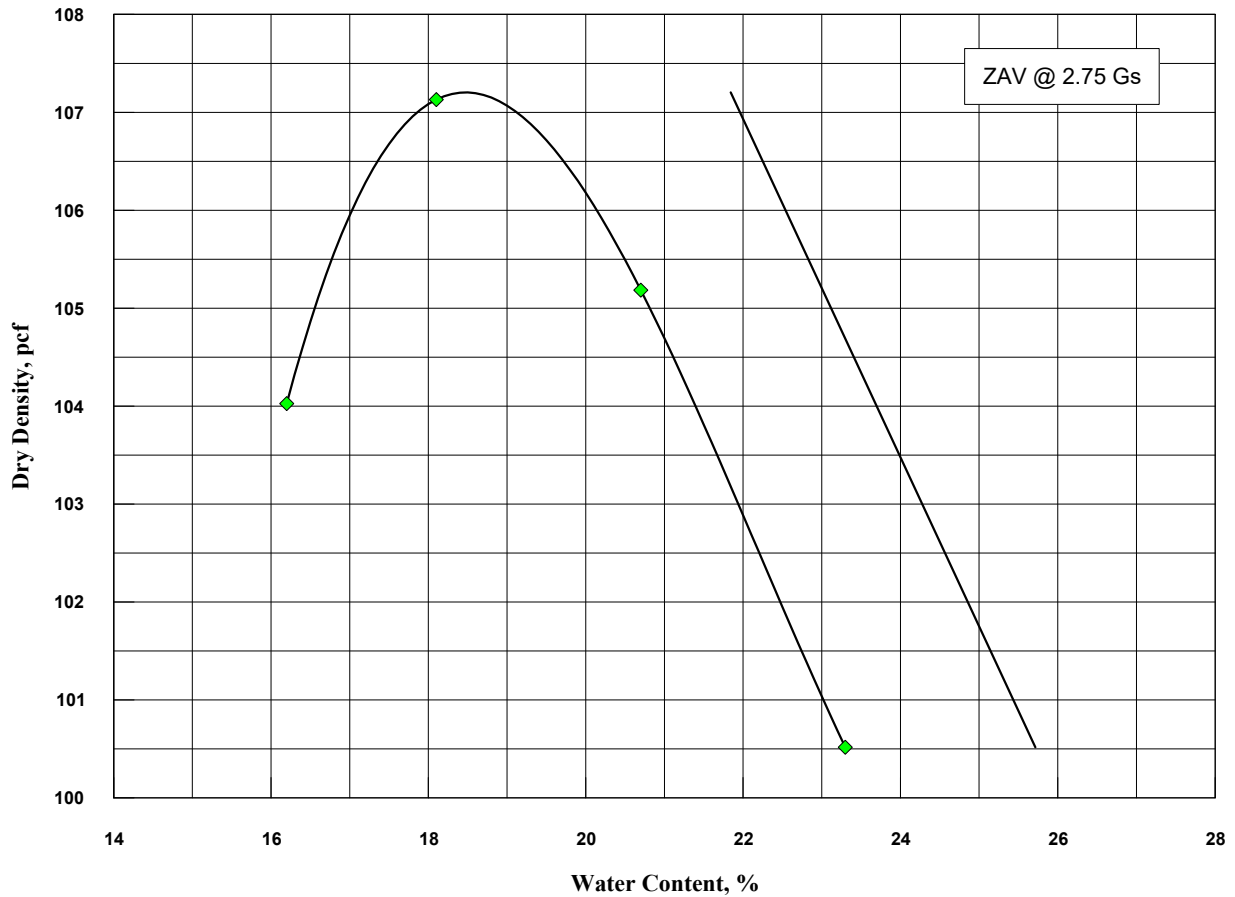


Proj. Name: Eco-Vista Class 4, Cell 8 A	Gravel, % 4.4	Sand, % 9.8	Silt, % 0.0	Clay, % 0.0	LL 48	PI 27
Project No.: 2223	Description and Classification					
Report Date 01.18.2023 Log-in Date 01.16.2023	Tan CL, lean clay,					
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "	2.5 "	3/8 "	97.2		
0110 A Bulk Sample	5 "	2 "	1/4 "	96.7		
Remarks: NMC, % 18.8	4.5 "	1- 1/2 "	100.0	# 4	95.6	
Moist Method, ASTM D422	4 "	1 "	99.4	# 10	93.8	
Sample split on 3/8 for D6913	3.5 "	3/4 "	98.7	# 40	90.8	
Sample wt., kg 18.64	3 "	1/2 "	97.7	# 200	85.8	

Hygroscopic Moisture Content Data		Hydrometer Specimen Wet wt.		0.00		Traceability Items	
WS+t	0.00	Hydrometer Specimen Dry wt.		ERR		Balance ID	1 2
DS+T	0.00	Assumed Gs		2.75		Therm ID	58981 NA
Tare wt	0.00	Percent <#40 based on complete specimen		90.76		Flask ID	1 NA
Moist Ratio	ERR	Calculated biased weight		ERR		Bulb ID	1 152H
		Composite Correction at 20 deg C		-6		Sol Mix, ml	125 NA
		Meniscus Correction only		1		Tested By	JMB BMG

Hydrometer Reading Data			Temp.	Corrected	K	Rm	Effective depth	Diameter, mm	Percent finer
Time, min.	Readings	Temp.	Correction, Ct	Reading, Rc					
2	0	0		-6		1	16.13	0.0000	
5	0	0		-6		1	16.13	0.0000	
15	0	0		-6		1	16.13	0.0000	
30	0	0		-6		1	16.13	0.0000	
120	0	0		-6		1	16.13	0.0000	
240	0	0		-6		1	16.13	0.0000	
600	0	0		-6		1	16.13	0.0000	

**Laboratory Compaction Test
ASTM D698, Standard Compaction Test, Mechanical Rammer
Method B, Moist Method**



Report Date: 01.17.2023	Received Date: 01.16.2023	Ran by: JMB	Checked by: BMG
Max. Dry Density, pcf: 107.2		OMC, %: 18.5	
Corrected for Oversize: N/A		Corrected: N/A	

Project: Eco-Vista Class 4 Landfill, Cell 8 A	Client: Eco-Vista, LLC
Project Number: 2223	Sample Location: 0110 A

Sample Description: Tan CL, lean clay,

LL	PL	PI	NMC	Traceability Items			
48	21	27	18.8	Balance ID	Hammer ID	Mold ID	Other
Gravel, %	Sand, %	Clay, %	P-200	1	1S	A	
				2	Page ID	3	Compaction
4.4	9.8	N/A	85.8				

Results of Falling Head Permeability, ASTM D5084 Recompacted Specimen

Project Number:	2223	Specimen Received Date:	01.16.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	01.18.2023
Client:	Promus Engineering	Test Date:	01.19.2023
		Tested By:	JMB
		Reviewed By:	BMG

Sample Id.	0110 A	Location:	N/A
		Elevation:	N/A
Specimen Condition:	Before Testing good	After Testing	good

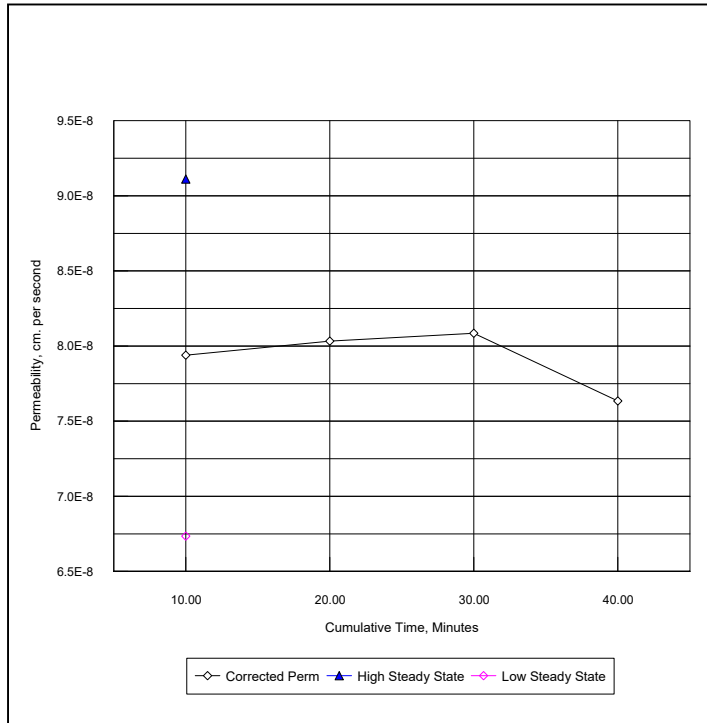
Special Selection or Preparation if Any: Recompacted Specimen	Permeant:	D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	18.5	24.8	Maximum Dry Density, pcf	107.2	101.8	0.0
Percent Saturation	74.3	96.3	Optimum Moisture Content, (%)	18.5	18.5	0.0
Wet Mass Density, (pcf)	120.7	125.4	Percent Compacted:	95.0	95.0	0.0
Dry Mass Density, (pcf)	101.9	100.5				
Height of Solids, (in)	1.186	1.178	Test Pressures During Test			
Void Ratio	0.686	0.709		50		
Calculated Porosity, (%)	40.68	41.47	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final	
Specimen Height, cm	5.08	5.11	
Specimen Diameter, cm	10.12	10.16	
Specimen Area, cm ²	80.45	81.02	
Specimen Mass	Initial	Final	
Initial Wet Mass, gms	790.21	832.1	
Specific Gravity (Assumed):	2.75		
Traceability Items			
Caliper ID	2	Cell ID	1
Balance ID	1	CV Hg ID	1
Thermo ID	2		
Constants During Testing and Equipment			
Inflow Buret, (cm ² , ain)		0.7671	
Outflow Buret, (cm ² , aout)		0.0314	
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56	
Manometer, M1, (ain*aout/ain+aout)		0.0302	
Manometer, M2, (1+[aout/ain])		1.041	
Sample, S=(Sample Length/ Sample Area)		0.0631	
Test Constant, C=(M1*S/G)		0.000152	

Test		Data	
Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (Uncorrected) (cm/sec)	Corrected k For 20 c (cm/sec)
0	0.00		
10	10.00	8.1E-008	7.9E-008
10	20.00	8.2E-008	8.0E-008
10	30.00	8.2E-008	8.1E-008
10	40.00	7.8E-008	7.6E-008

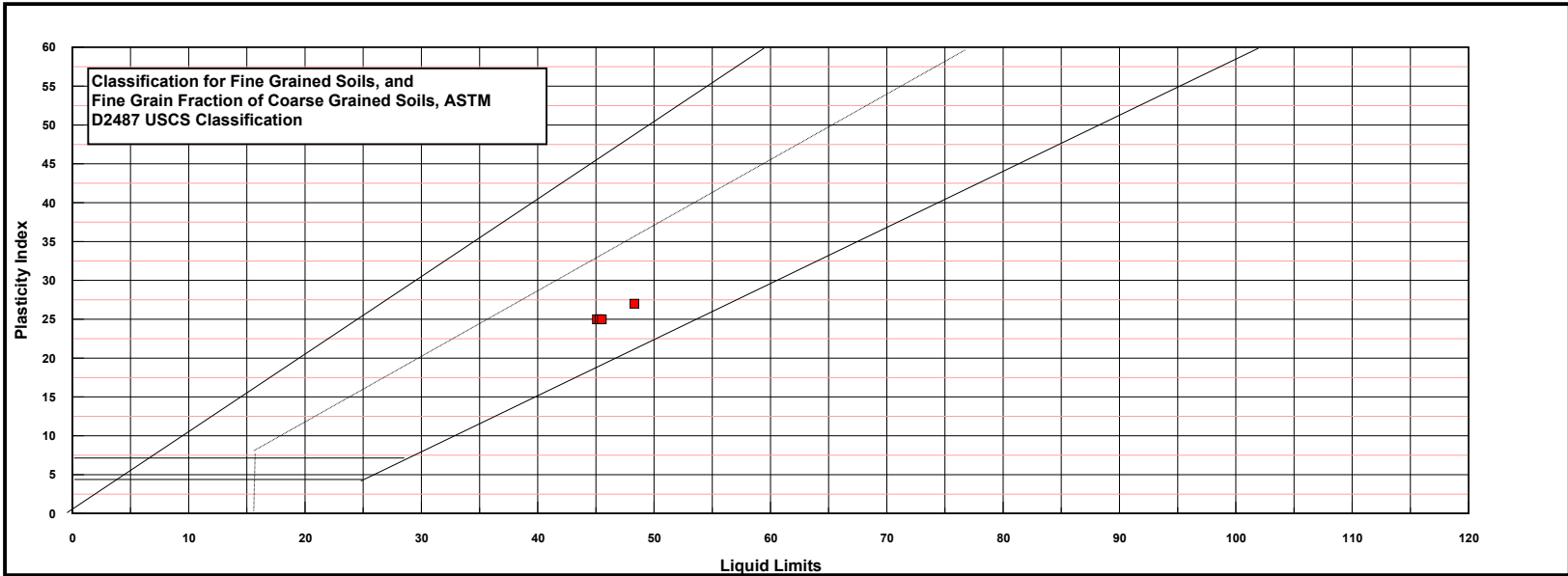
Average Permeability, Corrected k:	7.9E-008
15% of Average	1.2E-008
High Steady State Limit:	9.1E-008
Low Steady State Limit:	6.7E-008



Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Flow Outflow	Readings			T	Test Fluid Temp, c
					Gradient During Test	Out/Inflow Ratio	Z out		
01.19.2023	7.0000	0	1.100	12.500	30.430			0.091	21
01.19.2023	7.1667	600	1.223	9.500	22.094	1.000	3.000	0.126	21
01.19.2023	7.3333	600	1.313	7.300	15.981	1.000	2.200	0.174	21
01.19.2023	7.5000	600	1.378	5.700	11.536	1.000	1.600	0.241	21
01.19.2023	7.6667	600	1.423	4.600	8.479	1.000	1.100	0.328	21

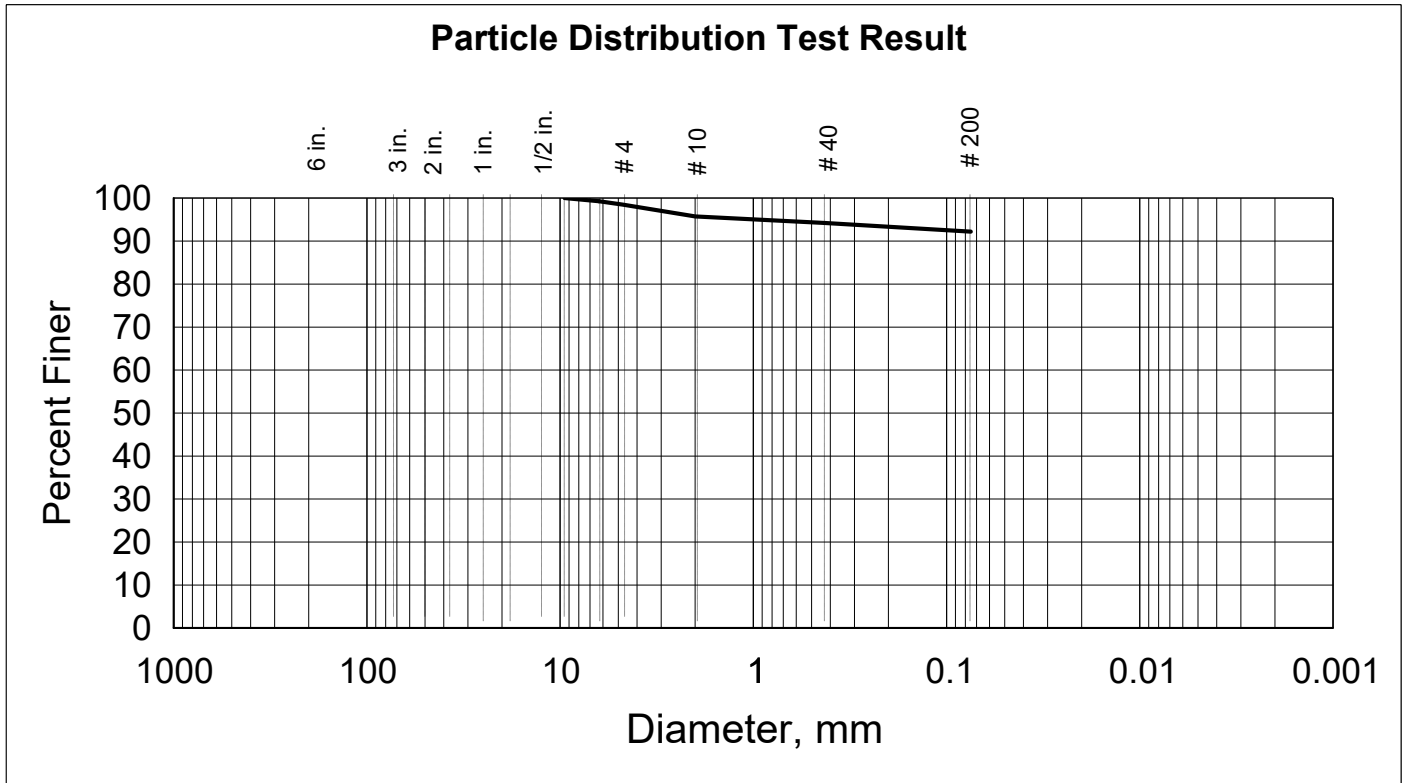
Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	11.24
Unmeasured Flow, cm:	-1.26

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = k x (-0.02452 x temp. + 1.495)



Project Name:	Eco-Vista Class 4, Cell 8 A	Client's Project No.:	220207.00000	ASTM D2217/AASHTO R-74, Method B, Moist Sample Preparation
Project Number:	2223	Project Location:	Arkansas	ASTM D4318, Method A - or - Method B, Liquid and Plastic Limits
Client:	Eco-Vista, LLC			ASTM D422/D1140 - or - D6913/D7928 - or - C136/C117, Grain Size Analysis

Project Test Count, This Page	Sample Number and Locations	Liquid Limits	Plasticity Index	Percent Gravel	Percent Fines (Minus #200)	Natural Moisture, %	Sample Description/Classification	
1	1109 A	45	25	0.9	83.9	20.9	Red/Brown	CL, lean clay, with sand
2	1130 A	45	25	0.0	75.5	14.9	Red/Brown	CL, lean clay, with sand
3	0110 A	48	27	4.4	85.8	18.8	Tan	CL, lean clay,
4	030623	46	25	1.5	92.2	25.7	Tan	CL, lean clay,
5								
6								
7								
8								
9								
10								
11								
12								
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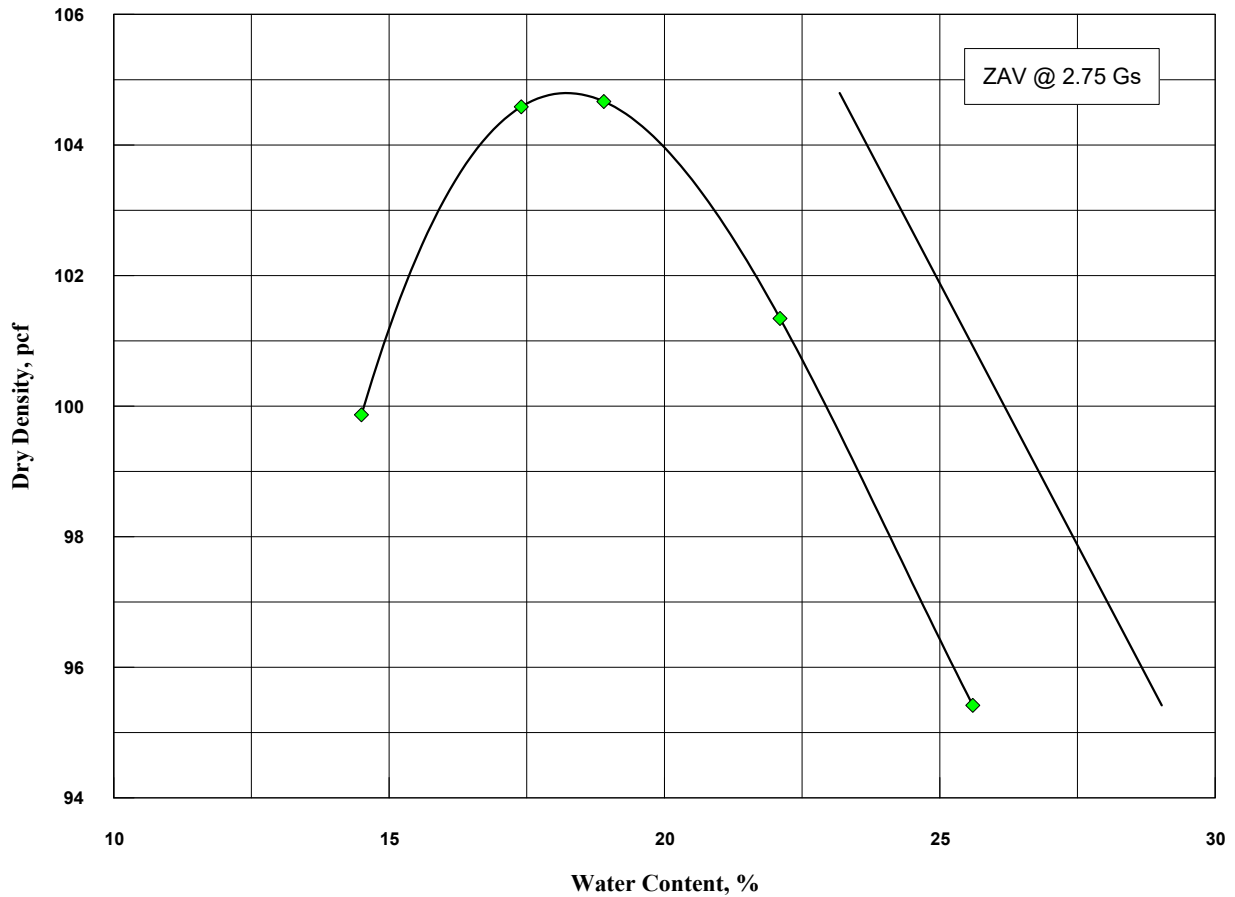


Proj. Name: Eco-Vista Class 4, Cell 8 A	Gravel, %	Sand, %	Silt, %	Clay, %	LL	PI
Project No.: 2223	1.5	6.3	0.0	0.0	46	25
Report Date 03.10.2023	Description and Classification					
Log-in Date 03.09.2023	Tan CL, lean clay,					
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "	2.5 "	3/8 "	100.0		
030623 Bulk Sample	5 "	2 "	1/4 "	99.3		
Remarks:	NMC, %	25.7	4.5 "	1- 1/2 "	# 4	98.5
Moist Method, ASTM D422	Bulk		4 "	1 "	# 10	95.7
Sample split on # 40 sieve	Sample wt., kg		3.5 "	3/4 "	# 40	94.2
Clay content reported at 0.005mm	14.06		3 "	1/2 "	# 200	92.2

Hygroscopic Moisture Content Data		Hydrometer Specimen Wet wt.		0.00		Traceability Items	
WS+t	0.00	Hydrometer Specimen Dry wt.		ERR		Balance ID	1 2
DS+T	0.00	Assumed Gs		2.75		Therm ID	58981 NA
Tare wt	0.00	Percent <#40 based on complete specimen		94.19		Flask ID	1 NA
Moist Ratio	ERR	Calculated biased weight		ERR		Bulb ID	1 152H
		Composite Correction at 20 deg C		-6		Sol Mix, ml	125 NA
		Meniscus Correction only		1		Tested By	JMB BMG

Hydrometer Reading Data			Temp.	Corrected	K	Rm	Effective depth	Diameter, mm	Percent finer
Time, min.	Readings	Temp.	Correction, Ct	Reading, Rc					
2	0	0		-6		1	16.13	0.0000	
5	0	0		-6		1	16.13	0.0000	
15	0	0		-6		1	16.13	0.0000	
30	0	0		-6		1	16.13	0.0000	
120	0	0		-6		1	16.13	0.0000	
240	0	0		-6		1	16.13	0.0000	
600	0	0		-6		1	16.13	0.0000	

**Laboratory Compaction Test
ASTM D698, Standard Compaction Test, Mechanical Rammer
Method B, Moist Method**



Report Date: 03.11.2023	Received Date: 03.09.2023	Ran by: JMB	Checked by: BMG
Max. Dry Density, pcf: 104.8		OMC, %: 18.2	
Corrected for Oversize: N/A		Corrected: N/A	

Project: Eco-Vista Class 4 Landfill, Cell 8 A	Client: Eco-Vista, LLC
Project Number: 2223	Sample Location: 030623

Sample Description: Tan CL, lean clay,

LL	PL	PI	NMC	Traceability Items			
46	21	25	25.7	Balance ID	Hammer ID	Mold ID	Other
Gravel, %	Sand, %	Clay, %	P-200	1	1S	A	
				2	Page ID	4	Compaction
1.5	6.3	N/A	92.2				

Results of Falling Head Permeability, ASTM D5084 Recompacted Specimen

Project Number:	2223	Specimen Received Date:	03.09.2023	Test Date:	03.12.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	03.11.2023	Tested By:	JMB
Client:	Promus Engineering			Reviewed By:	BMG

Sample Id.	030623	Location:	N/A	Elevation:	N/A
Specimen Condition:	Before Testing good	After Testing	good		

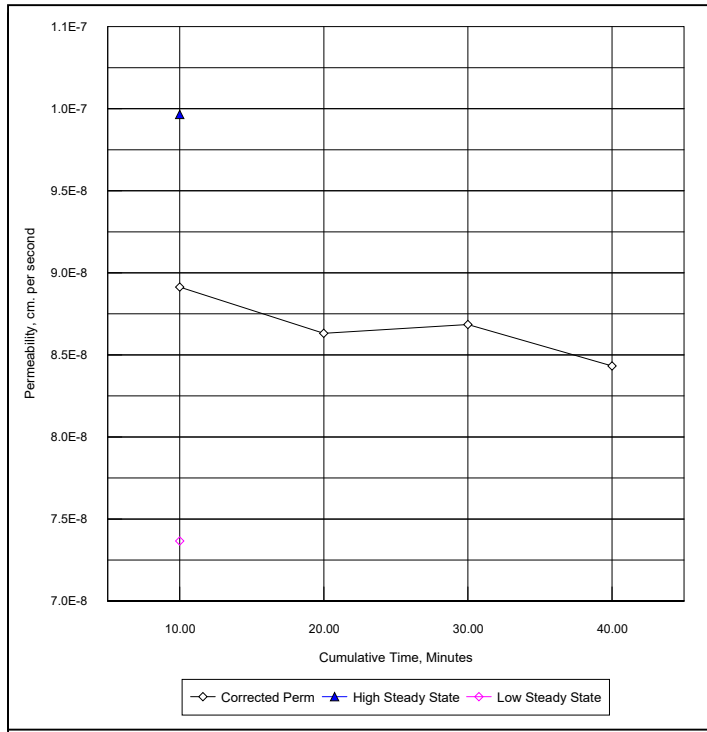
Special Selection or Preparation if Any: Recompacted Specimen	Permeant:	D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	18.2	25.7	Maximum Dry Density, pcf	104.8	99.6	0.0
Percent Saturation	69.2	97.1	Optimum Moisture Content, (%)	18.2	18.2	0.0
Wet Mass Density, (pcf)	117.7	124.8	Percent Compacted:	95.0	95.0	0.0
Dry Mass Density, (pcf)	99.6	99.3				
Height of Solids, (in)	1.160	1.157	Test Pressures During Test			
Void Ratio	0.724	0.730	Backpressure, psi	50		
Calculated Porosity, (%)	42.01	42.18	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final	
Specimen Height, cm	5.08	5.09	
Specimen Diameter, cm	7.31	7.31	
Specimen Area, cm ²	41.90	41.99	
Specimen Mass	Initial	Final	
Initial Wet Mass, gms	401.36	426.9	
Specific Gravity (Assumed):	2.75		
Traceability Items			
Caliper ID	2	Cell ID	9
Balance ID	3	CV Hg ID	1
Thermo ID	2		
Constants During Testing and Equipment			
Inflow Buret, (cm ² , ain)		0.7671	
Outflow Buret, (cm ² , aout)		0.0314	
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56	
Manometer, M1, (ain*aout/ain+aout)		0.0302	
Manometer, M2, (1+[aout/ain])		1.041	
Sample, S=(Sample Length/ Sample Area)		0.1212	
Test Constant, C=(M1*S/G)		0.000291	

	Test	Data	
Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (Uncorrected) (cm/sec)	Corrected k For 20 c (cm/sec)
0	0.00		
10	10.00	8.7E-008	8.9E-008
10	20.00	8.4E-008	8.6E-008
10	30.00	8.4E-008	8.7E-008
10	40.00	8.2E-008	8.4E-008

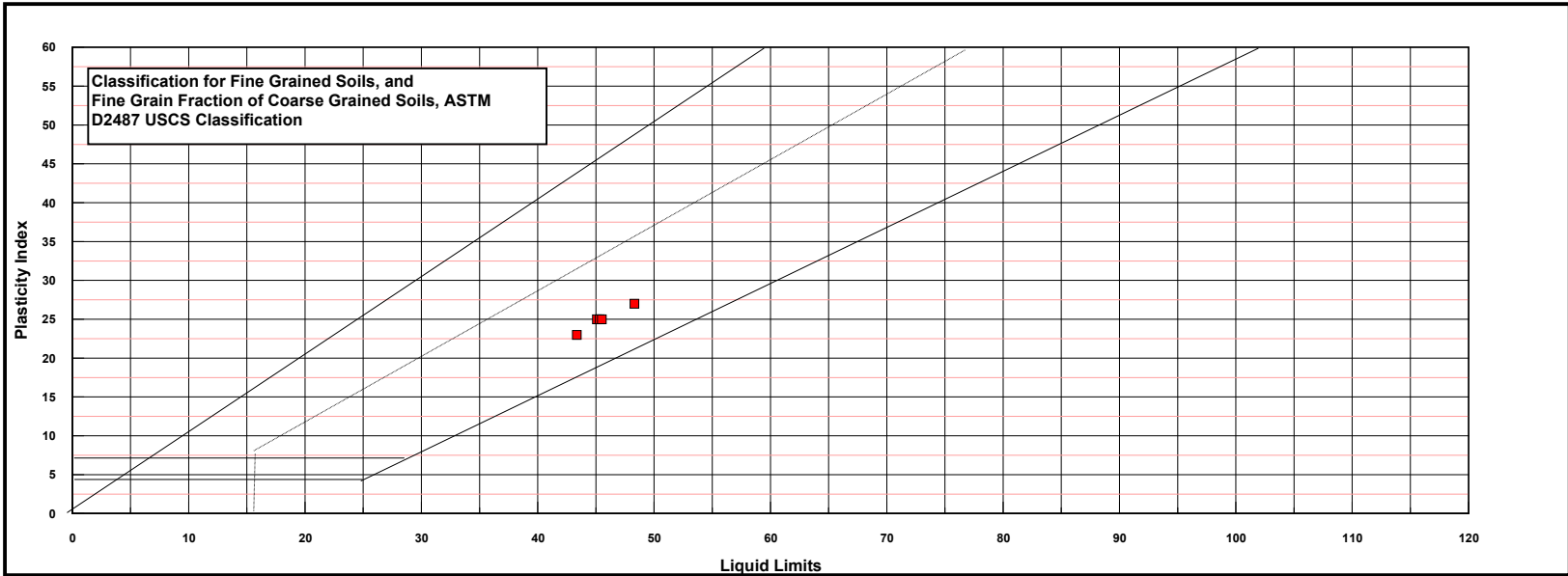
Average Permeability, Corrected k:	8.7E-008
15% of Average	1.3E-008
High Steady State Limit:	1.0E-007
Low Steady State Limit:	7.4E-008



Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Flow Outflow	Readings			T	Test Fluid Temp, c
					Gradient During Test	Out/Inflow Ratio	Z out		
03.12.2023	6.0000	0	1.200	11.400	27.227			0.102	19
03.12.2023	6.1667	600	1.265	9.800	22.781	1.000	1.600	0.122	19
03.12.2023	6.3333	600	1.319	8.500	19.169	1.000	1.300	0.145	19
03.12.2023	6.5000	600	1.364	7.400	16.113	1.000	1.100	0.172	19
03.12.2023	6.6667	600	1.401	6.500	13.612	1.000	0.900	0.204	19

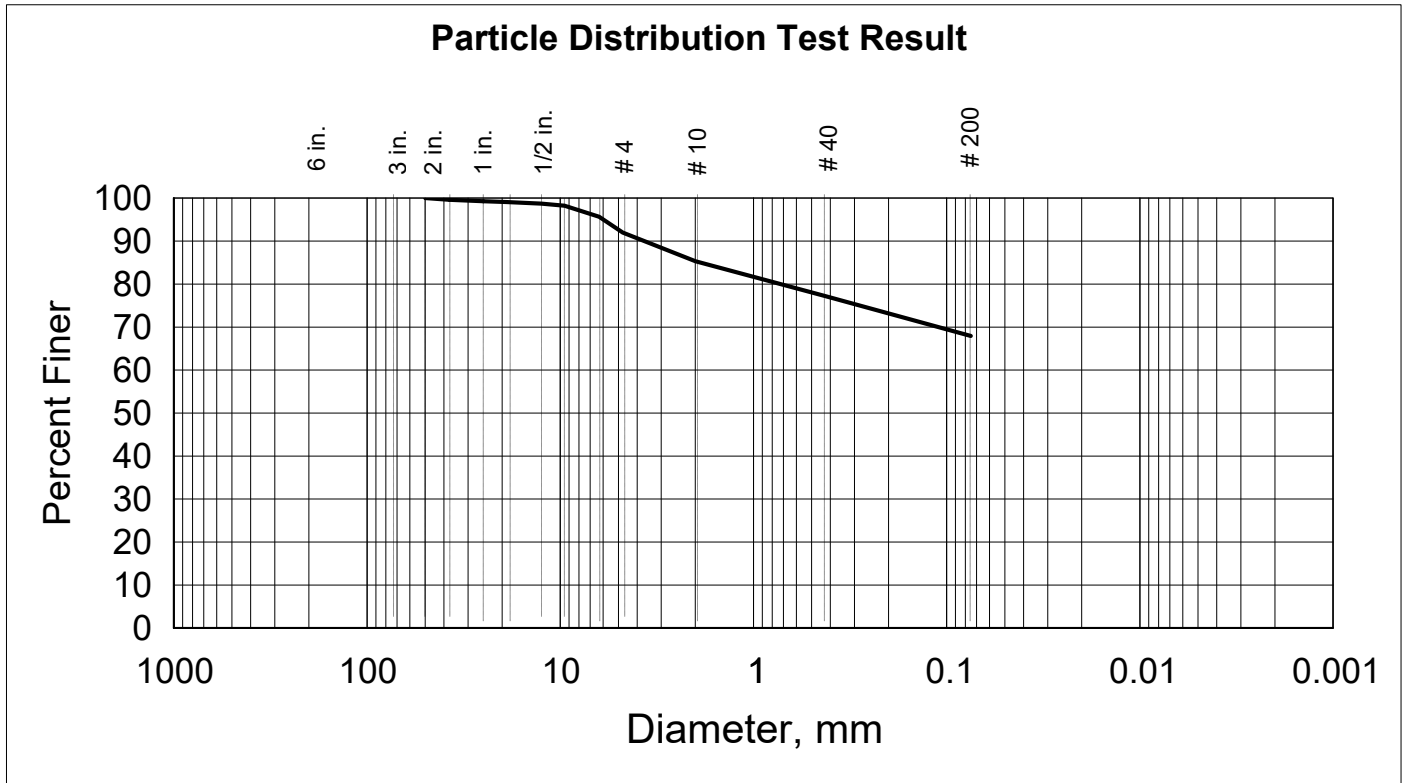
Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	11.24
Unmeasured Flow, cm:	-0.16

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp.} + 1.495)$



Project Name:	Eco-Vista Class 4, Cell 8 A	Client's Project No.:	220207.00000	ASTM D2217/AASHTO R-74, Method B, Moist Sample Preparation
Project Number:	2223	Project Location:	Arkansas	ASTM D4318, Method A - or - Method B, Liquid and Plastic Limits
Client:	Eco-Vista, LLC			ASTM D422/D1140 - or - D6913/D7928 - or - C136/C117, Grain Size Analysis

Project Test Count, This Page	Sample Number and Locations	Liquid Limits	Plasticity Index	Percent Gravel	Percent Fines (Minus #200)	Natural Moisture, %	Sample Description/Classification	
1	1109 A	45	25	0.9	83.9	20.9	Red/Brown	CL, lean clay, with sand
2	1130 A	45	25	0.0	75.5	14.9	Red/Brown	CL, lean clay, with sand
3	0110 A	48	27	4.4	85.8	18.8	Tan	CL, lean clay,
4	030623	46	25	1.5	92.2	25.7	Tan	CL, lean clay,
5	0414 E	43	23	8.0	68.0	19.5	Tan	CL, lean clay, sandy
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
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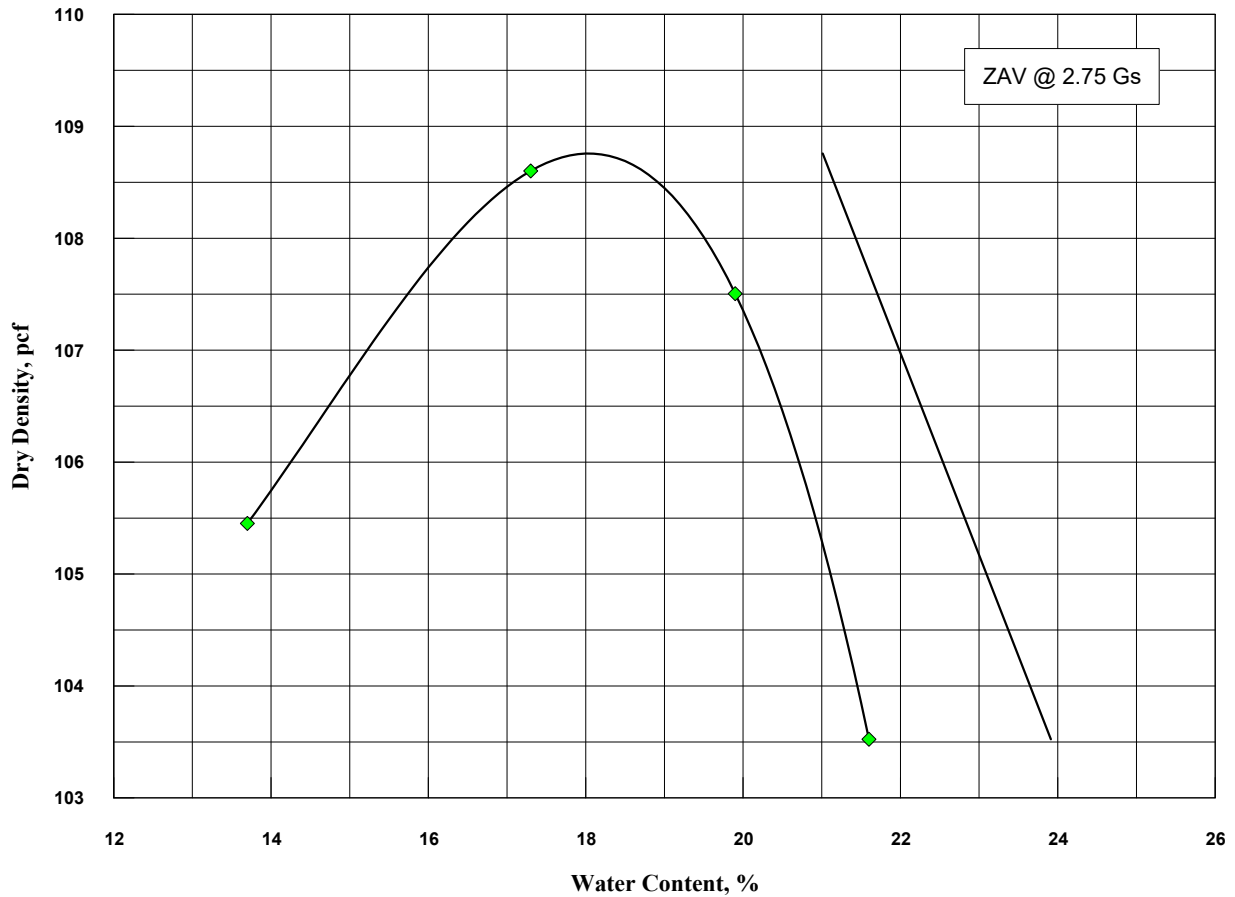


Proj. Name: Eco-Vista Class 4, Cell 8 A	Gravel, % 8.0	Sand, % 24.0	Silt, % 0.0	Clay, % 0.0	LL 43	PI 23
Project No.: 2223	Description and Classification					
Report Date 04.20.2023 Log-in Date 04.17.2023	Tan CL, lean clay, sandy					
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "	2.5 "	3/8 "	98.2		
0414 E Bulk Sample	5 "	2 "	100.0	1/4 "	95.7	
Remarks: NMC, % 19.5	4.5 "	1- 1/2 "	99.6	# 4	92.0	
ASTM D6913/D422	4 "	1 "	99.3	# 10	85.3	
Sample split on 0.375 sieve	3.5 "	3/4 "	99.1	# 40	77.2	
	3 "	1/2 "	98.7	# 200	68.0	
Bulk Sample wt., kg 21.60						

Hygroscopic Moisture Content Data		Hydrometer Specimen Wet wt.		0.00		Traceability Items	
WS+t	0.00	Hydrometer Specimen Dry wt.	ERR	Balance ID	1	2	
DS+T	0.00	Assumed Gs	2.75	Therm ID	58981	NA	
Tare wt	0.00	Percent <#40 based on complete specimen	77.21	Flask ID	1	NA	
Moist Ratio	ERR	Calculated biased weight	ERR	Bulb ID	1	152H	
		Composite Correction at 20 deg C	-6	Sol Mix, ml	125	NA	
		Meniscus Correction only	1	Tested By	JMB	BMG	

Hydrometer Reading Data			Temp.	Corrected	K	Rm	Effective depth	Diameter, mm	Percent finer
Time, min.	Readings	Temp.	Correction, Ct	Reading, Rc					
2	0	0		-6		1	16.13	0.0000	
5	0	0		-6		1	16.13	0.0000	
15	0	0		-6		1	16.13	0.0000	
30	0	0		-6		1	16.13	0.0000	
120	0	0		-6		1	16.13	0.0000	
240	0	0		-6		1	16.13	0.0000	
600	0	0		-6		1	16.13	0.0000	

**Laboratory Compaction Test
ASTM D698, Standard Compaction Test, Mechanical Rammer
Method B, Moist Method**



Report Date: 04.19.2023	Received Date: 04.17.2023	Ran by: JMB	Checked by: BMG
Max. Dry Density, pcf: 108.8		OMC, %: 18.0	
Corrected for Oversize: N/A		Corrected: N/A	

Project: Eco-Vista Class 4 Landfill, Cell 8 A	Client: Eco-Vista, LLC
Project Number: 2223	Sample Location: 0414 E

Sample Description: Tan CL, lean clay,

LL	PL	PI	NMC	Traceability Items			
46	21	25	25.7	Balance ID	Hammer ID	Mold ID	Other
Gravel, %	Sand, %	Clay, %	P-200	1	1S	A	
				2	Page ID	0414 E	Compaction
1.5	6.3	N/A	92.2				

Results of Falling Head Permeability, ASTM D5084 Recompacted Specimen

Project Number:	2223	Specimen Received Date:	04.17.2023	Test Date:	04.21.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	04.19.2023	Tested By:	JMB
Client:	Promus Engineering			Reviewed By:	BMG

Sample Id.	0414 E	Location:	N/A	Elevation:	N/A
Specimen Condition:	Before Testing good	After Testing	good		

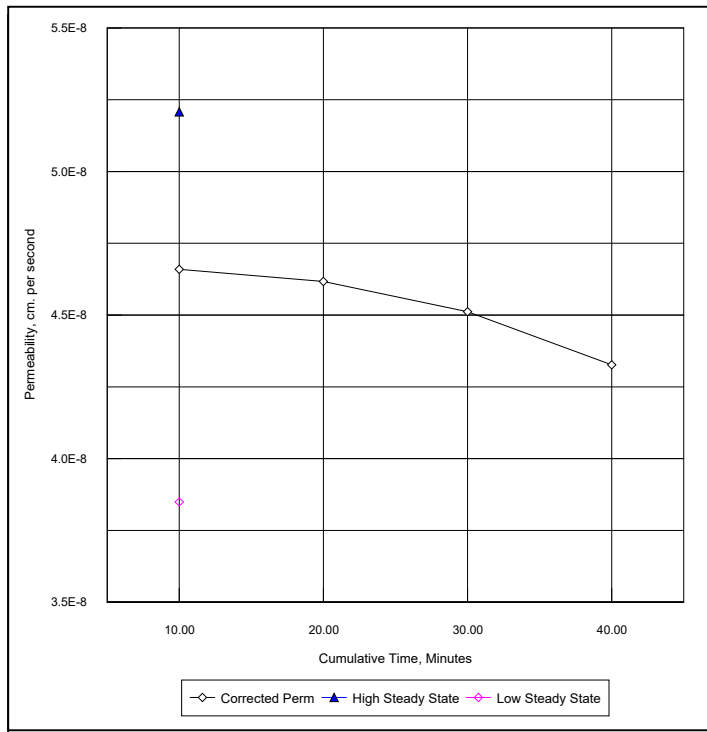
Special Selection or Preparation if Any: Recompacted Specimen	Permeant:	D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	18.0	24.8	Maximum Dry Density, pcf	108.8	103.4	0.0
Percent Saturation	75.0	101.3	Optimum Moisture Content, (%)	18.0	18.0	0.0
Wet Mass Density, (pcf)	122.0	127.9	Percent Compacted:	95.0	95.0	0.0
Dry Mass Density, (pcf)	103.4	102.5				
Height of Solids, (in)	1.204	1.198	Test Pressures During Test			
Void Ratio	0.661	0.676		50		
Calculated Porosity, (%)	39.79	40.32	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final	
Specimen Height, cm	5.08	5.10	
Specimen Diameter, cm	7.31	7.32	
Specimen Area, cm ²	41.90	42.11	
Specimen Mass	Initial	Final	
Initial Wet Mass, gms	415.97	440.1	
Specific Gravity (Assumed):	2.75		
Traceability Items			
Caliper ID	3	Cell ID	7
Balance ID	2	CV Hg ID	6
Thermo ID	1		
Constants During Testing and Equipment			
Inflow Buret, (cm ² , ain)		0.7671	
Outflow Buret, (cm ² , aout)		0.0314	
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56	
Manometer, M1, (ain*aout/ain+aout)		0.0302	
Manometer, M2, (1+[aout/ain])		1.041	
Sample, S=(Sample Length/ Sample Area)		0.1212	
Test Constant, C=(M1*S/G)		0.000291	

Test	Data	Data	Data
Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (Uncorrected) (cm/sec)	Corrected k For 20 c (cm/sec)
0	0.00		
10	10.00	4.7E-008	4.7E-008
10	20.00	4.7E-008	4.6E-008
10	30.00	4.5E-008	4.5E-008
10	40.00	4.4E-008	4.3E-008

Average Permeability, Corrected k:	4.5E-008
15% of Average	6.8E-009
High Steady State Limit:	5.2E-008
Low Steady State Limit:	3.8E-008



Date	Clock Time (hh:mm:ss)	Trial Elapsed t, sec.	Flow Inflow	Flow Outflow	Readings			Z out	T	Test Fluid Temp, c
					Gradient During Test	Out/Inflow Ratio				
04.21.2023	10.0000	0	1.200	12.500	30.163			0.092	20.5	
04.21.2023	10.1667	600	1.241	11.500	27.384	1.000	1.000	0.101	20.5	
04.21.2023	10.3333	600	1.278	10.600	24.884	1.000	0.900	0.112	20.5	
04.21.2023	10.5000	600	1.311	9.800	22.661	1.000	0.800	0.123	20.5	
04.21.2023	10.6667	600	1.339	9.100	20.716	1.000	0.700	0.134	20.5	

Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	11.24
Unmeasured Flow, cm:	-1.26

Remarks: $k = C/t \ln [1 - (Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp} + 1.495)$

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 4/18/2023

 SAMPLE ID: 0413-A DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.09
Moist Weight (g):	436.6
Unit Wt. (wet) (pcf):	126.4
Unit Wt. (dry) (pcf):	107.2
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST18	ST40
Tare Wt (g)	14.08	14.03
Wet Wt (g)	51.79	55.36
Dry Wt (g)	46.07	48.35
Moisture Content	17.9%	20.4%
+/- OMC	17.9%	20.4%
Sample Saturation:	87%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	12.9

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZp (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	4/21	300	12.5	0.4341	24.2	0.91	3.69E-8	3.1%	OK
2	4/21	600	12.1	0.8341	24.2	0.91	3.60E-8	0.4%	OK
3	4/21	900	11.7	1.2341	24.2	0.91	3.62E-8	1.0%	OK
4	4/21	1200	11.4	1.5341	24.2	0.91	3.42E-8	4.5%	OK
	4/21	1500		12.9341	24.2	0.91	#NUM!	#NUM!	#NUM!
	4/21	1800			24.2	0.91			

 Average of selected 4 consecutive values, k_a: 3.58E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.58E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 4/18/2023

 SAMPLE ID: 0413-B DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.25
Moist Weight (g):	467.8
Unit Wt. (wet) (pcf):	125.8
Unit Wt. (dry) (pcf):	107.1
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST07	ST25
Tare Wt (g)	14.13	14.07
Wet Wt (g)	53.95	58.26
Dry Wt (g)	48.03	50.82
Moisture Content	17.5%	20.2%
+/- OMC	17.5%	20.2%
Sample Saturation:	85%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	13.8

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZp (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)
1	4/21	300	13.3	0.5018	24.3	0.90	4.27E-8
2	4/21	600	12.8	1.0018	24.3	0.90	4.34E-8
3	4/21	900	12.3	1.5018	24.3	0.90	4.43E-8
4	4/21	1200	11.9	1.9018	24.3	0.90	4.29E-8
	4/21	1500		13.8018	24.3	0.90	#NUM!
	4/21	1800			24.3	0.90	

Acceptance	
Vm	OK?
1.5%	OK
0.1%	OK
2.3%	OK
1.0%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a: 4.33E-8

Acceptance Criteria (4 consecutive readings):

 Vm ≤ 15% for k_a ≥ 1.00E-8

 Vm < 50% for k_a < 1.00E-8

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k ₂₀ :	4.33E-08
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Comments/Qualifiers:

PROJECT NO.: 220207

PROJECT: Eco Vista Landfill

DATE: 4/18/2023

SAMPLE ID: 0413-C

DESCRIPTION:

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.37
Moist Weight (g):	482.6
Unit Wt. (wet) (pcf):	123.2
Unit Wt. (dry) (pcf):	103.3
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST50	ST32
Tare Wt (g)	14.02	14.16
Wet Wt (g)	57.94	51.08
Dry Wt (g)	50.84	44.35
Moisture Content	19.3%	22.3%
+/- OMC	19.3%	22.3%
Sample Saturation:	85%	98%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	14.5

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)
1	4/21	300	14.0	0.4526	24.1	0.91	3.85E-8
2	4/21	600	13.6	0.8526	24.1	0.91	3.70E-8
3	4/21	900	13.2	1.2526	24.1	0.91	3.69E-8
4	4/21	1200	12.8	1.6526	24.1	0.91	3.71E-8
	4/21	1500		14.4526	24.1	0.91	#NUM!
	4/21	1800			24.1	0.91	

Acceptance	
V _m	OK?
3.0%	OK
0.9%	OK
1.3%	OK
0.7%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a: 3.74E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.74E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 4/18/2023

 SAMPLE ID: 0413-D DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.11
Moist Weight (g):	429.6
Unit Wt. (wet) (pcf):	123.2
Unit Wt. (dry) (pcf):	104.6
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST11	ST05
Tare Wt (g)	14.09	14.04
Wet Wt (g)	50.46	62.33
Dry Wt (g)	44.96	53.64
Moisture Content	17.8%	21.9%
+/- OMC	17.8%	21.9%
Sample Saturation:	81%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	13.0

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)	Acceptance	
								V_m	OK?
1	4/21	300	12.5	0.5423	25.5	0.88	4.51E-8	5.2%	OK
2	4/21	600	12.0	1.0423	25.5	0.88	4.42E-8	3.1%	OK
3	4/21	900	11.6	1.4423	25.5	0.88	4.15E-8	3.1%	OK
4	4/21	1200	11.2	1.8423	25.5	0.88	4.06E-8	5.3%	OK
	4/21	1500		13.0423	25.5	0.88	#NUM!	#NUM!	#NUM!
	4/21	1800			25.5	0.88			

 Average of selected 4 consecutive values, k_a : 4.28E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$
 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20}:	4.28E-08
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Comments/Qualifiers:

Results of Falling Head Permeability, ASTM D5084 Undisturbed Specimen

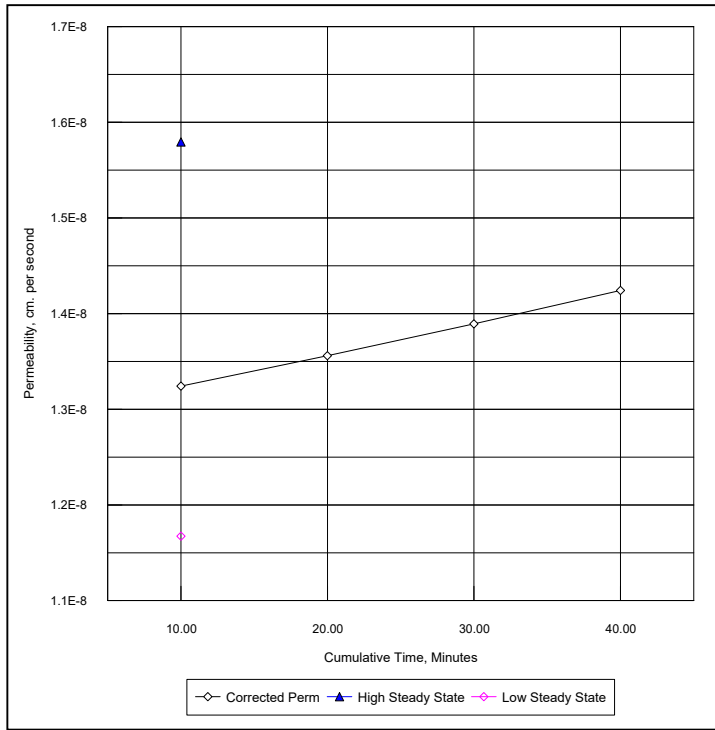
Project Number:	2223	Specimen Received Date:	04.17.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	04.18.2023
Client:	Promus Engineering	Test Date:	04.20.2023
		Tested By:	JMB
		Reviewed By:	BMG

Sample Id.	0414 A	Location:	N/A
Specimen Condition:	Before Testing good	After Testing	good
		Elevation:	N/A

Special Selection or Preparation if Any:	Permeant: D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	23.1	24.6	Maximum Dry Density, pcf			
Percent Saturation	95.3	103.9	Optimum Moisture Content, (%)			
Wet Mass Density, (pcf)	126.8	129.5	Percent Compacted:			
Dry Mass Density, (pcf)	103.0	103.9				
Height of Solids, (in)	1.383	1.378	Test Pressures During Test			
Void Ratio	0.667	0.652	Backpressure, psi	50		
Calculated Porosity, (%)	40.03	39.48	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final
Specimen Height, cm	5.86	5.78
Specimen Diameter, cm	7.20	7.21
Specimen Area, cm ²	40.66	40.80
Specimen Mass	Initial	Final
Initial Wet Mass, gms	483.6	489.5
Specific Gravity (Assumed):	2.75	
Traceability Items		
Caliper ID	2	Cell ID
Balance ID	3	CV Hg ID
Thermo ID	1	
Constants During Testing and Equipment		
Inflow Buret, (cm ² , ain)		0.7671
Outflow Buret, (cm ² , aout)		0.0314
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56
Manometer, M1, (ain*aout/ain+aout)		0.0302
Manometer, M2, (1+[aout/ain])		1.041
Sample, S=(Sample Length/ Sample Area)		0.1441
Test Constant, C=(M1*S/G)		0.000346



Test	Data
Elapsed Time (Minutes)	Cumulative Time (Minutes)
	Permeability, k (cm/sec) (Uncorrected)
	Corrected k For 20 c (cm/sec)
0	0.00
10	10.00
10	20.00
10	30.00
10	40.00

Average Permeability, Corrected k:	1.4E-008
15% of Average	2.1E-009
High Steady State Limit:	1.6E-008
Low Steady State Limit:	1.2E-008

Date	Clock Time	Trial	Flow	Readings	Test Fluid
	(hh+mm/60)	Elapsed t, sec.	Inflow	Outflow	Temp, c
				Gradient During Test	
				Out/Inflow Ratio	
				Z out	
				T	
04.20.2023	12.0000	0	1.100	14.600	21
04.20.2023	12.1667	600	1.112	14.300	21
04.20.2023	12.3333	600	1.125	14.000	21
04.20.2023	12.5000	600	1.137	13.700	21
04.20.2023	12.6667	600	1.149	13.400	21

Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	12.96
Unmeasured Flow, cm:	-1.64

Remarks: k = C/t ln [1-(Zout T)] and Corrected k for temp @ 20 C = k x (-0.02452 x temp. + 1.495)

Results of Falling Head Permeability, ASTM D5084 Undisturbed Specimen

Project Number:	2223	Specimen Received Date:	04.17.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	04.18.2023
Client:	Promus Engineering	Test Date:	04.20.2023
		Tested By:	JMB
		Reviewed By:	BMG

Sample Id.	0414 B	Location:	N/A
Specimen Condition:	Before Testing good	After Testing	good
		Elevation:	N/A

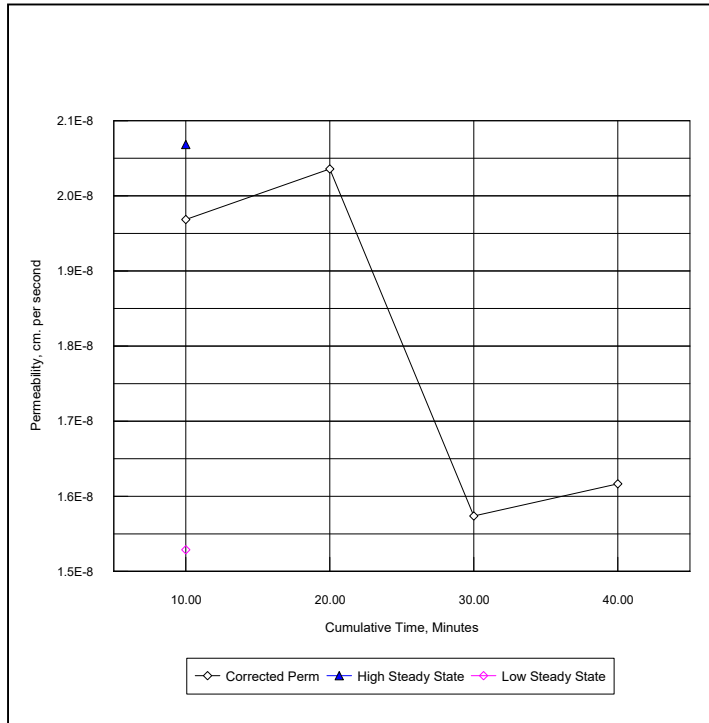
Special Selection or Preparation if Any:	Permeant: D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	22.2	23.5	Maximum Dry Density, pcf			
Percent Saturation	88.7	96.7	Optimum Moisture Content, (%)			
Wet Mass Density, (pcf)	124.2	127.0	Percent Compacted:			
Dry Mass Density, (pcf)	101.7	102.9				
Height of Solids, (in)	1.432	1.445	Test Pressures During Test			
Void Ratio	0.689	0.669	Backpressure, psi	50		
Calculated Porosity, (%)	40.80	40.08	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final
Specimen Height, cm	6.14	6.13
Specimen Diameter, cm	7.19	7.15
Specimen Area, cm ²	40.55	40.17
Specimen Mass	Initial	Final
Initial Wet Mass, gms	495.7	500.9
Specific Gravity (Assumed):	2.75	
Traceability Items		
Caliper ID	2	Cell ID
Balance ID	3	CV Hg ID
Thermo ID	1	
Constants During Testing and Equipment		
Inflow Buret, (cm ² , ain)		0.7671
Outflow Buret, (cm ² , aout)		0.0314
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56
Manometer, M1, (ain*aout/(ain+aout))		0.0302
Manometer, M2, (1+[aout/ain])		1.041
Sample, S=(Sample Length/ Sample Area)		0.1515
Test Constant, C=(M1*S/G)		0.00036437

	Test	Data	
Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (cm/sec) (Uncorrected)	Corrected k For 20 c (cm/sec)
0	0.00		
10	10.00	2.0E-008	2.0E-008
10	20.00	2.1E-008	2.0E-008
10	30.00	1.6E-008	1.6E-008
10	40.00	1.6E-008	1.6E-008

Average Permeability, Corrected k:	1.8E-008
15% of Average	2.7E-009
High Steady State Limit:	2.1E-008
Low Steady State Limit:	1.5E-008



Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Readings Outflow	Test Fluid				
					Gradient During Test	Out/Inflow Ratio	Z out		
04.20.2023	12.0167	0	1.000	13.800	28.249	1.000	0.400	0.081	21
04.20.2023	12.1833	600	1.016	13.400	27.330	1.000	0.400	0.084	21
04.20.2023	12.3500	600	1.033	13.000	26.411	1.000	0.300	0.087	21
04.20.2023	12.5167	600	1.045	12.700	25.722	1.000	0.300	0.089	21
04.20.2023	12.6833	600	1.057	12.400	25.033	1.000	0.300	0.092	21

Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	13.59
Unmeasured Flow, cm:	-0.21

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp} + 1.495)$

Results of Falling Head Permeability, ASTM D5084 Undisturbed Specimen

Project Number:	2223	Specimen Received Date:	04.17.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	04.18.2023
Client:	Promus Engineering	Test Date:	04.20.2023
		Tested By:	JMB
		Reviewed By:	BMG

Sample Id.	0414 C	Location:	N/A
Specimen Condition:	Before Testing good	After Testing	good
		Elevation:	N/A

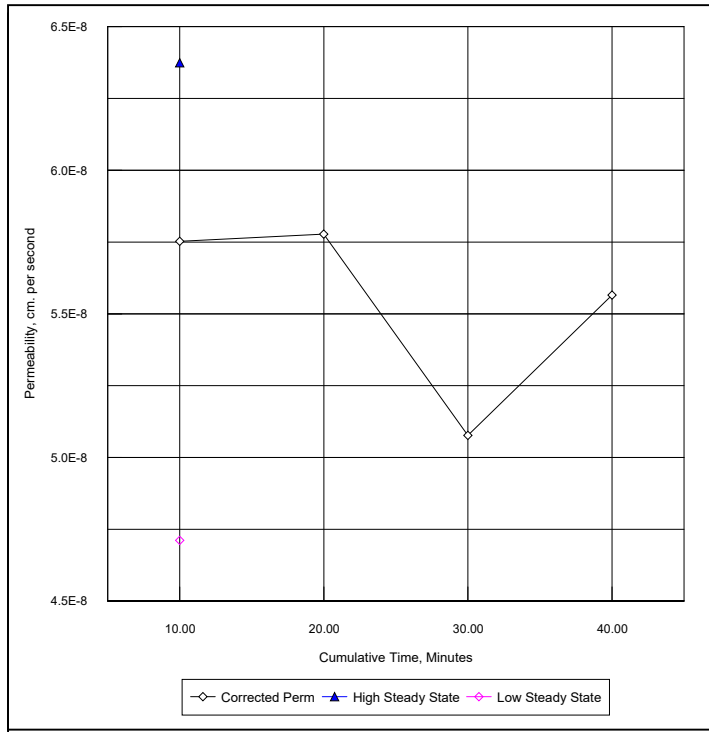
Special Selection or Preparation if Any:	Permeant: D/A Water
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Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	20.7	22.2	Maximum Dry Density, pcf			
Percent Saturation	88.0	100.4	Optimum Moisture Content, (%)			
Wet Mass Density, (pcf)	125.8	130.4	Percent Compacted:			
Dry Mass Density, (pcf)	104.3	106.8				
Height of Solids, (in)	1.436	1.469	Test Pressures During Test			
Void Ratio	0.647	0.608	Backpressure, psi	50		
Calculated Porosity, (%)	39.28	37.81	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final
Specimen Height, cm	6.01	6.00
Specimen Diameter, cm	7.21	7.12
Specimen Area, cm ²	40.78	39.86
Specimen Mass	Initial	Final
Initial Wet Mass, gms	493.6	499.7
Specific Gravity (Assumed):	2.75	
Traceability Items		
Caliper ID	2	Cell ID
Balance ID	3	CV Hg ID
Thermo ID	1	
Constants During Testing and Equipment		
Inflow Buret, (cm ² , ain)		0.7671
Outflow Buret, (cm ² , aout)		0.0314
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56
Manometer, M1, (ain*aoul/ain+aout)		0.0302
Manometer, M2, (1+[aout/ain])		1.041
Sample, S=(Sample Length/ Sample Area)		0.1473
Test Constant, C=(M1*S/G)		0.000354

	Test	Data	
	Elapsed Time (Minutes)	Cumulative Time (Minutes)	Permeability, k (cm/sec) (Uncorrected)
	0	0.00	
	10	10.00	5.9E-008
	10	20.00	5.9E-008
	10	30.00	5.2E-008
	10	40.00	5.7E-008
			5.8E-008
			5.8E-008
			5.1E-008
			5.6E-008

Average Permeability, Corrected k:	5.5E-008
15% of Average	8.3E-009
High Steady State Limit:	6.4E-008
Low Steady State Limit:	4.7E-008



Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Readings Outflow	Gradient During Test	Out/Inflow Ratio	Z out	T	Test Fluid Temp, c
04.20.2023	12.0333	0	1.000	13.100	27.314			0.086	21
04.20.2023	12.2000	600	1.045	12.000	24.729	1.000	1.100	0.095	21
04.20.2023	12.3667	600	1.086	11.000	22.379	1.000	1.000	0.105	21
04.20.2023	12.5333	600	1.119	10.200	20.499	1.000	0.800	0.115	21
04.20.2023	12.7000	600	1.151	9.400	18.620	1.000	0.800	0.126	21

Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	13.29
Unmeasured Flow, cm:	0.19

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp.} + 1.495)$

Results of Falling Head Permeability, ASTM D5084 Undisturbed Specimen

Project Number:	2223	Specimen Received Date:	04.17.2023
Project Name:	Eco-Vista Class 4 Landfill, Cell 8	Specimen Loaded into Cell:	04.18.2023
Client:	Promus Engineering	Test Date:	04.20.2023
		Tested By:	JMB
		Reviewed By:	BMG

Sample Id.	0414 D	Location:	N/A
Specimen Condition:	Before Testing good	After Testing	good
		Elevation:	N/A

Special Selection or Preparation if Any:	Permeant: D/A Water
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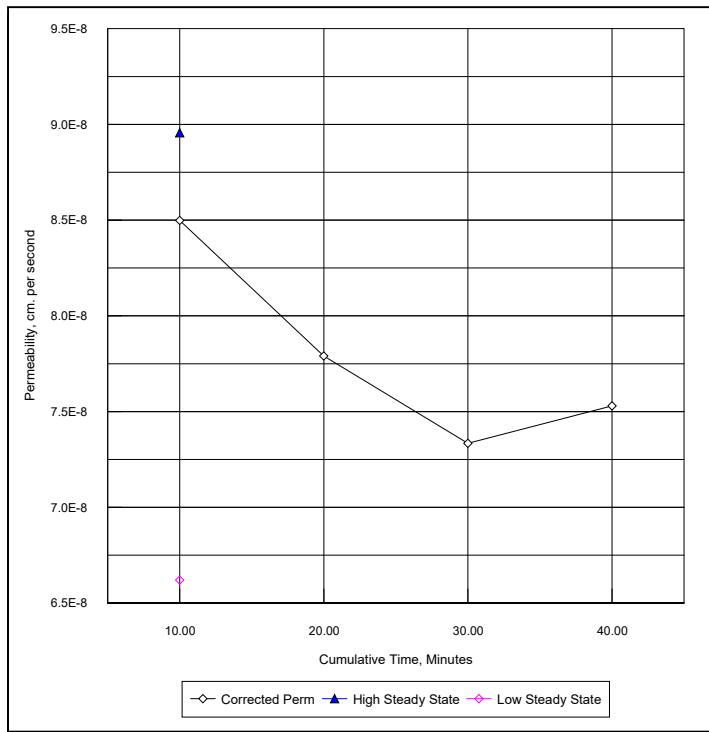
Specimen Data	Initial	Final	Compaction Data	Proctor	Target	Difference
Moisture Content, (%)	18.9	20.7	Maximum Dry Density, pcf			
Percent Saturation	90.5	102.5	Optimum Moisture Content, (%)			
Wet Mass Density, (pcf)	129.6	133.2	Percent Compacted:			
Dry Mass Density, (pcf)	109.0	110.3				
Height of Solids, (in)	1.196	1.197	Test Pressures During Test			
Void Ratio	0.575	0.557	Backpressure, psi	50		
Calculated Porosity, (%)	36.52	35.76	Effective Confining Stress, psi	3		

Specimen Dimensions	Initial	Final
Specimen Height, cm	4.79	4.73
Specimen Diameter, cm	7.18	7.17
Specimen Area, cm ²	40.43	40.40
Specimen Mass	Initial	Final
Initial Wet Mass, gms	401.7	407.8
Specific Gravity (Assumed):	2.75	
Traceability Items		
Caliper ID	2	Cell ID
Balance ID	3	CV Hg ID
Thermo ID	1	
Constants During Testing and Equipment		
Inflow Buret, (cm ² , ain)		0.7671
Outflow Buret, (cm ² , aout)		0.0314
Specific Gravity, (GHg - Gw) = (13.56 - 1)		12.56
Manometer, M1, (ain*aou/(ain+aout))		0.0302
Manometer, M2, (1+[aout/ain])		1.041
Sample, S=(Sample Length/ Sample Area)		0.1184
Test Constant, C=(M1*S/G)		0.000285

Test	Data
Elapsed Time (Minutes)	Cumulative Time (Minutes)
0	0.00
10	10.00
10	20.00
10	30.00
10	40.00

Permeability, k (cm/sec)	Corrected k For 20 c (cm/sec)
8.7E-008	8.5E-008
7.9E-008	7.8E-008
7.5E-008	7.3E-008
7.7E-008	7.5E-008

Average Permeability, Corrected k:	7.8E-008
15% of Average	1.2E-008
High Steady State Limit:	9.0E-008
Low Steady State Limit:	6.6E-008



Date	Clock Time (hh+mm/60)	Trial Elapsed t, sec.	Flow Inflow	Readings Outflow	Test Fluid		
					Gradient During Test	Out/Inflow Ratio	Z out
04.20.2023	12.0500	0	1.100	9.200	22.953	1.000	1.300
04.20.2023	12.2167	600	1.153	7.900	19.118	1.000	1.000
04.20.2023	12.3833	600	1.194	6.900	16.168	1.000	0.800
04.20.2023	12.5500	600	1.227	6.100	13.809	1.000	0.700
04.20.2023	12.7167	600	1.256	5.400	11.744	1.000	0.251

Initial Gradient:	30.00
Height of Mercury in Center Column, cm:	10.59
Unmeasured Flow, cm:	1.39

Remarks: $k = C/t \ln [1-(Zout T)]$ and Corrected k for temp @ 20 C = $k \times (-0.02452 \times \text{temp.} + 1.495)$

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0516-A DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.54
Moist Weight (g):	511.0
Unit Wt. (wet) (pcf):	121.7
Unit Wt. (dry) (pcf):	100.4
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST12	ST37
Tare Wt (g)	14.11	14.23
Wet Wt (g)	52.76	68.37
Dry Wt (g)	45.98	57.83
Moisture Content	21.3%	24.2%
+/- OMC	21.3%	24.2%
Sample Saturation:	87%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	15.4

TEST EQUIP. DATA

Board ID:	1M
Permeometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/25	300	14.6	0.7746	23.6	0.92	6.77E-8	2.5%	OK
2	5/25	600	14.0	1.3746	23.6	0.92	6.13E-8	7.1%	OK
3	5/25	900	13.2	2.1746	23.6	0.92	6.68E-8	1.2%	OK
4	5/25	1200	12.5	2.8746	23.6	0.92	6.82E-8	3.4%	OK
	5/25	1500		15.3746	23.6	0.92	#NUM!	#NUM!	#NUM!
	5/25	1800			23.6	0.92			

 Average of selected 4 consecutive values, k_a: 6.60E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	6.60E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0516-B DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.31
Moist Weight (g):	467.8
Unit Wt. (wet) (pcf):	122.5
Unit Wt. (dry) (pcf):	100.2
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST32	ST22
Tare Wt (g)	14.12	14.07
Wet Wt (g)	53.54	68.32
Dry Wt (g)	46.34	57.59
Moisture Content	22.3%	24.7%
+/- OMC	22.3%	24.7%
Sample Saturation:	91%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, Rp:	14.1

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZp (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								Vm	OK?
1	5/25	300	13.7	0.4274	23.4	0.92	3.71E-8	6.6%	OK
2	5/25	600	13.3	0.8274	23.4	0.92	3.64E-8	4.6%	OK
3	5/25	900	13.0	1.1274	23.4	0.92	3.35E-8	3.8%	OK
4	5/25	1200	12.7	1.4274	23.4	0.92	3.22E-8	7.4%	OK
	5/25	1500		14.1274	23.4	0.92	#NUM!	#NUM!	#NUM!
	5/25	1800			23.4	0.92			

 Average of selected 4 consecutive values, k_a: 3.48E-8

Acceptance Criteria (4 consecutive readings):

 Vm ≤ 15% for k_a ≥ 1.00E-8

 Vm < 50% for k_a < 1.00E-8

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.48E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0517-A DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.24
Moist Weight (g):	445.9
Unit Wt. (wet) (pcf):	120.5
Unit Wt. (dry) (pcf):	100.1
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST05	ST10
Tare Wt (g)	14.12	14.18
Wet Wt (g)	52.03	61.59
Dry Wt (g)	45.61	52.31
Moisture Content	20.4%	24.3%
+/- OMC	20.4%	24.3%
Sample Saturation:	83%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	13.7

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/25	300	13.3	0.4478	23.3	0.92	3.90E-8	0.7%	OK
2	5/25	600	12.9	0.8478	23.3	0.92	3.74E-8	4.7%	OK
3	5/25	900	12.4	1.3478	23.3	0.92	4.06E-8	3.2%	OK
4	5/25	1200	12.0	1.7478	23.3	0.92	4.02E-8	2.3%	OK
	5/25	1500		13.7478	23.3	0.92	#NUM!	#NUM!	#NUM!
	5/25	1800			23.3	0.92			

 Average of selected 4 consecutive values, k_a: 3.93E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.93E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0517-B DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.40
Moist Weight (g):	490.9
Unit Wt. (wet) (pcf):	123.8
Unit Wt. (dry) (pcf):	101.8
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST42	ST09
Tare Wt (g)	14.05	14.02
Wet Wt (g)	53.22	65.81
Dry Wt (g)	46.27	55.85
Moisture Content	21.6%	23.8%
+/- OMC	21.6%	23.8%
Sample Saturation:	92%	101%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, Rp:	14.6

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZp (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								Vm	OK?
1	5/25	300	14.0	0.6154	23.7	0.92	5.34E-8	4.4%	OK
2	5/25	600	13.3	1.3154	23.7	0.92	5.86E-8	4.8%	OK
3	5/25	900	12.8	1.8154	23.7	0.92	5.51E-8	1.5%	OK
4	5/25	1200	12.2	2.4154	23.7	0.92	5.64E-8	1.0%	OK
	5/25	1500		14.6154	23.7	0.92	#NUM!	#NUM!	#NUM!
	5/25	1800			23.7	0.92			

 Average of selected 4 consecutive values, k_a: 5.59E-8

Acceptance Criteria (4 consecutive readings):

 Vm ≤ 15% for k_a ≥ 1.00E-8

 Vm < 50% for k_a < 1.00E-8

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	5.59E-08
--	-----------------

Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0517-C DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.59
Moist Weight (g):	529.1
Unit Wt. (wet) (pcf):	123.6
Unit Wt. (dry) (pcf):	102.0
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST08	ST50
Tare Wt (g)	14.09	14.11
Wet Wt (g)	56.30	59.47
Dry Wt (g)	48.93	50.99
Moisture Content	21.2%	23.0%
+/- OMC	21.2%	23.0%
Sample Saturation:	90%	98%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	15.6

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/25	300	15.3	0.3457	23.9	0.91	2.95E-8	3.1%	OK
2	5/25	600	15.0	0.6457	23.9	0.91	2.78E-8	2.9%	OK
3	5/25	900	14.7	0.9457	23.9	0.91	2.74E-8	4.1%	OK
4	5/25	1200	14.3	1.3457	23.9	0.91	2.97E-8	3.9%	OK
	5/25	1500		15.6457	23.9	0.91	#NUM!	#NUM!	#NUM!
	5/25	1800			23.9	0.91			

 Average of selected 4 consecutive values, k_a: 2.86E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	2.86E-08
--	-----------------

Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/23/2023

 SAMPLE ID: 0517-D DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.39
Moist Weight (g):	487.2
Unit Wt. (wet) (pcf):	123.4
Unit Wt. (dry) (pcf):	102.3
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST01	ST14
Tare Wt (g)	14.02	13.93
Wet Wt (g)	52.81	63.90
Dry Wt (g)	46.18	54.21
Moisture Content	20.6%	24.1%
+/- OMC	20.6%	24.1%
Sample Saturation:	89%	103%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	14.6

TEST EQUIP. DATA

Board ID:	1M
Permeometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)	Acceptance	
								Vm	OK?
1	5/25	300	14.0	0.5612	23.3	0.92	4.89E-8	8.4%	OK
2	5/25	600	13.6	0.9612	23.3	0.92	4.24E-8	5.9%	OK
3	5/25	900	13.1	1.4612	23.3	0.92	4.39E-8	2.6%	OK
4	5/25	1200	12.6	1.9612	23.3	0.92	4.51E-8	0.1%	OK
	5/25	1500		14.5612	23.3	0.92	#NUM!	#NUM!	#NUM!
	5/25	1800			23.3	0.92			

 Average of selected 4 consecutive values, k_a : 4.51E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20} :	4.51E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0517-E DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.61
Moist Weight (g):	536.7
Unit Wt. (wet) (pcf):	124.4
Unit Wt. (dry) (pcf):	102.4
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST15	ST35
Tare Wt (g)	14.07	14.03
Wet Wt (g)	50.18	61.64
Dry Wt (g)	43.79	52.67
Moisture Content	21.5%	23.2%
+/- OMC	21.5%	23.2%
Sample Saturation:	93%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	15.8

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/27	300	15.4	0.3544	23.1	0.93	3.08E-8	12.3%	OK
2	5/27	600	14.9	0.8544	23.1	0.93	3.77E-8	7.4%	OK
3	5/27	900	14.6	1.1544	23.1	0.93	3.44E-8	2.2%	OK
4	5/27	1200	14.1	1.6544	23.1	0.93	3.76E-8	7.2%	OK
	5/27	1500		15.7544	23.1	0.93	#NUM!	#NUM!	#NUM!
	5/27	1800			23.1	0.93			

 Average of selected 4 consecutive values, k_a: 3.51E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k ₂₀ :	3.51E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0517-F DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.19
Moist Weight (g):	451.2
Unit Wt. (wet) (pcf):	124.7
Unit Wt. (dry) (pcf):	103.7
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST26	ST21
Tare Wt (g)	14.05	14.16
Wet Wt (g)	54.92	67.20
Dry Wt (g)	48.03	57.48
Moisture Content	20.3%	22.4%
+/- OMC	20.3%	22.4%
Sample Saturation:	90%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	13.5

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/27	300	13.2	0.2766	23.2	0.93	2.38E-8	1.6%	OK
2	5/27	600	12.9	0.5766	23.2	0.93	2.53E-8	7.8%	OK
3	5/27	900	12.7	0.7766	23.2	0.93	2.29E-8	2.4%	OK
4	5/27	1200	12.5	0.9766	23.2	0.93	2.18E-8	7.1%	OK
	5/27	1500		13.4766	23.2	0.93	#NUM!	#NUM!	#NUM!
	5/27	1800			23.2	0.93			

 Average of selected 4 consecutive values, k_a: 2.35E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	2.35E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0518-A DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.33
Moist Weight (g):	476.6
Unit Wt. (wet) (pcf):	123.8
Unit Wt. (dry) (pcf):	103.8
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST30	ST38
Tare Wt (g)	14.09	14.03
Wet Wt (g)	49.71	63.75
Dry Wt (g)	43.97	54.68
Moisture Content	19.2%	22.3%
+/- OMC	19.2%	22.3%
Sample Saturation:	86%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	14.2

TEST EQUIP. DATA

Board ID:	1M
Permeometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)	Acceptance	
								Vm	OK?
1	5/27	300	13.5	0.7359	23.0	0.93	6.48E-8	0.3%	OK
2	5/27	600	12.8	1.4359	23.0	0.93	6.55E-8	0.7%	OK
3	5/27	900	12.2	2.0359	23.0	0.93	6.35E-8	2.2%	OK
4	5/27	1200	11.5	2.7359	23.0	0.93	6.62E-8	1.8%	OK
	5/27	1500		14.2359	23.0	0.93	#NUM!	#NUM!	#NUM!
	5/27	1800			23.0	0.93			

 Average of selected 4 consecutive values, k_a : 6.50E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20} :	6.50E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0518-B DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.46
Moist Weight (g):	496.8
Unit Wt. (wet) (pcf):	122.2
Unit Wt. (dry) (pcf):	101.0
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST29	ST06
Tare Wt (g)	14.12	14.16
Wet Wt (g)	52.95	58.33
Dry Wt (g)	46.22	49.81
Moisture Content	21.0%	23.9%
+/- OMC	21.0%	23.9%
Sample Saturation:	87%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	14.9

TEST EQUIP. DATA

Board ID:	1M
Permeometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/27	300	14.4	0.5409	22.9	0.93	4.75E-8	13.0%	OK
2	5/27	600	14.0	0.9409	22.9	0.93	4.21E-8	0.3%	OK
3	5/27	900	13.6	1.3409	22.9	0.93	4.07E-8	3.2%	OK
4	5/27	1200	13.3	1.6409	22.9	0.93	3.78E-8	10.0%	OK
	5/27	1500		14.9409	22.9	0.93	#NUM!	#NUM!	#NUM!
	5/27	1800			22.9	0.93			

 Average of selected 4 consecutive values, k_a: 4.20E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	4.20E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0518-C DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.61
Moist Weight (g):	531.3
Unit Wt. (wet) (pcf):	123.2
Unit Wt. (dry) (pcf):	101.2
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST03	ST25
Tare Wt (g)	14.04	14.08
Wet Wt (g)	54.59	62.40
Dry Wt (g)	47.35	53.17
Moisture Content	21.7%	23.6%
+/- OMC	21.7%	23.6%
Sample Saturation:	91%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	15.8

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)	Acceptance	
								Vm	OK?
1	5/27	300	15.5	0.2543	23.3	0.92	2.19E-8	7.1%	OK
2	5/27	600	15.2	0.5543	23.3	0.92	2.41E-8	2.1%	OK
3	5/27	900	14.9	0.8543	23.3	0.92	2.50E-8	6.1%	OK
4	5/27	1200	14.7	1.0543	23.3	0.92	2.33E-8	1.1%	OK
	5/27	1500		15.7543	23.3	0.92	#NUM!	#NUM!	#NUM!
	5/27	1800			23.3	0.92			

 Average of selected 4 consecutive values, k_a : 2.36E-8

Acceptance Criteria (4 consecutive readings):

 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20} :	2.36E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/25/2023

 SAMPLE ID: 0518-D DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.29
Moist Weight (g):	472.5
Unit Wt. (wet) (pcf):	124.9
Unit Wt. (dry) (pcf):	104.7
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST17	ST04
Tare Wt (g)	14.13	14.05
Wet Wt (g)	52.81	67.44
Dry Wt (g)	46.58	57.89
Moisture Content	19.2%	21.8%
+/- OMC	19.2%	21.8%
Sample Saturation:	88%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	14.0

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)	Acceptance	
								Vm	OK?
1	5/27	300	13.4	0.6190	23.1	0.93	5.45E-8	0.5%	OK
2	5/27	600	12.7	1.3190	23.1	0.93	5.96E-8	8.9%	OK
3	5/27	900	12.3	1.7190	23.1	0.93	5.27E-8	3.7%	OK
4	5/27	1200	11.8	2.2190	23.1	0.93	5.22E-8	4.6%	OK
	5/27	1500		14.0190	23.1	0.93	#NUM!	#NUM!	#NUM!
	5/27	1800			23.1	0.93			

 Average of selected 4 consecutive values, k_a : 5.48E-8

Acceptance Criteria (4 consecutive readings):

 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20}:	5.48E-08
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Comments/Qualifiers:

CONSTANT HEAD PERMEABILITY TEST RESULTS

ASTM D 2434

Sample ID: 0518-E
 Description: Gravel
 Source: _____

Sample Date: 18-May
 Test Date: 28-May

Initial Moisture Content

Tare ID: SP02
 Tare Wt.: 184.29 g
 Wet Wt. w/Tare: 745.8 g
 Dry Wt. w/Tare: 743.8 g
 Moisture Content: 0.4%

Test Specimen Data

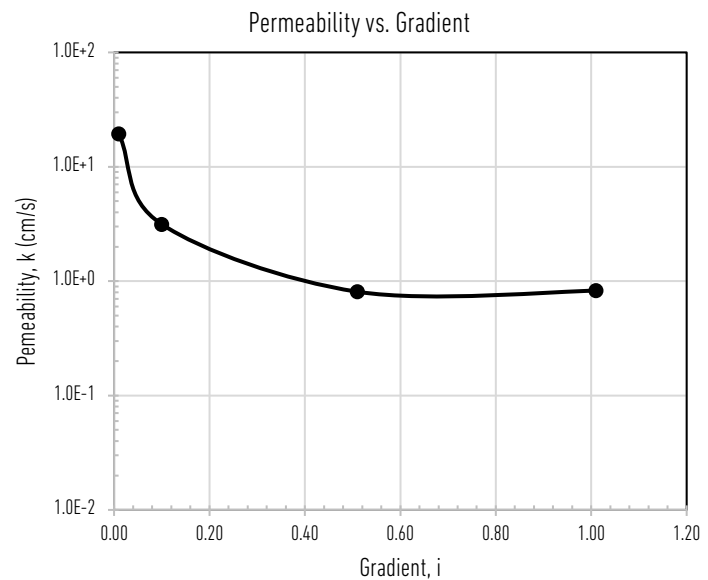
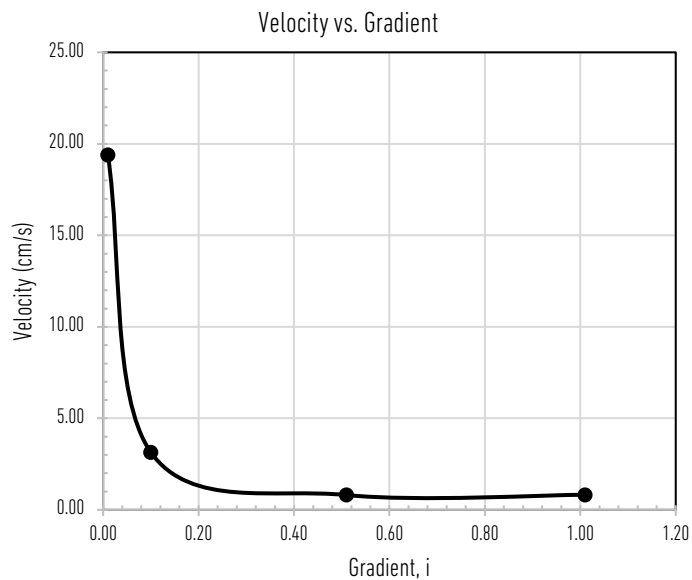
Diameter, D: 10.16 cm
 Area, A: 81.07 cm²
 Init. Length: 10.16 cm
 Deformation: 0.00 cm
 Final Length, L: 10.16 cm
 Volume, V: 823.7 cm³

Unit Weight

Tare ID: SP02
 Tare Wt.: 184.29 g
 Dry Wt. w/Tare: 1569.34 g
 Dry Unit Weight: 104.9 lb/ft³

Test Data

Test Run	Head, H (cm)	Gradient, i	Res. Reading Start	Res. Reading End	Time, t (s)	Flow, Q (cm ³)	Water Temp. °C	Perm., k (cm/s)
1	0.1	0.01	53.2	40.3	60	1045.8	27.1	1.9E+1
2	1.0	0.10	40.3	19.4	60	1694.4	27.2	3.1E+0
3	5.1	0.50	53.0	25.6	60	2221.4	27.2	8.1E-1
4	10.1	0.99	53.3	25.6	30	2245.7	27.4	8.3E-1
5								
6								
7								



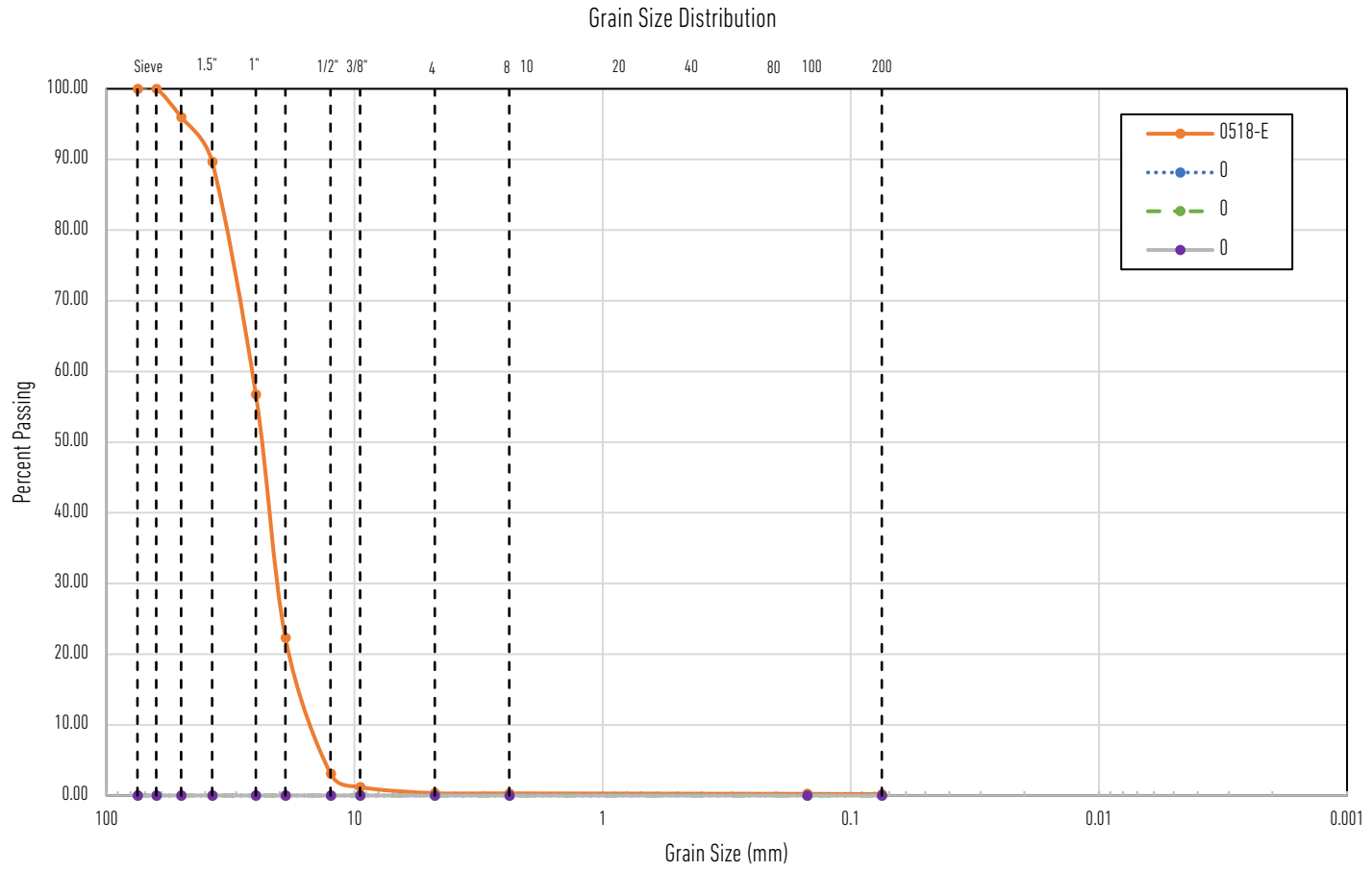
PROMUS
ENGINEERING

1200 Mountain Creek Rd. Ste 102, Chattanooga TN 37405 (888) 811-9066

PROJECT: Eco Vista Landfill
 PROJECT NO: 220207 TEST DATE: 28-May-23
 CLIENT: Waste Management

FIGURE

GRAIN SIZE ANALYSIS TEST RESULTS



Sample	% GRAVEL	% SAND	% FINES (SILT AND CLAY)
0518-E	99.68	0.13	0.20

Sample	0518-E		
Source			
MC	0.1%		
3.0"	100.00		
2.5"	100.00		
2.0"	95.97		
1.5"	89.66		
1.0"	56.74		
3/4"	22.33		
1/2"	3.10		
3/8"	1.19		
No. 4	0.32		
No. 8	0.30		
No. 200	0.20		



1200 Mountain Creek Rd. Ste 102, Chattanooga TN 37405 (888) 811-9066

PROJECT: Eco Vista Landfill
 PROJECT NO: 220207 TEST DATE: 30-May-23
 CLIENT: Waste Management

FIGURE

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/27/2023

 SAMPLE ID: 0522-A DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.31
Moist Weight (g):	477.9
Unit Wt. (wet) (pcf):	125.2
Unit Wt. (dry) (pcf):	103.8
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST31	ST05
Tare Wt (g)	14.01	14.12
Wet Wt (g)	57.53	63.24
Dry Wt (g)	50.11	54.19
Moisture Content	20.6%	22.6%
+/- OMC	20.6%	22.6%
Sample Saturation:	92%	101%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	14.1

TEST EQUIP. DATA

Board ID:	1M
Permeometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								V _m	OK?
1	5/30	300	13.7	0.4275	22.6	0.94	3.78E-8	10.2%	OK
2	5/30	600	13.4	0.7275	22.6	0.94	3.25E-8	5.4%	OK
3	5/30	900	13.0	1.1275	22.6	0.94	3.41E-8	0.5%	OK
4	5/30	1200	12.7	1.4275	22.6	0.94	3.28E-8	4.3%	OK
	5/30	1500		14.1275	22.6	0.94	#NUM!	#NUM!	#NUM!
	5/30	1800			22.6	0.94			

 Average of selected 4 consecutive values, k_a: 3.43E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.43E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/27/2023

 SAMPLE ID: 0522-B DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.15
Moist Weight (g):	437.5
Unit Wt. (wet) (pcf):	123.1
Unit Wt. (dry) (pcf):	101.7
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST14	ST23
Tare Wt (g)	13.94	14.09
Wet Wt (g)	58.30	60.71
Dry Wt (g)	50.57	51.9
Moisture Content	21.1%	23.3%
+/- OMC	21.1%	23.3%
Sample Saturation:	89%	99%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	13.3

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZp (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)	Acceptance	
								Vm	OK?
1	5/30	300	12.8	0.4599	22.4	0.94	4.10E-8	4.3%	OK
2	5/30	600	12.3	0.9599	22.4	0.94	4.35E-8	1.8%	OK
3	5/30	900	11.8	1.4599	22.4	0.94	4.52E-8	5.6%	OK
4	5/30	1200	11.5	1.7599	22.4	0.94	4.15E-8	3.1%	OK
	5/30	1500		13.2599	22.4	0.94	#NUM!	#NUM!	#NUM!
	5/30	1800			22.4	0.94			

 Average of selected 4 consecutive values, k_a: 4.28E-8

Acceptance Criteria (4 consecutive readings):

 Vm ≤ 15% for k_a ≥ 1.00E-8

 Vm < 50% for k_a < 1.00E-8

Vm Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	4.28E-08
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Comments/Qualifiers:

PROJECT NO.: 220207 PROJECT: Eco Vista Landfill DATE: 5/27/2023

 SAMPLE ID: 0522-C DESCRIPTION: _____

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.28
Moist Weight (g):	459.7
Unit Wt. (wet) (pcf):	122.0
Unit Wt. (dry) (pcf):	100.8
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST27	ST19
Tare Wt (g)	14.08	14.13
Wet Wt (g)	51.03	57.66
Dry Wt (g)	44.62	49.31
Moisture Content	21.0%	23.7%
+/- OMC	21.0%	23.7%
Sample Saturation:	87%	98%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	14.0

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)
1	5/30	300	13.7	0.2649	22.5	0.94	2.32E-8
2	5/30	600	13.4	0.5649	22.5	0.94	2.52E-8
3	5/30	900	13.1	0.8649	22.5	0.94	2.60E-8
4	5/30	1200	12.9	1.0649	22.5	0.94	2.42E-8
	5/30	1500		13.9649	22.5	0.94	#NUM!
	5/30	1800			22.5	0.94	

Acceptance	
Vm	OK?
5.9%	OK
2.1%	OK
5.5%	OK
1.7%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a : 2.46E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$
 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20}:	2.46E-08
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Comments/Qualifiers:

PROJECT NO.: 220207

PROJECT: Eco Vista Landfill

DATE: 5/27/2023

SAMPLE ID: 0522-D

DESCRIPTION:

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.51
Moist Weight (g):	507.4
Unit Wt. (wet) (pcf):	122.3
Unit Wt. (dry) (pcf):	101.5
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST46	ST25
Tare Wt (g)	14.02	14.08
Wet Wt (g)	54.74	65.11
Dry Wt (g)	47.82	55.36
Moisture Content	20.5%	23.6%
+/- OMC	20.5%	23.6%
Sample Saturation:	86%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	15.2

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date	Elapsed t	Z	ΔZ_p	Temp.	R_T	Perm., k_{20}
	(m/d)	(sec)	(pipet @t)	(cm)	°C	(T corr.)	(cm/sec)
1	5/30	300	14.7	0.5122	22.7	0.94	4.50E-8
2	5/30	600	14.2	1.0122	22.7	0.94	4.55E-8
3	5/30	900	13.7	1.5122	22.7	0.94	4.63E-8
4	5/30	1200	13.4	1.8122	22.7	0.94	4.21E-8
	5/30	1500		15.2122	22.7	0.94	#NUM!
	5/30	1800			22.7	0.94	

Acceptance	
Vm	OK?
0.6%	OK
1.8%	OK
3.4%	OK
5.9%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a : 4.47E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$
 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20}:	4.47E-08
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Comments/Qualifiers:

PROJECT NO.: 220207

PROJECT: Eco Vista Landfill

DATE: 5/27/2023

SAMPLE ID: 0524-A

DESCRIPTION:

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.17
Moist Weight (g):	451.2
Unit Wt. (wet) (pcf):	125.8
Unit Wt. (dry) (pcf):	104.9
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST51	ST39
Tare Wt (g)	14.07	14.14
Wet Wt (g)	52.88	63.29
Dry Wt (g)	46.42	54.52
Moisture Content	20.0%	21.7%
+/- OMC	20.0%	21.7%
Sample Saturation:	92%	100%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R_{eq} :	1.6
Pipette Menisci, R_p :	13.4

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a_p (cm ²):	0.031416
Annulus Area, a_a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ_p (cm)	Temp. °C	R_T (T corr.)	Perm., k_{20} (cm/sec)
1	5/30	300	12.7	0.6683	22.6	0.94	5.94E-8
2	5/30	600	12.1	1.2683	22.6	0.94	5.81E-8
3	5/30	900	11.5	1.8683	22.6	0.94	5.87E-8
4	5/30	1200	11.0	2.3683	22.6	0.94	5.73E-8
	5/30	1500		13.3683	22.6	0.94	#NUM!
	5/30	1800			22.6	0.94	

Acceptance	
Vm	OK?
1.7%	OK
0.4%	OK
0.6%	OK
1.9%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a : 5.84E-8

Acceptance Criteria (4 consecutive readings):
 $V_m \leq 15\%$ for $k_a \geq 1.00E-8$
 $V_m < 50\%$ for $k_a < 1.00E-8$
 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k_{20}:	5.84E-08
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Comments/Qualifiers:

PROJECT NO.: 220207

PROJECT: Eco Vista Landfill

DATE: 5/27/2023

SAMPLE ID: 0524-B

DESCRIPTION:

SAMPLE INFORMATION

Type (Remold/Und.):	UND
Diameter (in):	2.83
Height (in):	2.40
Moist Weight (g):	488.5
Unit Wt. (wet) (pcf):	123.2
Unit Wt. (dry) (pcf):	103.4
% Max DD:	#DIV/0!

MOISTURE CONTENT

	Initial	Final
Tare ID	ST40	ST16
Tare Wt (g)	14.12	14.05
Wet Wt (g)	55.96	67.36
Dry Wt (g)	49.26	57.42
Moisture Content	19.1%	22.9%
+/- OMC	19.1%	22.9%
Sample Saturation:	84%	101%

QUALITY CONTROL

Setup By:	JDY
Calc By:	JDY
Appr. By:	JDY

SOIL PROPERTIES

Specific Gravity:	2.65	*
Max DD:		
OMC:		

* assumed

TEST DATA

Consol. Press. (psi)	10.0
Back Press. (psi):	65.0
Hyd. Gradient:	28
Equil. Menisci, R _{eq} :	1.6
Pipette Menisci, R _p :	14.6

TEST EQUIP. DATA

Board ID:	1M
Permometer ID:	1
Pipete Area, a _p (cm ²):	0.031416
Annulus Area, a _a (cm ²):	0.76712
Permeant:	Tap Water

TEST READINGS

	Date (m/d)	Elapsed t (sec)	Z (pipet @t)	ΔZ _p (cm)	Temp. °C	R _T (T corr.)	Perm., k ₂₀ (cm/sec)
1	5/30	300	14.2	0.4156	22.8	0.94	3.65E-8
2	5/30	600	13.9	0.7156	22.8	0.94	3.17E-8
3	5/30	900	13.5	1.1156	22.8	0.94	3.35E-8
4	5/30	1200	13.1	1.5156	22.8	0.94	3.47E-8
	5/30	1500		14.6156	22.8	0.94	#NUM!
	5/30	1800			22.8	0.94	

Acceptance

V _m	OK?
7.0%	OK
7.0%	OK
1.8%	OK
1.8%	OK
#NUM!	#NUM!

 Average of selected 4 consecutive values, k_a: 3.41E-8

Acceptance Criteria (4 consecutive readings):

 V_m ≤ 15% for k_a ≥ 1.00E-8

 V_m < 50% for k_a < 1.00E-8

 V_m Acc: 15%

AVERAGE CORRECTED HYDRAULIC CONDUCTIVITY, k₂₀:	3.41E-08
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Comments/Qualifiers:

TABLE C-3

**Eco-Vista Class 4 Landfill, Cell 8A CQA
Field Moisture/Density Test Results - Compacted Clay Liner**



Identification					Field Test Results			Reference Proctor Data			Evaluations				Retest		Remarks
Test ID	Lift No.	General Area	Site Coordinate Location		Test Depth	w (%)	γ_d (pcf)	Curve No.	W_{opt} (%)	$\gamma_{d(max)}$ (pcf)	w-W _{opt} (%)	P/F	Compaction (%)	P/F	at:	of:	
			Northing	Easting													
0413-1	1	Cell Floor	664,610	644,800	6	18.5	108.3	1130A	17.4	109.8	1.1	P	98.6	P			0413-A
0413-2	2	Cell Floor	664,610	644,950	6	21.3	101.6	0306A	18.2	104.8	3.1	P	96.9	P			
0413-3	2	Cell Floor	664,660	644,925	6	17.6	109.3	1130A	17.4	109.8	0.2	P	99.5	P			0413-B
0413-4	1	Cell Floor	664,660	644,775	6	18.5	111.2	1130A	17.4	109.8	1.1	P	101.3	P			
0413-5	2	Cell Floor	664,610	644,675	6	20.7	102.0	0306A	18.2	104.8	2.5	P	97.3	P			
0413-6	1	Cell Floor	664,660	644,650	6	21.0	101.9	0306A	18.2	104.8	2.8	P	97.2	P			
0413-7	2	Cell Floor	664,610	644,600	6	21.8	101.6	0306A	18.2	104.8	3.6	P	96.9	P			
0413-8	2	North Slope	664,700	644,600	6	19.6	104.2	0306A	18.2	104.8	1.4	P	99.4	P			0413-C
0413-9	1	Cell Floor	664,550	644,675	6	18.1	104.8	1130A	17.4	109.8	0.7	P	95.4	P			0413-D
0413-10	2	Cell Floor	664,525	644,825	6	17.5	109.0	1130A	17.4	109.8	0.1	P	99.3	P			
0413-11	1	Cell Floor	664,550	644,950	6	20.5	102.2	0306A	18.2	104.8	2.3	P	97.5	P			
0414-1	3	Cell Floor	664,560	644,630	6	22.6	100.5	0306A	18.2	104.8	4.4	P	95.9	P			
0414-2	3	Cell Floor	664,530	644,850	6	20.9	100.0	0306A	18.2	104.8	2.7	P	95.4	P			0414A
0414-3	3	Cell Floor	664,500	645,020	6	21.8	101.5	0306A	18.2	104.8	3.6	P	96.9	P			0414B
0414-4	3	Cell Floor	664,590	644,980	6	18.3	111.3	1130A	17.4	109.8	0.9	P	101.4	P			
0414-5	3	Cell Floor	664,580	644,770	6	18.2	110.6	1130A	17.4	109.8	0.8	P	100.7	P			
0414-6	3	Cell Floor	664,650	645,000	6	18.8	108.1	0110A	18.5	107.2	0.3	P	100.8	P			
0414-7	3	Cell Floor	664,625	644,850	6	21.8	107.2	1130A	17.4	109.8	4.4	P	97.6	P			0414C
0414-8	3	Cell Floor	664,675	644,760	6	21.7	111.3	1130A	17.4	109.8	4.3	P	101.4	P			0414D
0414-9	3	Cell Floor	664,630	644,630	6	21.4	107.9	1130A	17.4	109.8	4.0	P	98.3	P			
0515-1	1	East Slope	664,800	645,150	12	19.0	102.1	0110A	18.5	107.2	0.5	P	95.2	P			
0515-2	2	East Slope	664,710	645,090	6	18.5	102.3	0110A	18.5	107.2	0.0	P	95.4	P			
0515-3	1	East Slope	664,650	645,085	12	18.0	103.8	0110A	18.5	107.2	-0.5	F	96.8	P	0516-3		
0515-4	2	East Slope	664,575	645,100	6	17.8	104.0	0110A	18.5	107.2	-0.7	F	97.0	P	0516-4		
0515-5	1	East Slope	664,650	645,155	12	18.7	102.0	0110A	18.5	107.2	0.2	P	95.1	P			
0515-6	2	East Slope	664,650	645,155	6	18.9	102.3	0110A	18.5	107.2	0.4	P	95.4	P			
0516-1	1	East Slope	664,685	645,125	12	22.0	102.5	0110A	18.5	107.2	3.5	P	95.6	P			0516-A
0516-2	2	East Slope	664,685	645,120	6	22.3	102.8	0110A	18.5	107.2	3.8	P	95.9	P			0516-B
0516-3	1	East Slope	664,600	645,085	12	21.6	102.0	0110A	18.5	107.2	3.1	P	95.1	P		0515-3	
0516-4	2	East Slope	664,575	645,100	6	21.0	102.2	0110A	18.5	107.2	2.5	P	95.3	P		0515-4	
0516-5	1	East Slope	664,575	645,175	12	22.9	99.0	0110A	18.5	107.2	4.4	P	92.4	F	0516-7		
0516-6	2	East Slope	664,545	645,150	6	20.0	97.3	0110A	18.5	107.2	1.5	P	90.8	F	0516-8		
0516-7	1	East Slope	664,575	645,175	12	21.6	102.0	0110A	18.5	107.2	3.1	P	95.1	P		0516-5	
0516-8	2	East Slope	664,545	645,150	6	20.7	101.9	0110A	18.5	107.2	2.2	P	95.1	P		0516-6	
0516-9	1	East Slope	664,425	645,150	12	21.8	103.9	0110A	18.5	107.2	3.3	P	96.9	P			
0516-10	2	East Slope	664,465	645,100	6	21.3	104.9	0110A	18.5	107.2	2.8	P	97.9	P			
0517-1	1	East Slope	664,500	645,120	12	20.9	102.2	0110A	18.5	107.2	2.4	P	95.3	P			0517A
0517-2	2	East Slope	664,500	645,115	6	21.8	102.7	0110A	18.5	107.2	3.3	P	95.8	P			0517B
0517-3	1	East Slope	664,515	645,065	12	22.4	103.4	0110A	18.5	107.2	3.9	P	96.5	P			

TABLE C-3

**Eco-Vista Class 4 Landfill, Cell 8A CQA
Field Moisture/Density Test Results - Compacted Clay Liner**



Identification					Field Test Results			Reference Proctor Data			Evaluations				Retest		Remarks
Test ID	Lift No.	General Area	Site Coordinate Location		Test Depth	w (%)	γ_d (pcf)	Curve No.	W_{opt} (%)	$\gamma_{d(max)}$ (pcf)	w-W _{opt} (%)	P/F	Compaction (%)	P/F	at:	of:	
			Northing	Easting													
0517-4	2	East Slope	664,515	645,065	6	22.5	102.9	0110A	18.5	107.2	4.0	P	96.0	P			
0517-5	1	North Slope	664,800	645,050	12	21.9	103.5	0110A	18.5	107.2	3.4	P	96.5	P			
0517-6	2	North Slope	664,820	645,125	6	22.0	102.8	0110A	18.5	107.2	3.5	P	95.9	P			
0517-7	1	North Slope	664,765	645,025	12	21.7	104.0	0110A	18.5	107.2	3.2	P	97.0	P			0517C
0517-8	2	North Slope	664,770	645,025	6	22.0	102.4	0110A	18.5	107.2	3.5	P	95.5	P			0517E
0517-9	1	North Slope	664,710	644,950	12	23.1	103.7	0110A	18.5	107.2	4.6	P	96.7	P			
0517-10	2	North Slope	664,715	644,955	6	19.9	103.9	0110A	18.5	107.2	1.4	P	96.9	P			
0517-11	1	North Slope	664,740	644,650	12	19.4	103.3	0110A	18.5	107.2	0.9	P	96.4	P			
0517-12	2	North Slope	664,745	644,915	6	20.2	102.2	0110A	18.5	107.2	1.7	P	95.3	P			
0517-13	1	North Slope	664,775	644,900	12	21.1	103.7	0110A	18.5	107.2	2.6	P	96.7	P			0517D
0517-14	2	North Slope	664,770	644,900	6	20.7	104.0	0110A	18.5	107.2	2.2	P	97.0	P			0517F
0517-15	1	North Slope	664,690	645,025	12	22.1	103.4	0110A	18.5	107.2	3.6	P	96.5	P			
0517-16	2	North Slope	664,750	645,030	6	22.4	103.8	0110A	18.5	107.2	3.9	P	96.8	P			
0517-17	1	North Slope	664,685	644,890	12	23.2	102.9	0110A	18.5	107.2	4.7	P	96.0	P			
0517-18	2	North Slope	664,690	644,895	6	22.8	103.6	0110A	18.5	107.2	4.3	P	96.6	P			
0517-19	1	North Slope	664,750	644,800	12	22.0	104.2	0110A	18.5	107.2	3.5	P	97.2	P			
0517-20	2	North Slope	664,755	644,955	6	21.5	103.5	0110A	18.5	107.2	3.0	P	96.5	P			
0518-1	3	East Slope	664,750	645,100	6	22.1	103.9	0110A	18.5	107.2	3.6	P	96.9	P			
0518-2	3	East Slope	664,475	645,150	6	19.6	106.3	0110A	18.5	107.2	1.1	P	99.2	P			0518A
0518-3	3	East Slope	664,600	645,075	6	20.9	105.0	0110A	18.5	107.2	2.4	P	97.9	P			
0518-4	3	East Slope	664,550	645,170	6	22.5	102.8	0110A	18.5	107.2	4.0	P	95.9	P			
0518-5	3	East Slope	664,685	645,050	6	20.1	104.8	0110A	18.5	107.2	1.6	P	97.8	P			
0518-6	3	East Slope	664,755	645,150	6	20.9	104.3	0110A	18.5	107.2	2.4	P	97.3	P			0518B
0518-7	3	North Slope	664,810	645,000	6	20.7	103.7	0110A	18.5	107.2	2.2	P	96.7	P			
0518-8	3	North Slope	664,805	645,100	6	21.6	103.0	0110A	18.5	107.2	3.1	P	96.1	P			
0518-9	3	North Slope	664,715	645,015	6	22.0	102.4	0110A	18.5	107.2	3.5	P	95.5	P			0518C
0518-10	3	North Slope	664,685	644,900	6	20.8	104.5	0110A	18.5	107.2	2.3	P	97.5	P			
0518-11	3	North Slope	664,475	644,950	6	21.0	104.2	0110A	18.5	107.2	2.5	P	97.2	P			
0518-12	3	North Slope	664,735	644,875	6	19.7	105.7	0110A	18.5	107.2	1.2	P	98.6	P			0518D
0518-13	3	North Slope	664,775	644,950	6	20.3	105.3	0110A	18.5	107.2	1.8	P	98.2	P			
0518-14	3	North Slope	664,740	645,000	6	20.8	103.9	0110A	18.5	107.2	2.3	P	96.9	P			
0522-1	1	North Slope	664,700	644,750	6	22.6	107.4	0110A	18.5	107.2	4.1	P	100.2	P			
0522-2	2	North Slope	664,730	644,760	6	20.7	105.4	0306A	18.2	104.8	2.5	P	100.6	P			0522A
0522-3	1	North Slope	664,820	644,700	6	20.3	108.9	0110A	18.5	107.2	1.8	P	101.6	P			
0522-4	2	North Slope	664,820	644,590	6	21.6	101.1	0306A	18.2	104.8	3.4	P	96.5	P			
0522-5	1	North Slope	664,710	644,580	6	21.3	104.8	0306A	18.2	104.8	3.1	P	100.0	P			0522B
0522-6	1	South Slope	664,455	644,910	6	23.0	99.8	0306A	18.2	104.8	4.8	P	95.2	P			
0522-7	1	South Slope	664,470	645,040	6	22.5	100.3	0306A	18.2	104.8	4.3	P	95.7	P			
0522-8	1	South Slope	664,475	644,990	6	21.4	102.9	0306A	18.2	104.8	3.2	P	98.2	P			0522C

TABLE C-3

**Eco-Vista Class 4 Landfill, Cell 8A CQA
Field Moisture/Density Test Results - Compacted Clay Liner**



Identification					Field Test Results			Reference Proctor Data			Evaluations				Retest		Remarks
Test ID	Lift No.	General Area	Site Coordinate Location		Test Depth	w (%)	γ_d (pcf)	Curve No.	W_{opt} (%)	$\gamma_{d(max)}$ (pcf)	w- W_{opt} (%)	P/F	Compaction (%)	P/F	at:	of:	
			Northing	Easting													
0522-9	2	South Slope	664,490	644,705	6	22.7	100.0	0306A	18.2	104.8	4.5	P	95.4	P			
0522-10	2	South Slope	664,450	644,900	6	22.7	99.8	0306A	18.2	104.8	4.5	P	95.2	P			
0522-11	2	South Slope	664,470	645,040	6	23.1	101.5	0306A	18.2	104.8	4.9	P	96.9	P			
0522-12	1	South Slope	664,505	644,730	6	23.5	107.6	0110A	18.5	107.2	5.0	P	100.4	P			
0522-13	2	South Slope	664,510	644,590	6	22.6	97.2	0306A	18.2	104.8	4.4	P	92.7	F	0522-15		
0522-14	1	South Slope	664,490	644,650	6	18.7	108.5	0110A	18.5	107.2	0.2	P	101.2	P			
0522-15	2	South Slope	664,510	644,590	6	20.9	104.2	0306A	18.2	104.8	2.7	P	99.4	P		0522-13	0522D
0523-1	3	North Slope	664,750	644,800	6	21.2	104.7	0306A	18.2	104.8	3.0	P	99.9	P			
0523-2	3	North Slope	664,815	644,840	6	19.9	106.8	0306A	18.2	104.8	1.7	P	101.9	P			
0523-3	3	North Slope	664,700	644,760	6	20.0	105.6	0306A	18.2	104.8	1.8	P	100.8	P			
0523-4	2	South Slope	664,450	644,800	6	22.2	103.2	0306A	18.2	104.8	4.0	P	98.5	P			
0523-5	2	South Slope	664,485	644,970	6	21.3	104.8	0306A	18.2	104.8	3.1	P	100.0	P			
0523-6	2	South Slope	664,445	644,650	6	18.7	106.3	0306A	18.2	104.8	0.5	P	101.4	P			
0523-7	1	South Slope	664,475	644,850	6	20.4	104.9	0306A	18.2	104.8	2.2	P	100.1	P			
0523-8	1	South Slope	664,460	644,770	6	19.3	104.9	0306A	18.2	104.8	1.1	P	100.1	P			
0524-1	3	North Slope	664,830	644,590	6	20.4	105.8	0306A	18.2	104.8	2.2	P	101.0	P			
0524-2	3	North Slope	664,810	644,730	6	20.3	106.9	0306A	18.2	104.8	2.1	P	102.0	P			
0524-3	3	North Slope	664,690	644,675	6	23.3	103.5	0306A	18.2	104.8	5.1	P	98.8	P			
0524-4	3	North Slope	664,750	644,705	6	21.9	104.8	0306A	18.2	104.8	3.7	P	100.0	P			
0524-5	3	North Slope	664,700	644,600	6	22.0	103.9	0306A	18.2	104.8	3.8	P	99.1	P			
0524-6	3	North Slope	664,750	644,600	6	20.2	106.3	0306A	18.2	104.8	2.0	P	101.4	P			0524A
0524-7	3	South Slope	664,490	644,840	6	15.2	106.3	0306A	18.2	104.8	-3.0	F	101.4	P	0524-13		
0524-8	3	South Slope	664,460	644,730	6	20.9	106.3	0306A	18.2	104.8	2.7	P	101.4	P			
0524-9	3	South Slope	664,450	644,590	6	17.4	102.9	0306A	18.2	104.8	-0.8	F	98.2	P	0524-11		
0524-10	3	South Slope	664,530	644,600	6	20.4	106.2	0306A	18.2	104.8	2.2	P	101.3	P			
0524-11	3	South Slope	664,450	644,590	6	22.9	103.3	0306A	18.2	104.8	4.7	P	98.6	P		0524-9	
0524-12	3	South Slope	664,510	644,670	6	19.3	106.8	0306A	18.2	104.8	1.1	P	101.9	P			0524B
0524-13	3	South Slope	664,490	644,840	6	20.1	106.1	0306A	18.2	104.8	1.9	P	101.2	P		0524-7	

Statistical Summary


Minimum	-	15.2	97.2			0.0	95.1
Maximum	-	23.5	111.3			5.1	102.0
Average	-	20.8	104.1			2.7	97.9
Standard Deviation	-	1.6	2.7			1.5	2.1
Requirements	-	-	-			0.0 to 6.0	≥ 90
Total Number of Tests	-	99					
Required Frequency	1/10000 SF/lift						
Actual Frequency	1/4840 SF/lift						

Notes: (1) Test frequency based on lined area of 239580 SF and total Compacted Soil Liner volume of approximately 13310 CY

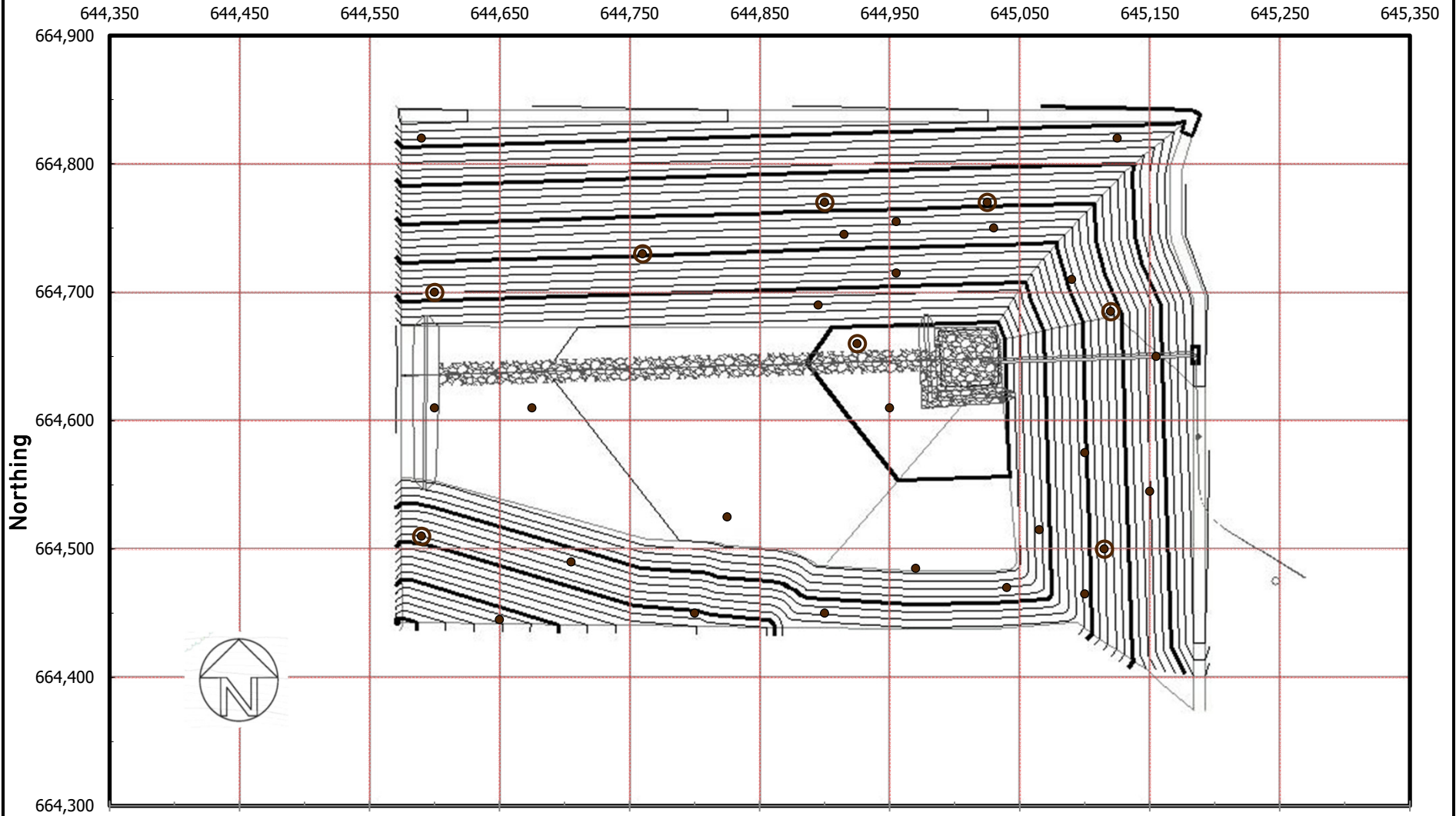


NOT TO SCALE

Note: This figure is not a survey. The test locations, grid coordinates and other items depicted are only approximate. The purpose of this figure is for illustrating approximate test locations only.

<p>Legend</p> <ul style="list-style-type: none"> ● Moisture/Density Tests ○ Permeability Tests 	<p><i>Field Compaction Test Location Plan</i></p> <p>Soil Liner</p>	<p>Eco-Vista Class 4 Landfill Cells 8A Project No.220207</p>		<p>Figure C-1</p>
---	---	--	---	------------------------------

Easting



NOT TO SCALE

Note: This figure is not a survey. The test locations, grid coordinates and other items depicted are only approximate. The purpose of this figure is for illustrating approximate test locations only.

Legend

- Moisture/Density Tests
- Permeability Tests

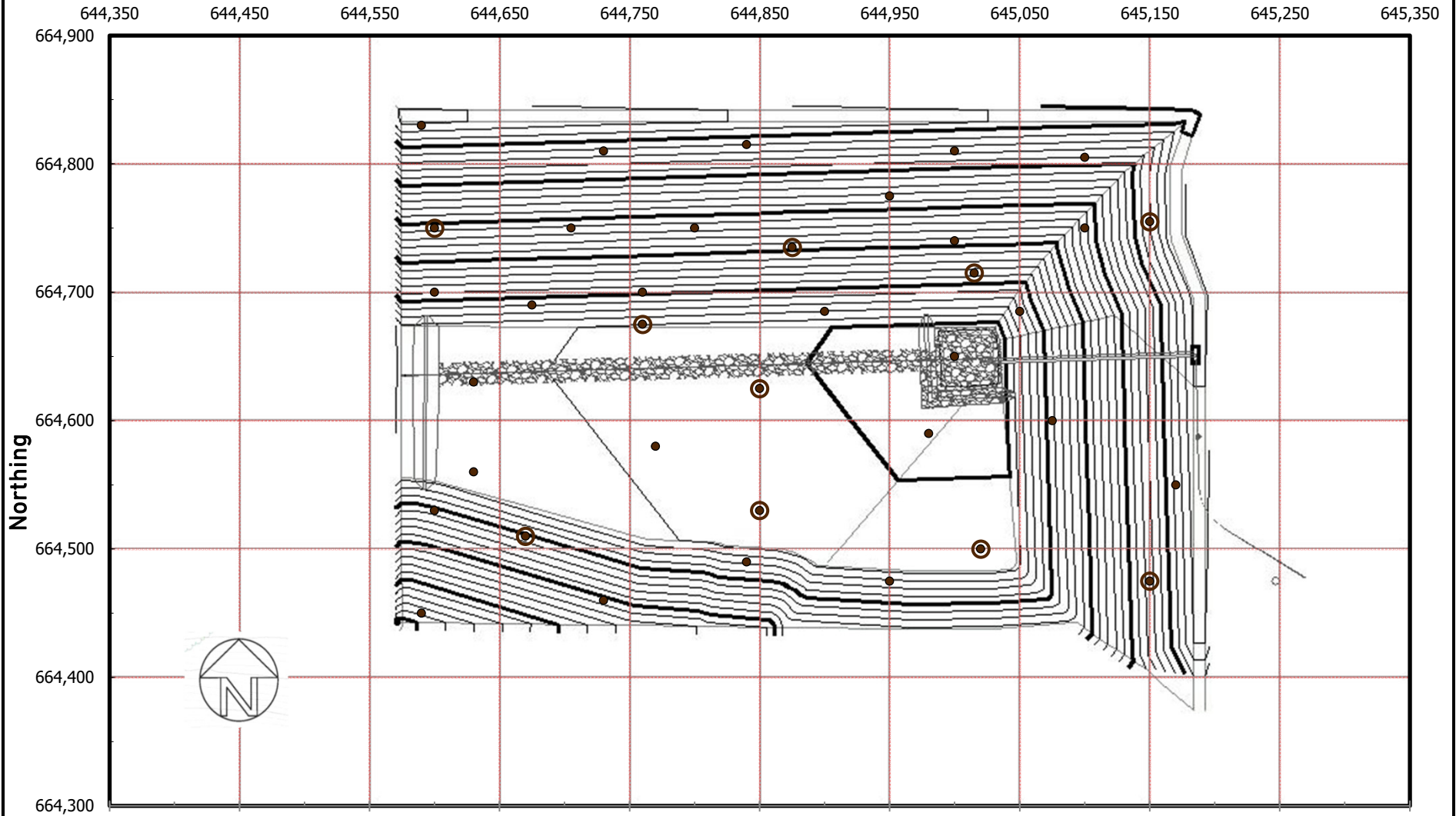
Field Compaction Test Location Plan
Soil Liner

Eco-Vista Class 4 Landfill
Cells 8A
Project No.220207



Figure
C-2

Easting



NOT TO SCALE

Note: This figure is not a survey. The test locations, grid coordinates and other items depicted are only approximate. The purpose of this figure is for illustrating approximate test locations only.

Legend

- Moisture/Density Tests
- Permeability Tests

Field Compaction Test Location Plan
Soil Liner

Eco-Vista Class 4 Landfill
Cells 8A
Project No.220207



Figure
C-3

APPENDIX D

DRAINAGE GEOCOMPOSITE



Drainage Geocomposite Material MQC Conformance Data





April 7, 2023

Customer: Waste Management
Customer P.O.#: 12368211
Project: WM Eco Vista Landfill Cell 8A, AR
Product: TN 200-2-6

We hereby certify that the TN 200-2-6 drainage geocomposite, meets or exceeds the project requirements as stated in the specifications. The properties listed in this section are:

Table with 5 columns: Property, Test Method, Unit, Value, Qualifier. Rows include Geonet (Thickness, Carbon Black, Tensile Strength, Melt Flow, Density), Composite (Ply Adhesion, Transmissivity), and Geotextile (Fabric Weight, Grab Strength, Grab Elongation, Puncture Resistance, Permittivity, AOS, UV Resistance).

Notes:

- 1. Transmissivity measured using water at 21 ± 2 ° C (70 ± 4 ° F) with a gradient of 0.1 and a confining pressure of 10,000 psf between steel plates after 15 minutes.
2. Condition 190/2.16
3. Geotextile and Geonet properties are prior to lamination.
4. Geotextile data is provided by the supplier.
5. MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.
6. Minium average value

Quality Approval

Malkesh Patel





Product: TN 200-2-6
Project : WM Eco Vista Landfill Cell 8A, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet						
Roll Number	Ply Adhesion (lb/in)		Transmissivity (m ² /sec)	Resin Lot Number	Density (g/cm ³)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m ² /sec)
	Side "A"	Side "B"							
131051010001	2.40	1.57	3.18 x 10 ⁻⁴	EQUX 019781	0.9551	225	2.27	59	
131051010002				EQUX 019781	0.9551				
131051010003				EQUX 019781	0.9551				
131051010004				EQUX 019781	0.9551				
131051010005				EQUX 019781	0.9551				
131051010006				EQUX 019781	0.9551				
131051010007				EQUX 019781	0.9551				
131051010008				EQUX 019781	0.9551				
131051010009				EQUX 019781	0.9551				
131051010010	1.74	2.63		EQUX 019781	0.9553	215	2.48	57	
131051010011				EQUX 019781	0.9553				
131051010012				EQUX 019781	0.9553				
131051010013				EQUX 019781	0.9553				
131051010014				EQUX 019781	0.9553				
131051010015				EQUX 019781	0.9553				
131051010016				EQUX 019781	0.9553				
131051010017				EQUX 019781	0.9553				
131051010018				EQUX 019781	0.9553				
131051010019				EQUX 019781	0.9553				
131051010020	1.47	1.80	3.25 x 10 ⁻⁴	EQUX 019781	0.9559	224	2.61	55	
131051010021				EQUX 019781	0.9559				



POLYETHYLENE RESIN CERTIFICATION

Customer Name : Waste Management
Project Name : WM Eco Vista Landfill Cell 8A, AR
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN 200-2-6

We hereby certify the following test results for the above referenced product/project:

Resin Manufacturer	Resin Lot Number	Property	Test Method	Units	Resin Manufacturer Value	Tested Value*
Osterman and Company	EQUX 019781	Density	ASTM D1505	g/cm ³	0.9500	0.9504
		Melt flow Index	ASTM D1238 ^(a)	g/10 min	0.30	0.25

(a) Condition 190/2.16

* Data from SKAPS Quality Control



Geotextile

Product: TN 200-2-6
Project : WM Eco Vista Landfill Cell 8A, AR

We hereby certify the following test results for the above referenced product/project :

GEOCOMP ROLL#	FABRIC SIDE	WEIGHT oz/yd²	GRAB lbs. (MD)	GRAB ELG % (MD)	GRAB lbs. (XMD)	GRAB ELG % (XMD)	PUNCTURE lbs.	AOS us sieve	PERM-ITY sec⁻¹
131051010001	Side A	6.28	162	67	173	83	100	70	1.77
	Side B	6.22	164	68	171	75	95	70	1.77
131051010020	Side A	6.43	168	65	178	77	98	70	1.77
	Side B	6.43	168	65	178	77	98	70	1.77

Drainage Geocomposite Material CQA Conformance Data





April 4, 2023

Mail To:

David Conrad
Waste Management, Inc.
100 Two Pine Dr.
North Little Rock AR 72117

email: dconrad@wm.com
cc email: bfureigh@promusengineering.com

Bill To:

<= Same

Dear Mr. Conrad:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.

Project: Eco Vista Landfill - Class 4 Cell 8A
TRI Job Reference Number: 23-000879
Material(s) Tested: One Skaps TN200-2-6 Double Sided Geocomposite(s)
Test(s) Requested: Transmissivity (ASTM D 4716) - GC
Peel Strength (ASTM D 7005) - GC
Thickness (ASTM D 5199) - GN
Density (ASTM D 1505) - GN
Carbon Content (ASTM D 4218) - GN
Tensile Properties (ASTM D 7179, 12 ipm strain rate) - GN
Mass/Unit Area (ASTM D 5261) - GT
Grab Tensile (ASTM D 4632) - GT
Puncture Strength (ASTM D 4833) - GT
Apparent Opening Size (ASTM D 4751) - GT
Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378

Sincerely,

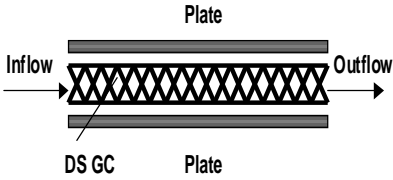
Mansukh Patel
Laboratory Manager
Geosynthetic Services Division

CQA REVIEWED

SIGNATURE	DATE
B.N. Fajil	04/04/2023


GEOCOMPOSITE TEST RESULTS
TRI Client: Waste Management, Inc.
Project: Eco Vista Landfill - Class 4 Cell 8A

Material: Skaps TN200-2-6 Double Sided Geocomposite
Sample Identification: 13151010001
TRI Log #: 23-000879

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Hydraulic Transmissivity (ASTM D 4716)												
Direction Tested: Machine Direction Normal Load (psf): 10,000 Hydraulic Gradient: 0.1 Test Length (in): 12 Test Width (in): 12												
												
Plate / Sample / Plate												
Seat Time (hours)												
	Specimen	1					2					
	Volume (cc)	824	803	798	627	625	624					
	Time (s)	25.46	25.53	25.43	25.81	25.87	26.05					
0.25	Flow Rate (GPM/ft width)	0.52	0.51	0.51	0.39	0.39	0.38					
	Transmissivity (m ² /s)	1.08E-03	1.05E-03	1.05E-03	8.06E-04	8.01E-04	7.95E-04					
	Test Temp (C)		19.5			19.7						
	Temp. Corr. Factor		1.015			1.011						
Peel Strength (ASTM D 7005)												
A - MD Average Peel Strength (ppi)	3.43	3.37	3.91	7.39	9.78							
A - MD Average Peel Strength (g/in)	1557	1530	1775	3355	4440							
B - MD Average Peel Strength (ppi)	4.17	3.11	1.91	3.98	11.60							
B - MD Average Peel Strength (g/in)	1893	1412	867	1807	5266							
Note: A and B represent a randomly assigned top and bottom of the sample												


MD Machine Direction

CQA REVIEWED



04/04/2023
DATE

SIGNATURE



PROMUS ENGINEERING


GEOCOMPOSITE TEST RESULTS
 TRI Client: Waste Management, Inc.
 Project: Eco Vista Landfill - Class 4 Cell 8A

Material: Solmax FS2-200E-06-06-FA-00 Double Sided Geocomposite
 Sample Identification: 2331-617568
 TRI Log #: 23-000879


GEONET COMPONENT

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Thickness (ASTM D 5199)												
Thickness (mils)	225.8	228	243	242	229	231	242	244	241	246	237	8
											226	<< min
Density (ASTM D 1505)												
Density (g/cm3)	0.951	0.951	0.951								0.951	0.000
Carbon Black Content (ASTM D 4218)												
% Carbon Black	2.16	2.18									2.17	0.01
Tensile Properties (ASTM D 7179, 12 ipm strain rate)												
MD Max. Strength (ppi)	55	76	63	67	73						67	8
MD Elong. @ Max. Strength (%)	24	20	21	23	20						21	2
MD Machine Direction												

CQA REVIEWED



SIGNATURE _____ DATE 04/04/2023





GEOCOMPOSITE TEST RESULTS
 TRI Client: Waste Management, Inc.
 Project: Eco Vista Landfill - Class 4 Cell 8A

Material: Skaps TN200-2-6 Double Sided Geocomposite
 Sample Identification: 13151010001
 TRI Log #: 23-000879


GEOTEXTILE - SIDE A

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Mass/Unit Area (ASTM D 5261)												
5" diameter Circle - Mass (g)	2.54	2.65	2.70	2.85	3.28	3.22	3.39	3.10	3.04	2.99	2.98	0.29
Mass/Unit Area (oz/sq.yd)	5.91	6.16	6.28	6.63	7.63	7.49	7.89	7.21	7.07	6.95	6.92	0.66
Grab Tensile Properties (ASTM D 4632)												
MD - Tensile Strength (lbs)	219	186	200	229	215	200	194	198	173	233	205	19
TD - Tensile Strength (lbs)	192	214	229	282	274	169	213	254	211	285	232	40
MD - Elong. @ Max. Load (%)	69	70	75	81	69	72	73	68	71	76	73	4
TD - Elong. @ Max. Load (%)	76	87	76	89	89	87	79	81	79	87	83	5
Puncture Resistance (ASTM D 4833)												
Puncture Strength (lbs)	111	111	122	97	119						112	10
Apparent Opening Size (ASTM D 4751)												
Opening Size Diameter (mm)	0.147	0.136	0.135	0.139	0.144						0.140	0.005
Sieve No.	100	100	100	100	100						100	
Permittivity (ASTM D 4491, Method C)												
Thickness (mil)	111	106	105	93	92	90	104	100	90	92	98	8
Thickness (mm)	2.83	2.69	2.67	2.35	2.33	2.30	2.64	2.54	2.29	2.33	2.50	0.20
Permittivity (Sec-1)	1.80	1.43	1.46	1.52	1.69	1.84	1.69	1.50	1.73	1.82	1.65	0.16
Permittivity (GPM/ft2)	134.6	107.0	109.2	113.7	126.4	137.6	126.4	112.2	129.4	136.1	123.3	11.7
Flow rate (LPM/m2)	5486	4358	4450	4633	5151	5608	5151	4572	5273	5547	5023	478
Permittivity (cm/sec)	0.509	0.385	0.389	0.358	0.393	0.422	0.446	0.381	0.397	0.424	0.410	0.043
MD Machine Direction	TD Transverse Direction											

CQA REVIEWED

B. N. Fajl 04/04/2023

SIGNATURE DATE

 **PROMUS ENGINEERING**

Drainage Geocomposite Material Inventory



APPENDIX E

GEOTEXTILE



Geotextile

Material MQC Conformance Data





SKAPS Industries (Nonwoven Division)
 335 Athena Drive
 Athens, GA 30601 (U.S.A.)
 Phone (706) 354-3700 Fax (706) 354-3737
 E-mail: contact@skaps.com

February 24, 2023
Waste Management

PO : 12368211

Dear Sir/Madam:

This is to certify that SKAPS GE110 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GE110 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE110 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Weight	ASTM D 5261	oz/sy (g/m ²)	9.10 (309)
Grab Tensile	ASTM D 4632	lbs (kN)	230 (1.02)
Grab Elongation	ASTM D 4632	%	50
CBR Puncture	ASTM D 6241	lbs (kN)	475 (2.11)
Permittivity*	ASTM D 4491	sec ⁻¹	0.90
AOS*	ASTM D 4751	US Sieve (mm)	60 (0.25)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:

* At the time of manufacturing. Handling may change these properties.

KOUROSH SABZEVARI
 QUALITY CONTROL MANAGER

www.skaps.com

CQA REVIEWED



B.N. Fajl

SIGNATURE 02/27/2023
DATE

PROMUS ENGINEERING

Product : GE110-180

ROLL #	WEIGHT	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	CBR PUNCTURE	AOS	PERMITTIVITY
ASTM METHOD	D5261	D4632	D4632	D4632	D4632	D6241	D4751	D4491
UNITS	oz/sq yd	lbs.	%	lbs	%	lbs.	US Sieve	sec ⁻¹
TARGET	9.10	230	50	230	50	475	60	0.90
75034.1	10.42	276	77	288	83	759	100	1.01
75034.2	10.42	276	77	288	83	759	100	1.01
75034.3	10.42	276	77	288	83	759	100	1.01

CQA REVIEWED	
	02/27/2023
SIGNATURE	DATE
	

*All values are MARV.

Geotextile

Material CQA Conformance Data





TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

Austin, TX - USA | CA - USA | SC - USA | Gold Coast - Australia | Suzhou - China | Sao Paulo, Brazil | Johannesburg - Africa

April 3, 2023

Mail To:

David Conrad
Waste Management

email: dconrad@wm.com
ccemail: bfureigh@promusengineering.com

Bill To:

<= Same

Dear Mr. Conrad:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.


Project:	Eco Vista Landfill - Class 4 Cell 8A
TRI Job Reference Number:	23-000835
Material(s) Tested:	One, Skaps GE110 10oz Nonwoven Geotextile(s)
Test(s) Requested:	Mass/Unit Area (ASTM D5261) Grab Tensile (ASTM D4632) Puncture Strength (ASTM D4833) Apparent Opening Size (ASTM D4751) Permittivity (ASTM D4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378

Sincerely,


Mansukh Patel
Laboratory Manager
Geosynthetic Services Division

CQA REVIEWED



04/04/2023

SIGNATURE DATE





TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

Austin, TX - USA | CA - USA | SC - USA | Gold Coast - Australia | Suzhou - China | Sao Paulo, Brazil | Johannesburg - Africa

GEOTEXTILE TEST RESULTS
TRI Client: Waste Management
Project: Eco Vista Landfill - Class 4 Cell 8A

Material: Skaps GE110 10oz Nonwoven Geotextile
 Sample Identification: 75034.2
 TRI Log #: 23-000835


PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Mass/Unit Area (ASTM D5261)												
5" diameter circle (grams)	4.65	4.90	5.17	4.81	4.44	3.97	4.69	4.30	4.48	4.97	4.64	0.35
Mass/Unit Area (oz/sq.yd)	10.82	11.40	12.03	11.19	10.33	9.23	10.91	10.00	10.42	11.56	10.79	0.82
Grab Tensile Properties (ASTM D4632)												
MD - Tensile Strength (lbs)	354	382	358	385	338	361	362	312	338	378	357	23
TD - Tensile Strength (lbs)	368	360	349	386	366	292	334	390	398	307	355	35
MD - Elong. @ Max. Load (%)	66	69	68	74	62	61	66	65	63	69	66	4
TD - Elong. @ Max. Load (%)	97	93	89	87	87	87	83	90	93	100	91	5
Puncture Resistance (ASTM D4833)												
Puncture Strength (lbs)	201	232	166	204	179						196	26
Apparent Opening Size (ASTM D4751, Method B.)												
Opening Size Diameter (mm)	0.132	0.142	0.131	0.126	0.130						0.132	0.006
Sieve No.	100	100	100	100	100						100	
Permittivity (ASTM D4491, Method C)												
Thickness (mil)	135.3	117.3	131.8	142.6	135.8	134.5	125.8	131.8	126.8	134.9	131.7	6.9
Thickness (mm)	3.44	2.98	3.35	3.62	3.45	3.42	3.20	3.35	3.22	3.43	3.34	0.18
Permittivity (Sec-1)	1.16	1.48	1.28	0.97	1.11	1.01	1.06	1.02	1.26	0.99	1.13	0.16
Permittivity (GPM/ft ²)	86.8	110.7	95.7	72.6	83.0	75.5	79.3	76.3	94.2	74.1	84.8	12.2
Permittivity (cm/sec)	0.399	0.441	0.429	0.351	0.383	0.345	0.339	0.341	0.406	0.339	0.377	0.039
MD Machine Direction	TD Transverse Direction											

CQA REVIEWED

B. N. Fajl

04/04/2023

SIGNATURE DATE

 **PROMUS ENGINEERING**

Geotextile Material Inventory



APPENDIX F

LCS AGGREGATE



TABLE F-1

Eco-Vista Class 4 Landfill, Cell 8A CQA

Laboratory Test Data - LCS Gravel

Sample ID	Grain Size				Permeability k (cm/sec)	USCS Classification	Comments
	Percent Finer (%)						
	2"	1/2"	3/8"	#200			
0105A	97.4	0.4	0.1	0.0	4.3E+1	GP	Preconstruction Sample
0105B	100.0	10	4	2.0	2.8E+01	GP	Preconstruction Sample
0518E	96.0	3	1	0.2	5.9E+00	GP	Construction Sample

Statistical Summary

Minimum	96.0	0.4	0.1	0.0	5.9E+00	N/A
Maximum	100.0	9.8	4.3	2.0	2.8E+01	N/A
Average	97.8	4.4	1.9	0.7	1.3E+01 ⁽²⁾	N/A
Standard Deviation	2.0	4.8	2.2	1.1	N/A	N/A
Material Requirements	-	-	-	< 5.0	1.E-01	GP, GW
Total Tests, Preconstruction	2				2	2
Total Tests, Construction	1				1	1
Required Frequency, Precon.	1/ Source				1/ Source	1/ Source
Required Frequency, Const.	1/5000 CY				1/5000 CY	1/5000 CY
Test Frequency, Precon.	1/750 Source				1/750 Source	1/750 Source
Test Frequency, Const. ⁽¹⁾	1/1500 CY				1/1500 CY	1/1500 CY

Notes:

(1) Actual test frequencies are approximate and based on single source and 1500 CY of material placed.

(2) Geometric mean.

LCS Aggregate Laboratory Test Data



**Permeability of Granular Material,
ASTM D2434**

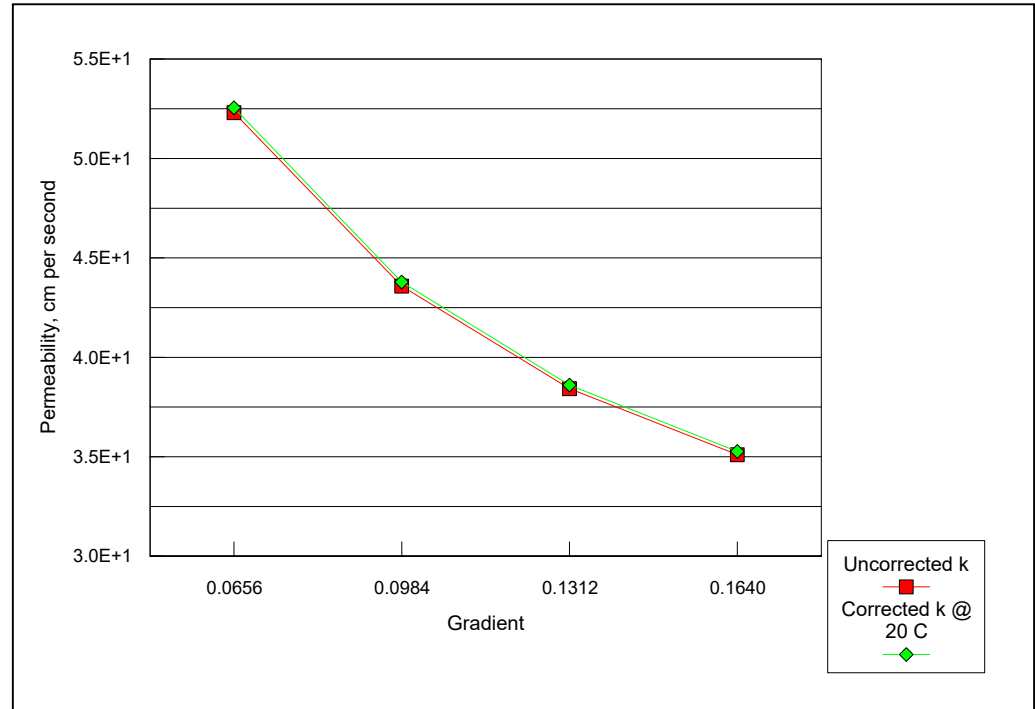
Date of Test:	01.11.2023	Date of Sample Receipt:	01.09.2023	Technician:	JMB
Client Name:	Promus Engineering			Reviewed By:	BMG
Project Name:	Eco-Vista Class4 Landfill, Cell 8 A			Balance ID:	2
Project Number:	2223			Thermometer ID:	2

Sample Number:	0105 A
Sample Location:	Bulk Gravel Sample
Other:	None

Specimen Data	
Specimen Area, cm ² (A)	182.415
Specimen Weight, lbs.	16.5
Specimen Height, cm (L)	30.48
Moisture Content, (as Tested), %	3.3
Dry Unit Weight, pcf	84.0
As Tested (Wet), pcf	86.8

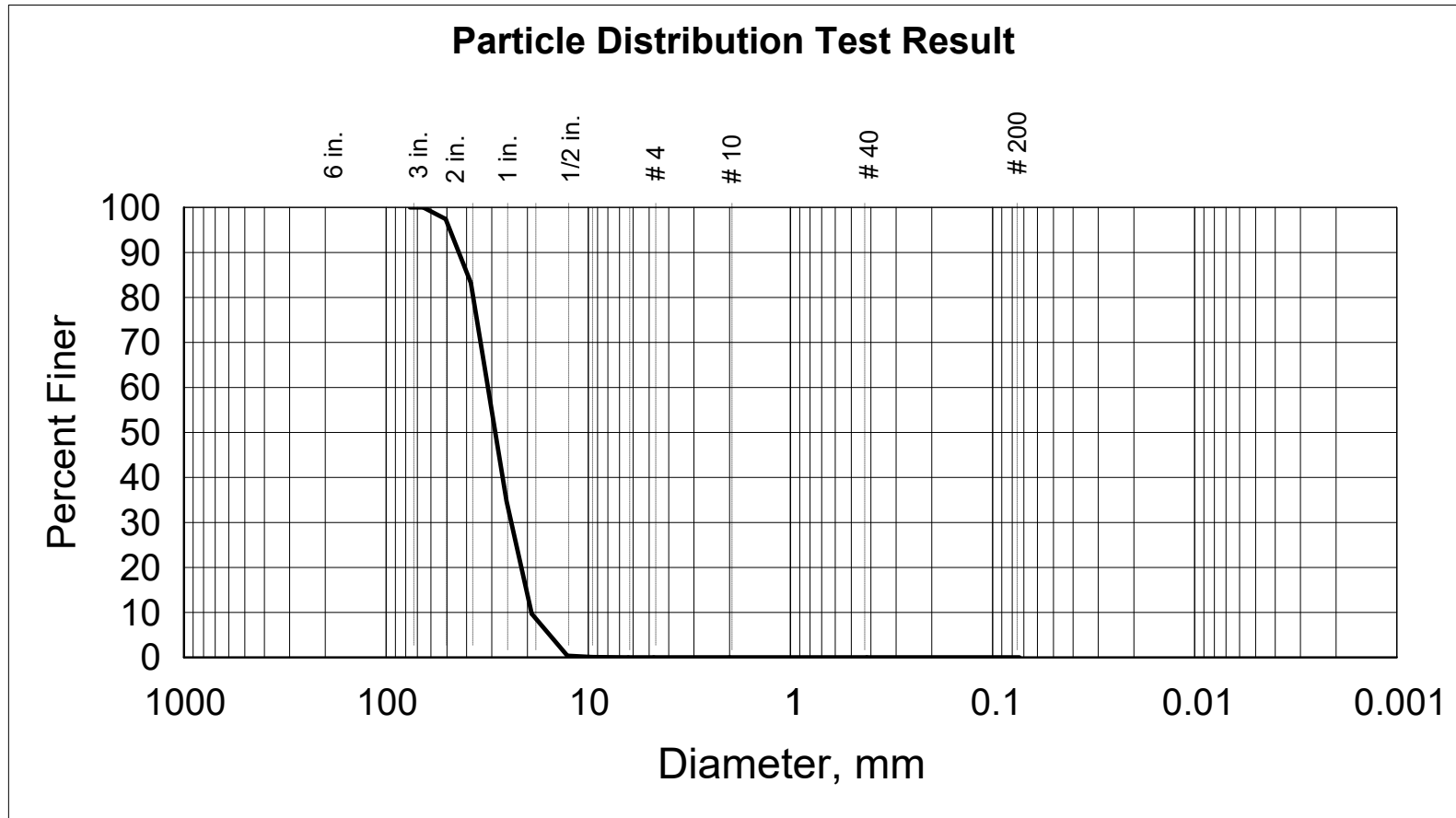
Test Constants	
Bubble Tube, cm ²	6.35
Reservoir Effective Area, cm ²	176.07

Avg. k Corrected @ 20 C, cm/sec	4.3E+001
--	-----------------



Height of Bubble Tube, cm (h)	Gradient (h/L)	Manometer Readings		Quantity of Flow (Q)	Time, sec. (t)	Permeant Temperature, C	Uncorrected k	Corrected k @ 20 C
		Start, cm	Finish, cm					
2.00	0.0656	50	0	8803.25	14.06	20	5.2E+001	5.3E+001
3.00	0.0984	50	0	8803.25	11.25	20	4.4E+001	4.4E+001
4.00	0.1312	50	0	8803.25	9.57	20	3.8E+001	3.9E+001
5.00	0.1640	50	0	8803.25	8.38	20	3.5E+001	3.5E+001

Remarks: $k = QL/Ath$, and Corrected for temp @ 20 C = $k * (-0.02452 * temp + 1.495)$



Proj. Name: Eco-Vista Class 4 Landfill, Cell 8 A	Gravel, % 100.0	Sand, % 0.0	P-200 0.0		LL N/A	PI N/A
Project No.: 2223	Description and Classification					
Date of Report: 01.11.2023	Gravel, Poorly graded, GP					
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "		2.5 "	100.0	3/8 "	0.1
0105 A Bulk Sample Sample wt Kg 22.6	5 "		2 "	97.4	1/4 "	0.0
Date Received 01.09.2023 NMC, % 3.3	4.5 "		1- 1/2 "	83.2	# 4	
Dry sample prep., ASTM C136, C117	4 "		1 "	34.8	# 10	
Balance ID: 1, 2	3.5 "		3/4 "	9.7	# 40	
Tested By: JMB Reviwed By BMG	3 "	100.0	1/2 "	0.4	# 200	

**Total Insoluble Carbonate Content
ASTM D3042
Modified Method**

Project: **Eco-Vista Class 4 Landfill**
Project No.: **2223**

Client: **Promus Engineering**
Client Project Number: **N/A**

Tested By: **JMB**
Date of Receipt of Sample: **01.09.2023**
Date of Report Issued: **01.11.2023**

Sample ID or Number: **0105 A**

Other: **Arkholo Ready Mix**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
1	1094.20	137.93	956.27	1091.80	137.93	953.87	2.40	0.25

Balance Reference ID: **1**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
2	1134.60	149.03	985.57	1131.90	149.03	982.87	2.70	0.27

Balance Reference ID: **1**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
3	1111.90	143.99	967.91	1109.10	143.99	965.11	2.80	0.29

Balance Reference ID: **1**

Remarks:

pH Meter: **1**
Buffer Sol. used: **6.8-4**
Date of checks: **01.10.2023**

NOTE: pH 4.0
AVG LOSS, % **0.27**

Page ID: **0105 A** **Modified Carb**

**Permeability of Granular Material,
ASTM D2434**

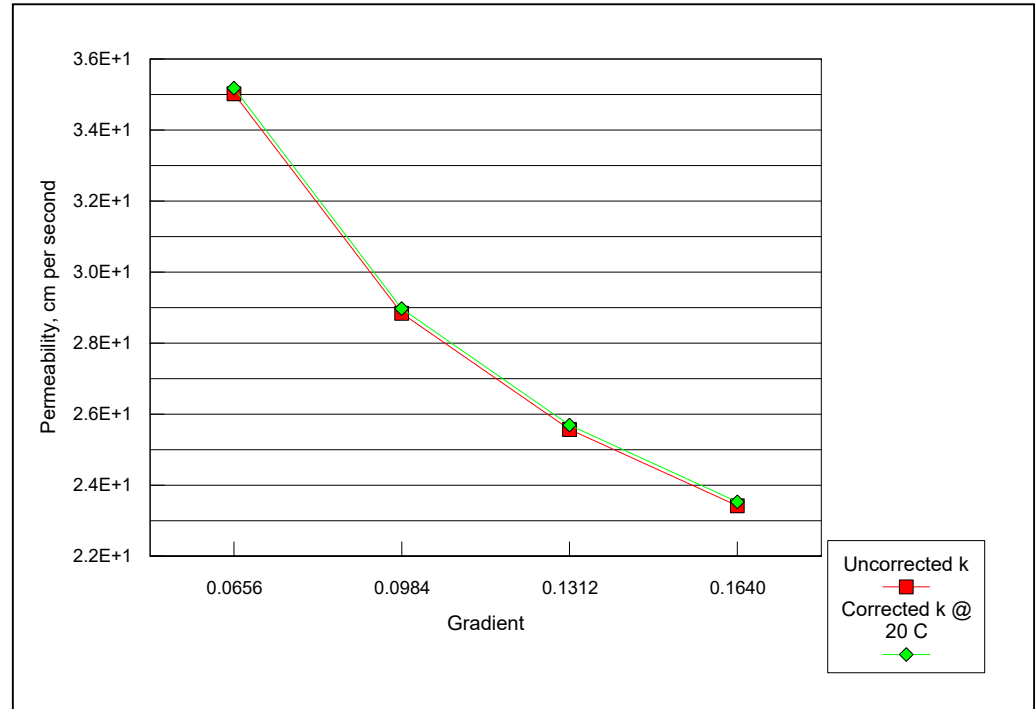
Date of Test:	01.11.2023	Date of Sample Receipt:	01.09.2023	Technician:	JMB
Client Name:	Promus Engineering	Reviewed By:	BMG	Balance ID:	2
Project Name:	Eco-Vista Class4 Landfill, Cell 8 A	Thermometer ID:	2		
Project Number:	2223				

Sample Number:	0105 B
Sample Location:	Bulk Gravel Sample
Other:	None

Specimen Data	
Specimen Area, cm ² (A)	182.415
Specimen Weight, lbs.	17.4
Specimen Height, cm (L)	30.48
Moisture Content, (as Tested), %	4.0
Dry Unit Weight, pcf	88.6
As Tested (Wet), pcf	92.2

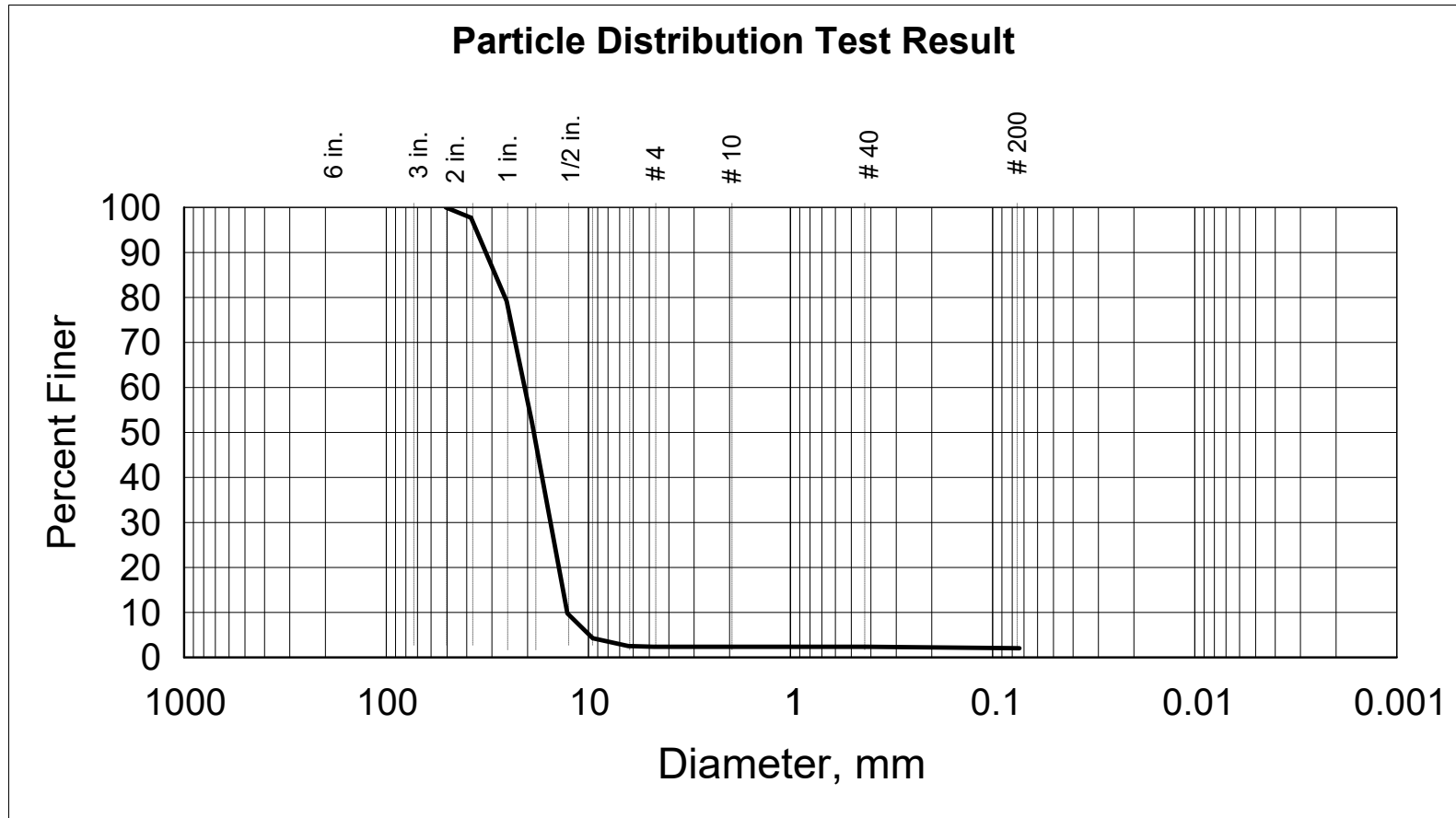
Test Constants	
Bubble Tube, cm ²	6.35
Reservoir Effective Area, cm ²	176.07

Avg. k Corrected @ 20 C, cm/sec	2.8E+001
--	-----------------



Height of Bubble Tube, cm (h)	Gradient (h/L)	Manometer Readings		Quantity of Flow (Q)	Time, sec. (t)	Permeant Temperature, C	Uncorrected k	Corrected k @ 20 C
		Start, cm	Finish, cm					
2.00	0.0656	50	0	8803.25	21.00	20	3.5E+001	3.5E+001
3.00	0.0984	50	0	8803.25	17.00	20	2.9E+001	2.9E+001
4.00	0.1312	50	0	8803.25	14.38	20	2.6E+001	2.6E+001
5.00	0.1640	50	0	8803.25	12.56	20	2.3E+001	2.4E+001

Remarks: k = QL/Ath, and Corrected for temp @ 20 C = k * (-0.02452 * temp + 1.495)



Proj. Name: Eco-Vista Class 4 Landfill, Cell 8 A	Gravel, % 97.6	Sand, % 0.4	P-200 2.0		LL N/A	PI N/A
Project No.: 2223	Description and Classification					
Date of Report: 01.11.2023	Gravel, Poorly graded, GP					
Project Loc. Arkansas	Standard Sieve Sizes - Percent Passing					
Sample Identification - Location - Type	6 "		2.5 "		3/8 "	4.3
0105 B Bulk Sample Sample wt Kg 18.9	5 "		2 "	100.0	1/4 "	2.5
Date Received 01.09.2023 NMC, % 4.0	4.5 "		1- 1/2 "	97.7	# 4	2.4
Dry sample prep., ASTM C136, C117	4 "		1 "	79.2	# 10	2.4
Balance ID: 1, 2	3.5 "		3/4 "	52.4	# 40	2.4
Tested By: JMB Reviwed By BMG	3 "		1/2 "	9.8	# 200	2.0

**Total Insoluble Carbonate Content
ASTM D3042
Modified Method**

Project: **Eco-Vista Class 4 Landfill**
Project No.: **2223**

Client: **Promus Engineering**
Client Project Number: **N/A**

Tested By: **JMB**
Date of Receipt of Sample: **01.09.2023**
Date of Report Issued: **01.11.2023**

Sample ID or Number: **0105 B**

Other: **Arkholo Ready Mix**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
1	915.40	137.93	777.47	912.70	137.93	774.77	2.70	0.35

Balance Reference ID: **1**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
2	906.80	149.03	757.77	904.10	149.03	755.07	2.70	0.36

Balance Reference ID: **1**

Before Liquid Wash				After Liquid Wash				
Trial No.	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample + Tare Weight, g	Tare Weight, g	Sample Weight, g	Sample Loss, g	Sample Loss, %
3	910.70	143.99	766.71	907.60	143.99	763.61	3.10	0.40

Balance Reference ID: **1**

Remarks:

pH Meter: **1**
Buffer Sol. used: **6.8-4**
Date of checks: **01.10.2023**

NOTE: pH 4.0
AVG LOSS, % **0.37**

Page ID: **0105 B Modified Carb**

CONSTANT HEAD PERMEABILITY TEST RESULTS

ASTM D 2434

Sample ID: 0518-E
 Description: Gravel
 Source: _____

Sample Date: 18-May
 Test Date: 28-May

Initial Moisture Content

Tare ID: SP02
 Tare Wt.: 184.29 g
 Wet Wt. w/Tare: 745.8 g
 Dry Wt. w/Tare: 743.8 g
 Moisture Content: 0.4%

Test Specimen Data

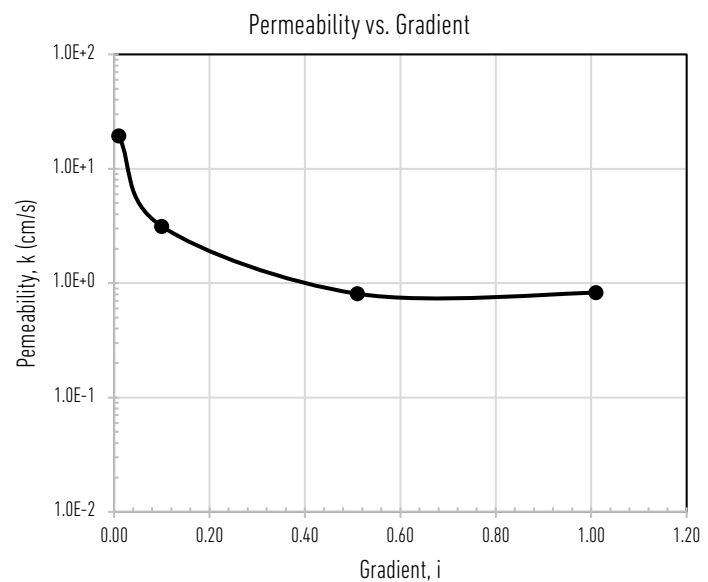
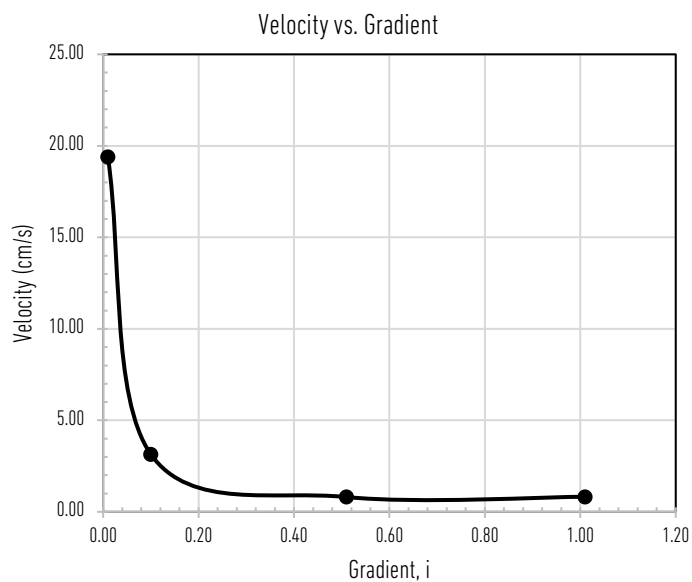
Diameter, D: 10.16 cm
 Area, A: 81.07 cm²
 Init. Length: 10.16 cm
 Deformation: 0.00 cm
 Final Length, L: 10.16 cm
 Volume, V: 823.7 cm³

Unit Weight

Tare ID: SP02
 Tare Wt.: 184.29 g
 Dry Wt. w/Tare: 1569.34 g
 Dry Unit Weight: 104.9 lb/ft³

Test Data

Test Run	Head, H (cm)	Gradient, i	Res. Reading Start	Res. Reading End	Time, t (s)	Flow, Q (cm ³)	Water Temp. °C	Perm., k (cm/s)
1	0.1	0.01	53.2	40.3	60	1045.8	27.1	1.9E+1
2	1.0	0.10	40.3	19.4	60	1694.4	27.2	3.1E+0
3	5.1	0.50	53.0	25.6	60	2221.4	27.2	8.1E-1
4	10.1	0.99	53.3	25.6	30	2245.7	27.4	8.3E-1
5								
6								
7								



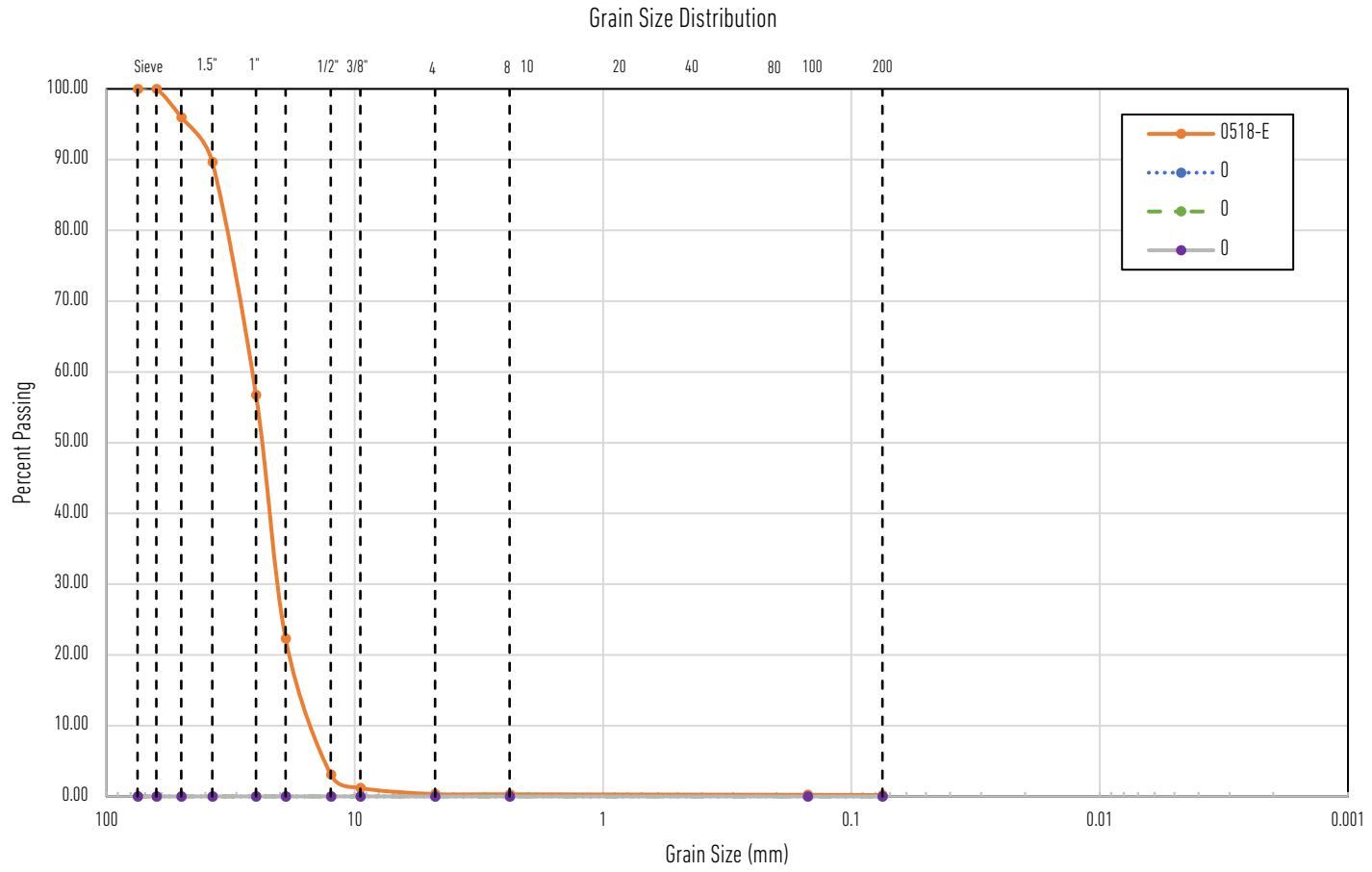
PROMUS
ENGINEERING

1200 Mountain Creek Rd. Ste 102, Chattanooga TN 37405 (888) 811-9066

PROJECT: Eco Vista Landfill
 PROJECT NO: 220207 TEST DATE: 28-May-23
 CLIENT: Waste Management

FIGURE

GRAIN SIZE ANALYSIS TEST RESULTS



Sample	% GRAVEL	% SAND	% FINES (SILT AND CLAY)
0518-E	99.68	0.13	0.20

Sample	0518-E		
Source			
MC	0.1%		
3.0"	100.00		
2.5"	100.00		
2.0"	95.97		
1.5"	89.66		
1.0"	56.74		
3/4"	22.33		
1/2"	3.10		
3/8"	1.19		
No. 4	0.32		
No. 8	0.30		
No. 200	0.20		



1200 Mountain Creek Rd. Ste 102, Chattanooga TN 37405 (888) 811-9066

PROJECT: Eco Vista Landfill
 PROJECT NO: 220207 TEST DATE: 30-May-23
 CLIENT: Waste Management

FIGURE

APPENDIX G

RECORD DRAWINGS



CELL LINER SYSTEM VERIFICATION TABLE

PNT. NO.	NORTHING	EASTING	SG ELEV	CL ELEV	CL DEPTH
1	664420.9	645124.8	1265.3	1266.9	1.6
2	664442.7	644575.6	1279.4	1281.1	1.7
3	664442.0	644624.8	1275.0	1276.7	1.7
4	664441.3	644674.8	1270.3	1272.1	1.7
5	664440.6	644724.8	1265.7	1267.5	1.7
6	664439.8	644774.8	1263.1	1264.7	1.7
7	664439.1	644824.8	1261.3	1262.9	1.6
8	664438.4	644874.8	1256.4	1258.0	1.6
9	664437.6	644924.8	1255.8	1257.3	1.5
10	664437.0	644974.8	1255.0	1256.7	1.7
11	664437.2	645024.8	1255.1	1256.7	1.7
12	664437.2	645029.8	1255.1	1256.7	1.6
13	664440.8	645074.8	1254.7	1256.4	1.7
14	664442.3	645093.4	1255.1	1256.9	1.7
15	664491.5	645474.7	1263.1	1264.8	1.7
16	664491.5	644624.8	1259.1	1260.8	1.7
17	664491.5	644674.8	1254.3	1256.0	1.7
18	664491.5	644724.8	1249.6	1251.1	1.5
19	664491.5	644774.8	1245.8	1247.4	1.6
20	664491.5	644824.8	1243.8	1245.3	1.5
21	664491.5	644874.8	1241.6	1243.3	1.6
22	664491.5	644924.8	1239.4	1241.0	1.6
23	664491.5	644974.8	1239.5	1241.1	1.6
24	664491.5	645024.8	1239.6	1241.1	1.5
25	664491.5	645074.8	1248.8	1250.4	1.6
26	664491.5	645124.8	1265.4	1267.0	1.6
27	664491.5	645174.8	1282.0	1283.7	1.7
28	664541.5	644574.4	1246.6	1248.2	1.6
29	664541.5	644624.8	1243.2	1244.8	1.6
30	664541.5	644674.8	1241.3	1242.9	1.6
31	664541.5	644724.8	1240.9	1242.4	1.5
32	664541.5	644774.8	1240.4	1241.9	1.5
33	664541.5	644824.8	1239.9	1241.4	1.5
34	664541.5	644874.8	1239.4	1240.9	1.5
35	664541.5	644924.8	1238.9	1240.5	1.6
36	664541.5	644974.8	1238.7	1240.3	1.5
37	664541.5	645024.8	1238.7	1240.3	1.7
38	664541.5	645074.8	1249.2	1250.9	1.7
39	664541.5	645124.8	1265.9	1267.6	1.6
40	664541.5	645174.8	1282.6	1284.1	1.5
41	664591.5	644574.8	1242.0	1243.6	1.6
42	664591.5	644624.8	1241.4	1243.0	1.6
43	664591.5	644674.8	1240.9	1242.4	1.6
44	664591.5	644724.8	1240.5	1242.0	1.5
45	664591.5	644774.8	1240.0	1241.5	1.5
46	664591.5	644824.8	1239.5	1241.1	1.5
47	664591.5	644874.8	1239.0	1240.5	1.6
48	664591.5	644924.8	1238.5	1240.1	1.6
49	664591.5	644974.8	1238.1	1239.6	1.5
50	664591.5	645024.8	1237.9	1239.5	1.5
51	664591.5	645074.8	1249.8	1251.4	1.6
52	664591.5	645124.8	1266.4	1268.0	1.6
53	664591.5	645174.8	1283.0	1284.7	1.7
54	664634.9	644574.5	1241.6	1243.2	1.6
55	664636.4	644624.8	1241.1	1242.6	1.5
56	664637.9	644674.8	1240.6	1242.2	1.6
57	664639.4	644724.8	1240.1	1241.6	1.5
58	664640.9	644774.8	1239.6	1241.1	1.5
59	664642.4	644824.8	1239.1	1240.6	1.5
60	664643.9	644874.8	1238.5	1240.1	1.6
61	664645.4	644924.8	1238.2	1239.7	1.6
62	664647.2	644985.7	1237.5	1239.0	1.5
63	664661.5	645029.0	1235.5	1237.2	1.7
64	664641.5	645074.8	1250.3	1251.9	1.6
65	664641.5	645124.8	1266.9	1268.5	1.6
66	664641.5	645174.8	1283.6	1285.2	1.6
67	664691.5	644574.8	1247.9	1249.6	1.7
68	664691.5	644624.8	1247.5	1249.1	1.6
69	664691.5	644674.8	1247.0	1248.6	1.6
70	664691.5	644724.8	1246.6	1248.2	1.6
71	664691.5	644774.8	1246.0	1247.6	1.6
72	664691.5	644824.8	1245.4	1247.1	1.7
73	664691.5	644874.8	1245.0	1246.6	1.6
74	664691.5	644924.8	1244.5	1246.2	1.7
75	664691.5	644974.8	1244.0	1245.6	1.7
76	664691.5	645024.8	1243.4	1245.1	1.7
77	664691.5	645074.8	1253.1	1254.8	1.7
78	664691.5	645124.8	1268.5	1270.1	1.7
79	664691.5	645174.8	1283.9	1285.6	1.7
80	664741.5	644574.8	1264.6	1266.3	1.7
81	664741.5	644624.8	1264.1	1265.9	1.7
82	664741.5	644674.8	1263.5	1265.3	1.7
83	664741.5	644724.8	1263.2	1264.8	1.7
84	664741.5	644774.8	1262.7	1264.2	1.5
85	664741.5	644824.8	1262.2	1263.7	1.5
86	664741.5	644874.8	1261.6	1263.2	1.6
87	664741.5	644924.8	1261.1	1262.7	1.6
88	664741.5	644974.8	1260.6	1262.2	1.6
89	664741.5	645024.8	1260.0	1261.7	1.7
90	664741.5	645074.8	1259.6	1261.2	1.6
91	664741.5	645124.8	1273.8	1275.5	1.7
92	664741.5	645166.3	1287.4	1289.1	1.7
93	664791.5	644574.8	1281.3	1282.9	1.6
94	664791.5	644624.8	1280.9	1282.4	1.6
95	664791.5	644674.8	1280.4	1282.0	1.6
96	664791.5	644724.8	1279.8	1281.5	1.6
97	664791.5	644774.8	1279.4	1280.9	1.6
98	664791.5	644824.8	1278.9	1280.5	1.6
99	664791.5	644874.8	1278.4	1279.9	1.6

PNT. NO.	NORTHING	EASTING	SG ELEV	CL ELEV	CL DEPTH
100	664791.5	644924.8	1277.8	1279.4	1.6
101	664791.5	644974.8	1277.3	1278.9	1.6
102	664791.5	645024.8	1276.9	1278.5	1.6
103	664791.5	645074.8	1276.3	1277.9	1.6
104	664791.5	645124.8	1275.7	1277.4	1.7
106	664841.5	644574.8	1294.9	1296.5	1.6
107	664841.5	644624.8	1294.3	1296.0	1.7
108	664841.5	644674.8	1294.0	1295.6	1.6
109	664841.5	644724.8	1293.5	1295.1	1.5
110	664841.5	644774.8	1293.0	1294.6	1.6
111	664841.5	644824.8	1292.4	1294.0	1.6
112	664841.5	644874.8	1291.9	1293.5	1.6
113	664841.5	644924.8	1291.4	1293.0	1.6
114	664841.5	644974.8	1291.0	1292.5	1.5
115	664841.5	645024.8	1290.5	1292.1	1.6
116	664841.5	645074.8	1289.9	1291.4	1.5
117	664841.5	645124.8	1289.3	1290.8	1.5
118	664841.5	645174.8	1288.7	1290.4	1.7
119	664391.5	645163.8	1274.9	1276.5	1.6
120	664374.4	645183.9	1280.6	1282.3	1.7
121	664374.4	645192.9	1280.7	1282.4	1.6
122	664441.5	645124.8	1264.9	1266.6	1.7
123	664441.5	645174.8	1281.6	1283.2	1.7
124	664441.5	645183.9	1284.5	1286.2	1.7
125	664441.5	645192.9	1284.6	1286.2	1.6
126	664555.1	644574.8	1242.3	1243.8	1.6
127	664546.2	644624.8	1241.8	1243.4	1.6
128	664532.2	644674.8	1241.3	1243.0	1.7
129	664518.2	644724.8	1241.1	1242.7	1.6
130	664507.5	644763.1	1240.8	1242.4	1.6
131	664507.1	644774.8	1240.7	1242.3	1.6
132	664505.9	644807.4	1240.3	1241.9	1.6
133	664502.9	644824.3	1240.0	1241.6	1.6
134	664499.8	644863.8	1239.8	1241.4	1.6
135	664486.8	644894.0	1239.6	1241.2	1.6
136	664485.0	644924.8	1239.8	1241.4	1.6
137	664482.5	644967.9	1239.9	1241.5	1.6
138	664482.7	645024.8	1240.0	1241.6	1.6
139	664483.6	645041.7	1239.8	1241.4	1.7
140	664491.1	645047.1	1239.6	1241.2	1.6
141	664541.5	645043.1	1238.7	1240.3	1.6
142	664591.5	645039.2	1237.9	1239.6	1.7
143	664625.9	645036.9	1237.5	1239.1	1.6
144	664622.3	644986.5	1237.6	1239.2	1.5
145	664629.2	644927.7	1235.5	1237.2	1.7
146	664631.2	645030.6	1235.5	1237.2	1.7
147	664553.5	644956.3	1238.5	1240.2	1.6
148	664624.8	645016.1	1237.3	1238.9	1.6
149	664515.9	644924.8	1239.0	1240.6	1.6
150	664673.1	644574.6	1241.9	1243.4	1.5
151	664673.0	644624.8	1241.4	1242.9	1.5
152	664673.0	644674.8	1240.9	1242.4	1.6
153	664673.0	644724.8	1240.3	1241.8	1.5
154	664672.9	644774.8	1239.9	1241.4	1.5
155	664672.9	644824.8	1239.2	1240.8	1.6
156	664672.9	644874.8	1238.8	1240.3	1.6
157	664672.8	644924.8	1238.3	1239.9	1.6
158	664672.8	644984.3	1237.7	1239.4	1.7
159	664666.8	644990.7	1235.4	1237.2	1.7
160	664666.8	645026.8	1235.5	1237.2	1.7
161	664672.8	645030.9	1237.2	1238.9	1.7
162	664662.9	645035.0	1237.3	1238.9	1.6
163	664691.5	645043.0	1243.3	1245.0	1.7
164	664733.8	645074.8	1257.1	1258.8	1.7
165	664793.6	645130.9	1276.8	1278.4	1.6
167	664671.2	645074.8	1250.5	1252.2	1.7
168	664681.4	645122.3	1266.5	1268.1	1.6
169	664800.6	645166.6	1288.0	1289.6	1.7
170	664694.9	645183.9	1287.1	1288.8	1.6
171	664641.5	645183.9	1286.6	1288.3	1.7
172	664591.5	645183.9	1286.0	1287.6	1.7
173	664541.5	645183.9	1285.6	1287.2	1.7
174	664491.5	645183.9	1285.1	1286.8	1.7
175	664427.0	645183.9	1284.3	1286.0	1.7
176	664427.0	645192.9	1284.4	1286.1	1.7
177	664391.5	645183.9	1281.1	1282.8	1.7
178	664391.5	645192.9	1281.1	1282.6	1.6
179	664491.5	645192.9	1285.1	1286.8	1.6
180	664541				