Kacy Murillo (adpce.ad)

Subject: RE: CQA Certification Report - Twin Rivers Pine Bluff LLC Class 3N Landfill Cells 15 and 16 (Permit 0243-S3N-R2, AFIN 35-00017)

AFIN: 35-00017
PMT#: 0243-S3N-R2
Received
By Kacy Murillo at 2:55 pm, Dec 8, 2022
DOC ID#: 83024
TO: AC>FILE <KM

From: Carpenter, Owen [mailto:Owen.Carpenter@terracon.com]
Sent: Thursday, December 8, 2022 6:52 AM
To: Greg Banic (adpce.ad)
Cc: Annette Cusher (adpce.ad); Derrell Ezell; Dorton, Robert; Potter, Drew
Subject: CQA Certification Report - Twin Rivers Pine Bluff LLC Class 3N Landfill Cells 15 and 16 (Permit 0243-S3N-R2, AFIN 35-00017)

Good morning Mr. Banic!

Please find attached to this email the CQA certification report for construction of the bottom liner system and leachate collection system for the Twin Rivers Pine Bluff Class 3N Landfill Cells 15 and 16. Notification for the construction was sent on October 3, 2022. If you have any questions or need any additional information, please contact Drew Potter or me at your earliest convenience. Thank you in advance for your review and approval of the construction certification.

Best regards,
Owen

F. Owen Carpenter, P.E., P.G.
Senior Engineer | Solid Waste Services
Terracon
25809 I-30 South | Bryant, Arkansas 72022
P (501) 847-9292 | F (501) 847-9210
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owen.carpenter@terracon.com | Terracon.com

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Construction Quality Assurance Certification Report

Cells 15 & 16 Bottom Liner System Construction

Twin Rivers Pine Bluff LLC
Permit No. 0243-S3N-R2
AFIN: 35-00017

November 2022
Project No. 35217168

Prepared for:
Twin Rivers Pine Bluff LLC
1701 Jefferson Parkway
White Hall, AR 71602
(870) 541-5046

Prepared by:
Terracon Consultants, Inc.
25809 Interstate 30 South
Bryant, Arkansas 72022
(501) 847-9292

Terracon
Explore with us

PROFESSIONAL ENGINEER'S CERTIFICATION

"I certify to the best of my professional judgment that the bottom liner system for Cells 15 and 16 of the Graphic Flexible Packaging Class 3N Landfill (Permit No. 0243-S3N-R2) was constructed in accordance with the project specifications, plans, and applicable Arkansas Department of Environmental Quality regulations. This certification is contingent on the fact that all information supplied to the signatory authority at the time of this certification is unquestionably accurate and was provided in good faith."

December 7, 2022

F. Owen Carpenter, P.E., P.G.,
Arkansas Professional Engineer No. 8653

Certification Date

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1.0 INTRODUCTION

Twin Rivers Pine Bluff, LLC (Twin Rivers) owns and operates a Class 3N Industrial Landfill (Landfill) near Pine Bluff, Arkansas, in accordance with Solid Waste Permit No. 0243-S3N-R2. The Landfill is located approximately one mile north of Pine Bluff in Jefferson County, Arkansas. Twin Rivers contracted with Terracon Consultants, Inc. (Terracon) to provide Construction Quality Assurance (CQA) services for the construction of the bottom liner system, leachate collection system and related work at their Landfill. **FIGURE 1** illustrates the geographic location of the facility.

Figure 1: Site Location Map

The following document summarizes the construction of the subgrade, bottom liner system, leachate collection system and related work. Correspondence, details, quality control test results, and certification associated with the construction are also provided. This document, in conjunction with the project as-built drawing, is intended to satisfy the requirements of Reg.22.428 of Arkansas Division of Environmental Quality (DEQ) Regulation 22, Solid Waste Management Rules and Permit No.0243-S3N-R2.

1.1 General

The construction of Cells 15 & 16 was conducted in accordance with the following documents:

- *"Permit Drawings – Gaylord Container Corporation Class 3N Landfill"*, by Genesis Environmental Consulting, Inc., dated: July 2001.
- "*Solid Waste Permit Number 0243-S3N-R2*", by Arkansas Division of Environmental Quality, OLR Solid Waste Section.
- *"Solid Waste Management Rules, Regulation 22"*, by Arkansas Pollution Control and Ecology Commission (APC&EC).

1.2 Site Description

The Landfill is maintained and operated in accordance with Solid Waste Permit Number 0243-S3N-R2 issued by the DEQ. The 12-acre Landfill is located on a 32-acre site within the Pine Bluff Industrial Park. The Landfill site is bordered on the north by a paved public road. Caney Bayou is located south and east of the Landfill. A layout of the Twin Rivers Landfill facility is shown on **FIGURE 2**.

1.3 Project Description

The project consists of the construction of Cells 15 and 16 (approximately ½ acre), bottom liner system and leachate collection system.

The following information summarizes the construction sequence associated with the construction of the bottom liner system for Landfill Cells 15 and 16 of the Landfill:

- Installation of a subgrade layer;
- Installation and quality assurance testing of a minimum 18-inch thick compacted clay liner, placed at 95 percent of the Standard Proctor density, with a maximum hydraulic conductivity of 1 x 10^{-6} cm/s;
- Installation of a minimum 12-inch thick drainage layer over the clay liner; and
- Leachate collection system.

The CQA report is organized using table, figures, and appendices to provide documentation of the observations and material testing during the construction of Cells 15 & 16. Daily project field records for the construction of Cells 15 and 16 and the leachate collection system are presented in **APPENDIX B**. **APPENDIX F** contains photographs that document the various stages of construction of Cells 15 and 16 and the leachate collection system.
As required by Reg.22.428(i) the CQA Report includes record drawings of Cells 15 & 16 are presented in the appendices and figures that identify the following:

Reg.22.428(i) (1) - The limits of liner or final cover barrier construction;
FIGURE 2 depicts the limits of the constructed bottom liner system for Cells 15 &16.

Reg.22.428(i)(2) - The top and bottom liner or final cover barrier elevations at 50' intervals referenced to the site grid coordinate system;
The **As-built drawing** in **APPENDIX A** provides the top and bottom elevations of the constructed clay liner system at 50' intervals referenced to the site grid coordinate system. The **As-built drawing** provides a table of elevations of the subgrade and top of clay liner as provided by a Registered Professional Land Surveyor.

Reg.22.428(i) (3)- If a granular drainage blanket is utilized in the design, top of blanket elevation should be identified at 50' elevations;
The **As-built drawing** in **APPENDIX A** provides the top elevations of the constructed drainage layer at 50' intervals referenced to the site grid coordinate system. **APPENDIX A** provides tabular elevations by a Registered Professional Land Surveyor of the top of drainage layer.

Reg.22.428(i)(4) The location and elevation of slope breaks, leachate piping, leachate sumps and trenches, berms, and any other features which are material to the disposal area construction;
The **As-built drawing** in **APPENDIX A** provides the location and elevation of applicable slope breaks, leachate piping, leachate sumps and trenches, berms, and other features of Cells 15 & 16 construction. Note that the leachate collection pipe from the newly constructed cells penetrates the liner at the south berm and ties into the leachate gravity main.

Reg.22.428(i)(5) A key map showing the location of the construction in relation to the permitted design, along with an identification of areas previously constructed and areas yet to be constructed;
FIGURE 2 depicts the limits of the constructed bottom liner system for Cells 15 & 16 in relation to the permitted design, along with an identification of areas previously constructed and areas yet to be constructed.

Reg.22.428(i)(6) Compaction and permeability testing locations;
Field logs in **APPENDIX C3** and **APPENDIX C4,** and **FIGURES 3 – 6** in **APPENDIX C5** provide compaction and permeability test results and locations for the bottom liner system of Cells 15 & 16.

Reg.22.428(i)(7) If necessary to document leachate head level compliance (subsections (a)(2) and (g)(6) of this section), the report should also indicate the lowest point of the liner constructed not including leachate trenches and sumps.
FIGURE 2 and the **As-built drawing** in **APPENDIX A** provide the lowest point of the liner constructed not including leachate trenches and sumps.

Reg.22.428(i)(8) In addition, the certifying professional shall make a statement that the cell was constructed in accordance with the permit drawings and narrative. The report should also include a list of any deviations from the permitted drawings, if they exist, and reasons for the deviations.

Cells 15 & 16 were constructed as close as possible and in accordance with the permit drawings and narrative. Construction variances and/or deviations are documented in section 5.0.

1.4 Key Personnel

Pickett Industries, Inc. was awarded the contract for the construction of the bottom liner system. The key personnel for each participating firm in the project are listed below.

- **Owner:**
  Twin Rivers Pine Bluff, LLC
  - Project Manager: Derrell Ezell

- **CQA Consultant:**
  Terracon Consultants, Inc.
  - Certifying Engineer: F. Owen Carpenter, P.E., P.G.
  - CQA Monitors: Jacob Billingsley, Cole Rodman, Jackson Mitchell

- **Survey Control:**
  Harmon Surveying, Inc.
  - Project Manager: Dodd Harmon, P.L.S.

- **Soil Testing Laboratory:**
  Terracon Consultants, Inc., Cincinnati, OH
  - Laboratory Manager: Kalyn Abrams

- **Contractor:**
  Pickett Industries, Inc.
  - Project Manager: Jordan DiGiacomo

- **Geosynthetic Testing Laboratory:**
  TRI Environmental
  - Project Manager: Mansukh Patel

2.0 SUBGRADE PREPARATION

This section summarizes the excavation and establishment of the subgrade surface corresponding to the permitted design for Cells 15 & 16. The subgrade surface conforms to the project plans and specifications.

2.1 Project Specifications

The project specifications indicated that a subgrade elevation was to be established to the lines and grades shown on the project construction plans. The subgrade was to be placed, smooth rolled, and tested to ensure a suitable foundation was established.

2.2 Construction Specifications

Placement of the leveling/subgrade layer was accomplished using dump trucks, a dozer and a compactor. The elevations associated with the subgrade surface established are provided in **APPENDIX A**. The subsurface was prepared in accordance with the permit plans (*Permit Drawings – Gaylord Container Corporation Class 3N Landfill*", by GEC, dated: July 2001).

2.3 Subgrade Testing

The Subgrade was compacted to at least 95% of Standard Proctor maximum dry density as verified by a Terracon soils technician. **FIGURE 3** in **APPENDIX C5** illustrates the locations of the field moisture/density tests for the subgrade. **APPENDIX C1** provides pre-construction test results for the subgrade material. **APPENDIX C3** includes the field logs for the moisture/density testing performed in association with Cells 15 & 16 subgrade construction.

3.0 CLAY LINER SYSTEM INSTALLATION

The following section describes the construction of the compacted clay liner system. The compacted clay liner was completed during October 2022.

3.1 Project Specifications

The project specifications indicated that the clay liner should be constructed in 6-inch thick compacted lifts to form a minimum 18-inch thick compacted clay liner. According to the project specifications, each clay lift was to be placed and compacted to a minimum of 95 percent of the Standard Proctor maximum dry density at a moisture content wet of optimum moisture for the clay material. As the CQA consultant, Terracon required each lift to be compacted to 95 percent of the Standard Proctor maximum dry density at moisture content between zero (0) and plus six (+6) percent of the optimum moisture content. As required by the facility permit, the hydraulic conductivity of the clay was not to exceed 1 x 10^{-6} cm/s.

3.2 Construction Specifications

Placement of the clay liner material was accomplished using a dozer, sheepsfoot roller and vibratory smooth drum roller. When the clay liner was too wet or excessively dry to achieve required emplacement conditions, the area was moisture adjusted prior to resuming the compaction effort. Finish grading of the surface was verified by the project surveyor.

The project surveyor verified the thickness and limits of the clay liner by performing a survey of the top and bottom of the clay liner on a minimum of 50-foot intervals. An as-built survey of the clay liner system is presented in **APPENDIX A**.

3.3 Pre-Construction Testing of Clay Liner Material

Pre-construction laboratory testing of the clay liner material was completed as specified in the project specifications, and in accordance with the requirements of DEQ Regulation 22. Pre-construction clay samples were obtained prior to construction of Cells 15 & 16. One sample from the proposed borrow area was taken and tested prior to construction. **APPENDIX C1** contains the results of the compacted clay liner pre-construction testing and test results from previous cell construction of Cells 13 & 14 (Composite 1). **TABLE 1** summarizes the results of the pre-construction testing. The results indicate that the materials meet or exceed the minimum project standards. (See also Section 5.0 Variances)

Table 1: Clay Liner Materials Pre-Construction Test Summary

SAMPLE NUMBER	Test Description				
	Moisture/Density Relationships ASTM D698	**Atterberg Limits ASTM D4318**	**Particle Size Analysis ASTM D1140, D422**	**Soils Classification (Unified) D2487**	**Permeability (cm/sec) D5084**
Project Requirements	Minimum 95% Standard Proctor maximum dry density	P.I. ≥ 10	≥ 30% passing No. 200 sieve ≥ 80% passing No. 4 sieve	CL, CH, or SC	1×10^{-6} cm/s or less
PC-1	Max Dry Density: 105.3 pcf Optimum Moisture: 18.2%	L.L. 31 P.L. 21 P.I. 10	89.1% Passing No. 200 Sieve 99.8% Passing No. 4 Sieve	CL	5.5×10^{-6}
PC-1 (Retest @ +2% OMC)	Max Dry Density: 105.3 pcf Optimum Moisture: 18.2%	L.L. 31 P.L. 21 P.I. 10	89.1% Passing No. 200 Sieve 99.8% Passing No. 4 Sieve	CL	2.1×10^{-7}
CS-2	Max Dry Density: 115.3 pcf Optimum moisture: 13.2%	L.L. 25 P.L. 16 P.I. 9	71.4% Passing the No. 200 Sieve 99.5% Passing the No. 4 Sieve	CL	7.8×10^{-8}
Composite 1	Max Dry Density: 94.9 pcf Optimum Moisture: 26.2%	L.L. 60 P.L. 22 P.I. 38	98.1% Passing No. 200 Sieve 100% Passing No. 4 Sieve	CH	1.5×10^{-8}

3.4 Construction Testing of Clay Liner Material

During the construction of the compacted clay liner, a sample was obtained for laboratory testing to verify the consistency of the materials during construction. Results were obtained for soil classification, Standard Proctor testing, sieve analysis, and re-molded permeability testing. The results of the construction test are included in **APPENDIX C2**. **TABLE 2** summarizes the results obtained from laboratory testing of this material. Based upon the results of the construction testing performed, the clay liner material complies with the project requirements.

Table 2: Clay Liner Materials Construction Test Summary

SAMPLE NUMBER	Test Description				
	Moisture/Density Relationships ASTM D698	**Atterberg Limits ASTM D4318**	**Particle Size Analysis ASTM D1140, D422**	**Soils Classification (Unified) D2487**	**Permeability (cm/sec) D5084**
Project Requirements	Minimum 95% Standard Proctor maximum dry density	P.I. ≥ 10	≥ 30% passing No. 200 sieve ≥ 80% passing No. 4 sieve	CL, CH, or SC	1×10^{-6} cm/s or less
CS-1	Max Dry Density: 100.5 pcf Optimum moisture: 19.7%	L.L. 43 P.L. 25 P.I. 18	97.3% Passing the No. 200 Sieve 100% Passing the No. 4 Sieve	CL	2.9×10^{-8}
SG-1 (Subgrade / CCL construction test)	Max Dry Density: 101.3 pcf Optimum Moisture: 27.3%	L.L. 65 P.L. 34 P.I. 31	99.2% Passing No. 200 Sieve 100.0% Passing No. 4 Sieve	MH	1.4×10^{-8}

Field moisture and density tests were performed at a minimum rate of one test for every 10,000 square feet of liner constructed, per compacted lift. **APPENDIX C3** includes the results of the moisture and density testing performed in association with the clay liner construction. Drawings illustrating the locations of the field moisture/density testing performed in association with the clay liner construction are presented on **FIGURES 4 - 6**.

Shelby Tube samples were obtained from each lift at a minimum rate of one test for every 40,000 square feet of liner constructed. Field logs in **APPENDIX C3**, as well as **FIGURES 4-6** in **APPENDIX C5** reference the location of the Shelby Tube samples taken in association with each compacted lift of clay liner construction. The Shelby Tubes were sealed and delivered to the laboratory for permeability testing using a flexible-wall permeameter (ASTM D5084). **APPENDIX C4** contains the compacted clay liner permeability test results. As indicated in **TABLE 3** below, permeability results for the completed compacted clay liner meet the project requirements (less than 1×10^{-6} cm/s).

Table 3: Permeability Results Summary

Test No.	Lift No./Layer	Test Results	
		K (cm/sec)	Pass/ Fail
P-1	1/Clay Liner	8.5×10^{-9}	Pass
P-2	2/Clay Liner	9.1×10^{-9}	Pass
P-3	3/Clay Liner	7.9×10^{-9}	Pass
P-4	3/Clay Liner (Berm)	9.4×10^{-9}	Pass

4.0 LEACHATE COLLECTION SYSTEM AND DRAINAGE LAYER

This section provides a summary of the construction of the leachate collection system and drainage layer that were installed in the Landfill. The leachate line consisted of a 6" perforated HDPE pipe surrounded by a 6' wide gravel bedding wrapped in 8-oz geotextile with a minimum 2% slope to a leachate collection trench. **APPENDIX A** presents an as-built drawing of the top of the drainage layer over the clay liner system.

4.1 Leachate Collection Pipe

During placement of the 12-inch thick drainage layer a 6-inch diameter HDPE leachate collection pipe was installed in the center of Cells 15 & 16 bottom liner system. A perforated collection pipe was constructed within Cells 15 & 16 to collect and remove future liquids from within the Landfill. The HDPE perforated leachate collection pipe was covered by gravel and wrapped in geotextile. The geotextile and gravel material laboratory test results are presented in **APPENDIX D**. The HDPE collection pipes, gravel, and geotextile were installed in the leachate collection trenches as shown in **APPENDIX A**. A summary of the laboratory test results for the gravel is presented in **TABLE 4.**

4.2 Leachate Pump System

The 6" diameter HDPE leachate collection pipe drains into an existing 6" diameter leachate collection pipe at the north end of Cell 14. This leachate collection pipe drains into an existing 8" diameter HDPE gravity main. The gravity main feeds to an existing HDPE pump station basin (manhole) east of the cells at a minimum of 0.5% slope. A duplex pumping system in the manhole pumps to an existing leachate storage tank to the north of the leachate collection manhole/pump station.

4.3 Protective Cover

A 12-inch (min) thick protective cover layer was placed on top of the compacted clay liner in Cells 15 & 16. The protective cover consists of sand/ gravel with a minimum hydraulic conductivity of $1.0X10^{-3}$ cm/s, as was required by the construction plans and technical specifications. **APPENDIX D** presents the laboratory test results on the protective cover layer. A summary of the laboratory test results for the drainage layer is presented in **TABLE 4.** The survey record drawing in **APPENDIX A** illustrates the elevations for the top of protective cover layer. The layer was placed using low ground pressure dozers while maintaining a 12-inch thick minimum working surface to ensure protection of the underlying compacted clay liner.

Table 4: Drainage Layer and Leachate Collection System Summary

Sample Number	Test Description			
	Carbonate Content (%)	Particle Size Analysis ASTM D1140, D422	Unified Soils Classification D2487	Permeability (cm/sec) D 2434
Project Requirements (Leachate Collection System Gravel)	<15	5% or less passing 1/4-inch perforations	GW, GP	≥ 1.0×10^{-2}
Project Requirements (Protective Cover/Drainage Layer)			GW, GP, SW, SP	> 1.0×10^{-3}
PG-1 (Gravel/ Pre-Construction)	0.07	2% approx.	GP	$1.33 \times 10^{+1}$
PS-1 (Protective Cover/ Pre-Construction)	N/A		SP	8.46×10^{-2}
PS-2 (Protective Cover/ Pre-Construction)	N/A		SP	7.15×10^{-2}
CG-1 (Gravel/ Pre-Construction)	N/A	5% approx.	GP	$1.14 \times 10^{+1}$
Constr. PC-1 (Protective Cover/ Construction)	N/A		SP	1.06×10^{-1}

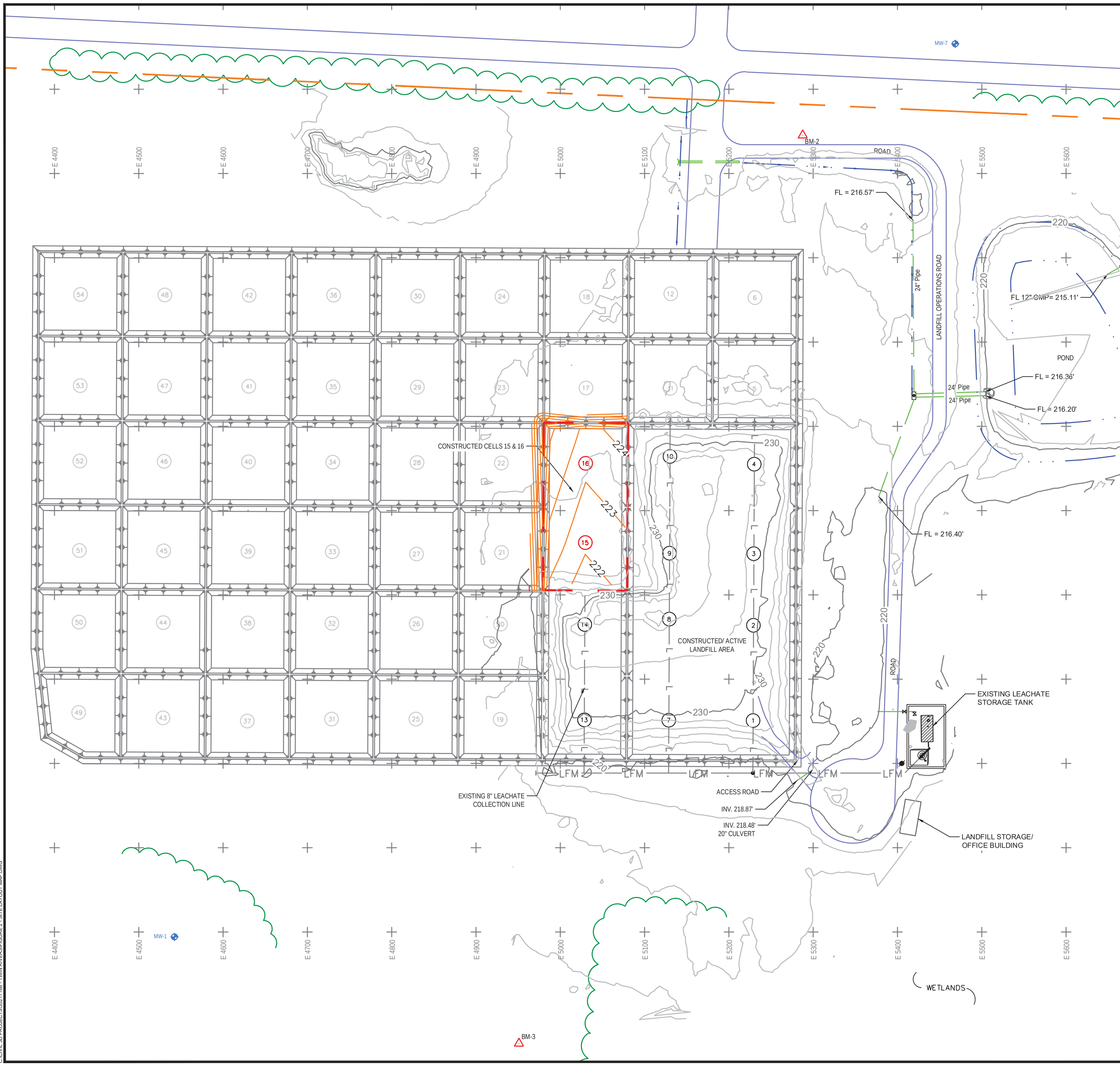
5.0 CONSTRUCTION PROBLEMS AND SOLUTIONS

Preconstruction samples were taken from a designated borrow area located in the vicinity of the Twin Rivers Pine Bluff wastewater treatment ponds. Sample PC-1 exhibited marginal plasticity characteristics and had to be remolded at approximately 2% wet of optimum or greater to achieve acceptable permeability in the laboratory. Sample CS-2 taken from the same borrow area, as construction was beginning, exhibited unacceptable plasticity characteristics. Therefore, it was requested that another borrow source be used for the clay liner for the project.

Another borrow area was identified and utilized that produced visually high quality clays with high plasticity, similar to soils that were used on the previous landfill cell liner system. A minimum amount of borrow area clays were needed to complete the subgrade to the design elevations. Soon after completing subgrade, the new borrow area soils were used to complete the compacted clay liner (CCL).

Since subgrade and CCL construction was ongoing, a soil sample with nearly the same soil description, color and other characteristics from the previous construction (Composite 1 or C-1), was used as a pre-construction sample. At their risk, the contractor completed the CCL construction. Construction samples SG-1 and CS-1 were tested and confirmed to be high quality barrier soil materials at about the end of the short CCL construction cycle. Confirmatory in-place permeability specimens from the CCL and adjoining berm exhibited very low permeability characteristics with all samples being slower than $1x10^{-8}$ cm/sec.

Manufacturer's minimum property certification for the leachate collection system geotextile indicated slightly lower strength properties than those specified. However, laboratory conformance testing tensile strength properties in the machine and transverse directions were 227 and 228 pounds respectively and therefore met the project specifications.



N

120 60 0 120

SCALE: 1" = 120'

BENCHMARK COORDINATE TABLE

NUMBER	NORTHING	EASTING	ELEVATION
BM-1	5204.57	4255.08	223.24
BM-2	5245.27	5287.50	223.71
BM-3	4167.90	4950.90	211.64

LEGEND

- PROPERTY LINE
- CURRENT ACTIVE AREA
- 230 — EXISTING CONTOURS (1')
- 230 / 222 — PERMITTED TOP OF CLAY CONTOURS (1')
- EXISTING ROAD
- L — L — EXISTING LEACHATE COLLECTION LINES
- BM-10 — PERMANENT SURVEY BENCHMARK

REV	DATE	BY	DESCRIPTION

SITE LAYOUT MAP

CELLS 15 & 16 BOTTOM LINER SYSTEM

TWIN RIVERS LLC

CLASS 3N LANDFILL

PINE BLUFF ARKANSAS

Terracon
Consulting Engineers and Scientists
25809 I-30 SOUTH
BRYANT, AR 72022
PH. (501) 847-9292
FAX. (501) 847-9210

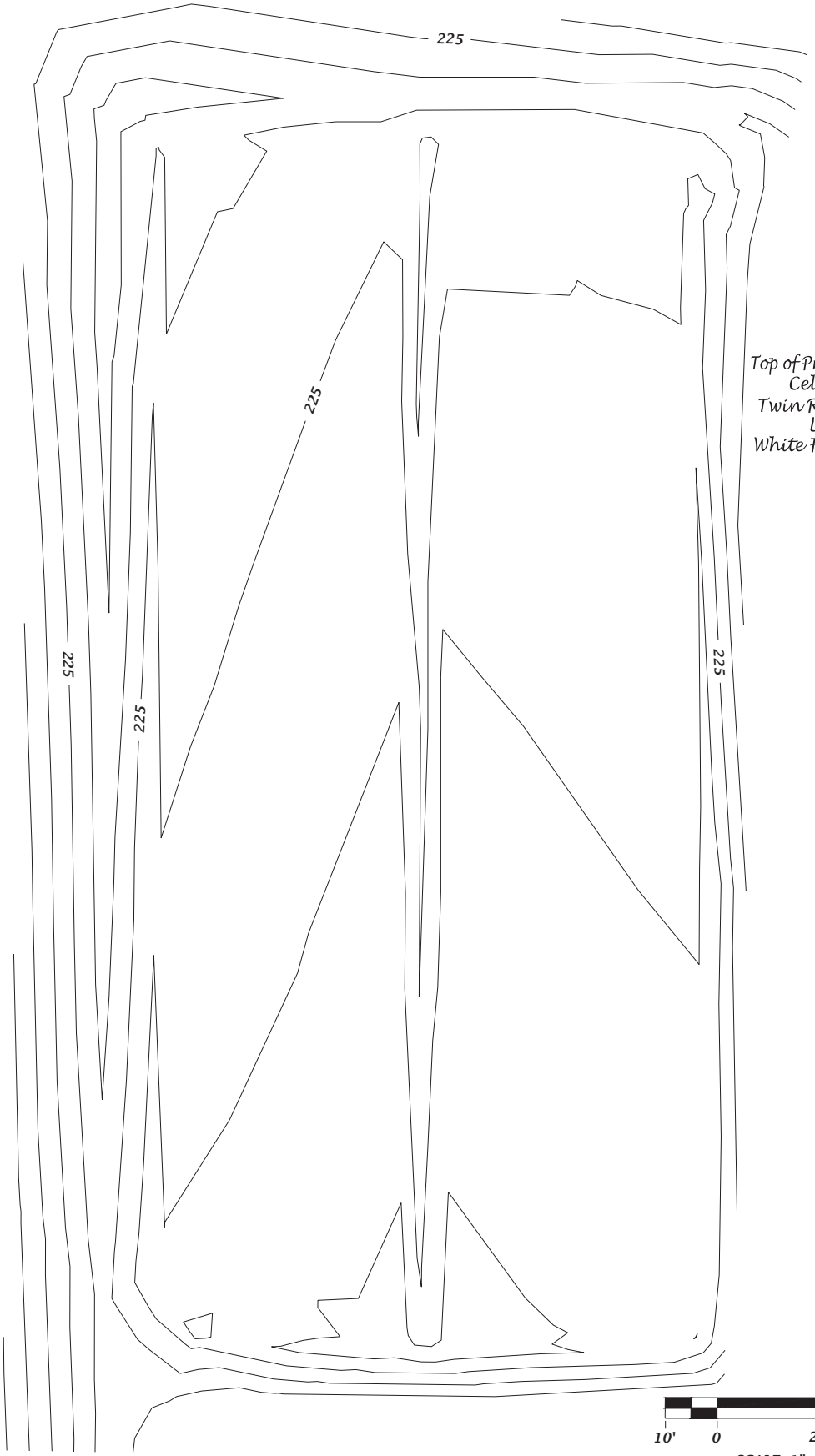
FIGURE 2

DESIGNED BY:	DAP
DRAWN BY:	DAP
APPVD. BY:	FOC
SCALE:	1" = 120'
DATE:	NOVEMEBR 2022
JOB NO.	123-001-35217168
ACAD NO.	
SHEET NO.:	1 OF 5

C:\CIVIL 3D PROJECTS\35217168 - TWIN RIVERS\FIGURE 2 - SITE LAYOUT MAP.DWG

APPENDIX A
Record Drawings and Figures

HARMON SURVEYING, INC.
2310 Ginger Kerry Lane
Conway, AR 72034
Phone: (501) 730-1518
Fax: (501) 730-0637



Top of Pro. Cover Surface
Cells 15 & 16
Twin Rivers Class 3N
Landfill
White Hall, Arkansas

10' 0 20' 40'

SCALE: 1"=20'
Date: 11/03/2022

POINT #	SUBGRADE ELEV.	TOP OF CLAY ELEV.	TOP OF PROTECTIVE COVER ELEV.
1	222.872	224.7352	226.0045
2	222.1651	223.9052	225.1588
3	222.2762	224.0448	225.2904
4	222.3674	223.3246	224.4047
5	221.7782	223.5479	224.695
6	221.7679	222.7388	223.7924
7	221.1349	222.9939	223.998
8	220.6009	222.138	223.2503

APPENDIX B
Daily Project Field Records

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/5/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett Industries
Project Name: Cells 15&16 Construction
Technician: Jacob Billingsley
Test Location:

WEATHER:

X	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
55	Low Temp. (°F)	84	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 12:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

	Dozer(s)		Tractor & Pans
X	Excavator(s)		Skidsteer
X	Backhoe(s)		Water Truck
	Haul Truck(s)		Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

X	Client		Liner Crew
	Contractor		Liner Installer
X	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Arrived onsite and ADEQ insepctor was observing site before construction

Client dug out a patch for subgrade samples and a sample from the borrow pit from where they will get the clay.

Contractor told me they were waiting on piping to arrive and should start construction next week.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/10/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett Industries
Project Name: Cells 15&16 Construction
Technician: Jacob Billingsley
Test Location: Cell 15 & 16

WEATHER:

X	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
59	Low Temp. (°F)	85	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 11:00 AM
Depart Site: 1:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

X	Dozer(s)		Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)		Water Truck
	Haul Truck(s)		Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
X	Contractor		Liner Installer
X	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Arrived on site and spoke with contractor. Contractor was finishing site calibration.

Contractor planned on only taking down the fencing on the perimeter of the cell construction and will being top soil in the morning.

Took photos of existing fencing around the cells.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/11/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett Industries
Project Name: Cells 15&16 Construction
Technician: Jacob Billingsley
Test Location: Cell 15 & 16

WEATHER:

X	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
60	Low Temp. (°F)	85	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 10:00 AM
Depart Site: 2:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

X	Dozer(s)		Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)		Water Truck
	Haul Truck(s)		Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
X	Contractor		Liner Installer
X	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Contractor stripped off top layer of grass and soil off off cells 15 & 16.

Contractor to do topography of subgrade.

Work will resume 10-12-22 after replacing GPS equipment on dozer

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/13/2022
Client Name:
Contractor: Pickett
Project Name: Twin Rivers Landfill cells 15-16
Technician: Jackson Mitchell
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
	Low Temp. (°F)		High Temp. (°F)

REPORTING TIMES:

Arrive Site:
Depart Site:

FIELD TESTING PERFORMED:

x	Moisture/Density	x	Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

0845- Arrived onsite; took pictures. Spoke with Manuel and Jon. Manuel mentioned using material removed in order to expose lechate line on south side as fill. Dozer GPS unit is not functioning, so grading will be conducted by hand. 0930- Owen Carpenter arrives onsite; borrow pit material inspected. material marginal for use in liner.1030- Owen leaves; dozer begins cut and grading from south berm.

1115- Gauge standardized; sheepsfoot begins rolling along south and east sides.1150- sheepsfoot stalls, refuel and re-assess. 1205-sheepsfoot repaired, crew breaks for lunch. 1255- work resumes.

1330- took first test; test failed CS-1 proctor. Contacted Tony Bardella for alternate proctor after contractor protests proctor selection. 1445- retested site of first proctor; passed CS-2 proctor. Work is at standstill as Manuel and Jon troubleshoot bulldozer GPS.

1530- Manuel runs to hardware store for supplies; jon test drives water truck. 1615- Manuel returns; both fill water truck.

1705- Manuel and Jon begin shutdown of equipment. Water truck tested for function. On-site fuel tank checked for fuel. Manuel mentions they will arrive between 0700 and 0715, but that technician can arrive onsite whenever. Water truck wets down site.

1730- technician leaves site, crew removes GPS basestation.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/14/2022
Client Name:
Contractor: Pickett
Project Name: Twin Rivers Landfill Cells 15&16
Technician: Jackson Mitchell
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
x	Windy		Foggy / Misty
	Low Temp. (°F)		High Temp. (°F)

REPORTING TIMES:

Arrive Site: 7:25 AM
Depart Site: 2:10 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

0725- Arrived onsite; took pictures of site. No Personel on site, and no contact with contractor.

0810- Contractor arrives on site; waiting on technician to fix GPS on Bulldozer. 0930- Mechanic arrives to work on bulldozer.

1100- contractor breaks for lunch. 1140- Contractor returns from lunch

1205- contractor leaves to test data link tablet on alternate bulldozer. 1225- Contractor returns; talks with mechanic working on D5 Bulldozer. 1240- Contractor leaves to photograph alternate Bulldozer.

1325- talked with crew and mechanic. Faulty ECM suspected. Work will be suspended until around 0800 Monday.

1410- leave site.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/17/2022
Client Name: Twin Rivers Paper
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Jackson Mitchell
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
x	Low Temp. (°F)		High Temp. (°F)

REPORTING TIMES:

Arrive Site: 7:25 AM
Depart Site: 6:00 PM

FIELD TESTING PERFORMED:

x	Moisture/Density	x	Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

0725- arrive on site, talk with jon the contractor, Manuel the contractor is ripping the subgrade material to receive the fill. Jon mentions a technician from catapillar will be in to look at ECM. 0810- First load of fill material arrives.

0905-Soil sampled from 6th truckload of fill material. 1040- Catapillar D6 Bulldozer from adjacent site trailored to site. Fill operations continue .

1120- Bradley with Pickett takes me to reconnoiter borrow pit. Location and photograps are sent to Owen Carpenter. 1315- Sheepsfoot begins rolling along East side.

1500-density testing begins. Testing along NE corner of site required additional compactive effort in order to pass compaction. 1800- Crew packs up site and leaves.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/18/2022
Client Name: Twin Rivers Paper Mill
Contractor: Pickett
Project Name: Twin Rivers Landfill CQA
Technician: Jackson Mitchell
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
	Low Temp. (°F)		High Temp. (°F)

REPORTING TIMES:

Arrive Site: 7:40 AM
Depart Site: 5:30 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)	x	Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

x	Client	x	Liner Crew
	Contractor		Liner Installer
	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
x	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

0740- Arrive on site; talked with Manuel and John from Pickett to explain that the subgrade had to be surveyed before clay could be installed. Manuel said he would begin stockpiling along West side. 0810- First Truck Arrives. Clay stockpiled along west side.

0830- Darrell Ezell stopped by the site. I informed him that our surveyor would be there to survey the site this morning.1030- Dodd Harmon comes by the site to survey. 1115- Dodd Harmon checks in, having difficulty locating monuments. 1210- Dodd returns; mentions discrepency with monuments; surveys subgrade. 1236- Dodd finishes subgrade. Subgrade prepared to accept liner material. 1300- Dodd Leaves.

1330- smooth drum arrives. Manuel confirms GPS Basestation. 1350- Manuel returns, John continues to place liner material. 1510- crew marks boundary of cell with rover. 1525- Standardize Gauge, crew continues to spread first lift.

1645- take confirmation tests with gauge to experiment with compactive effort. Told Manuel that aditional test would be required the next day for acceptance purposes. Three passes with sheepsfoot yield compaction values around 91%. Told Manuel that more compactive effort will be required the next day.

1730- Pack up and Leave site.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/20/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location: Cell 15 & 16

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
37	Low Temp. (°F)	74	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 6:00 PM

FIELD TESTING PERFORMED:

x	Moisture/Density		Subgrade
x	Shelby Tube(s)	x	Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
x	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett Finished Laying down Lift 2 and began laying lift 3 in both cell 15 and 16

I tested Lift 2 in both cell 15 and 16 and took a Perm.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/21/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location: Cell 15 &16

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
46	Low Temp. (°F)	81	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 5:15 PM

FIELD TESTING PERFORMED:

x	Moisture/Density		Subgrade
x	Shelby Tube(s)	x	Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett got lift 3 ready for testing and placed lifts 1 and 2 for the berm around cells 15 & 16

I tested the first two lifts of the berm and lift 3 of the clay liner and took a Perm tube sample.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/22/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location: Cell 15 & 16 Berm

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
x	Windy		Foggy / Misty
61	Low Temp. (°F)	81	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 6:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett finished the floor of both cells and put the last two lifts on the berm and began cutting it to grade after compacting and testing.

I observed and tested lifts 3 and 4 for the Berm

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/23/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location:

WEATHER:

	Clear		Cloudy
x	Partly Cloudy		Rain
	Windy		Foggy / Misty
65	Low Temp. (°F)	83	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 12:30 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett finished cutting the west berm to shape and getting the cells to final grade.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/24/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location:

WEATHER:

	Clear	x	Cloudy
	Partly Cloudy		Rain
x	Windy		Foggy / Misty
67	Low Temp. (°F)	83	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:30 AM
Depart Site: 6:30 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett checked the cells grade and berms with the new points and realized they were off. They reworked the cells with the new coordinates and got the berms and grade fixed.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/25/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location: Cell 15 & 16 Berm West

WEATHER:

	Clear	x	Cloudy
	Partly Cloudy		Rain
x	Windy		Foggy / Misty
	Low Temp. (°F)		High Temp. (°F)

REPORTING TIMES:

Arrive Site: 12:00 PM
Depart Site: 2:00 PM

FIELD TESTING PERFORMED:

x	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

I tested the West Berm that had been reconstructed but more testing was needed due to the recent rain event halting compaction efforts.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/26/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location: Cell 15 & 16 Berm West

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
43	Low Temp. (°F)	68	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 6:00 PM

FIELD TESTING PERFORMED:

x	Moisture/Density		Subgrade
x	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)		Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett finished work on the berms and clay liner, then installed the drainage pipe and textile.

I took a density test and perm tube on lift 4A of the West Berm

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/27/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location:

WEATHER:

	Clear		Cloudy
x	Partly Cloudy		Rain
	Windy		Foggy / Misty
41	Low Temp. (°F)	69	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 4:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
x	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
x	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Surveyor arrived on site at 9:30 AM, Left at 10:30 AM after shooting the points needed for the two Cells.

Pickett Welded and installed the leachate pipe as well as the gravel underdrain and textile.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/28/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
46	Low Temp. (°F)	81	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 1:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
x	Backhoe(s)	x	Water Truck
x	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

Pickett began Laying down Protective cover, they were able to lay down about a 4 inch lift on both cells before the end of the day to prepare for the rain storm.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

Daily Project Construction Summary

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Project No: 35217168
Date of Report: 10/31/2022
Client Name: Twin Rivers Paper Company
Contractor: Pickett
Project Name: Twin Rivers Landfill
Technician: Cole Rodman
Test Location:

WEATHER:

x	Clear		Cloudy
	Partly Cloudy		Rain
	Windy		Foggy / Misty
57	Low Temp. (°F)	73	High Temp. (°F)

REPORTING TIMES:

Arrive Site: 9:00 AM
Depart Site: 1:00 PM

FIELD TESTING PERFORMED:

	Moisture/Density		Subgrade
	Shelby Tube(s)		Clay Liner

EQUIPMENT ONSITE:

x	Dozer(s)	x	Tractor & Pans
	Excavator(s)		Skidsteer
10 - 10	Backhoe(s)	x	Water Truck
	Haul Truck(s)	x	Sheeps Foot Compactor
	Motor Grader(s)	x	Smooth Drum Compactor

PERSONNEL ONSITE:

	Client		Liner Crew
x	Contractor		Liner Installer
x	CQA Consultant		Concrete Crew
	Design Engineer		Pipe Installer
	Surveyor		Gas Line Inst.

SUMMARY OF ACTIVITIES OBSERVED:

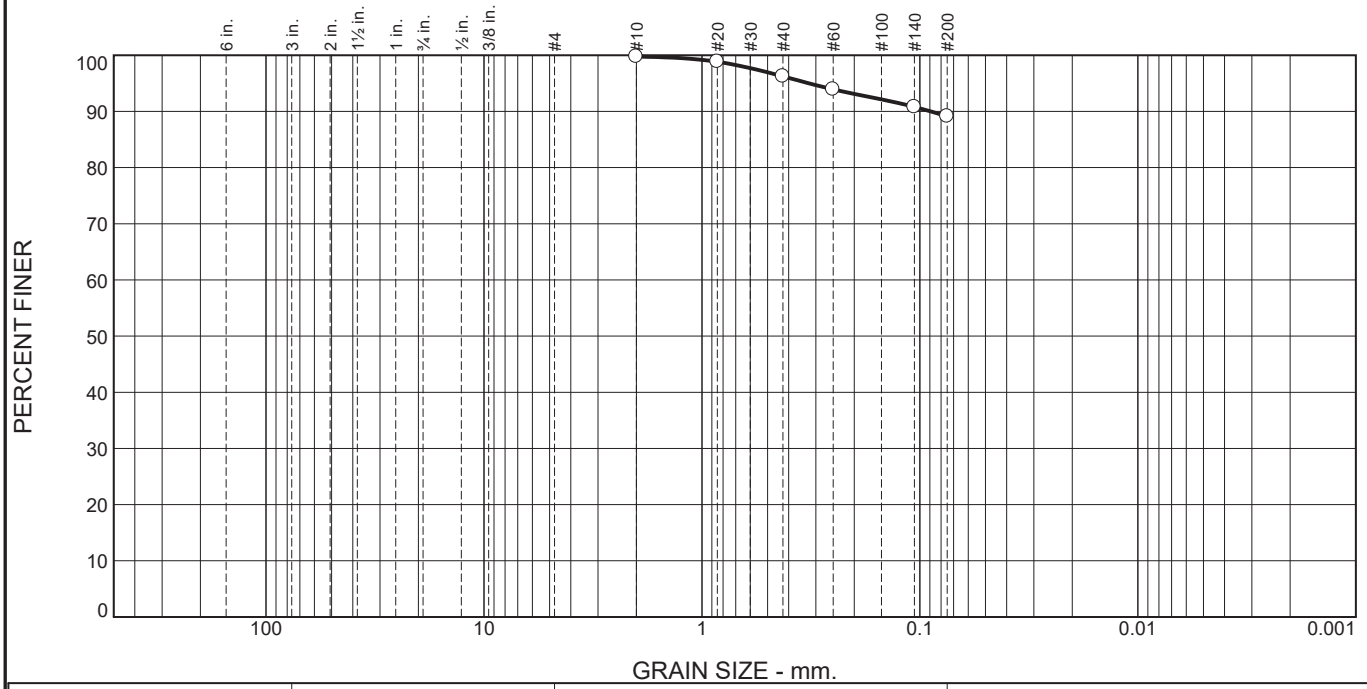
Pickett finished placing the protective cover in both cells.

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

APPENDIX C
Soils Information

C1
Pre-Construction Testing

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
				3.6	7.1	89.1	

TEST RESULTS (ASTM D 422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	99.8		
#20	98.8		
#40	96.2		
#60	93.9		
#140	90.8		
#200	89.1		

* (no specification provided)

Material Description

Red Lean Clay

Atterberg Limits (ASTM D 4318)

PL= 21 **LL=** 31 **PI=** 10

Classification

USCS (D 2487)= **AASHTO (M 145)=** A-4(8)

Coefficients

D_{90}= 0.0892 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Moisture Content: 19.3%

Date Received: 9/30/2022 **Date Tested:** 10/7/2022

Tested By: Mike Doust

Checked By: Kalyn Abrams

Title: Laboratory Supervisor

Location: PC-1, Borrow Area

Date Sampled: Unknown

Terracon, Inc.

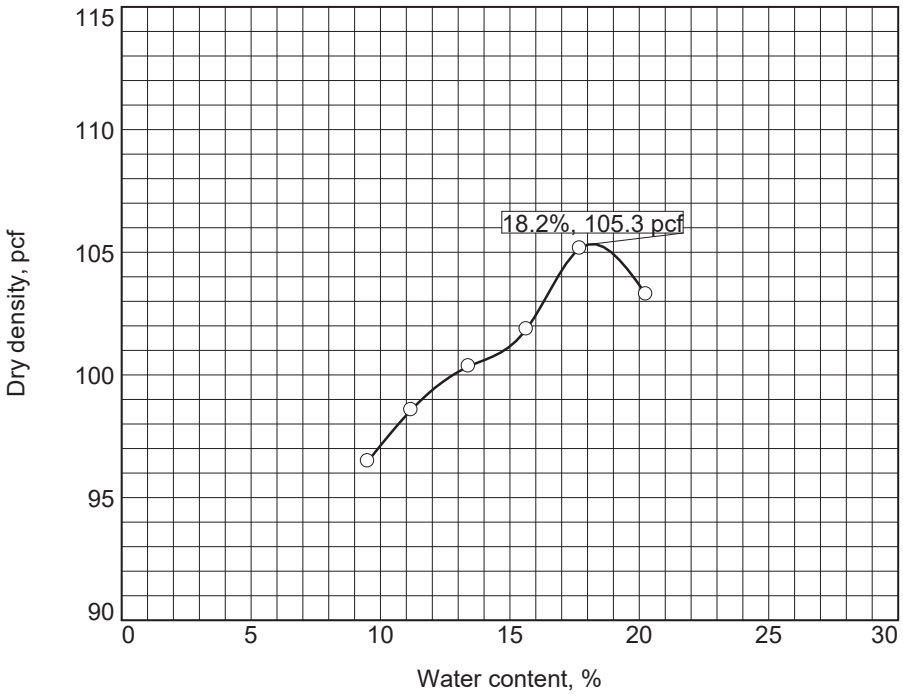
Cincinnati, Ohio

Client: Twin Rivers Paper Company

Project: Twin Rivers CQA

Project No: 35217168 **Figure**

COMPACTION TEST REPORT



Curve No.

Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method	Dry
Hammer Wt.	5.5 lb.
Hammer Drop	12 in.
Number of Layers	three
Blows per Layer	25
Mold Size	0.03333 cu. ft.

Test Performed on Material Passing 3/8 in. **Sieve**

NM 19.3 **LL** 31 **PI** 10
Sp.G. (ASTM D 854) --
%>3/8 in. **%<No.200** 89.1
USCS CL **AASHTO** A-4(8)
Date Sampled Unknown
Date Tested 10/4/2022
Tested By Mike Doust

TESTING DATA

	1	2	3	4	5	6
WM + WS	3640.1	3699.6	3763.1	3823.5	3913.9	3920.4
WM	2042.6	2042.6	2042.6	2042.6	2042.6	2042.6
WW + T #1	157.4	158.8	173.2	194.8	202.7	182.1
WD + T #1	148.2	149.1	160.3	176.9	181.5	162.0
TARE #1	51.5	61.8	63.4	62.5	62.0	62.4
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	9.5	11.2	13.4	15.6	17.7	20.3
DRY DENSITY	96.5	98.6	100.3	101.9	105.2	103.3

TEST RESULTS

Maximum dry density = 105.3 pcf

Optimum moisture = 18.2 %

Material Description

Red Lean Clay

Remarks:

Project No. 35217168 **Client:** Twin Rivers Paper Company
Project: Twin Rivers CQA

○ **Location:** PC-1, Borrow Area

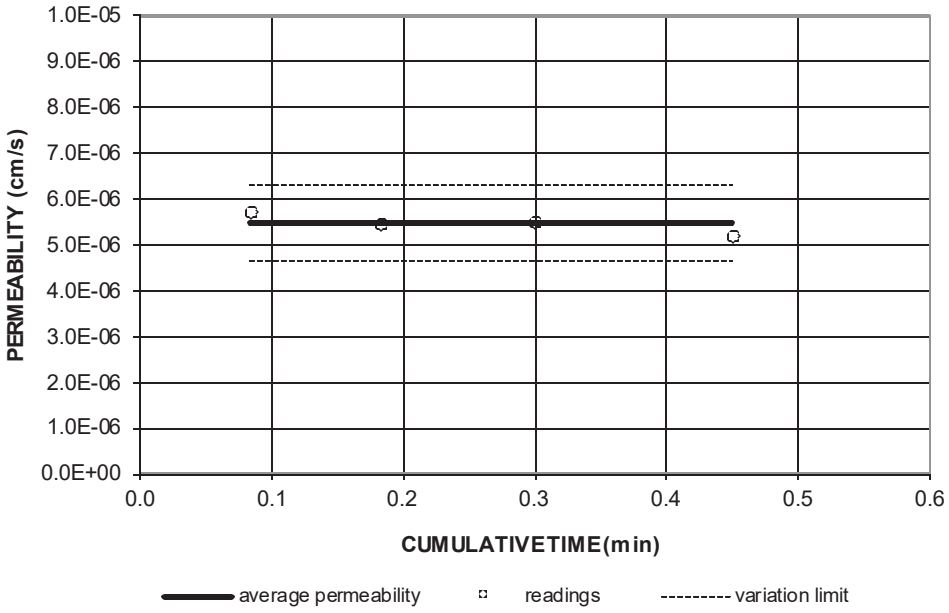
Checked by: Kalyn Abrams
Title: Laboratory Supervisor

Terracon, Inc.

Cincinnati, Ohio

Figure

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

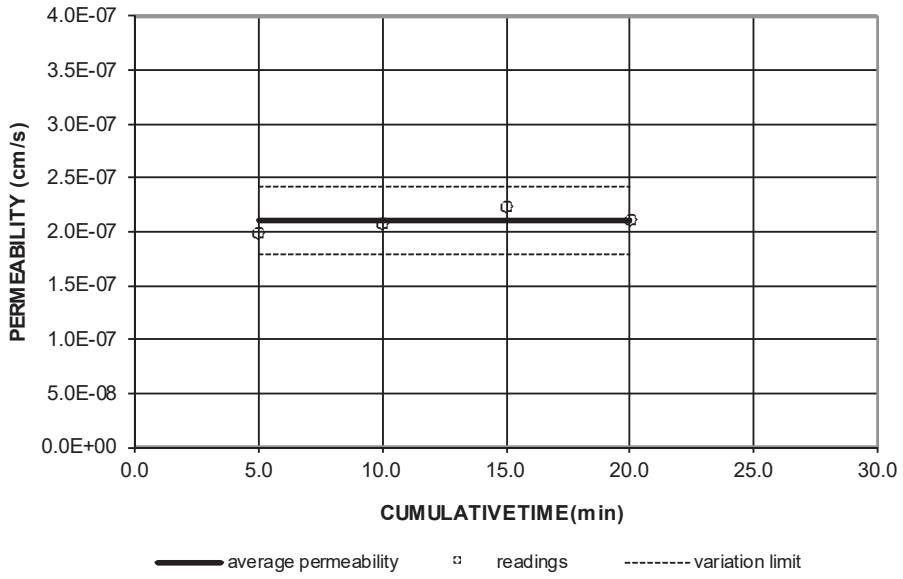
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	0.08	0.08	13.43	5.72E-06	
21.00	0.10	0.18	11.56	5.48E-06	
21.00	0.12	0.30	9.70	5.52E-06	**5.5E-06**
21.00	0.15	0.45	7.83	5.22E-06	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	100.0	Specimen Height, (inches)	2.98	2.98
Opti. M.C., (%)	18.2	Specimen Diameter, (inches)	4.00	4.00
Comp. Method		Specimen Volume, (cu. In.)	37.43	37.43
% Recompct.	95.0	Moisture Content, (%)	18.30	21.69
Test Pressures (psi)		Percent Saturation (%)	72.77	86.24
Backpressure	90.00	Wet Mass Density (pcf)	118.71	122.11
Cell pressure	95.00	Dry Mass Density (pcf)	100.34	100.34
Eff. Stress	**5.00**	Void Ratio	0.68	0.68
Specific Gravity	2.70	Calculated Porosity, %	40.44	40.44

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. PC-1
Sample Location: Borrow Area
Sample Description: Red Lean Clay

Test Date: 10/11/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

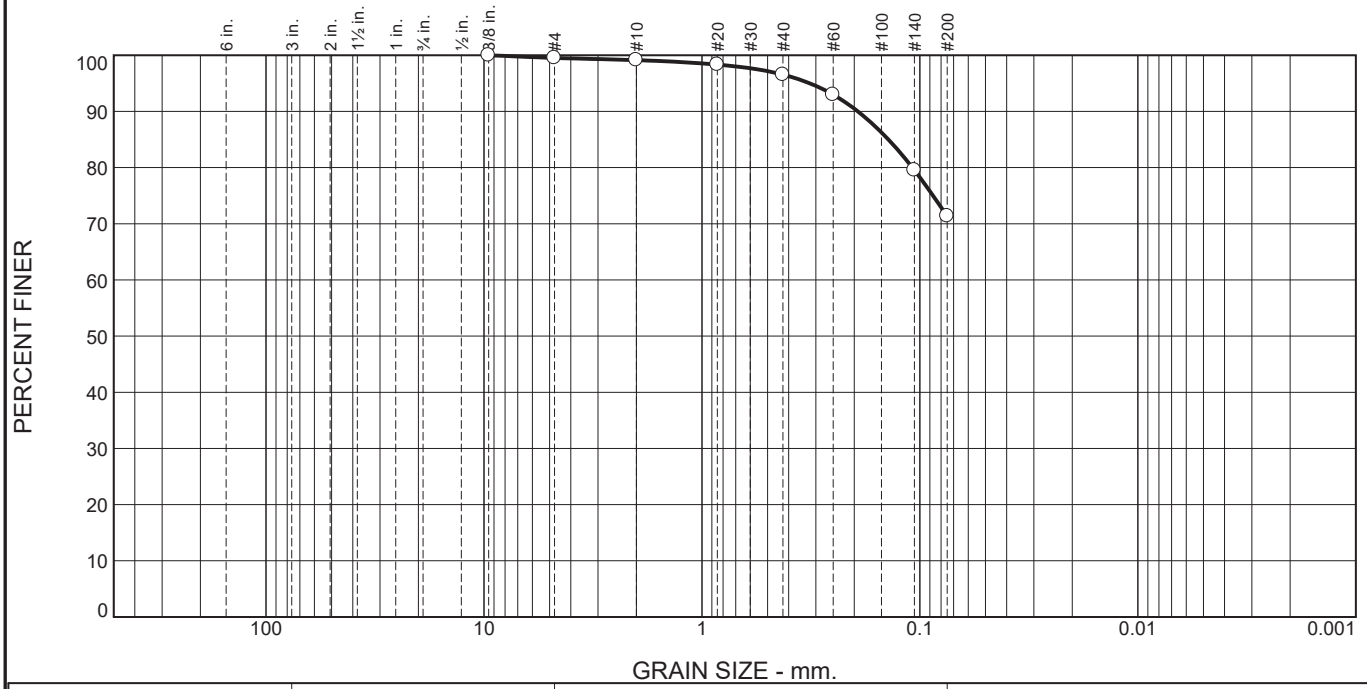
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	11.30	2.00E-07	
21.00	5.00	10.00	8.52	2.08E-07	
21.00	5.00	15.00	6.30	2.23E-07	**2.1E-07**
21.00	5.00	20.00	4.72	2.12E-07	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	100.0	Specimen Height, (inches)	3.00	2.97
Opti. M.C., (%)	18.2	Specimen Diameter, (inches)	4.00	4.00
Comp. Method		Specimen Volume, (cu. In.)	37.68	37.30
% Recompct.	95.0	Moisture Content, (%)	21.29	22.69
Test Pressures (psi)		Percent Saturation (%)	82.30	89.88
Backpressure	90.00	Wet Mass Density (pcf)	120.31	122.92
Cell pressure	95.00	Dry Mass Density (pcf)	99.19	100.19
Eff. Stress	**5.00**	Void Ratio	0.70	0.68
Specific Gravity	2.70	Calculated Porosity, %	41.13	40.53

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. PC-1, Retest +2% OMC
Sample Location: Borrow Area
Sample Description: Red Lean Clay

Test Date: 10/17/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.4	2.6	25.1	71.4	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.375	100.0		
#4	99.5		
#10	99.1		
#20	98.3		
#40	96.5		
#60	93.0		
#140	79.5		
#200	71.4		

* (no specification provided)

Material Description

Lean Clay with Sand

Atterberg Limits (ASTM D 4318)

PL= 16 **LL=** 25 **PI=** 9

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-4(4)

Coefficients

D_{90}= 0.1926 D_{85}= 0.1395 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Moisture Content: 7.5%

Date Received: 10/10/2022 **Date Tested:** 10/13/2022

Tested By: Mike Doust

Checked By: Kalyn Abrams

Title: Laboratory Supervisor

Location: CS-2 **Date Sampled:** Unknown

Terracon, Inc.

Cincinnati, Ohio

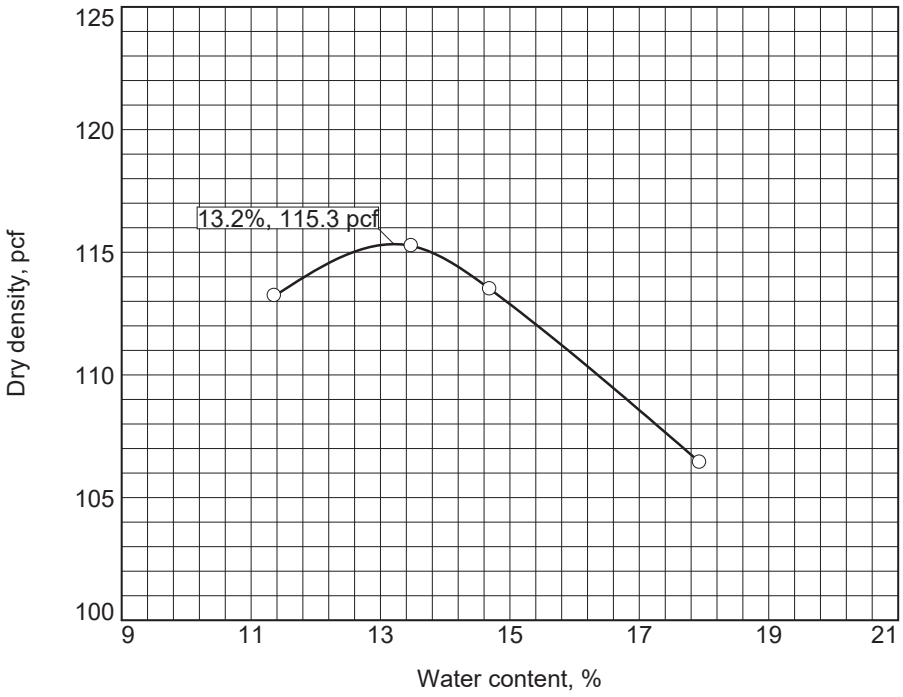
Client: Twin Rivers Paper Company

Project: Twin Rivers CQA

Project No: 35217168 **Figure**

COMPACTION TEST REPORT

Curve No.



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method	Dry
Hammer Wt.	5.5 lb.
Hammer Drop	12 in.
Number of Layers	three
Blows per Layer	25
Mold Size	0.03333 cu. ft.

Test Performed on Material Passing 3/8 in. **Sieve**

NM 7.5 **LL** 25 **PI** 9
Sp.G. (ASTM D 854)
%>3/8 in. 0.0 **%<No.200** 71.4
USCS CL **AASHTO** A-4(4)
Date Sampled Unknown
Date Tested 10/12/2022
Tested By Mike Doust

TESTING DATA

	1	2	3	4	5	6
WM + WS	3948.9	4020.0	4010.6	3940.3		
WM	2042.6	2042.6	2042.6	2042.6		
WW + T #1	177.3	199.4	194.9	226.9		
WD + T #1	165.7	183.1	177.9	198.0		
TARE #1	63.0	61.5	62.2	36.4		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	11.4	13.5	14.7	17.9		
DRY DENSITY	113.2	115.3	113.5	106.4		

TEST RESULTS

Maximum dry density = 115.3 pcf

Optimum moisture = 13.2 %

Material Description

Lean Clay with Sand

Remarks:

Project No. 35217168 **Client:** Twin Rivers Paper Company
Project: Twin Rivers CQA

○ **Location:** CS-2

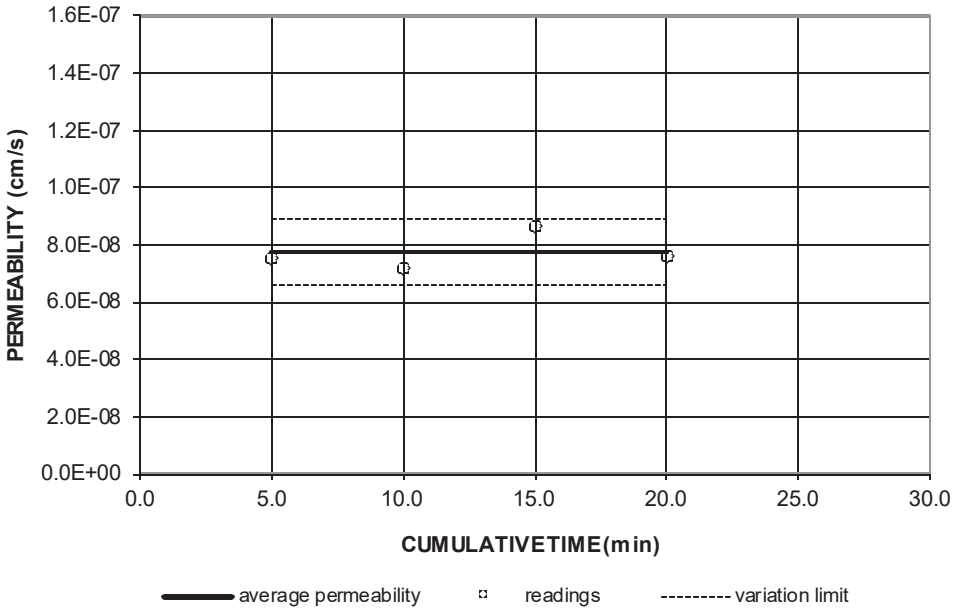
Checked by: Kalyn Abrams
Title: Laboratory Supervisor

Terracon, Inc.

Cincinnati, Ohio

Figure

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

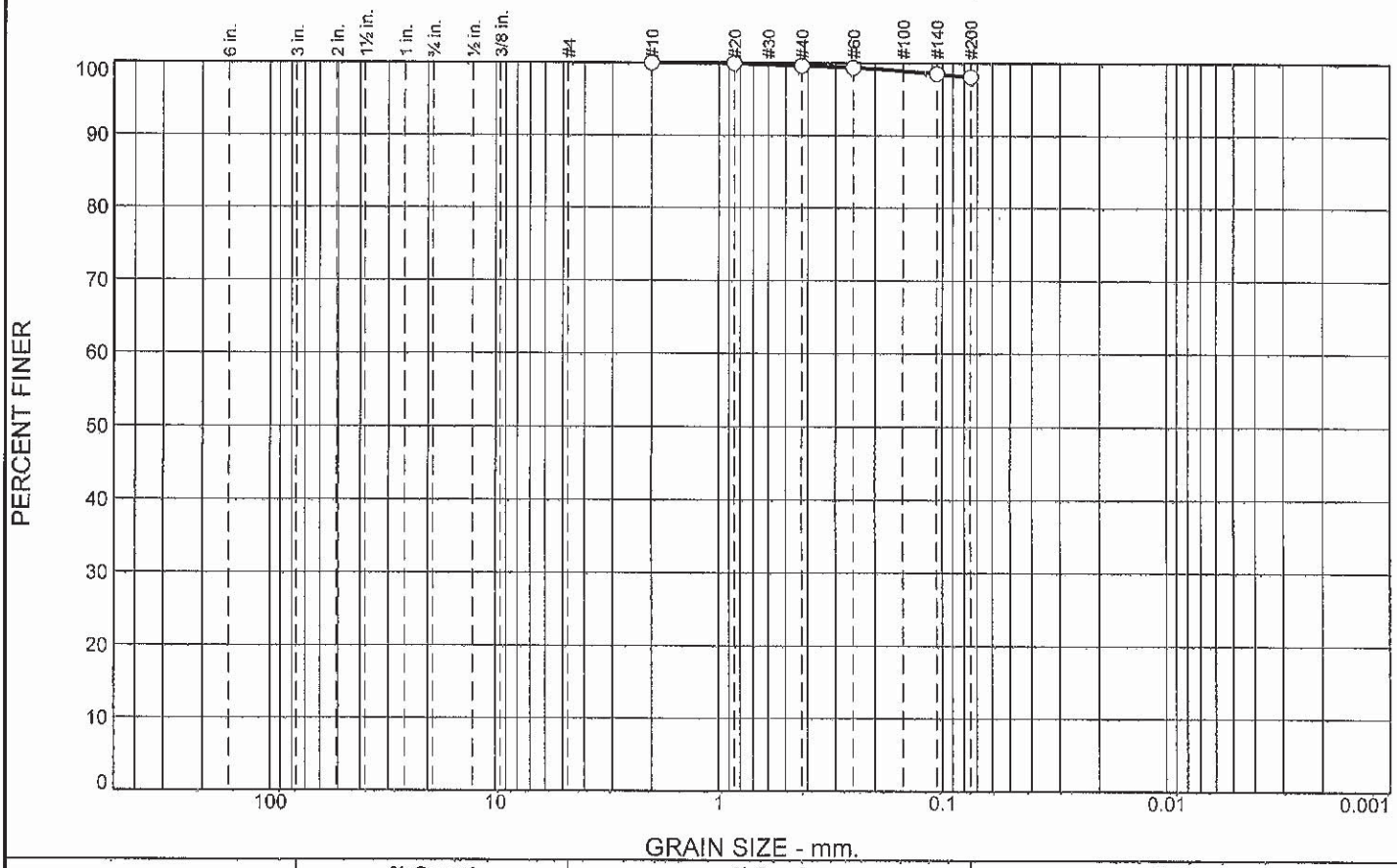
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	12.92	7.53E-08	
21.00	5.00	10.00	11.71	7.22E-08	
21.00	5.00	15.00	10.41	8.66E-08	**7.8E-08**
21.00	5.00	20.00	9.39	7.60E-08	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	115.3	Specimen Height, (inches)	2.99	2.96
Opti. M.C., (%)	13.2	Specimen Diameter, (inches)	4.00	4.00
Comp. Method		Specimen Volume, (cu. In.)	37.55	37.18
% Recompct.	95.0	Moisture Content, (%)	13.23	15.68
Test Pressures (psi)		Percent Saturation (%)	66.89	81.62
Backpressure	90.00	Wet Mass Density (pcf)	124.35	128.33
Cell pressure	95.00	Dry Mass Density (pcf)	109.82	110.94
Eff. Stress	**5.00**	Void Ratio	0.53	0.52
Specific Gravity	2.70	Calculated Porosity, %	34.82	34.15

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. CS-2
Sample Location: Borrow Area
Sample Description: Brown Lean Clay with Sand

Test Date: 10/21/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	1.5	98.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	99.6		
#60	99.4		
#140	98.5		
#200	98.1		

* (no specification provided)

Material Description

DARK BROWN FAT CLAY

Atterberg Limits

PL= 22 LL= 60 PI= 38

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(42)

Remarks

Source of Sample: 5569 **Depth:** 0-5'
Sample Number: Composite 1

Date: 9-18-13

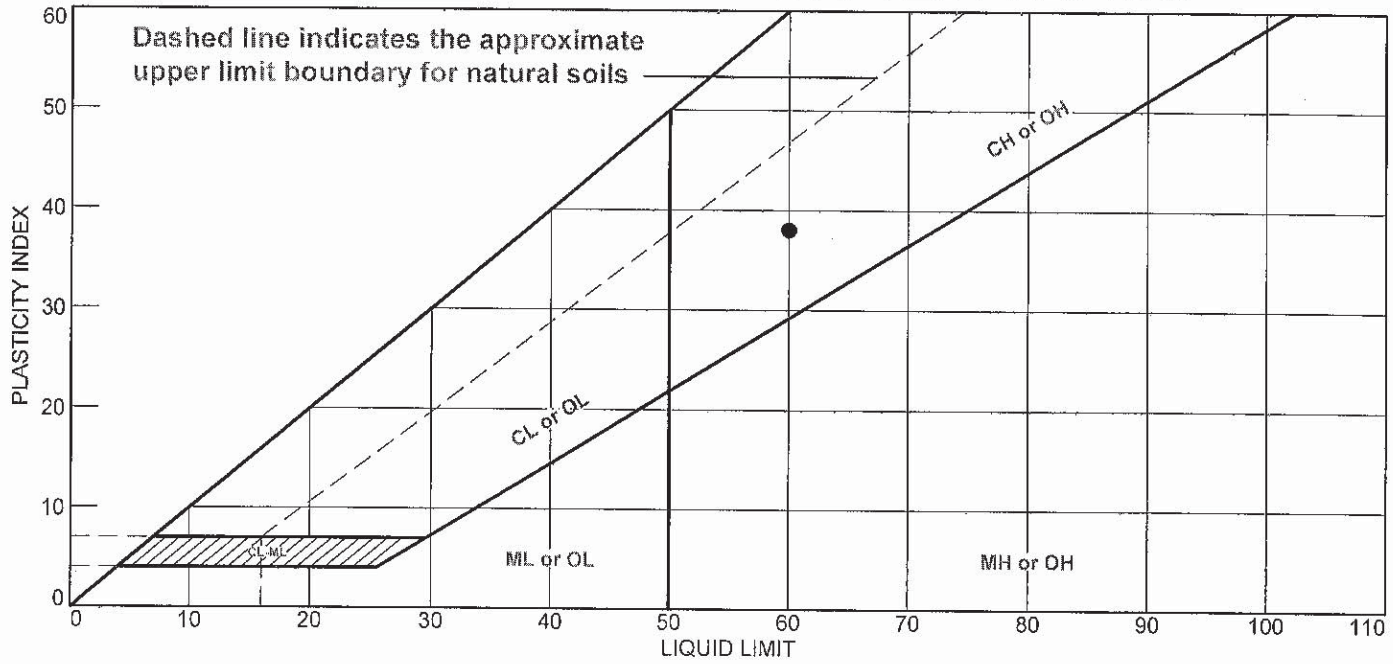
Terracon, Inc.

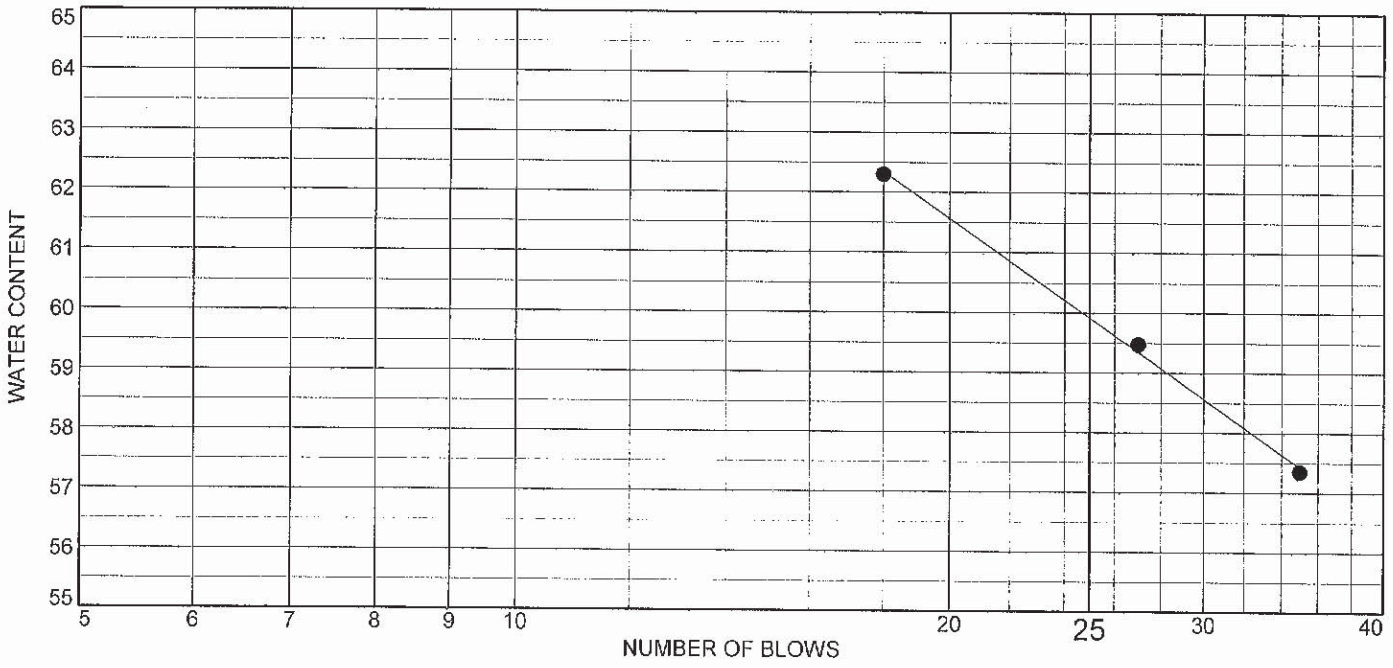
Cincinnati, Ohio

Client: GRAPHIC FLEXIBLE PACKAGING
Project: GFP - LABORATORY TESTING
PINE BLUFF, AR
Project No: 35137181 **Exhibit** 5569

Tested By: DR **Checked By:** GS

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK BROWN FAT CLAY	60	22	38	99.6	98.1	CH

Project No. 35137181 **Client:** GRAPHIC FLEXIBLE PACKAGING

Project: GFP - LABORATORY TESTING

PINE BLUFF, AR

Source of Sample: 5569 **Depth:** 0-5'

Sample Number: Composite 1

Remarks:

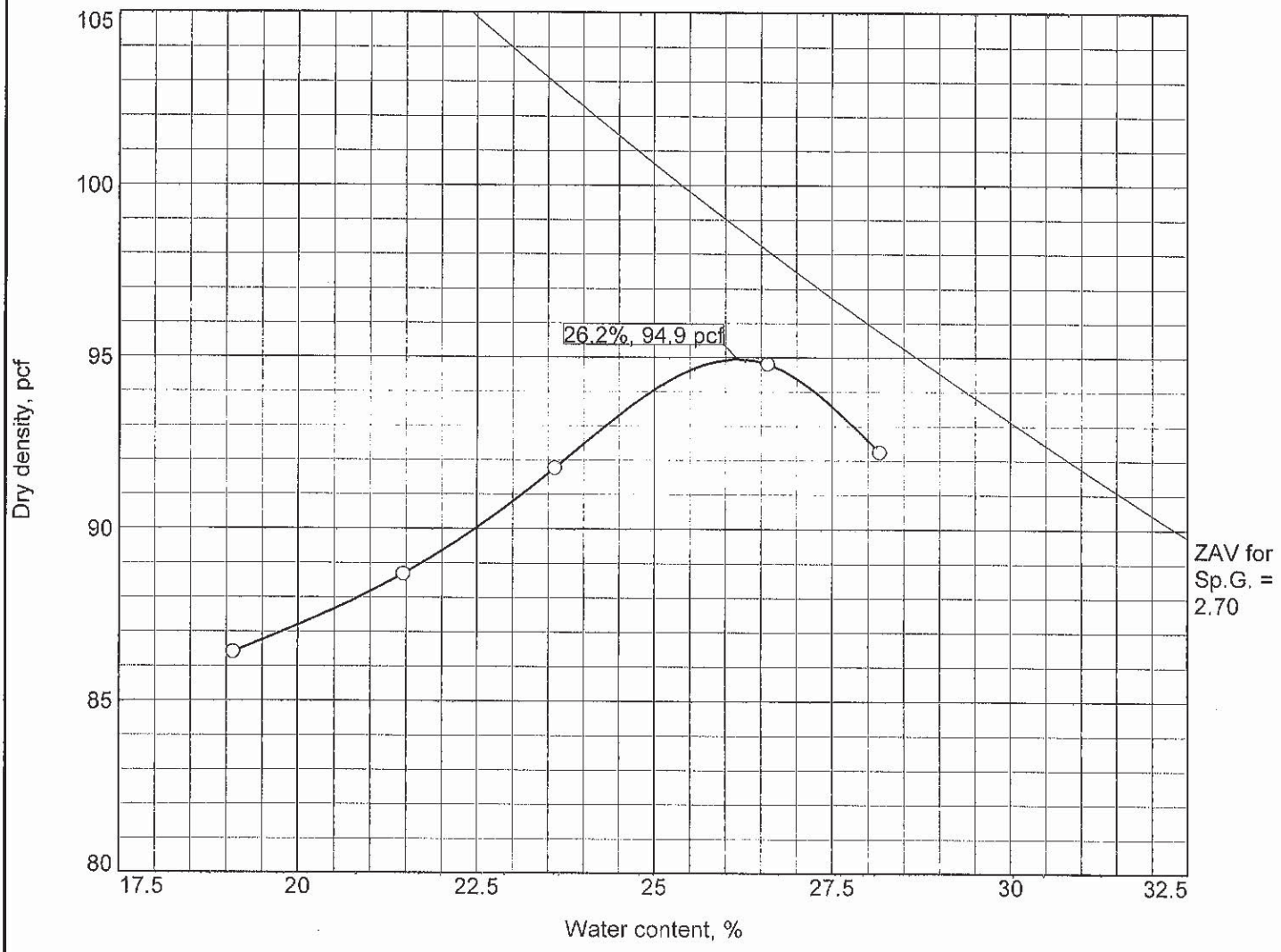
Terracon, Inc.

Cincinnati, Ohio

Exhibit 5569

Tested By: ND **Checked By:** GS

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0-5'	CH	A-7-6(42)		2.70	60	38	0.0	98.1

TEST RESULTS

Maximum dry density = 94.9 pcf

Optimum moisture = 26.2 %

MATERIAL DESCRIPTION

DARK BROWN FAT CLAY

Project No. 35137181 **Client:** GRAPHIC FLEXIBLE PACKAGING

Project: GFP - LABORATORY TESTING

PINE BLUFF, AR

○ **Source of Sample:** 5569 **Sample Number:** Composite I

Remarks:

Location: NW and NE

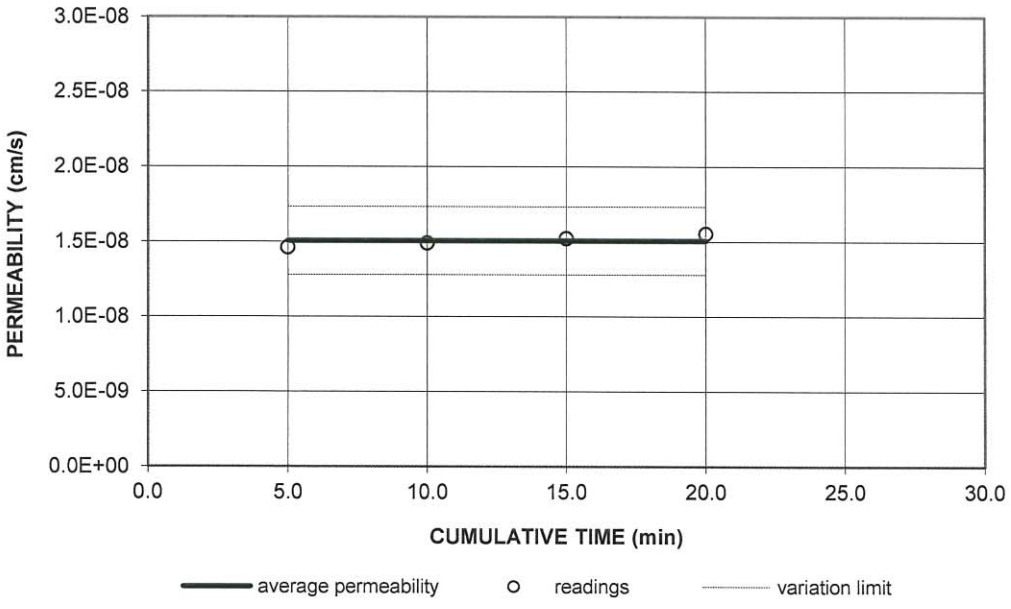
Terracon, Inc.

Cincinnati, Ohio

Exhibit 5569

Tested By: AL **Checked By:** GS

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	13.89	1.46E-08	
21.00	5.00	10.00	13.61	1.49E-08	
21.00	5.00	15.00	13.34	1.52E-08	**1.5E-08**
21.00	5.00	20.00	13.06	1.55E-08	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	94.9	Specimen Height, (inches)	3.00	3.02
Opti. M.C., (%)	26.2	Specimen Diameter, (inches)	4.00	4.00
Comp. Method		Specimen Volume, (cu. In.)	37.68	37.93
% Recompct.	94.9	Moisture Content, (%)	26.30	31.20
Test Pressures (psi)		Percent Saturation (%)	81.58	95.43
Backpressure	90.00	Wet Mass Density (pcf)	113.77	117.40
Cell pressure	95.00	Dry Mass Density (pcf)	90.08	89.49
Eff. Stress	**5.00**	Void Ratio	0.87	0.88
Specific Gravity	2.70	Calculated Porosity, %	46.53	46.89

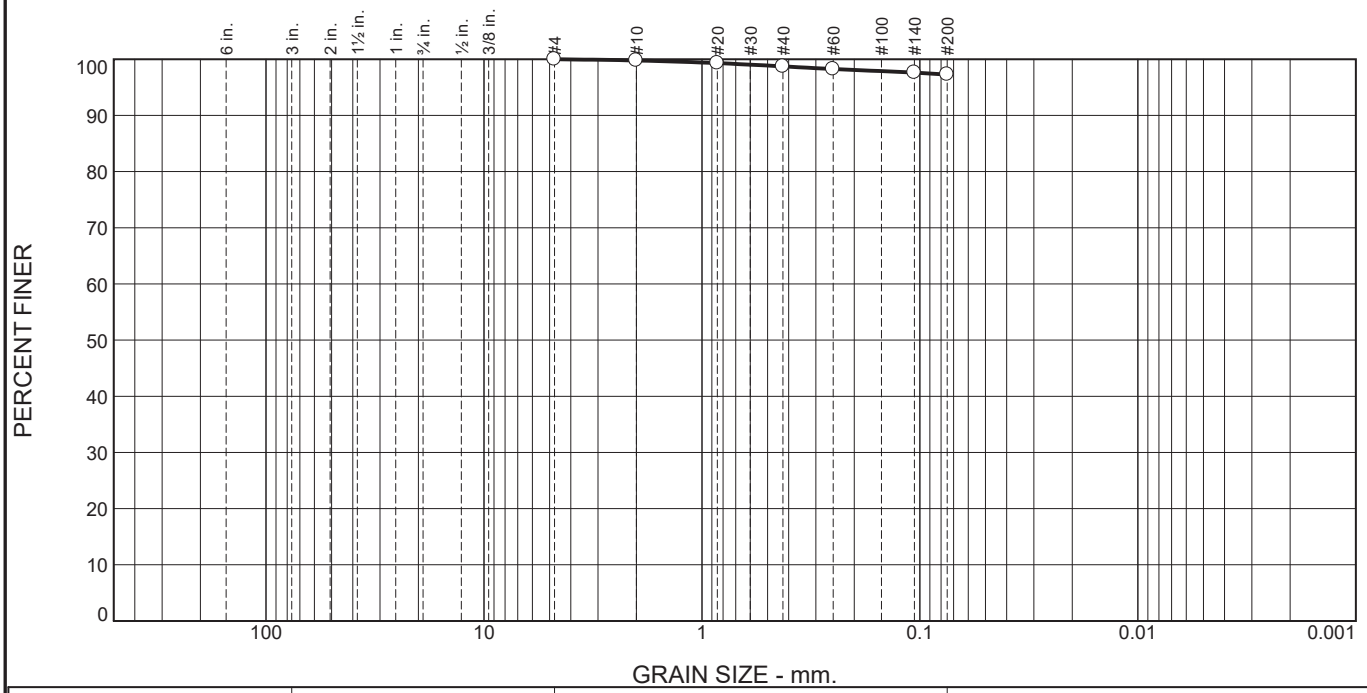
USCS	SG Assumed	LL	PI
Permeant Used:	WATER	Remarks	DARK GRAY FAT CLAY

Project Name	GFP-Laboratory Testing			Tested by FCE	Reviewed by TGG
Client	GFP	W.O.#	35137181		
Sample Number	Composite #1			FLEXIBLE WALL PERMEABILITY TEST	
Sample Location			0-5'	Terracon	
Date	9/11/2013	Lab No.	5569		

C2
Construction Testing

Explore with us

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.1	1.4	97.3	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.8		
#20	99.3		
#40	98.7		
#60	98.3		
#140	97.6		
#200	97.3		

* (no specification provided)

Material Description

Lean Clay

Atterberg Limits (ASTM D 4318)

PL= 25 **LL=** 43 **PI=** 18

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(20)

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Moisture Content: 23.1%

Date Received: 10/10/2022 **Date Tested:** 10/14/2022

Tested By: Mike Doust

Checked By: Kalyn Abrams

Title: Laboratory Supervisor

Location: CS-1 **Date Sampled:** Unknown

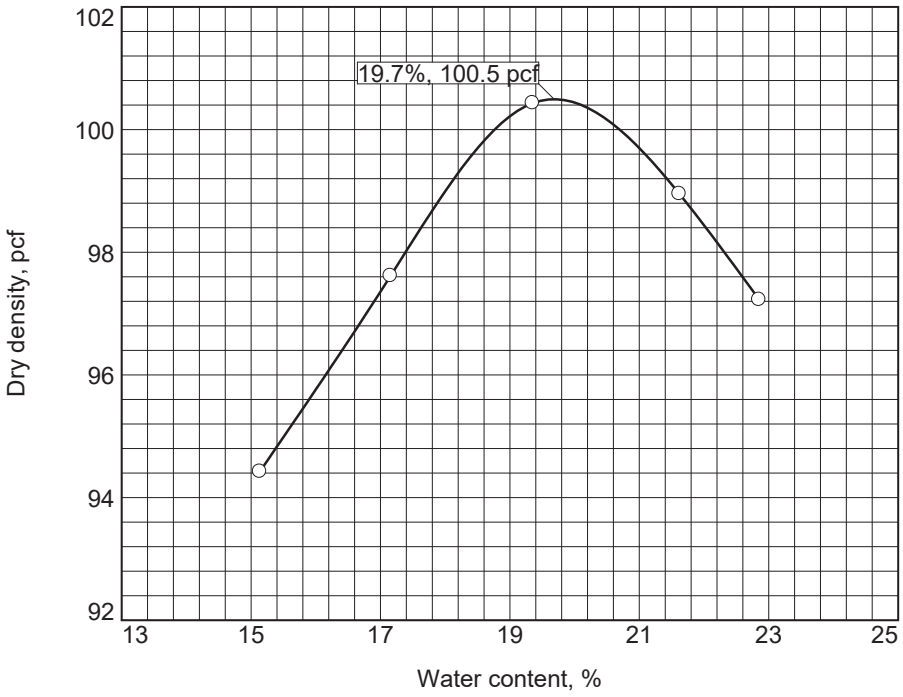
Terracon, Inc.

Cincinnati, Ohio

Client: Twin Rivers Paper Company
Project: Twin Rivers CQA

Project No: 35217168 **Figure**

COMPACTION TEST REPORT



Curve No.

Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method	Dry
Hammer Wt.	5.5 lb.
Hammer Drop	12 in.
Number of Layers	three
Blows per Layer	25
Mold Size	0.03333 cu. ft.

Test Performed on Material Passing 3/8 in. **Sieve**

NM 23.1 **LL** 43 **PI** 18
Sp.G. (ASTM D 854)
%>3/8 in. 0.0 **%<No.200** 97.3
USCS CL **AASHTO** A-7-6(20)
Date Sampled Unknown
Date Tested 10/12/2022
Tested By Mike Doust

TESTING DATA

	1	2	3	4	5	6
WM + WS	3686.1	3771.5	3854.7	3861.9	3848.3	
WM	2042.5	2042.5	2042.5	2042.5	2042.5	
WW + T #1	164.6	204.1	184.3	195.6	182.4	
WD + T #1	149.7	183.4	165.1	172.1	158.3	
TARE #1	51.2	62.7	65.8	63.4	52.8	
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	15.1	17.2	19.4	21.6	22.9	
DRY DENSITY	94.4	97.6	100.4	99.0	97.2	

TEST RESULTS

Maximum dry density = 100.5 pcf

Optimum moisture = 19.7 %

Material Description

Lean Clay

Remarks:

Project No. 35217168 **Client:** Twin Rivers Paper Company
Project: Twin Rivers CQA

○ **Location:** CS-1

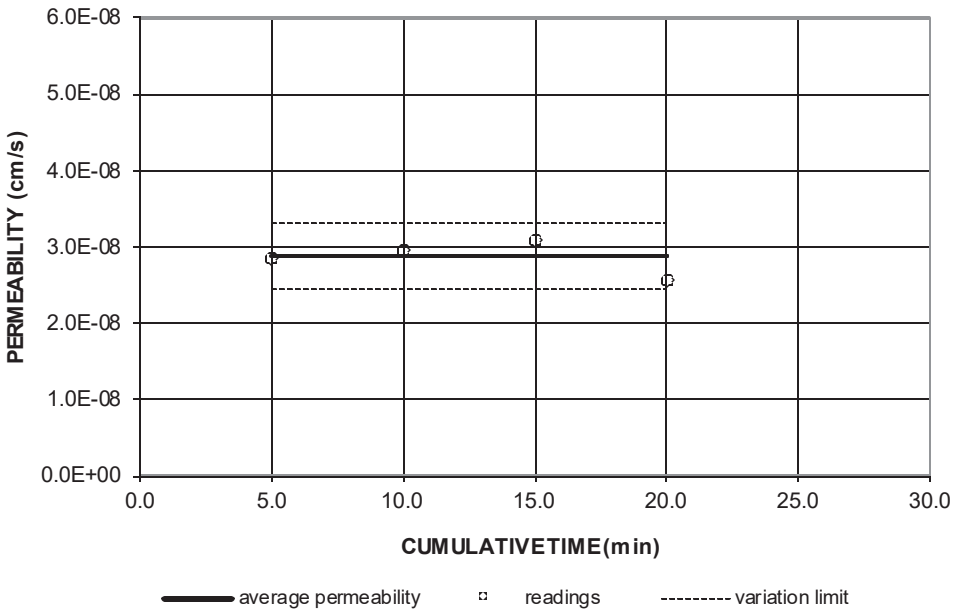
Checked by: Kalyn Abrams
Title: Laboratory Supervisor

Terracon, Inc.

Cincinnati, Ohio

Figure

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

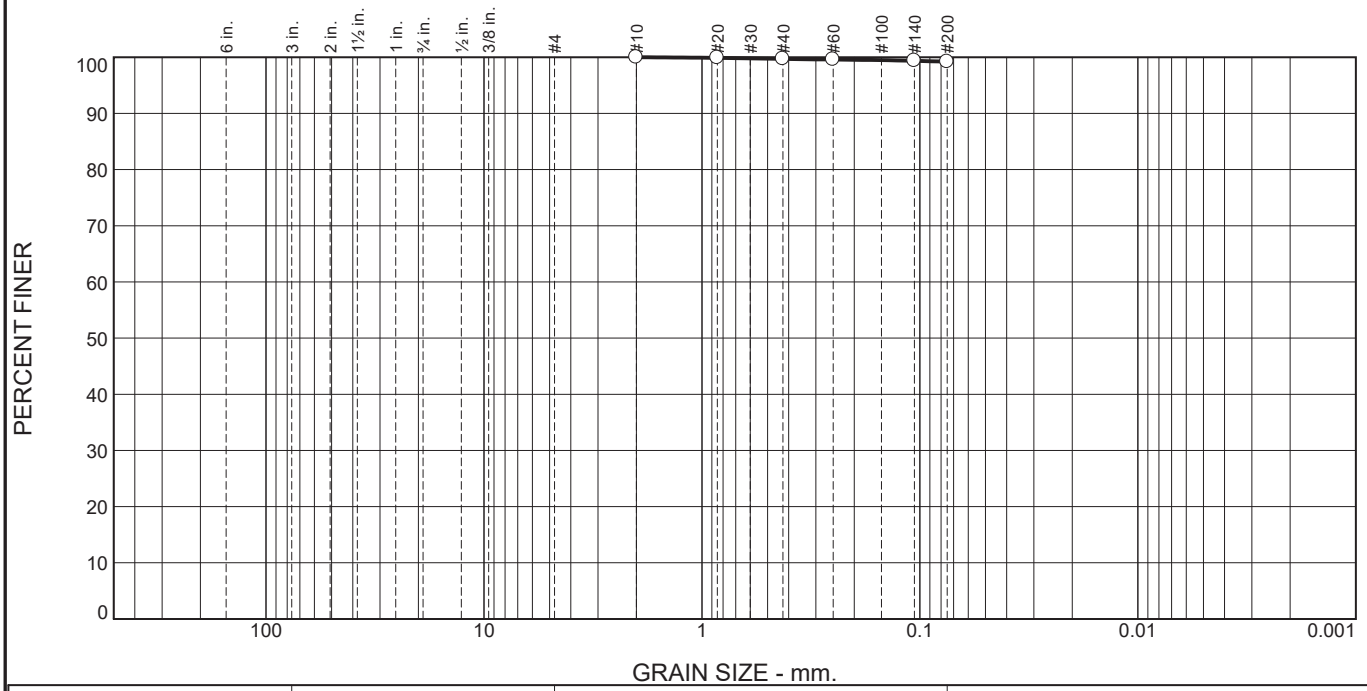
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	11.71	2.86E-08	
21.00	5.00	10.00	11.24	2.98E-08	
21.00	5.00	15.00	10.78	3.10E-08	**2.9E-08**
21.00	5.00	20.00	10.41	2.58E-08	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	100.1	Specimen Height, (inches)	2.99	2.93
Opti. M.C., (%)	19.7	Specimen Diameter, (inches)	4.00	3.95
Comp. Method		Specimen Volume, (cu. In.)	37.55	35.89
% Recompct.	95.0	Moisture Content, (%)	19.47	23.43
Test Pressures (psi)		Percent Saturation (%)	69.44	93.14
Backpressure	90.00	Wet Mass Density (pcf)	114.56	123.85
Cell pressure	95.00	Dry Mass Density (pcf)	95.88	100.34
Eff. Stress	**5.00**	Void Ratio	0.76	0.68
Specific Gravity	2.70	Calculated Porosity, %	43.09	40.44

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. CS-1
Sample Location: Borrow Area
Sample Description: Red Lean Clay

Test Date: 10/19/2022
Tested By: Charissa Swinford
Reviewed By: Kalyn Abrams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	0.5	99.2	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.7		
#60	99.6		
#140	99.4		
#200	99.2		

* (no specification provided)

Material Description

Dark Brown Elastic Silt

Atterberg Limits (ASTM D 4318)

PL= 34 **LL=** 65 **PI=** 31

Classification

USCS (D 2487)= MH **AASHTO (M 145)=** A-7-5(38)

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Moisture Content: 37.0%

Date Received: 10/20/2022 **Date Tested:** 10/24/2022

Tested By: Charissa Swinford

Checked By: Kalyn Abrams

Title: Laboratory Supervisor

Location: SG-1
Sample Number: 1

Date Sampled: 10/17/2022

Terracon, Inc.

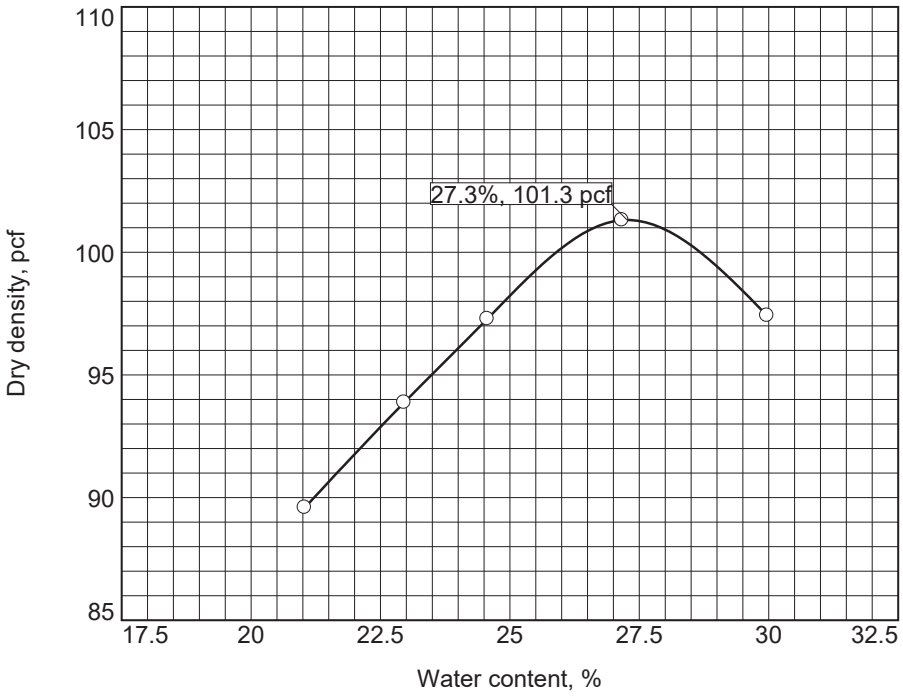
Cincinnati, Ohio

Client: Twin Rivers Paper Company
Project: Twin Rivers CQA

Project No: 35217168 **Figure**

COMPACTION TEST REPORT

Curve No.



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method	Dry
Hammer Wt.	5.5 lb.
Hammer Drop	12 in.
Number of Layers	three
Blows per Layer	25
Mold Size	0.03333 cu. ft.

Test Performed on Material Passing 3/8 in. **Sieve**

NM 37.0 **LL** 65 **PI** 31
Sp.G. (ASTM D 854)
%>3/8 in. 0.0 **%<No.200** 99.2
USCS MH **AASHTO** A-7-5(38)
Date Sampled 10/17/2022
Date Tested 10/20/2022
Tested By Mike Doust

TESTING DATA

	1	2	3	4	5	6
WM + WS	3685.5	3791.2	3878.2	3993.9	3960.3	
WM	2046.2	2046.2	2046.2	2046.2	2046.2	
WW + T #1	165.3	165.8	175.1	168.2	165.4	
WD + T #1	147.3	146.5	153.0	145.4	141.5	
TARE #1	61.5	62.3	63.1	61.9	61.8	
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	21.0	23.0	24.6	27.2	30.0	
DRY DENSITY	89.6	93.9	97.3	101.3	97.4	

TEST RESULTS

Maximum dry density = 101.3 pcf

Optimum moisture = 27.3 %

Material Description

Dark Brown Elastic Silt

Remarks:

Project No. 35217168 **Client:** Twin Rivers Paper Company
Project: Twin Rivers CQA

○ **Location:** SG-1 **Sample Number:** 1

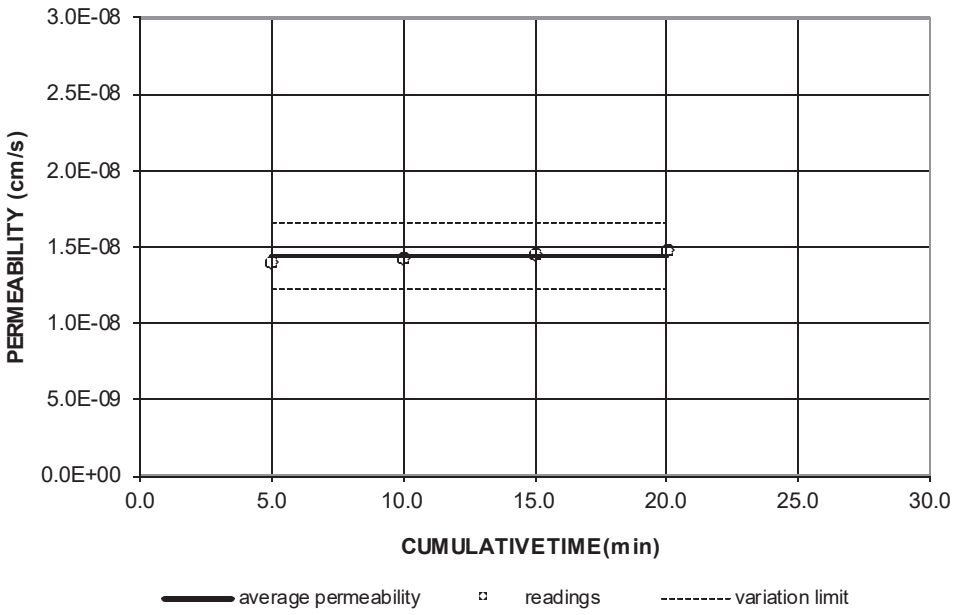
Checked by: Kalyn Abrams
Title: Laboratory Supervisor

Terracon, Inc.

Cincinnati, Ohio

Figure

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	14.49	1.40E-08	
21.00	5.00	10.00	14.22	1.43E-08	
21.00	5.00	15.00	13.94	1.46E-08	**1.4E-08**
21.00	5.00	20.00	13.66	1.48E-08	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)	101.3	Specimen Height, (inches)	3.01	3.04
Opti. M.C., (%)	27.3	Specimen Diameter, (inches)	4.00	4.00
Comp. Method		Specimen Volume, (cu. In.)	37.81	38.18
% Recompct.	95.0	Moisture Content, (%)	27.52	29.27
Test Pressures (psi)		Percent Saturation (%)	98.93	100.00
Backpressure	90.00	Wet Mass Density (pcf)	122.69	123.15
Cell pressure	95.00	Dry Mass Density (pcf)	96.21	95.26
Eff. Stress	**5.00**	Void Ratio	0.75	0.79
Specific Gravity	2.70	Calculated Porosity, %	42.89	44.14

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. SG-1
Sample Location: Stockpile
Sample Description: Dark Brown Elastic Silt

Test Date: 10/28/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

C3
Field Moisture/Density Testing

Summary of Field Density Test Results
ASTM D 2922

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Client Name: Twin Rivers Pine Bluff, LLC
Project Name: Twin Rivers Landfill Cells 15-16
Site Location: Pine Bluff, Arkansas
Contractor: Pickett Industries, LLC

Technician: Jackson Mitchell
Reviewed by: Drew Potter
Approved by: Owen Carpenter, P.E.
Test Location: Subgrade

Test Date	Test No.	Lift or Elev.	Test Location	Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content	Optimum Moisture %	PASS or FAIL
13-Oct	1	1	Confirmation- South Central		CS-1	120.0	99.8	117.3	85.1	95.0	20.2	11.8	FAIL
13-Oct	2	1	Retest-site 1		CS-2	115.1	97.9	101.7	96.2	95.0	17.6	20.0	PASS

Summary of Field Density Test Results
ASTM D 2922

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Client Name: Twin Rivers Pine Bluff, LLC
Project Name: Twin Rivers Landfill Cells 15-16
Site Location: Pine Bluff, Arkansas
Contractor: Pickett Industries, LLC

Technician: Jackson Mitchell
Reviewed by: Drew Potter
Approved by: Owen Carpenter, P.E.
Test Location: Subgrade

Test Date	Test No.	Lift or Elev.	Test Location	Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content	Optimum Moisture %	PASS or FAIL
17-Oct	3	1	Cell 15 & 16 Subgrade		C-1	114.0	92.9	94.9	97.9	95.0	22.7	26.2	PASS
17-Oct	4	1	Cell 15 & 16 Subgrade		C-1	115.7	98.5	94.9	103.8	95.0	17.5	26.2	PASS
17-Oct	5	1	Cell 15 & 16 Subgrade		C-1	114.4	94.8	94.9	99.9	95.0	20.7	26.2	PASS
17-Oct	6	1	Cell 15 & 16 Subgrade		C-1	110.0	91.8	94.9	96.8	95.0	19.8	26.2	PASS

Summary of Field Density Test Results
ASTM D 2922

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

Client Name: Twin Rivers Pine Bluff, LLC
Project Name: Twin Rivers Landfill Cells 15-16
Site Location: Pine Bluff, Arkansas
Contractor: Pickett Industries, LLC

Technician: Cole Rodman
Reviewed by: Drew Potter
Approved by: Owen Carpenter, P.E.
Test Location: Clay Liner

Test Date	Test No.	Lift or Elev.	Test Location	Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content	Optimum Moisture %	PASS or FAIL
19-Oct	7	1	Cell 16 Floor	P-1	C-1	119.5	92.0	94.9	96.9	95.0	29.9	26.2	PASS
19-Oct	8	1	Cell 15 Floor		C-1	117.9	92.2	94.9	97.1	95.0	27.9	26.2	PASS
19-Oct	9	1	Cell 15 Floor		C-1	115.8	91.5	94.9	96.5	95.0	26.5	26.2	PASS
20-Oct	10	1	Cell 16 Floor		C-1	115.9	90.5	94.9	95.3	95.0	28.1	26.2	PASS
20-Oct	11	2	Cell 15 Floor		C-1	117.1	92.6	94.9	97.6	95.0	26.4	26.2	PASS
20-Oct	12	2	Cell 16 Floor		C-1	117.5	90.5	94.9	95.3	95.0	29.9	26.2	PASS
20-Oct	13	2	Cell 16 Floor		C-1	117.6	91.5	94.9	96.4	95.0	28.5	26.2	PASS
20-Oct	14	2	Cell 15 Floor	P-2	C-1	115.9	91.0	94.9	95.9	95.0	27.3	26.2	PASS
21-Oct	15	3	Cell 16 Floor	P-3	C-1	115.4	90.7	94.9	95.6	95.0	27.2	26.2	PASS
21-Oct	16	3	Cell 15 Floor		C-1	117.5	91.7	94.9	96.7	95.0	28.1	26.2	PASS
21-Oct	17	3	Cell 16 Floor		C-1	116.2	90.6	94.9	95.4	95.0	28.3	26.2	PASS
21-Oct	18	3	Cell 15 Floor		C-1	115.7	91.3	94.9	96.2	95.0	26.7	26.2	PASS

Summary of Field Density Test Results
ASTM D 2922

Terracon
25809 Interstate 30 South
Bryant, AR 72022
(501) 847-9292

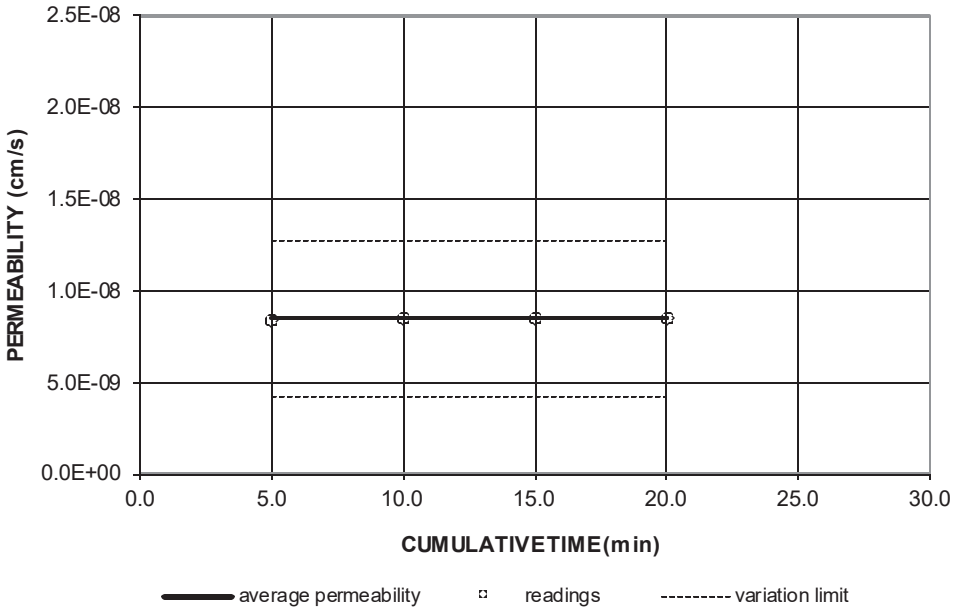
Client Name: Twin Rivers Pine Bluff, LLC
Project Name: Twin Rivers Landfill Cells 15-16
Site Location: Pine Bluff, Arkansas
Contractor: Pickett Industries, LLC

Technician: Cole Rodman
Reviewed by: Drew Potter
Approved by: Owen Carpenter, P.E.
Test Location: Clay Berm

Test Date	Test No.	Lift or Elev.	Test Location	Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content	Optimum Moisture %	PASS or FAIL
21-Oct	19	1	Cell 15 & 16 Berm		C-1	114.6	90.4	94.9	95.2	95.0	26.8	26.2	PASS
21-Oct	20	2	Cell 15 & 16 Berm		C-1	115.6	90.4	94.9	95.2	95.0	27.9	26.2	PASS
22-Oct	21	3	Cell 15 & 16 Berm		C-1	114.6	90.2	94.9	95.0	95.0	27.1	26.2	PASS
22-Oct	22	4	Cell 15 & 16 Berm		C-1	116.2	90.1	94.9	95.0	95.0	28.9	26.2	PASS
25-Oct	23	3A	Cell 15 & 16 Berm		C-1	114.8	90.5	94.9	95.4	95.0	26.8	26.2	PASS
26-Oct	24	4A	Cell 15 & 16 Berm	P-4	C-1	118.0	92.1	94.9	97.1	95.0	28.1	26.2	PASS

C4
Permeability Test Results

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

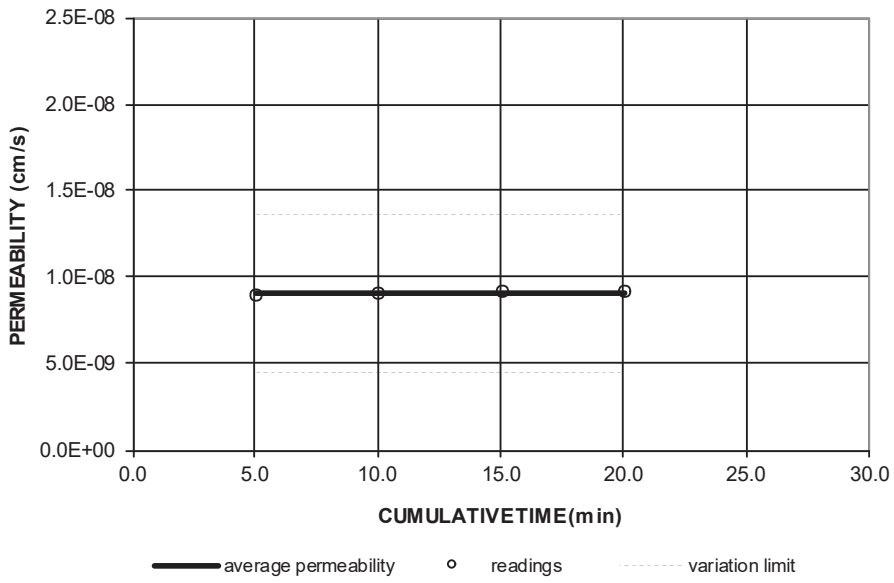
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	16.25	8.43E-09	
21.00	5.00	10.00	16.15	8.48E-09	
21.00	5.00	15.00	16.06	8.53E-09	**8.5E-09**
21.00	5.00	20.00	15.97	8.58E-09	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)		Specimen Height, (inches)	3.01	3.00
Opti. M.C., (%)		Specimen Diameter, (inches)	2.82	2.86
Comp. Method		Specimen Volume, (cu. In.)	18.79	19.26
% Recompct.		Moisture Content, (%)	28.83	33.21
Test Pressures (psi)		Percent Saturation (%)	85.20	93.25
Backpressure	90.00	Wet Mass Density (pcf)	113.43	114.41
Cell pressure	95.00	Dry Mass Density (pcf)	88.04	85.88
Eff. Stress	**5.00**	Void Ratio	0.91	0.96
Specific Gravity	2.70	Calculated Porosity, %	47.74	49.03

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. P-1
Sample Location: Cell 16, 0.5
Sample Description: Dark Brown Clay

Test Date: 11/1/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

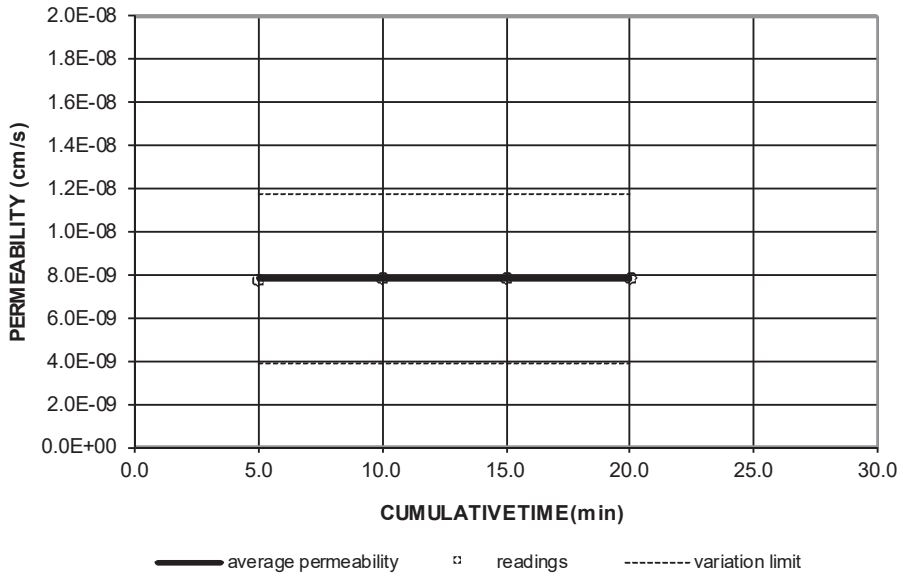
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	15.13	9.05E-09	
21.00	5.00	10.00	15.03	9.11E-09	
21.00	5.00	15.00	14.94	9.17E-09	**9.1E-09**
21.00	5.00	20.00	14.84	9.23E-09	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)		Specimen Height, (inches)	2.92	2.92
Opti. M.C., (%)		Specimen Diameter, (inches)	2.82	2.82
Comp. Method		Specimen Volume, (cu. In.)	18.23	18.23
% Recompct.		Moisture Content, (%)	36.38	39.52
Test Pressures (psi)		Percent Saturation (%)	99.93	100.00
Backpressure	90.00	Wet Mass Density (pcf)	115.87	118.53
Cell pressure	95.00	Dry Mass Density (pcf)	84.96	84.96
Eff. Stress	**5.00**	Void Ratio	0.98	1.07
Specific Gravity	2.70	Calculated Porosity, %	49.57	51.62

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. P-2
Sample Location: Cell 15, 0.5
Sample Description: Dark Brown Clay

Test Date: 11/3/2022
Tested By: Charissa Swinford
Reviewed By: Kalyn Abrams

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

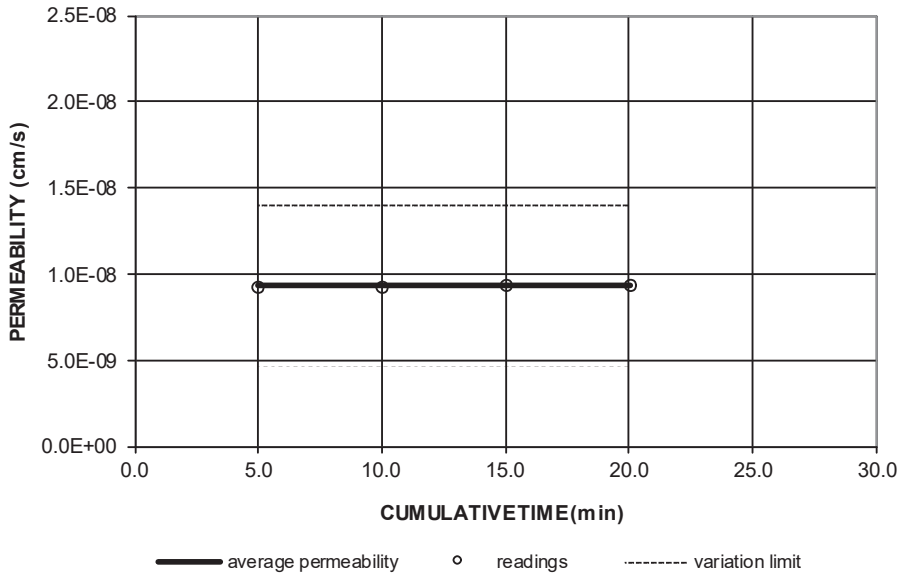
Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	17.85	7.79E-09	
21.00	5.00	10.00	17.76	7.83E-09	
21.00	5.00	15.00	17.66	7.87E-09	**7.9E-09**
21.00	5.00	20.00	17.57	7.91E-09	

Compaction Data		Sample Data	Initial	Final
Proctor (pcf)		Specimen Height, (inches)	3.02	3.01
Opti. M.C., (%)		Specimen Diameter, (inches)	2.80	2.84
Comp. Method		Specimen Volume, (cu. In.)	18.59	19.06
% Recompct.		Moisture Content, (%)	33.66	38.93
Test Pressures (psi)		Percent Saturation (%)	90.93	100.00
Backpressure	90.00	Wet Mass Density (pcf)	112.62	114.17
Cell pressure	95.00	Dry Mass Density (pcf)	84.26	82.18
Eff. Stress	**5.00**	Void Ratio	1.00	1.05
Specific Gravity	2.70	Calculated Porosity, %	49.99	51.25

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. P-3
Sample Location: Cell 16, 0.5
Sample Description: Dark Brown Clay

Test Date: 11/1/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

FLEXIBLE WALL PERMEABILITY TEST



Test Specification: ASTM D 5084 Method F

Fluid Temp. (°C)	Elapsed Time (min.)	Cumulative Time (min.)	Gradient (cm-Hg)	Calculated Permeability (cm/sec)	Average Permeability (cm/sec)
21.00	5.00	5.00	14.67	9.27E-09	
21.00	5.00	10.00	14.58	9.33E-09	
21.00	5.00	15.00	14.49	9.39E-09	**9.4E-09**
21.00	5.00	20.00	14.40	9.45E-09	

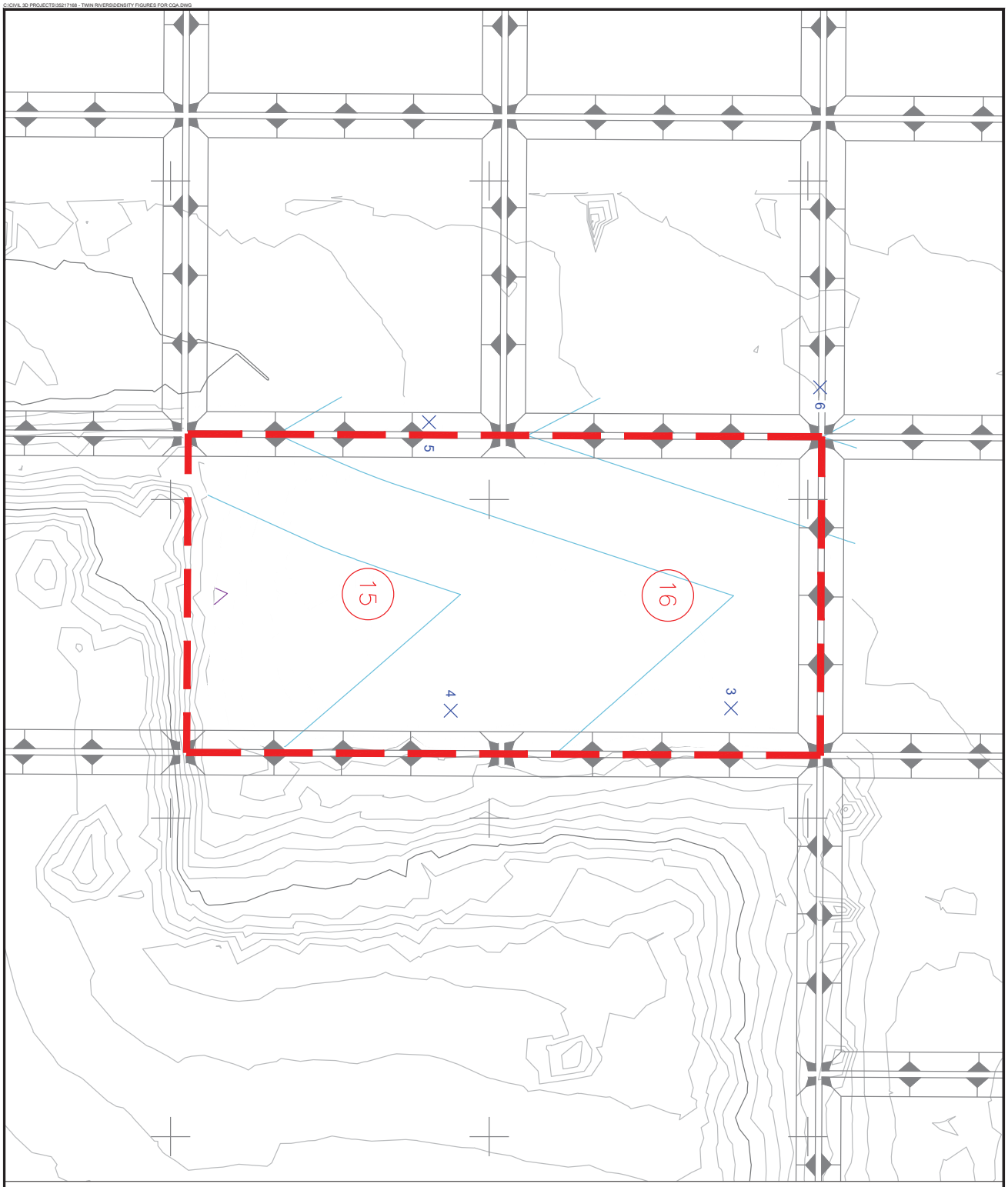
Compaction Data		Sample Data	Initial	Final
Proctor (pcf)		Specimen Height, (inches)	3.03	3.05
Opti. M.C., (%)		Specimen Diameter, (inches)	2.83	2.85
Comp. Method		Specimen Volume, (cu. In.)	19.05	19.49
% Recompct.		Moisture Content, (%)	33.20	36.25
Test Pressures (psi)		Percent Saturation (%)	100.13	100.00
Backpressure	90.00	Wet Mass Density (pcf)	118.41	118.39
Cell pressure	95.00	Dry Mass Density (pcf)	88.90	86.89
Eff. Stress	**5.00**	Void Ratio	0.90	0.98
Specific Gravity	2.70	Calculated Porosity, %	47.24	49.46

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. P-4
Sample Location: Cell 15 and 16 Berm
Sample Description: Dark Brown Clay

Test Date: 11/8/2022
Tested By: Charissa Swinford
Reviewed By: Kalyn Abrams

C5
Density Maps

C:\CIVIL 3D PROJECTS\3521716B - TWIN RIVERS\DENSITY FIGURES FOR CQA.DWG



LEGEND

CELL 15 & 16 BOUNDARY

SUBGRADE CONTOURS (1')

3 DENSITY TEST

SCALE: 1" = 30'

30 15 0 30

N

FIGURE 3

DESIGNED BY:	DAP
DRAWN BY:	DAP
APPVD. BY:	PDC
DATE:	NOVEMBER 2022
JOB NO.	123-009.3521716B
ACAD NO.	
SHEET NO.:	2 OF 5

Terracon
Consulting Engineers and Scientists

25809 I-30 SOUTH BRYANT, AR 72022
PH. (501) 847-9292 FAX. (501) 847-9210

SUBGRADE - LIFT 1

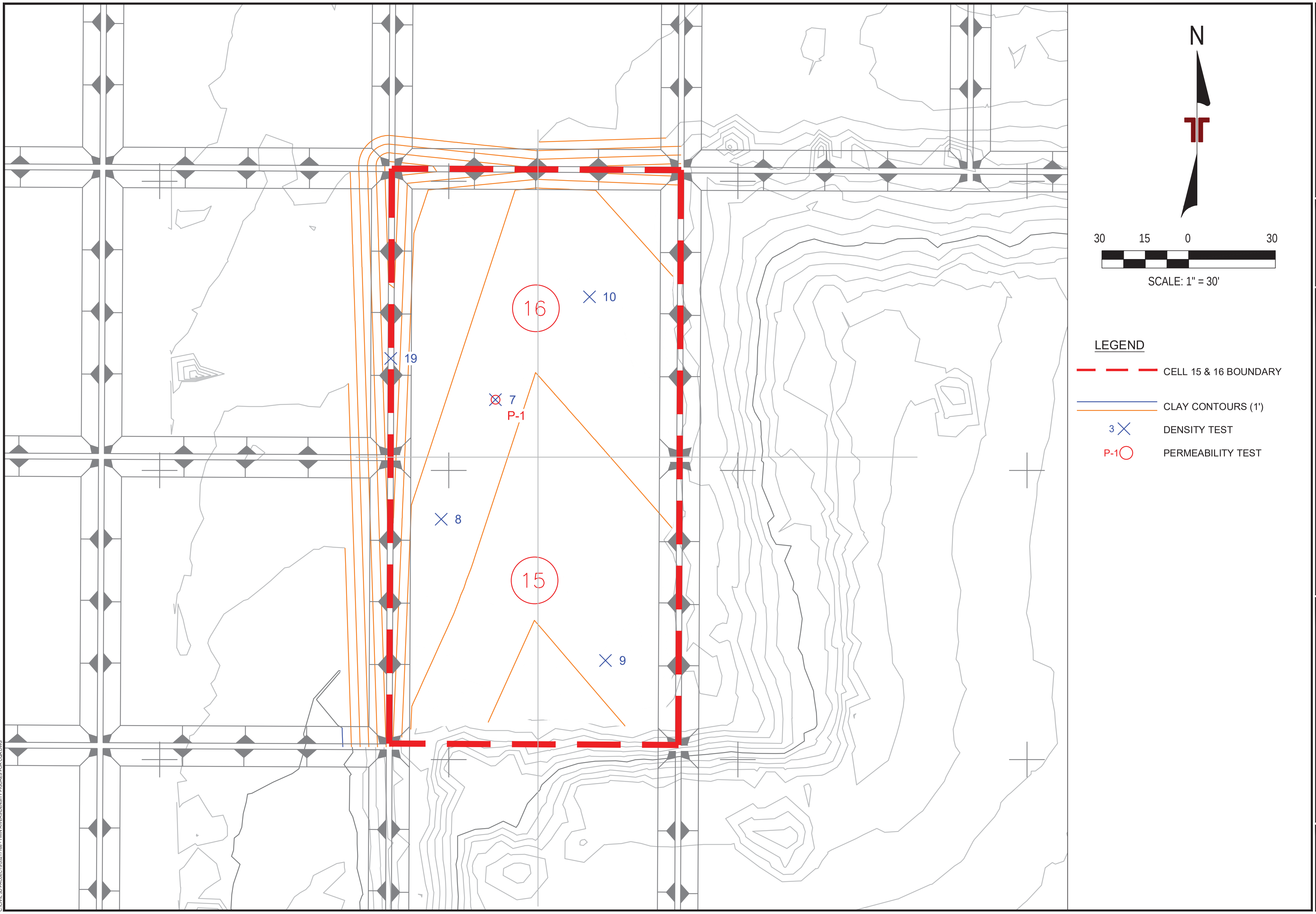
CELL 15 & 16 BOTTOM LINER SYSTEM

TWIN RIVERS PAPER COMPANY

CLASS 3N LANDFILL

PINE BLUFF ARKANSAS

REV.	DATE	BY	DESCRIPTION



REV	DATE	BY	DESCRIPTION

CLAY - LIFT 1

CELL 15 & 16 BOTTOM LINER SYSTEM
TWIN RIVERS PAPER COMPANY
CLASS 3N LANDFILL
PINE BLUFF ARKANSAS

Terracon
Consulting Engineers and Scientists
25809 I-30 SOUTH BRYANT, AR 72022
PH. (501) 847-9292 FAX. (501) 847-9210

FIGURE 4

DESIGNED BY:	DAP
DRAWN BY:	DAP
APPVD. BY:	FOC
SCALE:	1" = 30'
DATE:	NOVEMBER 2022
JOB NO.	123-001-35217168
ACAD NO.	
SHEET NO.:	3 OF 5

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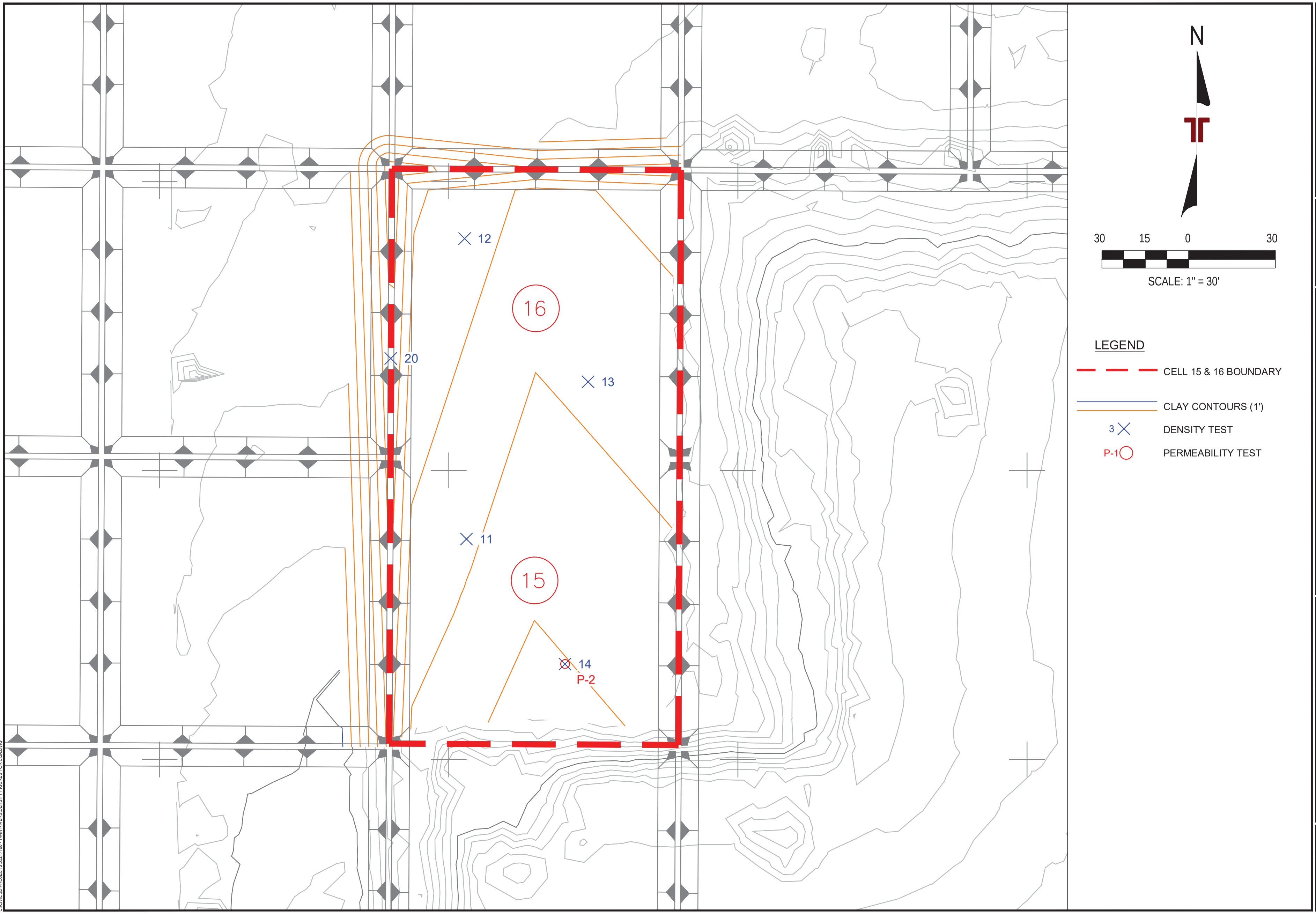


REV	DATE	BY	DESCRIPTION

CLAY - LIFT 2

CELL 15 & 16 BOTTOM LINER SYSTEM

TWIN RIVERS PAPER COMPANY

CLASS 3N LANDFILL

PINE BLUFF ARKANSAS

Terracon

Consulting Engineers and Scientists

25809 I-30 SOUTH BRYANT, AR 72022

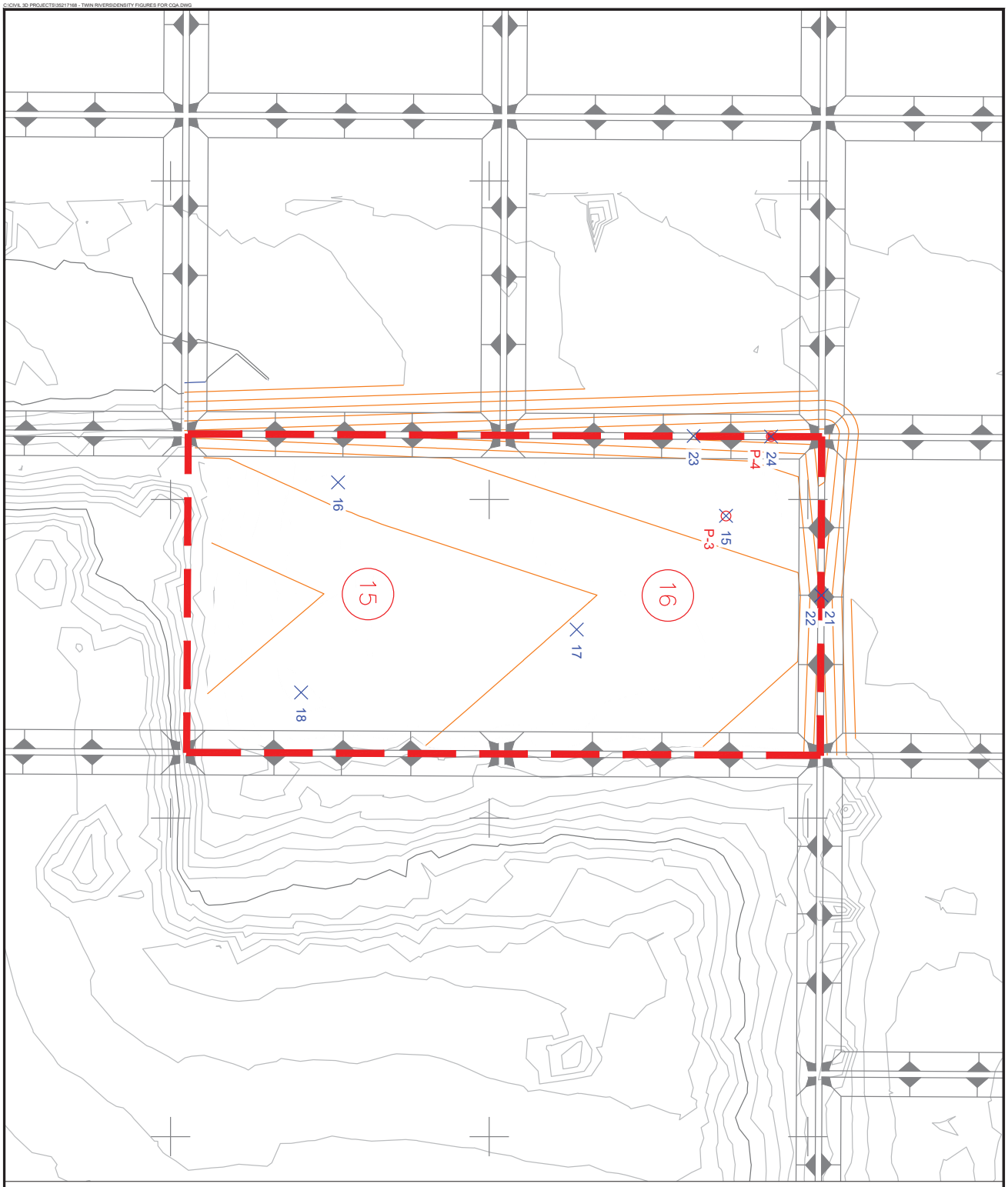
PH. (501) 847-9292 FAX. (501) 847-9210

FIGURE 5

DESIGNED BY:	DAP
DRAWN BY:	DAP
APPVD. BY:	FOC
SCALE:	1" = 30'
DATE:	NOVEMBER 2022
JOB NO.	123-001-35217168
ACAD NO.	
SHEET NO.:	4 OF 5

C:\CIVIL 3D PROJECTS\35217168 - TWIN RIVERS\DENSITY FIGURES FOR CQA.DWG

C:\CIVIL 3D PROJECTS\3521768 - TWIN RIVERS\DENSITY FIGURES FOR CQA.DWG



LEGEND

CELL 15 & 16 BOUNDARY

CLAY CONTOURS (1')

3 DENSITY TEST

P-1 PERMEABILITY TEST

SCALE: 1" = 30'

30 15 0 30

N

FIGURE 6

DESIGNED BY	DAP
DRAWN BY	DAP
APP'VD. BY	PDC
DATE	NOVEMBER 2022
JOB NO.	123-009.3901.7168
ACAD NO.	
SHEET NO.	5 OF 5

Terracon
Consulting Engineers and Scientists

25809 I-30 SOUTH
PH. (501) 847-9292

BRYANT, AR 72022
FAX. (501) 847-9210

CLAY - LIFT 3

CELL 15 & 16 BOTTOM LINER SYSTEM

TWIN RIVERS PAPER COMPANY

CLASS 3N LANDFILL

PINE BLUFF ARKANSAS

REV.	DATE	BY	DESCRIPTION

APPENDIX D
Leachate Collection System Material Test Results

November 18, 2022

Mail To:

Owen Carpenter
Terracon
25809 I-30 South
Bryant, AR 72022

email: owen.carpenter@terracon.com

Bill To:

<= Same (Proj # 35217168)

Dear Mr. Carpenter:

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:	**Twin Rivers Pine Bluff LLC Cells 15 & 16 Construction**
TRI Job Reference Number:	76143
Material(s) Tested:	One Terrastop D1F Batch 14381 Nonwoven Geotextile(s)
Test(s) Requested:	Mass/Unit Area (ASTM D5261) Grab Tensile (ASTM D4632) CBR Puncture Strength (ASTM D6241) Trapezoidal Tear (ASTM D4533) 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

GEOTEXTILE TEST RESULTS
TRI Client: Terracon
Project: Twin Rivers Pine Bluff LLC Cells 15 & 16 Construction

Material: Terrastop D1F Batch 14381 Nonwoven Geotextile
Sample Identification: GT180 Lot N220000259
TRI Log #: 76143

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D5261)													
5" diameter circle (grams)	3.03	2.98	3.30	3.11	3.47	2.89	3.04	3.13	3.55	3.20	**3.17**	0.21	
Mass/Unit Area (oz/sq.yd)	7.05	6.93	7.68	7.23	8.07	6.72	7.07	7.28	8.26	7.44	**7.37**	0.50	8.0 min
Grab Tensile Properties (ASTM D4632)													
MD - Tensile Strength (lbs)	237	229	199	215	198	224	210	230	252	277	**227**	24	220 min
TD - Tensile Strength (lbs)	212	228	227	224	228	203	218	232	271	231	**228**	18	220 min
MD - Elong. @ Max. Load (%)	67	67	59	73	59	72	69	65	79	67	**68**	6	50 min
TD - Elong. @ Max. Load (%)	111	91	110	101	109	116	113	97	96	122	**107**	10	50 min
CBR Puncture Strength (ASTM D6241)													
Puncture Resistance (lbs)	580	607	679	704	622	754	611	652	618	578	**641**	57	130 min
Trapezoidal Tear (ASTM D4533)													
MD - Tear Strength (lbs)	119	98	94	103	85	113	86	109	109	105	**102**	11	90 min
TD - Tear Strength (lbs)	126	101	107	119	102	90	103	108	128	119	**110**	12	90 min
Apparent Opening Size (ASTM D4751)													
Opening Size Diameter (mm)	0.101	0.138	0.134	0.103	0.075						**0.110**	0.026	
Sieve No.	140	100	100	140	200						**100**		80 min
Permittivity (ASTM D4491,Method C: 2-inch Dia.)													
Thickness (mil)	42.3	62.7	58.4	60.6	53.3						**55.5**	8.1	
Thickness (mm)	1.07	1.59	1.48	1.54	1.35						**1.41**	0.21	
Permittivity (Sec-1)	1.41	1.46	1.48	1.36	1.05						**1.35**	0.18	1.26 min
Permittivity (GPM/ft2)	105.5	109.2	110.7	101.7	78.5						**101.1**	13.1	
Flow rate (LPM/m2)	4297	4450	4511	4145	3200						**4120**	534	
Permittivity (cm/sec)	0.151	0.233	0.220	0.209	0.142						**0.191**	0.041	

MD Machine Direction TD Transverse Direction

#57 Gravel

Client
Twin Rivers Paper Company

Project
Twin Rivers CQA

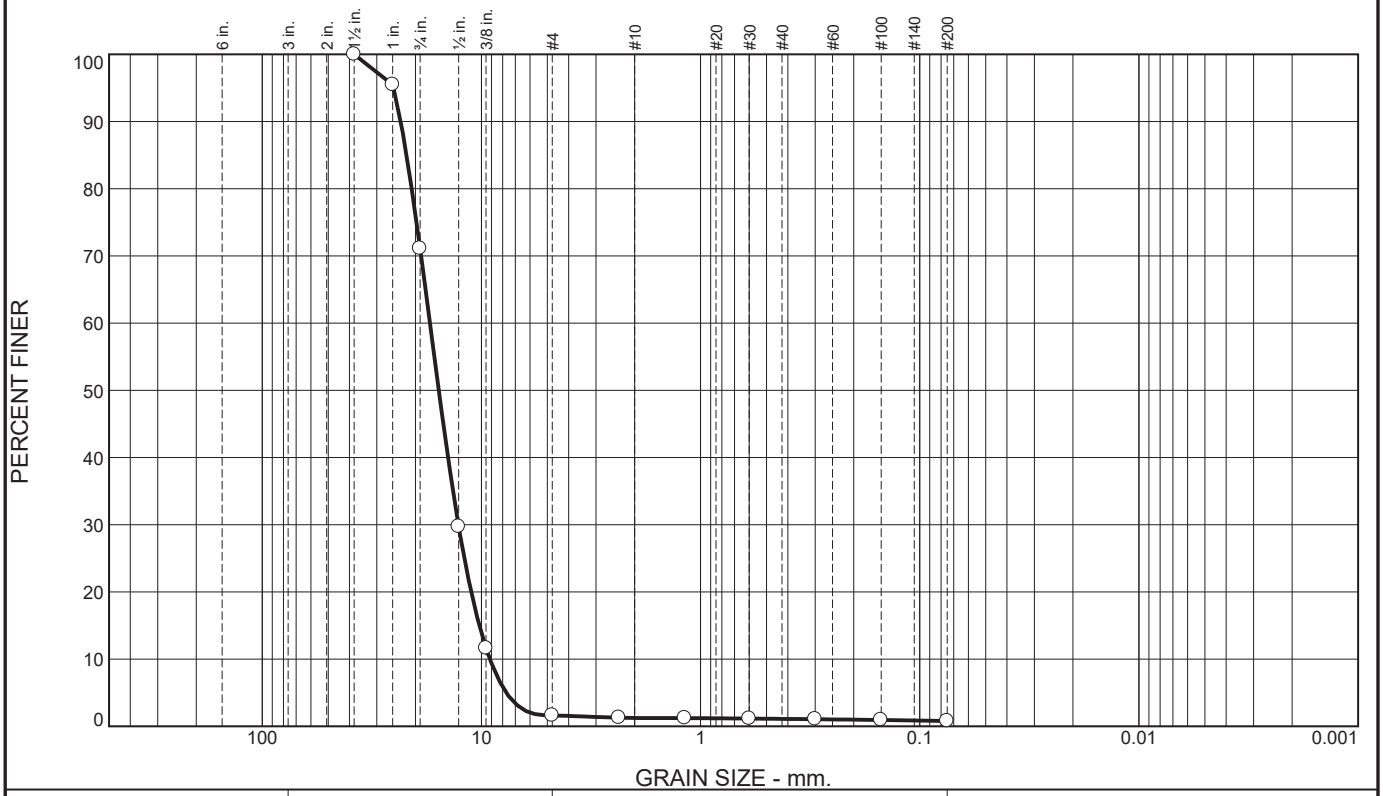
Project No. 35217168

Total Insoluble Carbonate Content, ASTM D3042

Sample No.	--
Sample Location:	PG-1
Material Description:	#57 Gravel
pH Value:	4
Lab No.	9814

Before Acid Wash				After Acid Wash				
Trial No.	Sample + Tare Wt. (g)	Tare Wt. (g)	Sample Wt. (g)	Sample + Tare Wt. (g)	Tare Wt. (g)	Sample Wt. (g)	Sample Loss (g)	Percent Loss (%)
1	686.25	187.65	498.6	685.74	187.65	498.09	0.51	0.07
2	684.17	186.25	497.92	683.56	186.25	497.31	0.61	0.09
3	769.85	174.49	595.36	769.38	174.49	594.89	0.47	0.06
Total	**2140.27**	**548.39**	**1591.88**	**2138.68**	**548.39**	**1590.29**	**1.59**	**0.07**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	28.9	69.5	0.4	0.1	0.3	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.5		
.75	71.1		
.5	29.7		
.375	11.6		
#4	1.6		
#8	1.3		
#16	1.2		
#30	1.2		
#50	1.1		
#100	0.9		
#200	0.8		

* (no specification provided)

Material Description

#57 Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 23.3393 D_{85}= 21.9574 D_{60}= 17.1749
D_{50}= 15.6493 D_{30}= 12.7425 D_{15}= 10.2209
D_{10}= 9.1491 C_u= 1.88 C_c= 1.03

Classification

USCS= GP AASHTO=

Remarks

Lab No. 9814

Location: PG-1

Date: 11/1/2022

Terracon, Inc.

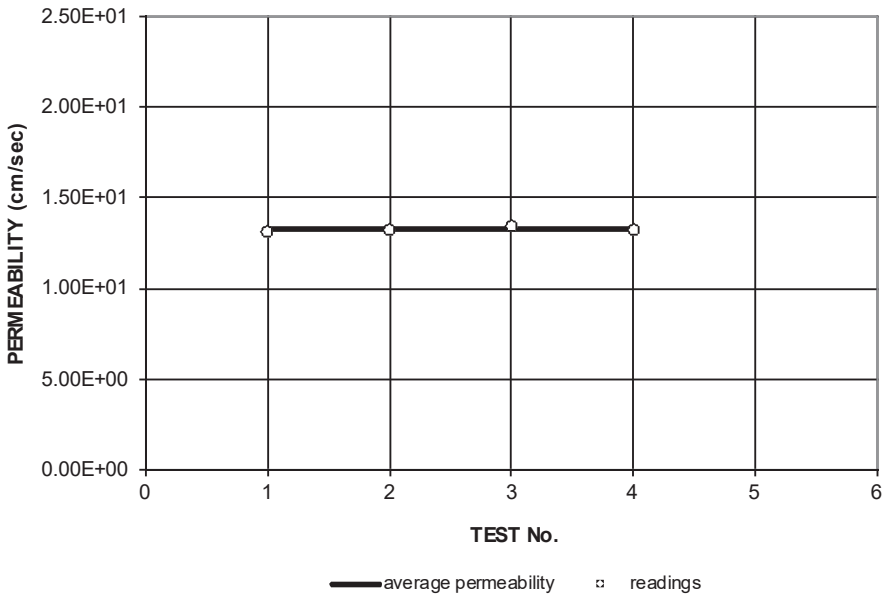
Cincinnati, Ohio

Client: Twin Rivers Paper Company
Project: Twin Rivers CQA

Project No: 35217168 **Figure**

Tested By: Dave Roelker **Checked By:** Kalyn Abrams

CONSTANT HEAD PERMEABILITY TEST



Test Specification: ASTM D 2434

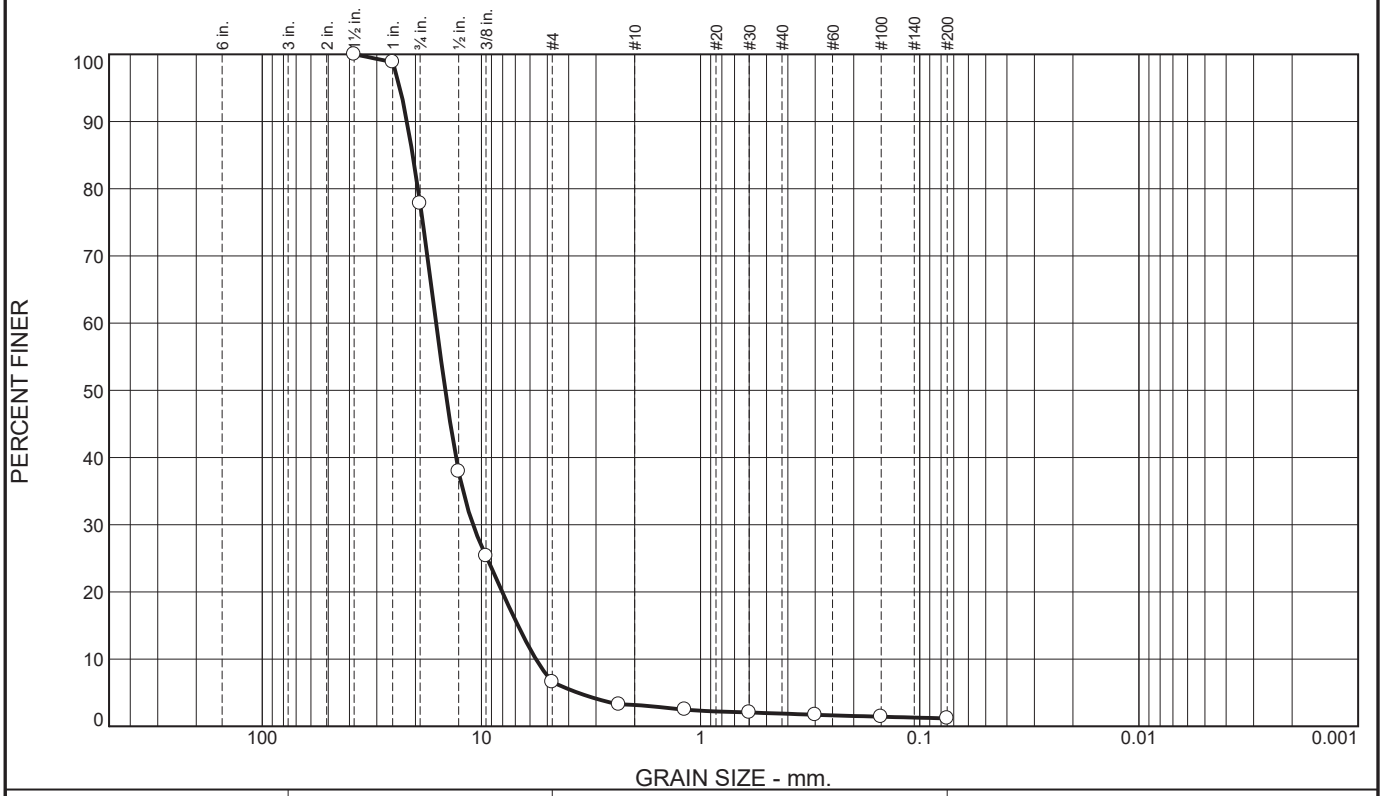
Test No.	Manometers		Water Levels		Water Head	Flow Volume	Elapsed Time	Calculated Permeability
	H1 (cm)	H2 (cm)	L1 (cm)	L2 (cm)	(cm)	(cm^3)	(s)	(cm/s)
1	0	7.6	50	20	7.6	19238.48	9.01	1.31E+01
2	0	7.6	50	20	7.6	19238.48	8.95	1.32E+01
3	0	7.6	50	20	7.6	19238.48	8.81	1.34E+01
4	0	7.6	50	20	7.6	19238.48	8.97	1.32E+01
Average								**1.33E+01**

Specimen Conditions			
Diameter D (in)	11.25	Weight of Specimen (gms)	15470.0
Length of Specimen (in)	7.00	Density of Specimen (pcf)	84.7
Length of Flow (in)	11.81	Approximate Porosity(%)	49.7

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. PG-1
Sample Location: Cell 16, 0.5
Sample Description: #57 Gravel, GP

Test Date: 11/1/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.2	71.2	3.4	1.3	0.7	1.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	98.8		
.75	77.8		
.5	37.9		
.375	25.3		
#4	6.6		
#8	3.3		
#16	2.5		
#30	2.1		
#50	1.7		
#100	1.4		
#200	1.2		

* (no specification provided)

Material Description

Leachate Gravel Construction Sample - Supplier Source

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 21.8680 D_{85}= 20.5730 D_{60}= 16.0917
D_{50}= 14.6130 D_{30}= 10.9309 D_{15}= 6.8113
D_{10}= 5.6392 C_u= 2.85 C_c= 1.32

Classification

USCS= GP AASHTO=

Remarks

Lab No. 9969

Location: CG-1

Date: 11/4/2022

Terracon, Inc.

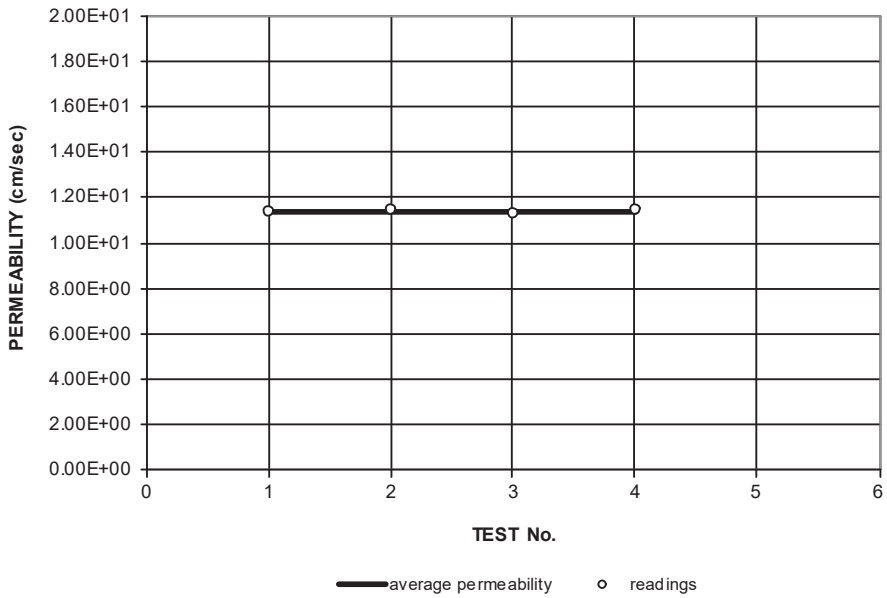
Cincinnati, Ohio

Client: Twin Rivers Paper Company
Project: Twin Rivers CQA

Project No: 35217168 **Figure**

Tested By: Dave Roelker **Checked By:** Kalyn Abrams

CONSTANT HEAD PERMEABILITY TEST



Test Specification: ASTM D 2434

Test No.	Manometers		Water Levels		Water Head	Flow Volume	Elapsed Time	Calculated Permeability
	H1 (cm)	H2 (cm)	L1 (cm)	L2 (cm)	(cm)	(cm^3)	(s)	(cm/s)
1	0	7.6	50	20	7.6	19238.482	10.38	1.14E+01
2	0	7.6	50	20	7.6	19238.482	10.34	1.15E+01
3	0	7.6	50	20	7.6	19238.482	10.44	1.13E+01
4	0	7.6	50	20	7.6	19238.482	10.29	1.15E+01
Average								**1.14E+01**

Specimen Conditions			
Diameter D (in)	11.25	Weight of Specimen (gms)	13310.0
Length of Specimen (in)	6.00	Density of Specimen (pcf)	85.0
Length of Flow (in)	11.81	Approximate Porosity(%)	49.5

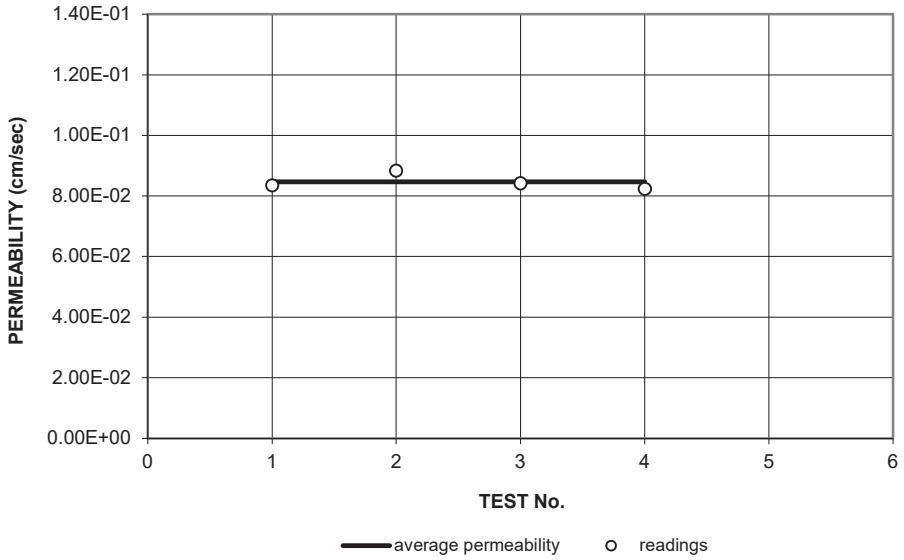
Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. CG-1
Sample Location: Supplier Source
Sample Description: Leachate Gravel - Construction Sample

Test Date: 11/3/2022
Tested By: Charissa Swinford
Reviewed By: Kalyn Abrams

Protective Cover

Explore with us

CONSTANT HEAD PERMEABILITY TEST



Test Specification: ASTM D 2434

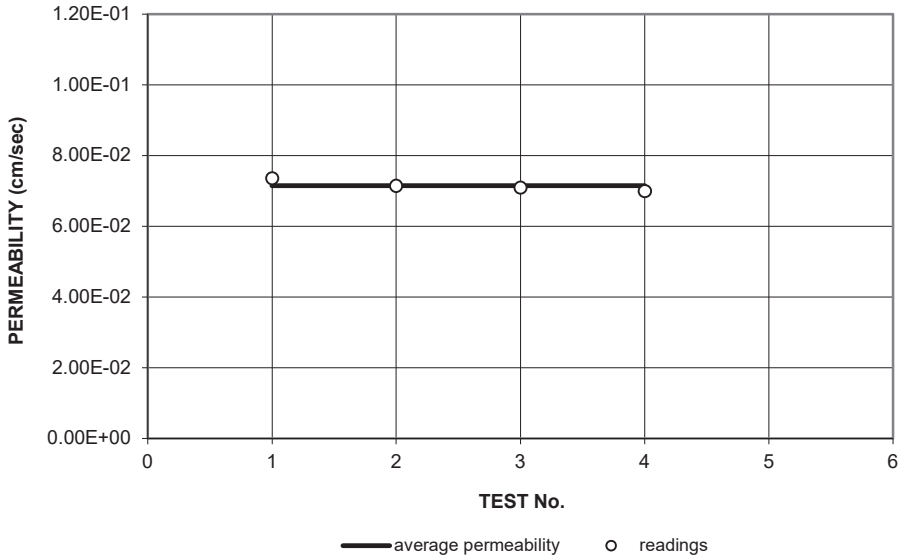
Test No.	Manometers		Water Levels		Water Head	Flow Volume	Elapsed Time	Calculated Permeability
	H1 (cm)	H2 (cm)	L1 (cm)	L2 (cm)	(cm)	(cm^3)	(s)	(cm/s)
1	1.8	4.8	100	0	3	100	66.7	8.35E-02
2	2.4	5.9	100	0	3.5	100	54.05	8.84E-02
3	2.9	6.9	100	0	4	100	49.65	8.42E-02
4	3.3	7.8	100	0	4.5	100	45.09	8.24E-02
Average								**8.46E-02**

Specimen Conditions			
Diameter D (in)	3.00	Weight of Specimen (gms)	1125.0
Length of Specimen (in)	5.75	Density of Specimen (pcf)	105.4
Length of Flow (in)	3.00	Approximate Porosity(%)	37.4

Material Description	Remarks
Carbonate Content (%) USCS Water Content (%)	

Project Name	Twin Rivers CQA	Tested by	FCE Review. by LAE
Client	Twin Rivers Paper Company	**CONSTANT HEAD PERMEABILITY TEST**	
Sample Number	PS-1 W.O.# 35217168		
Sample Location	Pine Bluff Sand & Gravel		
Date	31-Oct-22 Lab No. 9815	Terracon	

CONSTANT HEAD PERMEABILITY TEST



Test Specification: ASTM D 2434

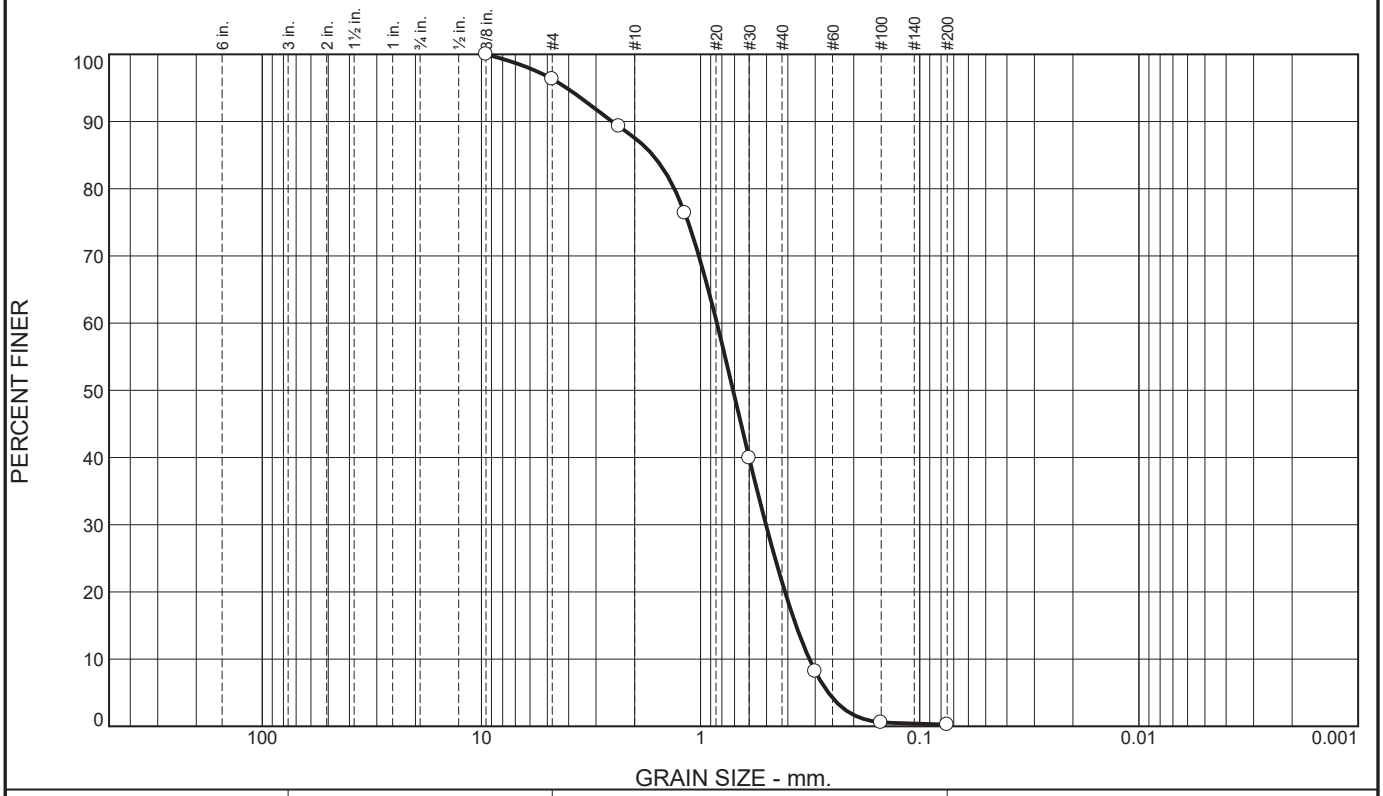
Test No.	Manometers		Water Levels		Water Head	Flow Volume	Elapsed Time	Calculated Permeability
	H1 (cm)	H2 (cm)	L1 (cm)	L2 (cm)	(cm)	(cm^3)	(s)	(cm/s)
1	2	5	100	0	3	100	75.69	7.36E-02
2	2.4	5.9	100	0	3.5	100	66.87	7.14E-02
3	2.8	6.8	100	0	4	100	58.89	7.10E-02
4	3.2	7.7	100	0	4.5	100	53.13	6.99E-02
Average								**7.15E-02**

Specimen Conditions			
Diameter D (in)	3.00	Weight of Specimen (gms)	1180.0
Length of Specimen (in)	5.79	Density of Specimen (pcf)	109.8
Length of Flow (in)	3.00	Approximate Porosity(%)	34.8

Material Description	Remarks
Carbonate Content (%) USCS Water Content (%)	

Project Name	Twin Rivers CQA	Tested by	FCE Review. by LAE
Client	Tiwn Rivers Paper Company	**CONSTANT HEAD PERMEABILITY TEST**	
Sample Number	PS-1 W.O.# 35217168		
Sample Location	Pine Bulff Sand & Gravel		
Date	1-Nov-22 Lab No. 9816	Terracon	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.7	8.7	66.2	21.2	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	96.3		
#8	89.3		
#16	76.4		
#30	39.9		
#50	8.2		
#100	0.6		
#200	0.2		

* (no specification provided)

Material Description

Sand - Protective Cover

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 2.5328 D_{85}= 1.6511 D_{60}= 0.8424
D_{50}= 0.7106 D_{30}= 0.5032 D_{15}= 0.3668
D_{10}= 0.3190 C_u= 2.64 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

Lab No. 9970

Location: Constr-PC-1

Date: 11/4/2022

Terracon, Inc.

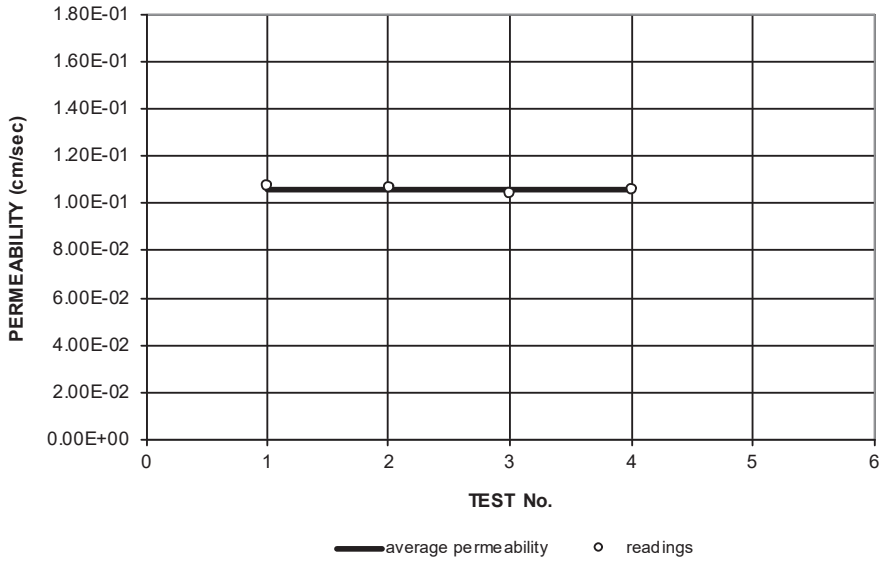
Cincinnati, Ohio

Client: Twin Rivers Paper Company
Project: Twin Rivers CQA

Project No: 35217168 **Figure**

Tested By: Dave Roelker **Checked By:** Kalyn Abrams

CONSTANT HEAD PERMEABILITY TEST



Test Specification: ASTM D 2434

Test No.	Manometers		Water Levels		Water	Flow	Elapsed	Calculated
	H1 (cm)	H2 (cm)	L1 (cm)	L2 (cm)	Head (cm)	Volume (cm^3)	Time (s)	Permeability (cm/s)
1	2	5	100	0	3	100	131.02	1.08E-01
2	2.4	5.9	100	0	3.5	100	113.1	1.07E-01
3	2.8	6.8	100	0	4	100	101.65	1.04E-01
4	3.2	7.7	100	0	4.5	100	88.93	1.06E-01
Average								**1.06E-01**

Specimen Conditions			
Diameter D (in)	1.18	Weight of Specimen (gms)	15470.0
Length of Specimen (in)	5.76	Density of Specimen (pcf)	9338.7
Length of Flow (in)	1.18	Approximate Porosity(%)	-5442.9

Project: Twin Rivers CQA
Project No. 35217168
Client: Twin Rivers Paper Company
Sample No. Protective Cover - Sand
Sample Location: Constr-PC-1
Sample Description: Dark Brown Clay

Test Date: 11/3/2022
Tested By: Fred Eichler
Reviewed By: Kalyn Abrams

APPENDIX E
Contractor Material Submittals

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

Sales Office:
Engineered Synthetic Product Inc.
Phone: (770)564-1857
Fax: (770)564-1818

March 26, 2018
Industrial Fabrics, Inc.
510 O'Neal Lane Extension
Baton Rouge, LA, 70819

Dear Sir/Madam:

This is to certify that SKAPS GT180 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 GT180 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 GT180 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Grab Tensile	ASTM D 4632	lbs (kN)	205 (0.91)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	85 (0.38)
CBR Puncture	ASTM D 6241	lbs (kN)	535 (2.38)
Permittivity*	ASTM D 4491	sec^{-1}	1.40
Water Flow*	ASTM D 4491	$gpm/ft^2(l/min/m^2)$	95 (3871)
AOS*	ASTM D 4751	US Sieve (mm)	80 (0.18)
UV Resistance	ASTM D 4355	%/hrs	70/500

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

KOUROSH SABZEVARI
QUALITY CONTROL MANAGER

APPENDIX F
Project Photographic Log

1. Stripping Topsoil

2. Topsoil Completely Stripped

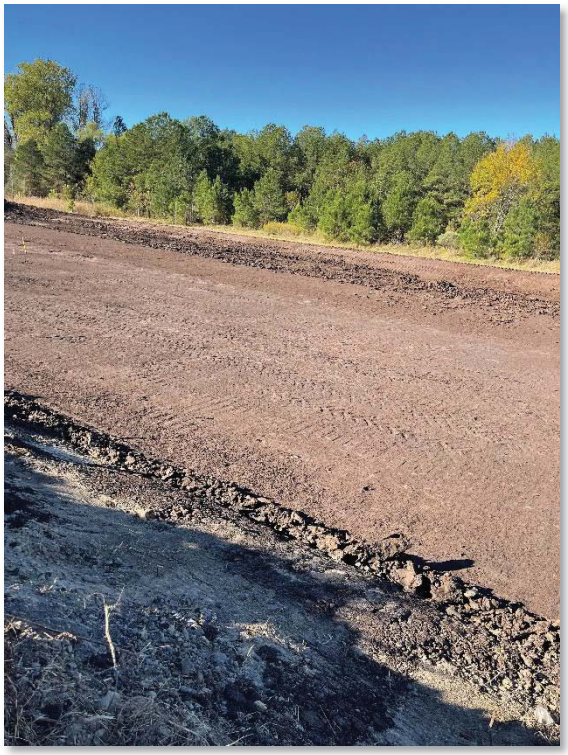
3. Completed Subgrade

4. Clay Liner Construction

5. North Berm

6. West Berm

7. Clay Liner Grading with Dozer



8. Completed Clay Liner

9. Leachate Collection Pipe and Geotextile

10. Leachate Collection Pipe and Gravel

11. Leachate Collection “Burrito”

12. Protective Cover Construction

13. Completed Protective Cover