KINGSPORT
TENNESSEE

Streets & Sanitation

January 10, 2022

Mr. George Thornsbury, PE
Tennessee Department of Environment and Conservation
Division of Solid Waste Management
Johnson City EFO
2305 Silverdale Drive
Johnson City, Tennessee 37601

RE: Report of Construction Quality Assurance (CQA)
Kingsport Demolition Landfill Phase 1 Area 2 Closure
Kingsport, Tennessee
Permit No. DML 82-000-0016

Dear Mr. Thornsbury:

The City of Kingsport is submitting the required Construction Quality Assurance (CQA) report prepared by Barge Design Solutions (Barge) for the Kingsport Demolition Landfill Phase 1 Area 2 Closure. The requirements for this closure are authorized under Permit No. DML 82-000-0016.

Barge provided engineering design, project management, surveying, and CQA services for the closure project. GeoServices, LLC provided CQA support services for clay cap source quality control testing and on-site soil density, moisture content, and hydraulic conductivity testing. On-site earthmoving activities were performed by City of Kingsport in-house personnel. American Environmental LLC was contracted to provide and haul the clay cap material for the closure project. Southern Seeding, Inc. was contracted for seeding and mulch.

This report is submitted to indicate that the City of Kingsport Demolition Landfill Phase 1 Area 2 Closure was completed in accordance with facility's Closure/Post-Closure Plan and the Tennessee Division of Solid Waste Management (DSWM) Regulation (Rule 1200-1-7):

> *I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. As specified in T.C.A. § 39-16-702(a)(4), this declaration is made under penalty of perjury.*

The City of Kingsport is pleased to submit this report. Please let me know if you have any questions.

Sincerely,

Rodney Deel
Kingsport Sanitation Supervisor

cc: Mr. Tim Elsea, City of Kingsport
Mr. Noah McMurray, City of Kingsport
Mr. Eddie Lawrence, Barge Design Solutions
Mr. Chris Lamb, TDEC

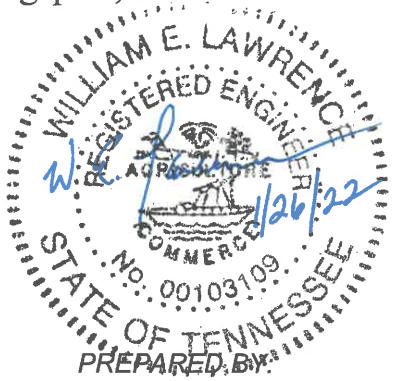
CITY OF KINGSPORT
KINGSPORT DEMOLITION LANDFILL
DML 820000016
PHASE 1 AREA 2 CLOSURE PROJECT
KINGSPORT, TENNESSEE

CONSTRUCTION QUALITY ASSURANCE REPORT

January 2022

Submitted to:

City of Kingsport
415 Broad Street
Kingsport, Tennessee 37660



PREPARED BY:

BARGE
DESIGN SOLUTIONS
FOUR SHERIDAN SQUARE, SUITE 100
KINGSPORT, TENNESSEE 37660
(423) 247-5525 PHONE

Kingsport Demolition Landfill – Phase 1 Area 2 Closure Project

Construction Quality Assurance Report

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1.0 Overview

The City of Kingsport Demolition Landfill (DML 82-000-0016) Phase 1 Area 2 Partial Closure Project consisted of closing the remaining 6.74-acres for Phase 1 Area 2. The closure area is adjacent to the Phase 1 Area 1 Closure completed in the 1990s to the west, the 2012 Phase 1 Area 2 Partial Closure to the north, and the Phase 2 Area 3 active cell to the east. An Exhibit showing the project location is provided on the following page. The project consisted of the following components:

- Installation of 18-inches of clay cap material with an in-place hydraulic conductivity of less than or equal to $1x10^{-6}$ cm/sec
- Installation of 12-inches of on-site topsoil
- Installation of Stormwater diversion berms
- Installation of Shale in the northwestern corner of the closure area for proper stormwater drainage
- Seeding and Mulch

Barge Design Solutions. Inc. (Barge) provided engineering design, project management, surveying, and construction quality assurance (CQA) services for the Phase 1 Area 2 Closure Project. GEOServices, LLC provided CQA support services for clay cap source quality control testing and on-site soil density, moisture content, and hydraulic conductivity testing. On-site earthmoving activities were performed by City of Kingsport (City) in-house personnel. American Environmental LLC was contracted to provide and haul the clay cap material for the closure project. Southern Seeding, Inc. was contracted for seeding and mulch.

Appendix A provides the project's Daily Field Reports prepared by the Barge CQA representative. **Appendix B** provides copies of TDEC Construction Facility Inspection Checklists and Site Photos from site visits performed by TDEC personnel during the project.

2.0 Clay Cap Material

The City solicited bids for the clay cap material. Potential suppliers for the clay cap material were required to provide pricing and geotechnical qualification data for their borrow site's material. American Environmental, LLC was selected to provide and haul the clay cap material based on both pricing and geotechnical qualifications. The clay cap borrow site is located in Church Hill, Tennessee. The geotechnical qualification data, designated as Sample Number: Log 812, and the

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EXHIBIT

KINGSPORT C & D LANDFILL
PHASE 1 AREA 2 CLOSURE
KINGSPORT, TENNESSEE

DRAWN BY:	CHECKED BY:
TL	EL
DRAWING NO.:	
1 of 1	
PROJECT NO.:	DATE:
36793-04	1-2022

borrow site's topographic map are provided in **Appendix C**. The borrow site's topographic map is taken from the site's Stormwater Pollution Prevention Plan.

2.1 Clay Cap Material Quality Control Testing

The area of clay cap material installed was 6.74-acres. This area included overlaps with the Phase 1 Area 1 Closure completed in the 1990s and the 2012 Phase 1 Area 2 Partial Closure. The estimated volume of clay cap material that would be required was 16,000 CY. The estimated volume included the closure area requiring 18-inches of clay cap material and the previous closures overlaps that required a depth to achieve a uniform grade with the previous closures.

Table 1 provides the clay cap material quality control testing and required frequency that was performed for the closure:

TABLE 1
Clay Cap Material Quality Control Testing

Parameter	Test Method	Frequency
Percent Fines (200)	ASTM D1140	1 per 5,000 cu yd
Percent Gravel (#4)	ASTM D422	1 per 5,000 cu yd
Atterberg Limits	ASTM D4318	1 per 5,000 cu yd
Water Content (Natural Moisture Content)	ASTM D2216	1 per 5,000 cu yd
Moisture/Density (Standard Proctors)	ASTM D698	1 per 5,000 cu yd
Hydraulic Conductivity	ASTM D5084	1 per 5,000 cu yd

Five clay cap material quality control samples were performed. The clay cap quality control samples were designated as Log 812, CB-1, CB-2, CB-3, and CB-4. Sample Number Log 812 was collected during the bidding geotechnical qualification. Sample Numbers CB-1, CB-2, CB-3, and CB-4 were collected prior to the start of the clay cap installation. Quality control testing results are provided in **Appendix C**. Samples were collected within the proposed grading area of the topographic map provided in **Appendix C**.

An extra sample was collected and tested, CB-4, in an area that was not utilized for the Closure. The additional sample was collected should subsurface conditions at the borrow site require American

Environmental to shift excavation of clay cap material laterally beyond the area the was estimated to meet the Closure volume.

2.2 Clay Cap Material Installation

The clay cap material installation began on May 25, 2021 and was completed on July 6, 2021. The clay cap material was installed in two 9-inch lifts, consistent with the 2012 Phase 1 Area 2 closure. Each lift was installed using a CAT D6T dozer equipped with GPS. All GPS files used for the project were prepared by Barge. Each lift was compacted with a CAT CP56B vibratory sheepsfoot compactor.

Each load of the clay cap material was weighed at the landfill scales for tracking the quantity of clay cap material used. The clay cap installation was tracked daily using a project grid system overlain with the closure area. A sketch of the project grid system and the daily clay cap installation log that includes the clay cap material quantities is provided in **Appendix D**.

Ground surveying performed by a Barge surveyor confirmed and recorded the final clay cap elevations using an acceptance accuracy of +/- 0.1-ft. Top of Waste elevations were surveyed and recorded prior to the clay cap installation to provide the baseline elevations for the clay cap installation. Survey points were established throughout the project grid system and used to record the Top of Waste elevations, Top of Clay Cap elevations, Top of Shale elevations, and Top of Topsoil elevations. A sketch of the project survey points and a table providing the fill thickness of the clay cap layer is provided in the as-built drawings in **Appendix G**.

The overlaps with the Phase 1 Area 1 Closure completed in the 1990s and the 2012 Phase 1 Area 2 Partial Closure was performed by stripping the vegetative cover and topsoil to the top of the previous closure's clay cap. This was performed prior to the start of the clay cap installation. The previous closures were stripped to the lateral extent that was needed to achieve a uniform grade with the previous closures.

2.3 Clay Cap Material Geotechnical Testing

Table 2 provides the clay cap material on-site geotechnical testing, the frequency utilized for the closure, and the number of tests required based on the 6.74-acre closure area. The number of tests is rounded up to the next whole number:

TABLE 2
Clay Cap Material On-Site Geotechnical Testing

Parameter	Test Method	Frequency	Number of Tests Required	Number of Tests Performed
Density	ASTM D2922	5/acre/lift	68	**72**
Moisture Content	ASTM D3017	5/acre/lift	68	**72**
Permeability	ASTM D5084	1/3-acre/lift	6	**6**

The project grid system and survey points were used to track the locations and number of density and moisture content test performed. The project grid system consisted of 36 grids and a density and moisture content test was performed in each grid for each lift. Therefore, a total of 72 density and moisture content test were performed. Each density and moisture content test were assigned a grid number and a survey point number for documentation of the location.

Moisture content tests were performed to ensure the clay cap material was +1% to +5% above the Standard Proctor optimum moisture content. Based on the hydraulic conductivity quality control testing, a target range for compaction of 91% to 94% of the Standard Proctor maximum dry density was established to achieve hydraulic conductivity of less than or equal to $1x10^{-6}$ cm/sec. A sketch with the density and moisture content test grid and survey point locations and the test results are provided in **Appendix E**.

A total of six hydraulic conductivity tests were collected during the clay cap installation, three from each lift. Hydraulic conductivity tests were performed to confirm that the clay cap material was less than or equal to $1x10^{-6}$ cm/sec. A sketch with the hydraulic conductivity test grid and survey point locations and the test results are provided in **Appendix F**.

Granular bentonite was used to repair penetrations made in the clay cap material for density/moisture content testing and hydraulic conductivity testing.

2.4 Bottom Clay Liner Connection

A connection with the bottom clay liner and the closure clay cap was achieved by excavating a trench at the toe of the closure. The trench was excavated using an excavator with a 2-foot bucket across the

extent of the closure. Shale material was excavated to the top of bottom clay liner. The bottom clay liner was observed by the Barge CQA representative and landfill personnel. The Barge surveyor recorded the top of the clay liner along the length of the trench. Clay cap material that had been stockpiled the previous day upslope of the trench was installed and compacted using a track loader. Clay cap material was also installed within and graded over top of the trench. The location of the trench is provided on the Top of Clay Cap As-Built in **Appendix G**. Photos are provided in **Appendix H**.

3.0 Stormwater Diversion Berms and Shale Installed for Proper Stormwater Drainage

Three stormwater diversion berms were installed using on-site shale. The berms were installed on the clay cap layer and the topsoil installed over the berms. The berms were constructed approximately 2-ft in height with 3:1 side slopes.

The two northern most berms were connected to existing berms on the Phase 1 Area 1 Closure. These berms drain to an existing ditch adjacent to the access road on the west side of Phase 1 Area 1 Closure that discharges into Stormwater Pond 1. The southernmost berm drains directly to the same existing ditch that discharges into Stormwater Pond 1.

On-site shale was installed in the northwestern portion of the closure to provide proper stormwater drainage in this area. This shale was installed on the clay cap layer and topsoil installed over the shale. The 2000 Minor Permit Modification closure elevations resulted in low areas that retain water after rain events. The shale was installed to provide proper stormwater drainage for this area.

The Barge surveyor recorded the on-site shale installed in the northwestern portion of the closure and the drainage toe of the stormwater diversion berms. A sketch of the project survey points and a table providing the fill thickness of the shale is provided in the as-built drawings in **Appendix G**.

4.0 Topsoil Installation

Topsoil used for the closure was generated on-site from composted leaves collected by the City on an annual basis. The topsoil was located in five stockpiles on the Landfill's property. It was installed after completion of the clay cap layer, the stormwater diversion berms, and the installation of the shale in the northwestern corner of the closure area. The topsoil layer was installed in a 12-inch lift and tracked-in with the CAT D6T dozer equipped with GPS.

The area of topsoil installed was approximately 7.25-acres. The topsoil area exceeded the clay cap area because the overlaps with the previous closures extended laterally beyond the clay cap overlaps

to achieve uniform grades, and because of the additional area outside the northwestern portion of the closure that shale was installed.

The topsoil installation was tracked daily using the project grid system. A sketch of the project grid system and the daily topsoil installation log is provided in **Appendix D**.

The Barge surveyor confirmed and recorded the topsoil elevations using an acceptance accuracy of +/- 0.1-ft. The previously recorded Top of Clay Cap elevations were the baseline elevations for the topsoil installation. In the northwestern closure area where shale was used for drainage grading, the previously recorded Top of Shale elevations were used as the baseline elevations for the topsoil installation. The established survey points were used to record the Top of Topsoil elevations. A sketch of the project survey points and a table providing the fill thickness of the topsoil layer is provided in the as-built drawings in **Appendix G**. Ten of the survey points fell within the stormwater diversion berms and therefore result in greater than 1-foot, +/- 0.1-ft. These points are noted in the table providing the fill thickness.

5.0 Seed and Mulching

Seed, fertilizer, and mulch was installed after the Topsoil was completed. Southern Seeding, Inc. was contracted by the City to perform this work. TDOT Seed Mix C, consisting of Kentucky 31 Fescue, English Rye, and White Clover was used. At their recommendation, Southern Seeding used additional Kentucky 31 Fescue seed above the amount provided in the TDOT Seed Mix C. 15-15-15 fertilizer was used. Mulch was installed approximately 1-inch thick.

Seed and fertilizer were installed using a truck mounted spreader, except for the southern end of the closure where a hydroseeder was used. The mulch was installed using a truck mounted straw blower.

The total amount of TDOT Seed Mix C used was 1,100-lbs. The total amount of Kentucky 31 Fescue used was 1,100-lbs. The total amount of 15-15-15 fertilizer used was 3,000-lbs.

The seed and fertilizer tickets and TDOT Grass Seed Certification are provided in **Appendix I**.

Appendix A

Daily Field Reports

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 5-25-21
Barge CQA Peronnel: E. Lawrence
Weather: 80s - Partly Cloudy

Activities Performed:

☒ **Clay Cap Installation:** 1st lift - Grids 5, 2, 4, 6, 3, 1, 7, 8

☐ **Topsoil Installation:**

Additional Observations/Remarks:

First day of clay cap installation. AE hauling 7-trucks. CAT D6T with GPS grade control installing clay cap. CAT CP56B vibratory sheeps-foot compacting clay cap.

Barge Surveyors on-site checking lift thickness for 1st lift of clay cap

GeoServices technician on-site checking moisture. Checks are within +1 to +5% of OMC. Performed compaction checks and determined that approx 12 passes achieve correct compaction. Will monitor number of passes as project progresses based on any change in the clay cap material
Performed compaction tests for 1st lift

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 5-24-21
Barge CQA Peronnel: E. Lawrence

Weather: 80s · Partly Cloudy

Activities Performed:

[X] **Clay Cap Installation:** 1st Lift - Grids 6, 3, 1

2nd Lift - Grids 8, 7, 4, 5, 2

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap, CAT CP56B compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5% of OMC. Performed compaction tests for 1st lift

TDEC on-site for inspection

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 5-27-21
Barge CQA Peronnel: E. Lawrence

Weather: 80s - Partly Cloudy

Activities Performed:

☒ **Clay Cap Installation:** 1st Lift - 10, 11, 7, 8, 9

2nd Lift - 4, 5, 2

☐ **Topsoil Installation:**

Additional Observations/Remarks:

- AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting
- Barge surveyors on-site checking lift thickness for 1st lift of clay cap and recording Top of Clay Cap

GeoServices technician on-site checking moisture. Checks are within +1 to +5% OMC
Performed compaction tests for 1st and 2nd lifts.
Collected 2 permeabilities. One for second lift and one for first lift.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 5-28-21
Barge CQA Peronnel: E. Lawrence

Weather: 70s - Cloudy
Rain @ 3:00pm

Activities Performed:

☒ **Clay Cap Installation:** 2nd Lift - 6, 7, 3, 4, 2, 1

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5%OMC
Performed compaction tests for 2nd lift

Rain at 3:00 pm stopped work.

No additional work planned until Tuesday 6-1-21. Landfill personnel will monitor clay cap material and apply water as necessary over the 3-day weekend.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-1-21
Barge CQA Peronnel: E. Lawrence

Weather: 70s - Cloudy

Activities Performed:

[X] **Clay Cap Installation:** 2nd lift - 9, 10, 6, 7, 3, 4, 11, 8, 5

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B Compacting

Barge Surveyors on-site recording Top of Clay Cap

GeoServices techician on-site checking moisture. Checks are within +1 to +5 OMC Performed compaction tests for 2nd lift

Landfill Personnel wetting cap clay in AM and PM as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-2-21
Barge CQA Peronnel: E. Lawrence

Weather: 70s - Cloudy

Activities Performed:

☒ **Clay Cap Installation:** 1st Lift - 14, 13, 10, 9

2nd Lift - 14, 13, 10, 11

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting.
Geo Services technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 2nd lift. Performed compaction tests for 1st lift
Landfill Personnel wetting cap clay in AM and PM as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-3-21
Barge CQA Peronnel: E. Lawrence
Weather: 70s - Cloudy w/Rain

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No work on closure due to rain.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-4-21
Barge CQA Peronnel: E. Lawrence
Weather: 70s- Partly Cloudy

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to previous days rain

Compacted 2nd lift in grids 14, 13, 11, 10, 9 in afternoon.

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 2nd lift.

Landfill personnel will wet cap clay over the weekend as needed.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-7-21
Barge CQA Peronnel: E. Lawrence

Weather: 70s · Cloudy
Rain @ 3:30

Activities Performed:

☒ **Clay Cap Installation:** 1st Lift - 14, 16, 13, 12

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-8-21
Barge CQA Peronnel: E. Lawrence

Weather: 80s - Partly cloudy
Trace of afternoon rain

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to previous days rain. Approximately 2-inch of rain in 2-hours Monday afternoon.

Some reeling of cap clay observed in lower end of closure area. Will require some dressing-up and addition of cap clay material as needed.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-9-21
Barge CQA Peronnel: E. Lawrence

Weather: 70s - Cloudy

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to previous days rain at borrow site.

CAT D6T dozer tracking previously installed clay cap material to dress-up from Monday, 6-7-21, rain. CAT CP56B compacting previously installed clay cap material.

Additional Landfill dozer re-grading area outside of closure, adjacent to new cell, to address erosion along the edge of the closure area.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-10-21
Barge CQA Peronnel: E. Lawrence
Weather: 70s - Cloudy w/ Showers

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to overnight rain.

Some rooling of cap clay observed in lower end of closure area.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-11-21
Barge CQA Peronnel: E. Lawrence
Weather: 70s - Rain

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to Wednesday, 6-9-21, overnight rain and rain during the day.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-14-21
Barge CQA Peronnel: E. Lawrence

Weather: 80s - Partly Cloudy

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to previous nights rain at borrow site.

CAT D6T dozer tracking previously installed clay cap material to dress-up from Friday night and Saturday (6/11 & 6/12) rain events. CAT CP56B compacting previously installed clay cap material.

Landfill perssonnel applied water to the cap clay in the afternoon.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-15-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 70s

Activities Performed:

☒ **Clay Cap Installation:** 2nd lift - 14, 16, 13, 12

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 6 trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC. Performed compaction tests for 2nd lift.

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-16-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 70s

Activities Performed:

[X] **Clay Cap Installation:** 2nd lift - 12, 13, 2nd lift erosion repair in grids 1 and 2
1st lift - 19, 22, 18, 16, 15

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap.

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC. Performed compaction tests for 1st lift.

Landfill personnel applying water to previously installed clay cap material as needed.

Repaired erosion in grids 1 and 2. Erosion depth averaged 8 to 9-inches. Water was applied and the dozer tracked over the erosion area. Cap clay was then installed with dozer and then compacted. Barge Surveyor checked grades upon completion.

Constructed lower stormwater diversion berm using on-site soils.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-17-21
Barge CQA Peronnel: E. Laurence

Weather: Sunny - 70s

Activities Performed:

[X] **Clay Cap Installation:** 2nd lift - 19, 22, 18, 16, 15

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B Compacting

Barge Surveyor on-site recording Top of Clay Cap

GeoServices technician on-site checking moisture. Checks are with in +1 to +5 OMC
Performed compaction tests for 2nd lift.
Collected permeability sample for 1st lift.

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-18-21
Barge CQA Peronnel: E. Lawrence
Weather: Sunny - 80s

Activities Performed:

☒ **Clay Cap Installation:** 1st lift - 17, 18, 26, 22, 21, 20
2nd lift - 17, 18

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap.

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift and 2nd lift
Collected permeability sample for 2nd lift.

Landfill personnel applying water to previously installed clay cap material as needed

Excavated a trench accross the full length of the closure at the toe of the closure. An excavator with a 2-ft bucket removed soil/shale to the bottom buffer clay. The bottom buffer clay was visually observed and recorded by the Barge Surveyor. Clay cap material was installed and compacted using a track-loader. Clay cap material was installed/graded from the edge of the closure over top of the trench.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-21-21
Barge CQA Peronnel: E. Lawrence

Weather: Cloudy. 80s

Activities Performed:

[X] **Clay Cap Installation:** 2nd lift - 20, 21, 22, 23, 24, 25

1st lift - 20, 23, 21, 24, 22, 25

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 8-trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap.

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift and 2nd lift.

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-22-21
Barge CQA Peronnel: E. Lawrence

Weather: AM - Rain
PM - Partly Cloudy - 70s

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No cap clay installation due to previous nights and morning rain. No rutting of the cap clay observed.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-23-21
Barge CQA Peronnel: E. Lawrence
Weather: Sunny - 70s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 1, 2, 3, 4, 5

Additional Observations/Remarks:

No cap clay installation due to previous days rain at borrow site. Previously installed clay cap material has good moisture on top and will not require Landfill personnel to apply water on this date.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-24-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☒ **Clay Cap Installation:** 1st Lift - 23, 24, 25, 26

2nd Lift - 23, 24, 25, 26

☒ **Topsoil Installation:** Grids - 3, 4, 5, 6, 7, 8, 9, 10, 11

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56 compacting.

Barge Surveyor on-site recording Top of Clay Cap and Topsoil.

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift

Landfill personnel applying water to previously installed clay cap material as needed

Constructed middle stormwater diversion berm using on-site soils

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-25-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☒ **Clay Cap Installation:** 1st Lift - 26, 29, 25, 28, 24, 27, 23

2nd Lift - 26, 29, 25, 28, 24, 27, 23

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56 Compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC

Performed compaction tests for 2nd lift and 1st lift

Landfill personnel applying water to previously installed clay cap material as needed

Constructed upper stormwater diversion berm using on-site soils

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-28-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny · 80s

Activities Performed:

[X] **Clay Cap Installation:** 1st Lift - 33, 29, 28, 31, 27, 30

2nd Lift - 27, 30, 28, 31

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift and 2nd lift

Barge Surveyor on-site Top of Clay Cap

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-29-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny 80s

Activities Performed:

☒ **Clay Cap Installation:** 2nd Lift - 29, 33

1st Lift - 36, 35, 34, 30

☐ **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC

Performed compaction tests for 2nd lift and 1st lift

Collected 1 permeability for 2nd lift

Barge Surveyor on-site recording Top of Clay Cap

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 6-30-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

[X] **Clay Cap Installation:** 2nd Lift - 36, 35, 34, 50

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting
GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 2nd lift
Collected 1 permeability for 1st lift
Barge Surveyor on-site recording Top of Clay Cap
Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-1-21
Barge CQA Peronnel: E. Lawrence

Weather: Cloudy - 70s

Activities Performed:

[X] Clay Cap Installation: 1st Lift - 31, 32, 33

2nd Lift - 33, 36

[ ] Topsoil Installation:

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 1st lift.

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-2-21
Barge CQA Peronnel: E. Lawrence
Weather: Am Rain

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

No work due to previous nights rain and morning rain.

No additional work scheduled until Tuesday, July 6, due to holiday.

Landfill personnel will apply water to previously installed clay cap material as needed over the weekend

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-6-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

[X] **Clay Cap Installation:** 2nd Lift - 33, 32, 31, 30

Completed Clay Cap Installation on this date.

[ ] **Topsoil Installation:**

Additional Observations/Remarks:

AE hauling 7-trucks. CAT D6T installing clay cap. CAT CP56B compacting

Barge Surveyor on-site recording Top of Clay Cap

GeoServices technician on-site checking moisture. Checks are within +1 to +5 OMC
Performed compaction tests for 2nd Lift

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-7-21
Barge CQA Peronnel: E. Lawrence

Weather: P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

Installed on-site soils for drainage grading at entrance area of closure

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-8-21
Barge CQA Peronnel: E. Lawrence

Weather: Cloudy. 70s

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

Installed on-site soils for drainage grading at entrance area of closure

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-9-21
Barge CQA Peronnel: E. Lawrence
Weather: Cloudy - 70s w/ Showers

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

Installed on-site soils for drainage grading at entrance area of closure

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-12-21
Barge CQA Peronnel: E. Lawrence

Weather: P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

Installed on-site soils for drainage grading at entrance area of closure

Barge surveyor on-site recording drainage grading

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-13-21
Barge CQA Peronnel: E. Lawrence

Weather: P.Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 10, 11, 14, 9, 12, 15, 17

Additional Observations/Remarks:

Installed on-site soils for drainage grading at entrance area of closure

Barge surveyor on-site recording drainage grading

Landfill personnel applying water to previously installed clay cap material as needed

CAT D6T installing Topsoil. Landfill personnel loading and hauling Topsoil

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-14-21
Barge CQA Peronnel: E. Lawrence

Weather: AM - Rain
P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 9, 12, 13, 14, 15, 16

Additional Observations/Remarks:

No work until 10:00 am due to morning rain

CAT D6T installing Topsoil from previous days loads. No Topsoil hauled to Closure Area due to morning rain

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-15-21
Barge CQA Peronnel: E. Lawrence

Weather: P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 12, 15, 13, 16, 14

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personel loading 2 contracted trucks

Barge surveyor on-site recording Topsoil

Landfill personel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-16-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 15, 17, 16, 18, 14, 19

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 2 contracted trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-19-21
Barge CQA Peronnel: E. Lawrence
Weather: P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 30, 34, 35, 36, 33, 32, 31

Additional Observations/Remarks:
CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks
Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-20-21
Barge CQA Peronnel: E. Lawrence

Weather: Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 33, 32, 17, 18

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-21-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☐ Clay Cap Installation:

☒ Topsoil Installation: Grids - 14, 19, 22, 20, 21, 23

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-22-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 21, 22, 24, 25, 26

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-23-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny- 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 24, 25, 26, 27, 28, 30, 31

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-26-21
Barge CQA Peronnel: E. Lawrence

Weather: P. Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 25, 28, 31, 26, 29

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-27-21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80s

Activities Performed:

☐ Clay Cap Installation:

☒ Topsoil Installation: Grids - 26, 29, 1, 3, 4

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

Landfill personnel applying water to previously installed clay cap material as needed

Began installing remaining Topsoil layer in area between the lowest berm and the second berm on top of protective layer of topsoil that was previously installed. Previous layer was approximately 6-inches thick.

All clay cap surface has been covered with Topsoil on this date.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7.28.21
Barge CQA Peronnel: E. Lawrence

Weather: Sunny - 80/90s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 3, 4, 5, 6, 7, 8, 9

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks

Barge surveyor on-site recording Topsoil

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-29-21
Barge CQA Peronnel: E. Lawrence
Weather: Sunny. 80/90s

Activities Performed:

☐ Clay Cap Installation:

☒ Topsoil Installation: Grids - 7, 8, 10, 11, 13, 14

Additional Observations/Remarks:
CAT D6T installing Topsoil. Landfill personnel loading 1 contracted truck and 2 City trucks
Barge surveyor on-site recording Topsoil

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 7-30-21
Barge CQA Peronnel: E. Lawrence

Weather: Cloudy - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☒ **Topsoil Installation:** Grids - 31, 30, 5, 1, 4

Additional Observations/Remarks:

CAT D6T installing Topsoil. Landfill personnel loading 2 City trucks

Completed Topsoil installation at Access Road for Grids 31 and 30. Installed additional Topsoil along the edge of Grid 5 to address low area. Installed additional Topsoil in Grids 1 and 4 to address low area adjacent to lowest berm.

Barge surveyor on-site recording Topsoil

Topsoil installation was completed on this date.

City of Kingsport C&D Landfill Phase 1 Area 2 Closure
Field Report

Date: 8-5-21
Barge CQA Peronnel: E. Lawrence
Weather: Sunny - 80s

Activities Performed:

☐ **Clay Cap Installation:**

☐ **Topsoil Installation:**

Additional Observations/Remarks:

Southern Seeding on-site installing seeding, fertilizer, and straw. A truck mounted seed spreader is installing seed and fertilizer on approximately 5.25-acres of the upper closure area. The truck mounted seed spreader is making uniform and even passes accross the topsoil.

A hydroseeder is installing seed and fertilizer on approximately 2.0- acres of the lower closure area

A straw blower is installing ~~straw~~ straw to the closure area. Straw is being installed evenly and at an approximately 01-inch thickness across closure area

All work was completed on this date

Appendix B

TDEC Construction Facility Inspection Checklist and Site Photos

TENNESSEE DIVISION OF SOLID WASTE MANAGEMENT
CONSTRUCTION FACILITY INSPECTION CHECKLIST*

CONSTRUCTION

FACILITY NAME	PERMIT NUMBER	DATE/TIME	WEATHER
Kingsport Demollition Landfill	DML 82-000-0016	6/25/2021	Partly Cloudy

FACILITY ADDRESS	EFO
DM1921 Brookside Lane, Kingsport, TN Sullivan Co.	JCITY

☑ CLAY LINER INSTALL ☐ FML SYNTHETIC LINER ☐ DRAINAGE LAYER CONSTRUCTION

A. CLAY LINER	OBSERVED		
1. BORROW MATERIAL	YES	NO	N/A
ARE ANY ROOTS OR DEBRIS PRESENT?	☐	☒	☐
COMMENT			
ARE BORROW MATERIALS BEING FIELD TESTED?	☐	☒	☐
COMMENT	Yes		
IS THE SOIL COHESIVE?	☐	☒	☐
COMMENT	Yes		
ARE ROCKS LARGER THAN 2 INCHES PRESENT?	☒	☐	☐
COMMENT	Yes, Some rock larger than 2" inches were present in some of the fill being placed.		
2. PLACEMENT	YES	NO	N/A
IS A WATER TRUCK ON SITE TO PROTECT THE LINER FROM DESICCATION?	☒	☐	☐
COMMENT			
IS SUBGRADE (PREVIOUS LIFT) SCARIFIED PRIOR TO PLACEMENT?	☒	☐	☐
COMMENT	Yes		
IS SUBGRADE DRYING OUT?	☒	☐	☐
COMMENT	A little dry, but the water truck was getting ready to run over the material.		
ARE CQA PERSONNEL ON SITE?	☒	☐	☐
COMMENT	Yes		
ARE LOOSELIFTS OF PROPER THICKNESS?	☒	☐	☐
COMMENT	As discussed prior to the construction, in 9" lifts.		

3. COMPACTION	YES	NO	N/A
IS EQUIPMENT ON SITE APPROPRIATE FOR CONSTRUCTION OF LINER?	☒	☐	☐
COMMENT			
IS COMPACTED LINER BEING FIELD TESTED?	☒	☐	☐
COMMENT			
DOES NUMBER OF PASSES CONFORM TO PLAN?	☒	☐	☐
COMMENT			

4. SURFACE FINISHING	YES	NO	N/A
IS THE FINAL LIFT SMOOTH ENOUGH FOR THE PLACEMENT OF THE GEOMEMBRANE?	☐	☐	☒
COMMENT			

5. PROTECTION	YES	NO	N/A
IS THE LINER BEING PROTECTED FROM DESICCATION AND FREEZING?	☒	☐	☐
COMMENT			

6. FINAL GRADING	YES	NO	N/A
HAS LINER BEEN SURVEYED TO CHECK GRADE AND THICKNESS?	☒	☐	☐
COMMENT			

B. FML SYNTHETIC LINER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS LINER BEEN DAMAGED DURING STORAGE?	☐	☐	☒
COMMENT			
IS FML PROPER THICKNESS AND TYPE?	☐	☐	☒
COMMENT			
2. INSTALLATION	YES	NO	N/A
IS EARTH MOVING EQUIPMENT KEPT OFF LINER?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
ARE SEAM SURFACES CLEAN AND FREE OF DIRT?	☐	☐	☒
COMMENT			
ARE LINER ANCHORS IN CONFORMANCE WITH DESIGN?	☐	☐	☒
COMMENT			
IS LINER WEIGHTED AGAINST WIND?	☐	☐	☒
COMMENT			
IS CLAY SURFACE SMOOTH AND FREE OF ROCKS?	☐	☐	☒
COMMENT			
3. TESTING	YES	NO	N/A
HAVE ALL SEAMS BEEN (OR ARE BEING) TESTED?	☐	☐	☒
COMMENT			
ARE DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			
ARE NON-DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			

C. DRAINAGE LAYER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS GEOTEXTILE BEEN INSTALLED TO PROTECT FML (IF NECESSARY)?	☐	☐	☒
COMMENT			
HAS (SAND / AGGREGATE) DRAINAGE MATERIAL PASSED THE MINIMUM PERMEABILITY SPECIFICATION?	☐	☐	☒
COMMENT			
IS THE FML EXPOSED?	☐	☐	☒
COMMENT			
IS DRAINAGE MATERIAL FREE OF DIRT?	☐	☐	☒
COMMENT			
2. PLACEMENT METHOD	YES	NO	N/A
DOES PLACEMENT METHOD PROTECT THE FML?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
HAVE LEACHATE TRENCHES BEEN INSTALLED ACCORDING TO PLAN?	☐	☐	☒
COMMENT			
3. GEOTEXTILE	YES	NO	N/A
DOES GEOTEXTILE MEET THE REQUIREMENTS OUTLINED IN THE PLAN?	☐	☐	☒
COMMENT			
4. PIPES	YES	NO	N/A
DOES PIPE MEET SIZE AND THICKNESS REQUIREMENTS SPECIFIED IN THE DESIGN PLANS / DRAWINGS?	☐	☐	☒
COMMENT			
5. SUMPS	YES	NO	N/A
DO SUMP LOCATION, CONFIGURATION, AND CONSTRUCTION MATERIALS CONFORM TO THE APPROVED?	☐	☐	☒
COMMENT			

FOLLOW-UP INSPECTION DATE

SAVE FORM

INSPECTOR SIGNATURE George M. Thornsbury Digitally signed by George M. Thornsbury Date: 2021.06.30 16:11:39 -04'00'

ADDITIONAL COMMENTS

Inspection findings are based upon site observations, file review, and/or verbal and written information provided by facility personnel during the inspection. The Construction inspection was completed with Noah from the City of Kingsport and Eddie Lawrence from Barge Design Solutions.

The facility had completed about 2/3 of the clay liner and had ~ 2 acres left to finish both lifts of clay liner. The facility has finished the 12 inches of topsoil on the slope facing the sediment pond and had roughly 2 more acres that had the initial lift of topsoil placed. The facility has done a great job at installing their tack-on berms as they have closed this area. The facility was going to be installing the third tack-on berm before they left that day.

The facility plans on continuing with the clay liner and topsoil in the coming weeks and finish the closure of this area. Continue to make several passes over the clay with sheep foot compactor to ensure compaction of all the material.

Figure 1: CLAY BEING HAULED INTO THE SITE

Figure 2: EDGE OF CLAY LINER INSTALLED

Figure 3: CLAY LINER BEING COMPACTED

Figure 4: COMPACTED CLAY LINER

Figure 5: TACK-ON BERM CONSTRUCTED OF SHALE OVER THE CLAY LINER

Figure 6: FIRST LIFT OF TOPSOIL BETWEEN THE LOWEST TACK-ON BERM AND THE SECOND TACK-ON BERM

Figure 7: FIRST LIFT OF TOPSOIL BETWEEN THE LOWEST TACK-ON BERM AND THE SECOND TACK-ON BERM

Figure 8: SECOND TACK-ON BERM (LOOKING NORTH)

Figure 9: LOOKING SOUTHEAST

Figure 10: NORTHERN EDGE OF CLAY LINER

Figure 11: EDGE OF CLAY LINER OF WHAT HAS BEEN CONSTRUCTED

Figure 12: EDGE OF CLAY LINER CONSTRUCTED TO-DATE

Figure 13: EASTERN SLOPE WITH TOPSOIL INSTALLED

TENNESSEE DIVISION OF SOLID WASTE MANAGEMENT
CONSTRUCTION FACILITY INSPECTION CHECKLIST*

CONSTRUCTION

FACILITY NAME	PERMIT NUMBER	DATE/TIME	WEATHER
Kingsport Demollition Landfill	DML 82-000-0016	7/14/2021/ 11:00AM	Cloudy

FACILITY ADDRESS	EFO
DM1921 Brookside Lane, Kingsport, TN Sullivan Co.	JCITY

☑ CLAY LINER INSTALL ☐ FML SYNTHETIC LINER ☐ DRAINAGE LAYER CONSTRUCTION

A. CLAY LINER	OBSERVED		
1. BORROW MATERIAL	YES	NO	N/A
ARE ANY ROOTS OR DEBRIS PRESENT?	☐	☒	☐
COMMENT			
ARE BORROW MATERIALS BEING FIELD TESTED?	☒	☐	☐
COMMENT	Yes		
IS THE SOIL COHESIVE?	☒	☐	☐
COMMENT	Yes		
ARE ROCKS LARGER THAN 2 INCHES PRESENT?	☒	☐	☐
COMMENT	Yes, Some rock larger than 2" inches were present in some of the fill being placed.		
2. PLACEMENT	YES	NO	N/A
IS A WATER TRUCK ON SITE TO PROTECT THE LINER FROM DESICCATION?	☒	☐	☐
COMMENT			
IS SUBGRADE (PREVIOUS LIFT) SCARIFIED PRIOR TO PLACEMENT?	☐	☐	☒
COMMENT	Clay has been fully installed.		
IS SUBGRADE DRYING OUT?	☒	☐	☐
COMMENT	The site had received rain earlier in the day and over night.		
ARE CQA PERSONNEL ON SITE?	☒	☐	☐
COMMENT	Yes, watching the installation of the topsoil.		
ARE LOOSELIFTS OF PROPER THICKNESS?	☒	☐	☐
COMMENT			

3. COMPACTION	YES	NO	N/A
IS EQUIPMENT ON SITE APPROPRIATE FOR CONSTRUCTION OF LINER?	☒	☐	☐
COMMENT			
IS COMPACTED LINER BEING FIELD TESTED?	☒	☐	☐
COMMENT			
DOES NUMBER OF PASSES CONFORM TO PLAN?	☒	☐	☐
COMMENT			

4. SURFACE FINISHING	YES	NO	N/A
IS THE FINAL LIFT SMOOTH ENOUGH FOR THE PLACEMENT OF THE GEOMEMBRANE?	☐	☐	☒
COMMENT			

5. PROTECTION	YES	NO	N/A
IS THE LINER BEING PROTECTED FROM DESICCATION AND FREEZING?	☒	☐	☐
COMMENT			

6. FINAL GRADING	YES	NO	N/A
HAS LINER BEEN SURVEYED TO CHECK GRADE AND THICKNESS?	☒	☐	☐
COMMENT	Surveyor was on-site surveying.		

B. FML SYNTHETIC LINER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS LINER BEEN DAMAGED DURING STORAGE?	☐	☐	☒
COMMENT			
IS FML PROPER THICKNESS AND TYPE?	☐	☐	☒
COMMENT			
2. INSTALLATION	YES	NO	N/A
IS EARTH MOVING EQUIPMENT KEPT OFF LINER?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
ARE SEAM SURFACES CLEAN AND FREE OF DIRT?	☐	☐	☒
COMMENT			
ARE LINER ANCHORS IN CONFORMANCE WITH DESIGN?	☐	☐	☒
COMMENT			
IS LINER WEIGHTED AGAINST WIND?	☐	☐	☒
COMMENT			
IS CLAY SURFACE SMOOTH AND FREE OF ROCKS?	☐	☐	☒
COMMENT			
3. TESTING	YES	NO	N/A
HAVE ALL SEAMS BEEN (OR ARE BEING) TESTED?	☐	☐	☒
COMMENT			
ARE DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			
ARE NON-DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			

C. DRAINAGE LAYER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS GEOTEXTILE BEEN INSTALLED TO PROTECT FML (IF NECESSARY)?	☐	☐	☒
COMMENT			
HAS (SAND / AGGREGATE) DRAINAGE MATERIAL PASSED THE MINIMUM PERMEABILITY SPECIFICATION?	☐	☐	☒
COMMENT			
IS THE FML EXPOSED?	☐	☐	☒
COMMENT			
IS DRAINAGE MATERIAL FREE OF DIRT?	☐	☐	☒
COMMENT			
2. PLACEMENT METHOD	YES	NO	N/A
DOES PLACEMENT METHOD PROTECT THE FML?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
HAVE LEACHATE TRENCHES BEEN INSTALLED ACCORDING TO PLAN?	☐	☐	☒
COMMENT			
3. GEOTEXTILE	YES	NO	N/A
DOES GEOTEXTILE MEET THE REQUIREMENTS OUTLINED IN THE PLAN?	☐	☐	☒
COMMENT			
4. PIPES	YES	NO	N/A
DOES PIPE MEET SIZE AND THICKNESS REQUIREMENTS SPECIFIED IN THE DESIGN PLANS / DRAWINGS?	☐	☐	☒
COMMENT			
5. SUMPS	YES	NO	N/A
DO SUMP LOCATION, CONFIGURATION, AND CONSTRUCTION MATERIALS CONFORM TO THE APPROVED?	☐	☐	☒
COMMENT			

FOLLOW-UP INSPECTION DATE

SAVE FORM

INSPECTOR SIGNATURE George M. Thornsbury Digitally signed by George M. Thornsbury Date: 2021.07.16 15:04:11 -04'00'

ADDITIONAL COMMENTS

Inspection findings are based upon site observations, file review, and/or verbal and written information provided by facility personnel during the inspection. The Construction inspection was completed with Noah McMurray (City of Kingsport), Eddie Lawrence (Barge Design Solutions), Briana Bishop (DSWM).

The facility has completed all of the clay liner and also installed shale for grading purposes above the clay liner. The facility has finished the 12 inches of topsoil on the slope facing the sediment pond and grass is starting to grow, but some of the areas looked a little thin in this area of topsoil.

The facility had constructed the third tack-on berm. The operators were installing topsoil between the first and second tack-on berms and the surveyor was on-site surveying.

The facility plans on continuing topsoil in the coming two weeks and finish the closure of this area.

Figure 1: 3RD TACK-ON BERM INSTALLED

Figure 2: SHALE AREA IN THE NORTH EAST CORNER OF THE CLOSURE AREA

Figure 3: 2ND TACK-ON BERM

Figure 4: INSTALLATION OF THE TOPSOIL BETWEEN THE 1ST AND 2ND TACK-ON BERM

Figure 5: CLOSER LOOK AT THE TOPSOIL

Figure 6: ONE OF FIVE TOPSOIL PILES

Figure 7: EASTERN SLOPE TOPSOIL GROWING GRASS

TENNESSEE DIVISION OF SOLID WASTE MANAGEMENT
CONSTRUCTION FACILITY INSPECTION CHECKLIST*

CONSTRUCTION

FACILITY NAME	PERMIT NUMBER	DATE/TIME	WEATHER
Kingsport Demollition Landfill	DML 82-000-0016	8/11/2021/ 11:00AM	Partly Cloudy

FACILITY ADDRESS	EFO
DM1921 Brookside Lane, Kingsport, TN Sullivan Co.	JCITY

☐ CLAY LINER INSTALL ☐ FML SYNTHETIC LINER ☐ DRAINAGE LAYER CONSTRUCTION

A. CLAY LINER	OBSERVED		
1. BORROW MATERIAL	YES	NO	N/A
ARE ANY ROOTS OR DEBRIS PRESENT?	☐	☐	☒
COMMENT			
ARE BORROW MATERIALS BEING FIELD TESTED?	☐	☐	☒
COMMENT			
IS THE SOIL COHESIVE?	☐	☐	☒
COMMENT			
ARE ROCKS LARGER THAN 2 INCHES PRESENT?	☐	☐	☒
COMMENT			
2. PLACEMENT	YES	NO	N/A
IS A WATER TRUCK ON SITE TO PROTECT THE LINER FROM DESICCATION?	☐	☐	☒
COMMENT			
IS SUBGRADE (PREVIOUS LIFT) SCARIFIED PRIOR TO PLACEMENT?	☐	☐	☒
COMMENT			
IS SUBGRADE DRYING OUT?	☐	☐	☒
COMMENT			
ARE CQA PERSONNEL ON SITE?	☒	☐	☐
COMMENT	Yes, for the inspection of the area closed.		
ARE LOOSELIFTS OF PROPER THICKNESS?	☐	☐	☒
COMMENT			

3. COMPACTION	YES	NO	N/A
IS EQUIPMENT ON SITE APPROPRIATE FOR CONSTRUCTION OF LINER?	☐	☐	☒
COMMENT			
IS COMPACTED LINER BEING FIELD TESTED?	☐	☐	☒
COMMENT			
DOES NUMBER OF PASSES CONFORM TO PLAN?	☐	☐	☒
COMMENT			
4. SURFACE FINISHING	YES	NO	N/A
IS THE FINAL LIFT SMOOTH ENOUGH FOR THE PLACEMENT OF THE GEOMEMBRANE?	☐	☐	☒
COMMENT			
5. PROTECTION	YES	NO	N/A
IS THE LINER BEING PROTECTED FROM DESICCATION AND FREEZING?	☐	☐	☒
COMMENT			
6. FINAL GRADING	YES	NO	N/A
HAS LINER BEEN SURVEYED TO CHECK GRADE AND THICKNESS?	☐	☐	☒
COMMENT			

B. FML SYNTHETIC LINER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS LINER BEEN DAMAGED DURING STORAGE?	☐	☐	☒
COMMENT			
IS FML PROPER THICKNESS AND TYPE?	☐	☐	☒
COMMENT			
2. INSTALLATION	YES	NO	N/A
IS EARTH MOVING EQUIPMENT KEPT OFF LINER?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
ARE SEAM SURFACES CLEAN AND FREE OF DIRT?	☐	☐	☒
COMMENT			
ARE LINER ANCHORS IN CONFORMANCE WITH DESIGN?	☐	☐	☒
COMMENT			
IS LINER WEIGHTED AGAINST WIND?	☐	☐	☒
COMMENT			
IS CLAY SURFACE SMOOTH AND FREE OF ROCKS?	☐	☐	☒
COMMENT			
3. TESTING	YES	NO	N/A
HAVE ALL SEAMS BEEN (OR ARE BEING) TESTED?	☐	☐	☒
COMMENT			
ARE DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			
ARE NON-DESTRUCTIVE TESTS BEING PERFORMED?	☐	☐	☒
COMMENT			

C. DRAINAGE LAYER	OBSERVED		
1. MATERIAL	YES	NO	N/A
HAS GEOTEXTILE BEEN INSTALLED TO PROTECT FML (IF NECESSARY)?	☐	☐	☒
COMMENT			
HAS (SAND / AGGREGATE) DRAINAGE MATERIAL PASSED THE MINIMUM PERMEABILITY SPECIFICATION?	☐	☐	☒
COMMENT			
IS THE FML EXPOSED?	☐	☐	☒
COMMENT			
IS DRAINAGE MATERIAL FREE OF DIRT?	☐	☐	☒
COMMENT			
2. PLACEMENT METHOD	YES	NO	N/A
DOES PLACEMENT METHOD PROTECT THE FML?	☐	☐	☒
COMMENT			
IS QA MANAGER ON SITE?	☐	☐	☒
COMMENT			
HAVE LEACHATE TRENCHES BEEN INSTALLED ACCORDING TO PLAN?	☐	☐	☒
COMMENT			
3. GEOTEXTILE	YES	NO	N/A
DOES GEOTEXTILE MEET THE REQUIREMENTS OUTLINED IN THE PLAN?	☐	☐	☒
COMMENT			
4. PIPES	YES	NO	N/A
DOES PIPE MEET SIZE AND THICKNESS REQUIREMENTS SPECIFIED IN THE DESIGN PLANS / DRAWINGS?	☐	☐	☒
COMMENT			
5. SUMPS	YES	NO	N/A
DO SUMP LOCATION, CONFIGURATION, AND CONSTRUCTION MATERIALS CONFORM TO THE APPROVED?	☐	☐	☒
COMMENT			

FOLLOW-UP INSPECTION DATE

SAVE FORM

INSPECTOR SIGNATURE George M. Thornsbury Digitally signed by George M. Thornsbury Date: 2021.08.18 14:10:56 -04'00'

ADDITIONAL COMMENTS

Inspection findings are based upon site observations, file review, and/or verbal and written information provided by facility personnel during the inspection. The Construction inspection was completed with Rodney Deel and Greg (City of Kingsport), and Eddie Lawrence (Barge Design Solutions)..

The inspection was look at the final work of the closure area and a final inspection of area. The facility has completed all of the clay liner, shale placement, topsoil, straw and seeding and drainage breaks on the closure area. The area was walked by all of use to look at the area and the area was covered with topsoil, straw and seed. The work appeared to be completed as permitted and the CQA report will be coming in the next couple of months.

Seed and straw was also placed past the waste boundary on the southern end of the closure area. Due to the time of year, the hot part of the year, the vegetative growth will have to be watched to ensure growth on the final closure area.

Figure 1: SOUTHERN END OF THE CLOSURE CELL

Figure 2: SOUTHERN END OF THE CLOSURE AREA (EAST SIDE)

Figure 3: NORTHERN EDGE

Figure 4: LOOKING SOUTH ALONG THE TIE-IN TO THE PREVIOUS CELL

Figure 5: DRAINAGE BERM (LOOKING WEST)

Figure 6: LOOKING EAST ALONG DRAINAGE BERM

Figure 7: LOOKING SOUTH OVER DRAINAGE BERM

Figure 8: SECOND DRAINAGE BERM

Figure 9: EASTERN EDGE OF CLOSURE AREA (LOOKING SOUTH)

Figure 10: EASTERN CLOSURE EDGE (LOOKING NORTH)

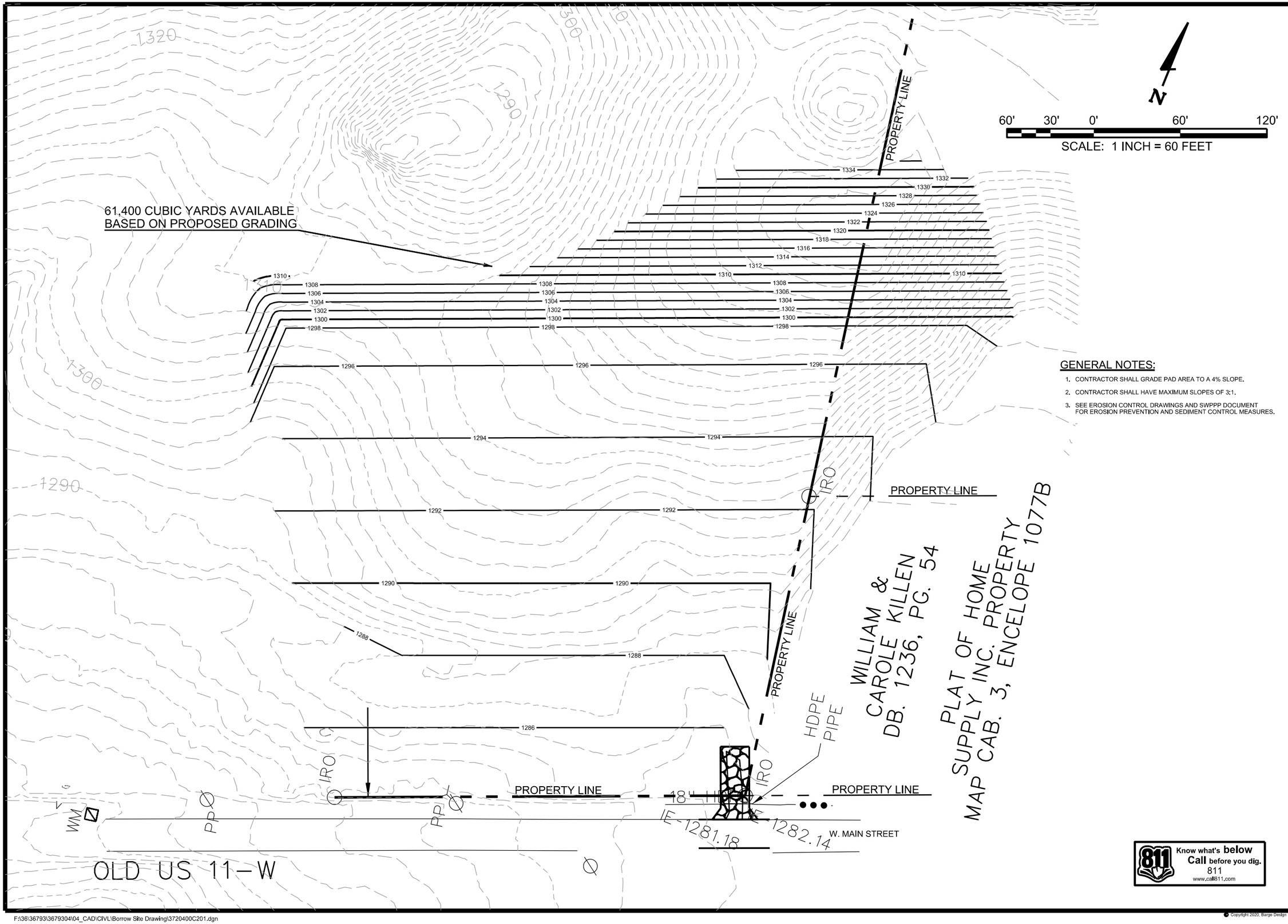
Figure 11: TOP OF THE EASTERN EDGE CONNECTING INTO A CLOSED AREA

Figure 12: LOOKING WEST ALONG THE NORTHERN CLOSURE AREA EDGE

Figure 13: EASTERN EDGE OF THE CLOSURE AREA (LOOKING SOUTH)

Appendix C

Clay Cap Source Quality Control and Borrow Site Topographic Map



GENERAL NOTES:

1. CONTRACTOR SHALL GRADE PAD AREA TO A 4% SLOPE.
2. CONTRACTOR SHALL HAVE MAXIMUM SLOPES OF 3:1.
3. SEE EROSION CONTROL DRAWINGS AND SWPPP DOCUMENT FOR EROSION PREVENTION AND SEDIMENT CONTROL MEASURES.

BARGE DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

MICHAEL D. HECK
REGISTERED ENGINEER
AGRICULTURE
STATE OF TENNESSEE
No. 112974

BORROW SITE

AMERICAN ENVIRONMENTAL BORROW SITE
AMERICAN ENVIRONMENTAL, LLC
CHURCH HILL, TENNESSEE

REV.	DR.	CHK.	DATE	REVISION INFORMATION DESCRIPTION
0	MH	EL	08/12/2020	ISSUED FOR PERMIT/CONSTRUCTION

C2.01

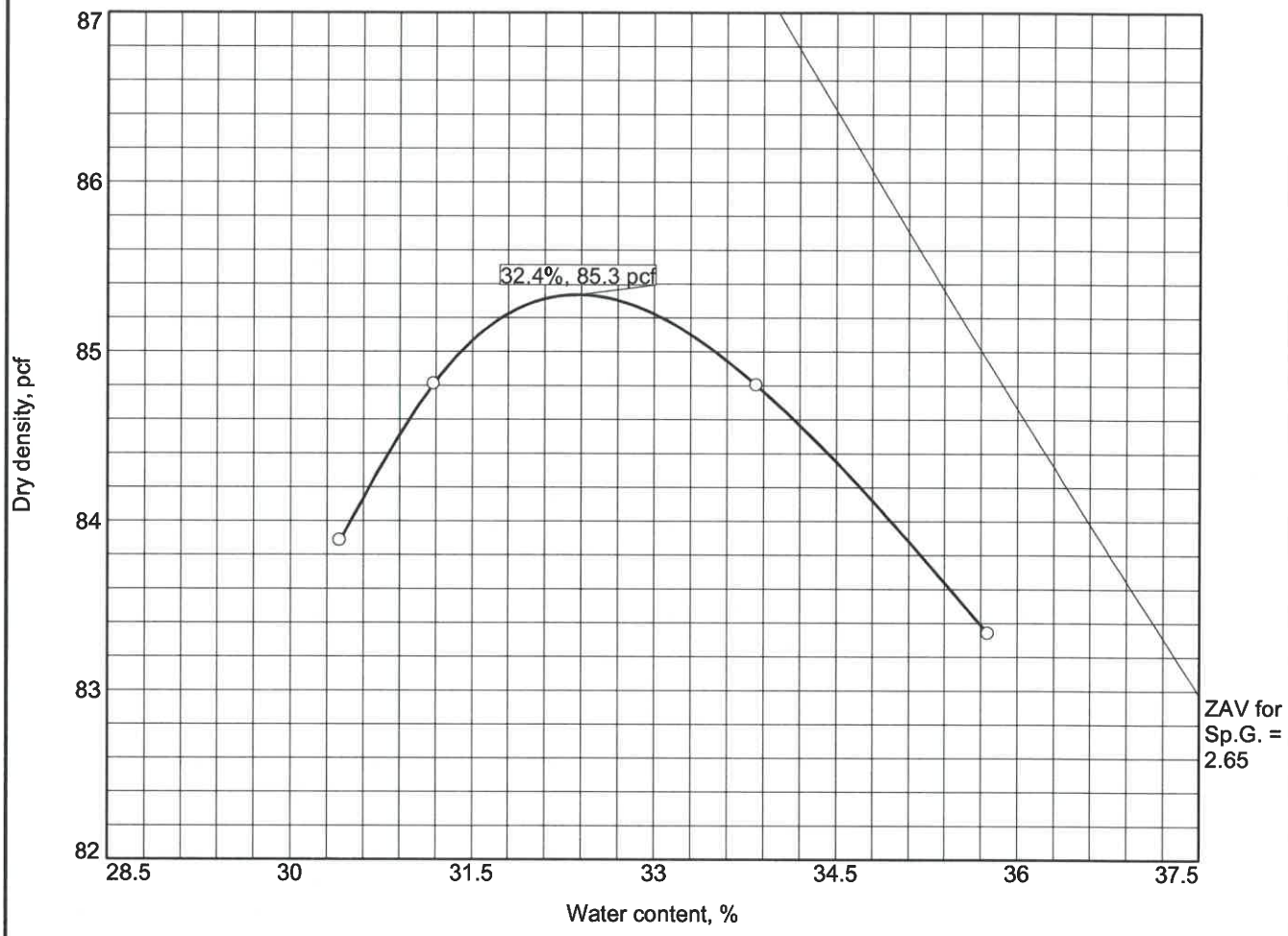
FILE NO. 36793-04

Know what's **below** Call **before you dig.** 811 www.call811.com

9/24/2021
8:32:19 AM
STLeonard
LandRes,pen Workspace: LandRes

F:\36\36793\3679304\04_CAD\CIVL\Borrow Site Drawing\3720400C201.dgn

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure B Standard / Natural Moisture - (ASTM D 2216)

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH	A-7-5(25)	40.9	2.65	63	33	15.9	73.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 85.3 pcf Optimum moisture = 32.4 %	Reddish Tan Clay with Chert

Project No. 52-21103 **Client:** American Environmental
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

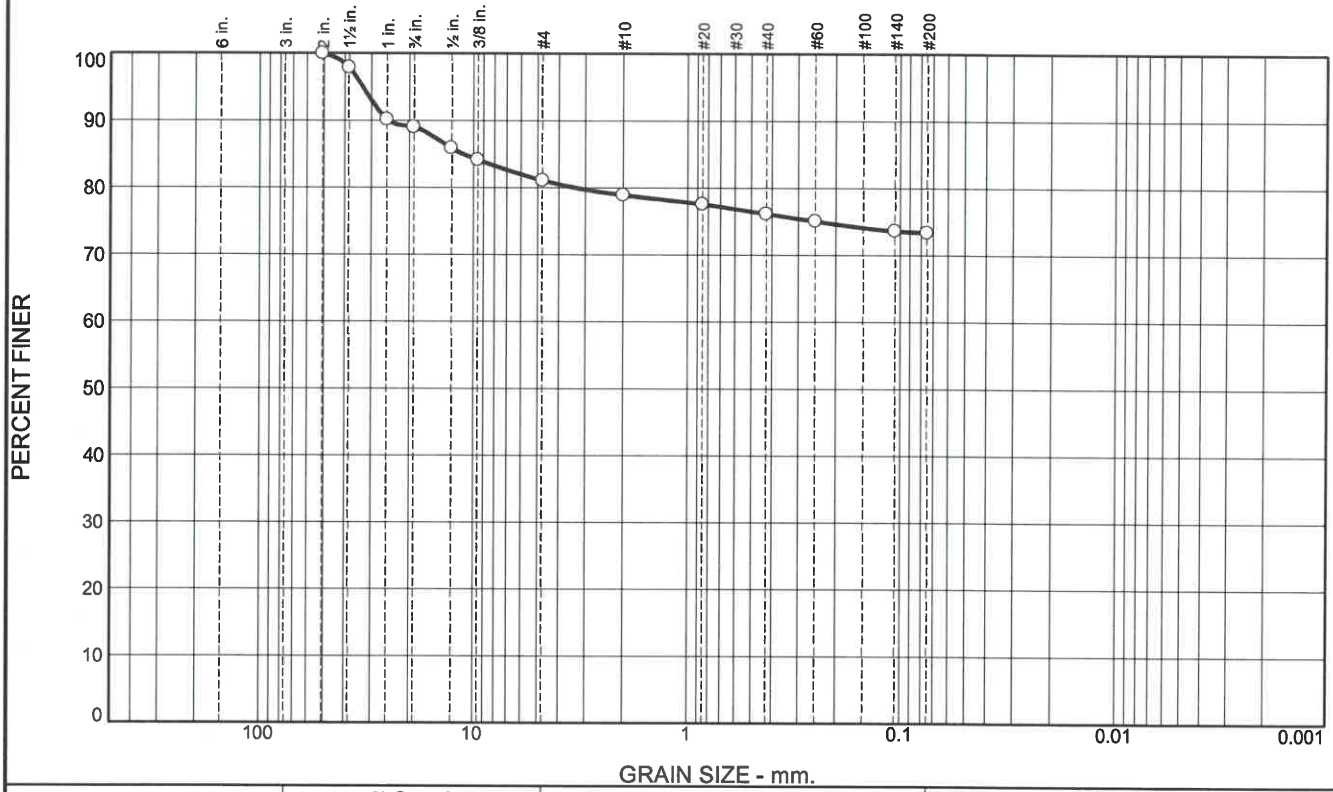
○**Location:** American Environmental Borrow Pit **Sample Number:** Log 812

GEOServices, LLC, Knoxville, Tennessee

Remarks:

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.0	7.9	2.2	2.8	2.7	73.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	97.9		
1	90.1		
.75	89.0		
.5	85.9		
.375	84.1		
#4	81.1		
#10	78.9		
#20	77.6		
#40	76.1		
#60	75.1		
#140	73.6		
#200	73.4		

* (no specification provided)

Soil Description

Reddish Tan Clay with Chert

Atterberg Limits

PL= 30 LL= 63 PI= 33

Coefficients

D_{90}= 25.1406 D_{85}= 11.2188 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(25)

Remarks

Location: American Environmental Borrow Pit
Sample Number: Log 812

Date:

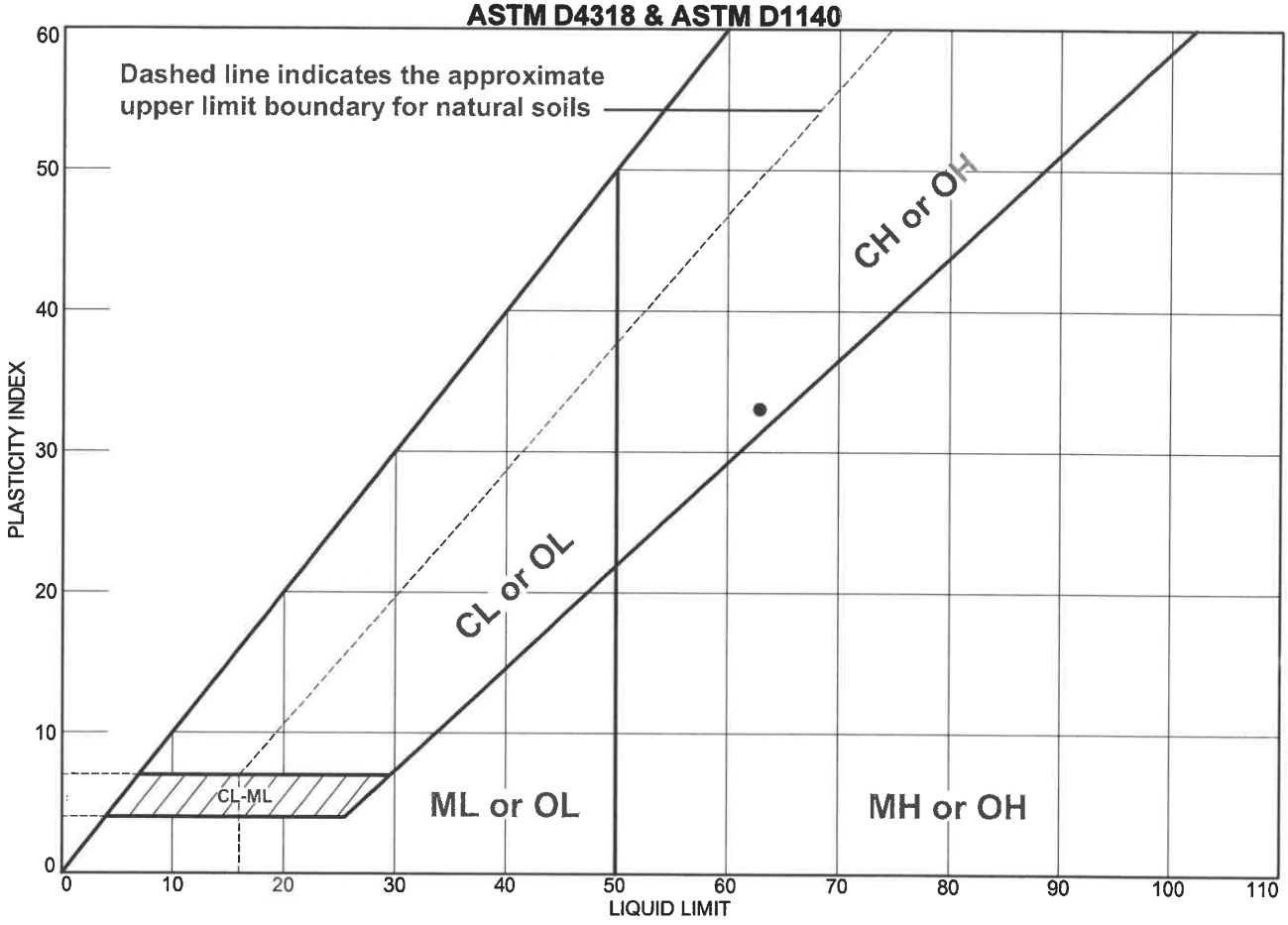
GEOServices, LLC, Knoxville, Tennessee

Client: American Environmental
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing
Project No: 52-21103

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT

ASTM D4318 & ASTM D1140



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Reddish Tan Clay with Chert	63	30	33	76.1	73.4	CH

Project No. 52-21103 **Client:** American Environmental

Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

●**Location:** American Environmental Borrow Pit **Sample Number:** Log 812

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **2/15/2021**
Test Date: **2/10 - 2/12**
Date Recieved: **2/5/2021**
Log No: **812**
Sample Type: **Remolded**

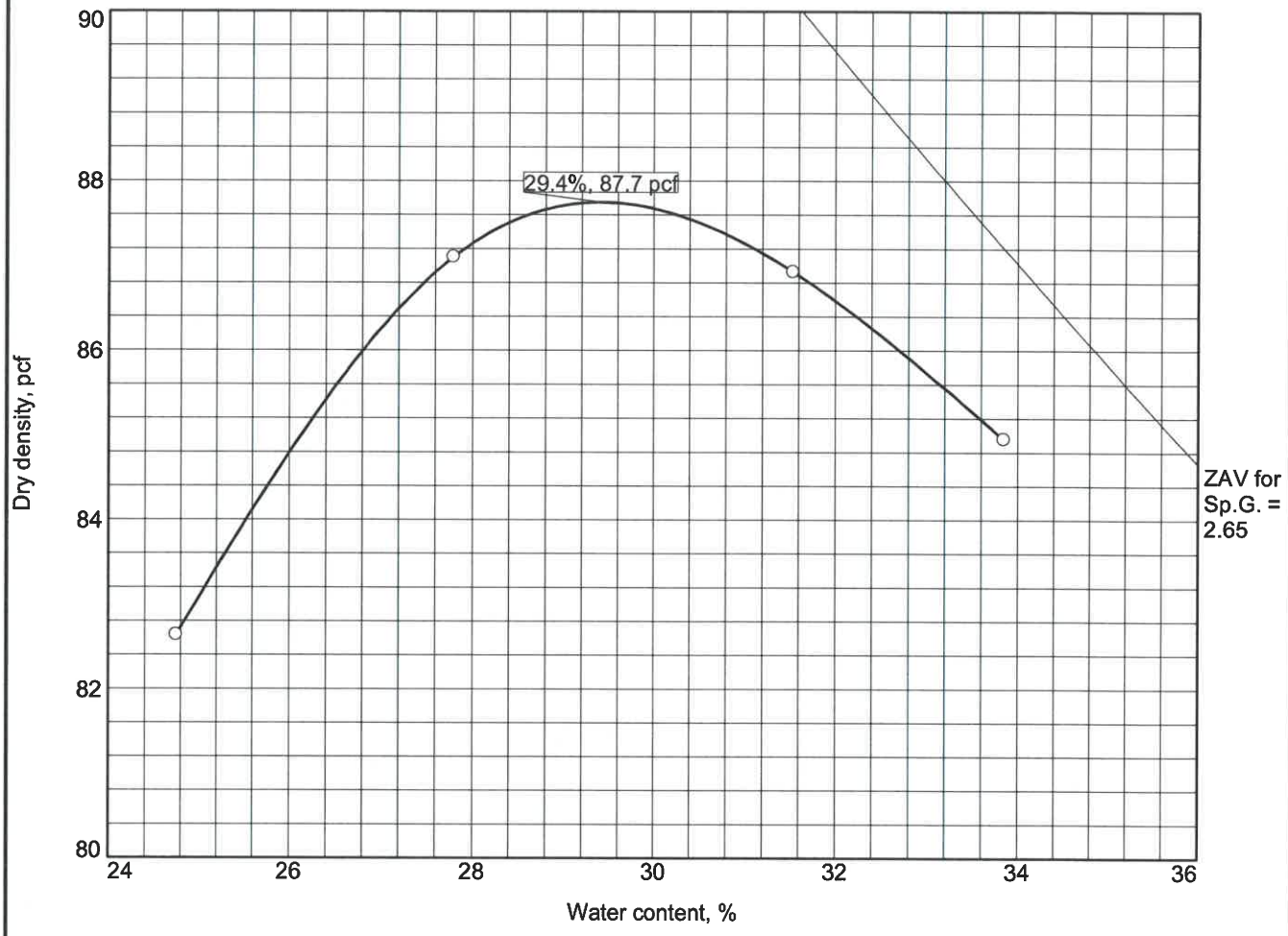
Sample Location: **American Environmental Borrow Pit**
Depth: **NA**
mple Description: **Reddish Brown Clay with some chert**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	7.19	Wet Density (PCF):	108.9	Length (cm):	7.19	Wet Density (PCF):	109.5
Diameter (cm):	7.27	Dry Density (PCF):	77.6	Diameter (cm):	7.27	Dry Density (PCF):	77.6
Area (cm^2)	41.56	Act. Moist. %	40.3%	Area (cm^2)	41.56	Percent Saturation:	
Volume (cm^3)	298.76	Proctor MDD	85.5	Volume (cm^3)	298.76	B-Parameter:	
		Proctor Opt Moist.	32.6%				
Wet weight (grams)	521.2	Percent Compaction	90.8%	Wet weight (grams)	523.9	Void Ratio:	
Dry Weight (grams)	371.5	Void Ratio:		Dry Weight (grams)	371.5	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	41.0%		
Test Parameters:		Effective Consolidation Stress (psi):	5.0		Permeant Liquid Used:	water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
5:51	6:40	2940	23.0	23.0	23.0	0.9312	21.40	2.60	20.90	3.00	159.8	158.9	22.23	22.10	1.66E-07	1.55E-07
6:40	21:51	54660	23.0	23.0	23.0	0.9312	20.90	3.00	13.70	10.30	158.9	144.1	22.10	20.04	1.52E-07	1.41E-07
9:51	14:40	17340	23.0	23.0	23.0	0.9312	13.70	10.30	11.20	12.50	144.1	139.3	20.04	19.38	1.65E-07	1.54E-07
14:40	22:10	27000	23.0	23.0	23.0	0.9312	11.20	12.50	7.60	16.10	139.3	131.9	19.38	18.35	1.70E-07	1.58E-07
													Averages:		***1.63E-07***	***1.52E-07***

Notes:

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH	A-7-6(25)	34.5	2.65	56	27	6.7	83.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 87.7 pcf Optimum moisture = 29.4 %	Yellowish Tan Silty Clay

Project No. 52-21103 **Client:**
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

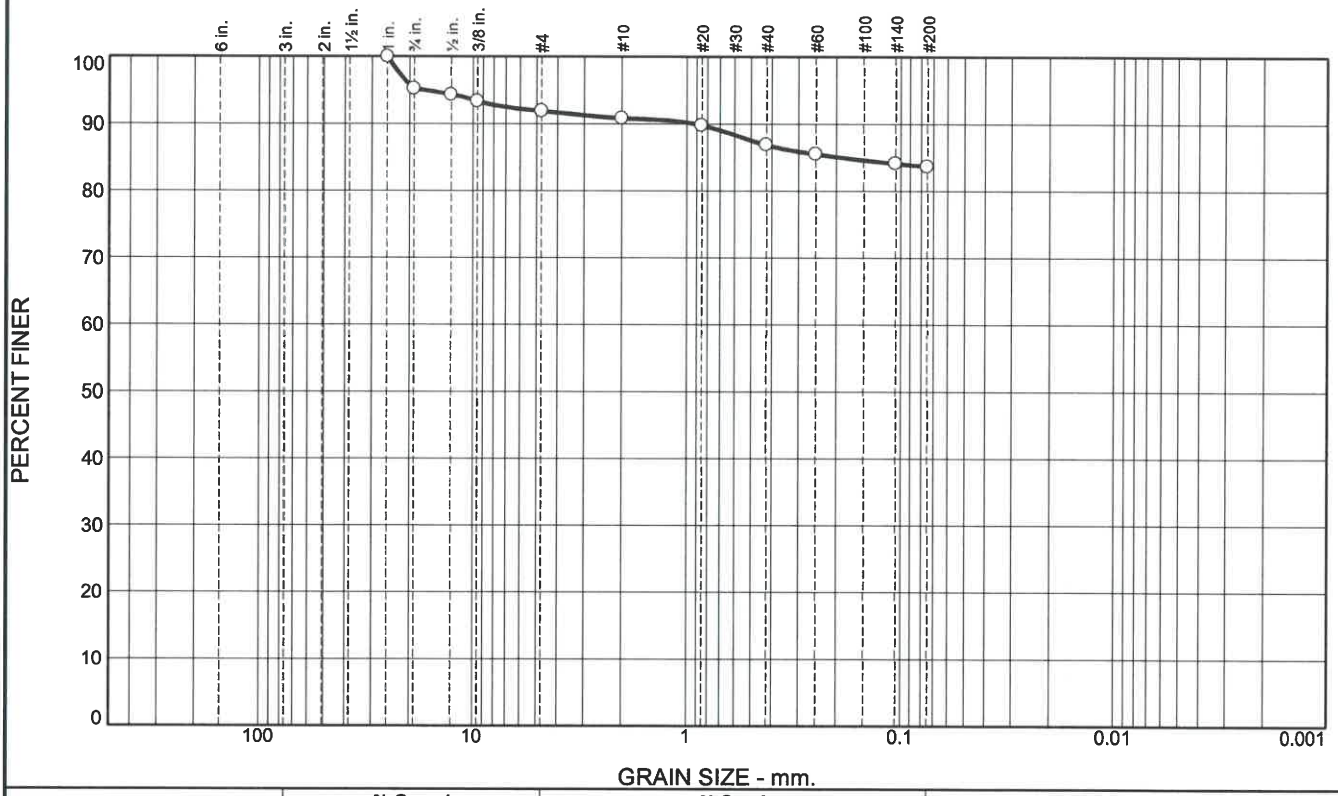
○**Source:** American Environmental Borrow Site **Sample No.:** CB-1 / Bulk

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	3.3	1.1	4.0	3.1	83.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	95.2		
.5	94.3		
.375	93.3		
#4	91.9		
#10	90.8		
#20	89.8		
#40	86.8		
#60	85.5		
#140	84.1		
#200	83.7		

* (no specification provided)

Soil Description

Yellowish Tan Silty Clay

Atterberg Limits

PL= 29 LL= 56 PI= 27

Coefficients

D_{90}= 0.9244 D_{85}= 0.1912 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(25)

Remarks

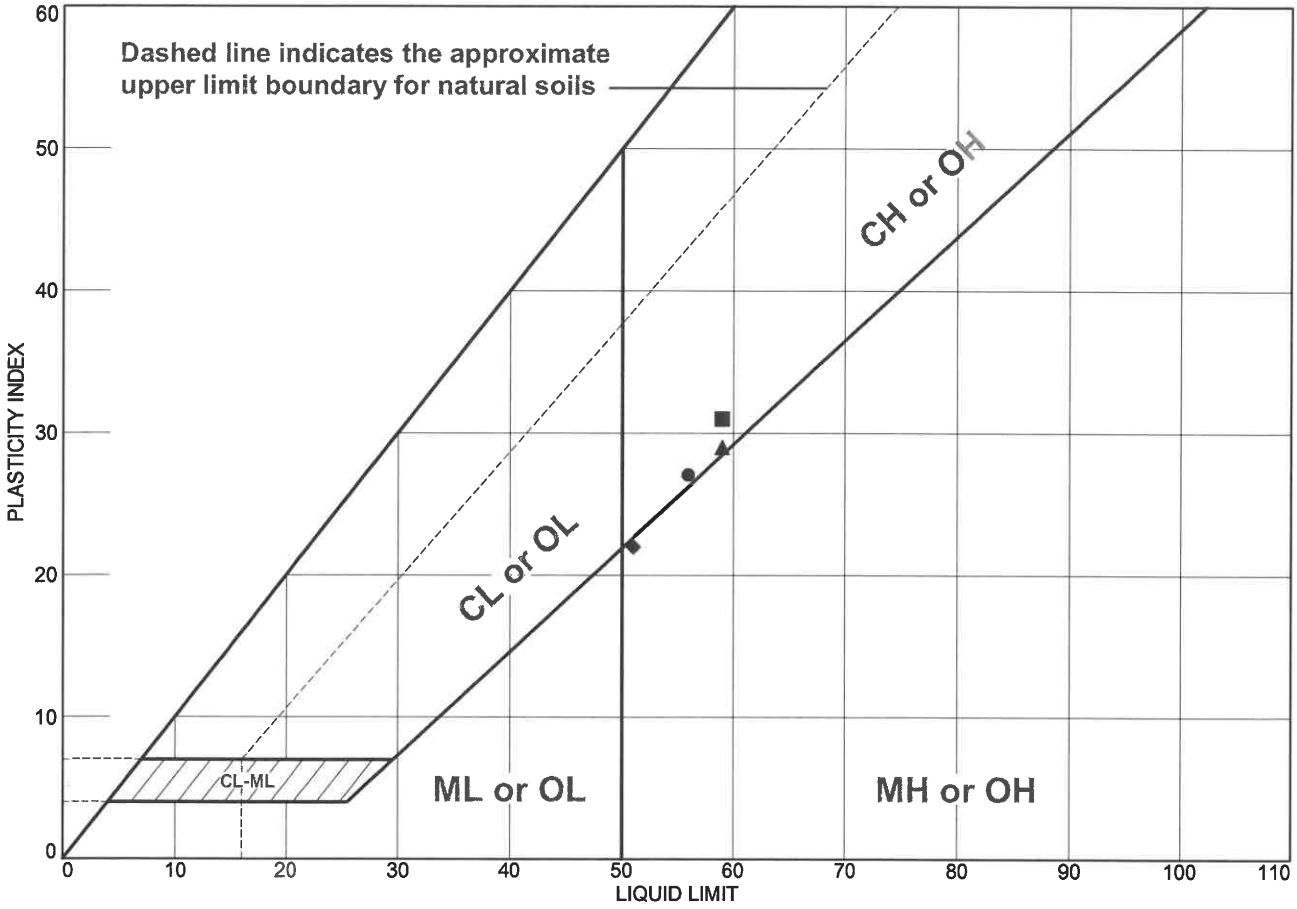
Source of Sample: American Environmental Borrow Site
Sample Number: CB-1 / Bulk

Date: 5/6/21

GEOServices, LLC, Knoxville, Tennessee

Client:
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing
Project No: 52-21103 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Yellowish Tan Silty Clay	56	29	27	86.8	83.7	CH
■	Reddish Brown and Tan Clay	59	28	31	89.8	86.8	CH
▲	Reddish Brown and Yellowish Brown Silty Clay	59	30	29	84.4	77.9	CH
◆	Yellowish Tan Clayey Silt	51	29	22	93.6	88.3	MH

Project No. 52-21103 **Client:**

Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

●**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-1 / Bulk
■**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-2 / Bulk
▲**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-3 / Bulk
◆**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-4 / Bulk

GEOServices, LLC, Knoxville, Tennessee

Remarks:

Figure

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **5/10/2021**
Test Date: **5/5 - 5/7**
Date Recieved:

Sample Location: **CB-1 American Enviro. Borrow**
Depth: **NA**
nple Description: **Yellowish Tan Silty Clay**

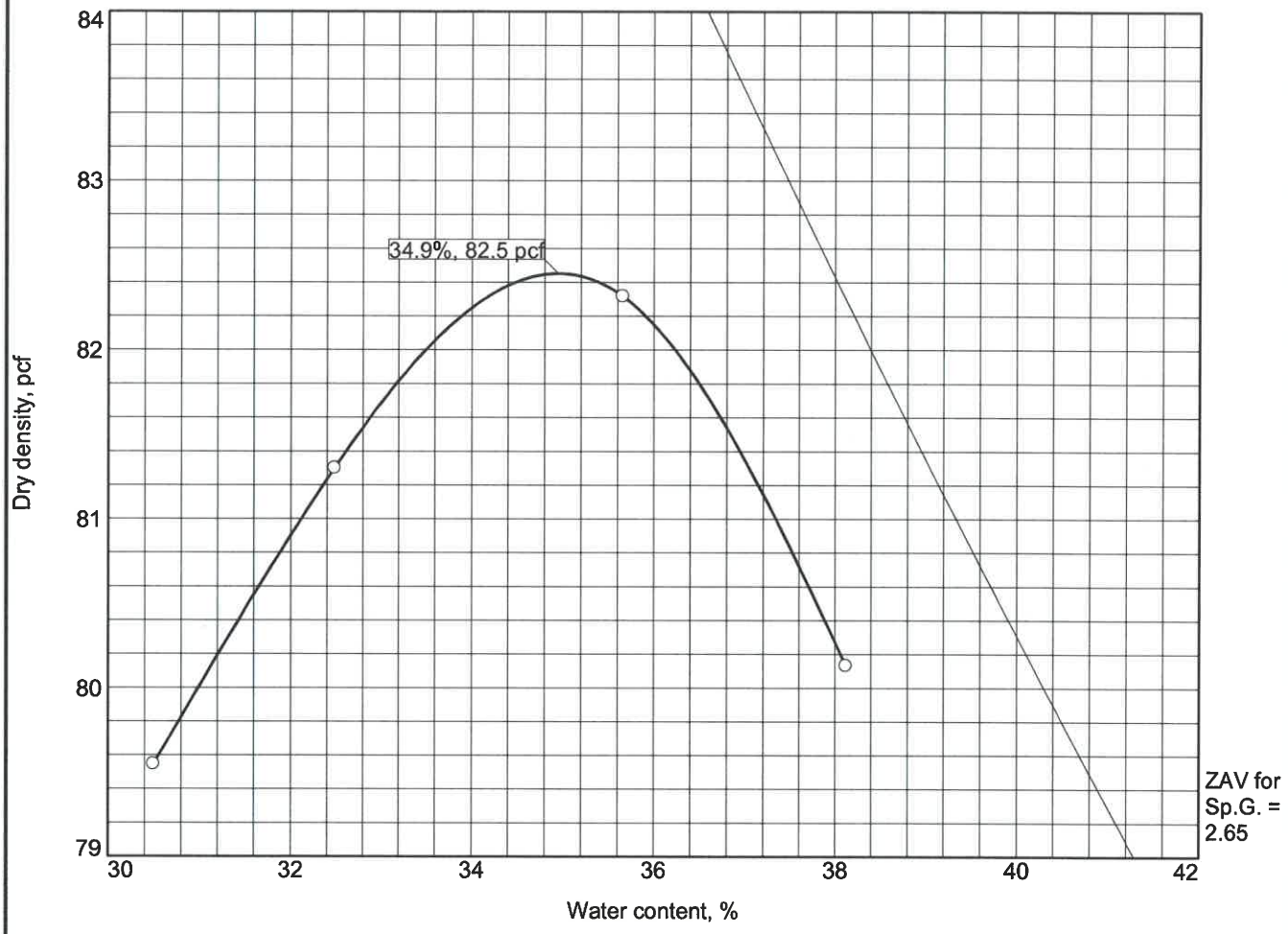
Log No: **NA**
Sample Type: **Remolded**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	8.44	Wet Density (PCF):	108.8	Length (cm):	7.19	Wet Density (PCF):	137.3
Diameter (cm):	7.31	Dry Density (PCF):	82.0	Diameter (cm):	7.27	Dry Density (PCF):	97.3
Area (cm^2)	42.01	Act. Moist. %	32.7%	Area (cm^2)	41.56	Percent Saturation:	
Volume (cm^3)	354.61	Proctor MDD	87.7	Volume (cm^3)	298.76	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	618.1	Percent Compaction	93.5%	Wet weight (grams)	657.2	Void Ratio:	
Dry Weight (grams)	466.0	Void Ratio:		Dry Weight (grams)	466.0	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	41.0%		
Test Parameters:	Effective Consolidation Stress (psi):		3.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:20	8:55	2100	23.0	23.0	23.0	0.9312	23.70	4.50	21.90	6.30	160.2	156.5	22.28	21.77	9.36E-07	8.71E-07
8:55	9:30	2100	23.0	23.0	23.0	0.9312	21.90	6.30	20.20	8.00	156.5	153.0	21.77	21.29	9.04E-07	8.42E-07
9:30	9:46	960	23.0	23.0	23.0	0.9312	20.20	8.00	19.40	8.80	153.0	151.4	21.29	21.06	9.46E-07	8.81E-07
9:46	10:17	1860	23.0	23.0	23.0	0.9312	19.40	8.80	17.90	10.30	151.4	148.4	21.06	20.64	9.30E-07	8.66E-07
													Averages:		*9.29E-07*	*8.65E-07*

Notes:

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH	A-7-6(30)	36.4	2.65	59	31	4.1	86.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 82.5 pcf Optimum moisture = 34.9 %	Reddish Brown and Tan Clay

Project No. 52-21103 **Client:**
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

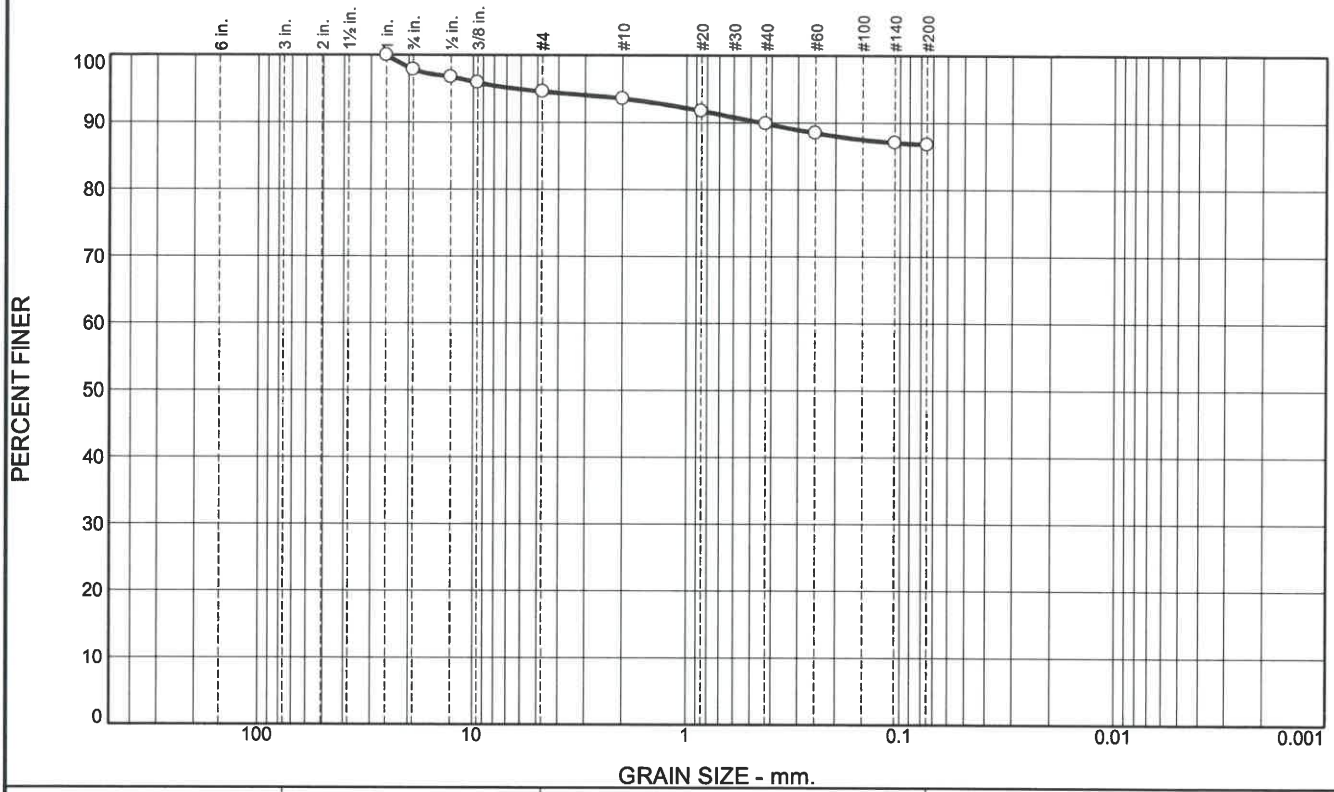
○**Source:** American Environmental Borrow Site **Sample No.:** CB-2 / Bulk

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.2	3.2	1.1	3.7	3.0	86.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.8		
.5	96.7		
.375	95.9		
#4	94.6		
#10	93.5		
#20	91.7		
#40	89.8		
#60	88.5		
#140	87.0		
#200	86.8		

* (no specification provided)

Soil Description

Reddish Brown and Tan Clay

Atterberg Limits

PL= 28 LL= 59 PI= 31

Coefficients

D_{90}= 0.4518 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remarks

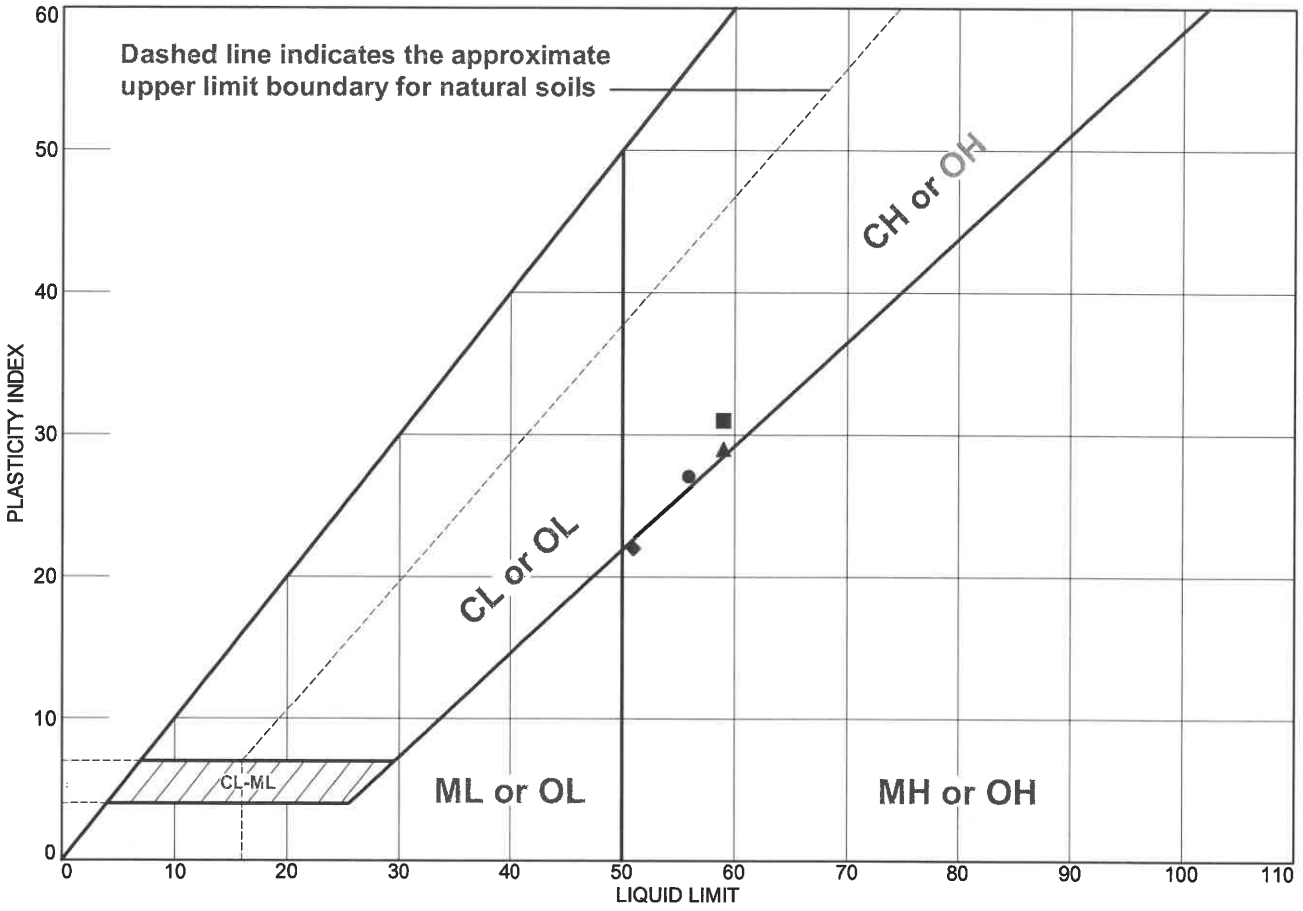
Source of Sample: American Environmental Borrow Site
Sample Number: CB-2 / Bulk

Date: 5/5/21

GEOServices, LLC, Knoxville, Tennessee

Client:
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing
Project No: 52-21103 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Yellowish Tan Silty Clay	56	29	27	86.8	83.7	CH
■	Reddish Brown and Tan Clay	59	28	31	89.8	86.8	CH
▲	Reddish Brown and Yellowish Brown Silty Clay	59	30	29	84.4	77.9	CH
◆	Yellowish Tan Clayey Silt	51	29	22	93.6	88.3	MH

Project No. 52-21103 **Client:**

Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

●**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-1 / Bulk
■**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-2 / Bulk
▲**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-3 / Bulk
◆**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-4 / Bulk

GEOServices, LLC, Knoxville, Tennessee

Remarks:

Figure

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **5/10/2021**
Test Date: **5/6 - 5/8**
Date Recieved:
Log No: **NA**
Sample Type: **Remolded**

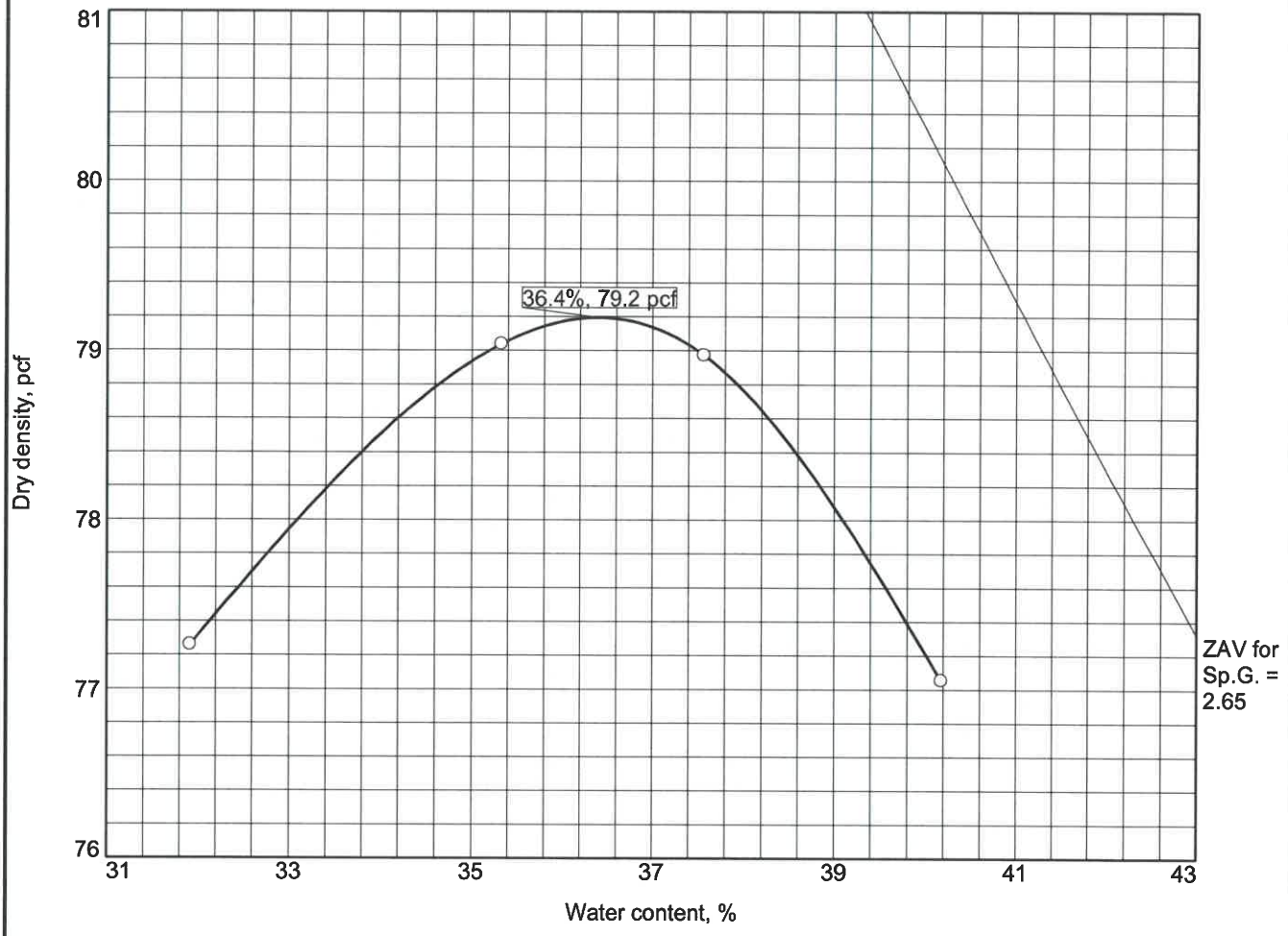
Sample Location: **CB-2 American Enviro. Borrow**
Depth: **NA**
nple Description: **Reddish Brown & Tan Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	9.17	**Wet Density (PCF):**	**106.1**	Length (cm):	7.19	Wet Density (PCF):	140.8
Diameter (cm):	7.32	**Dry Density (PCF):**	**77.4**	Diameter (cm):	7.27	Dry Density (PCF):	99.8
Area (cm^2)	42.06	**Act. Moist. %**	**37.2%**	Area (cm^2)	41.56	Percent Saturation:	
Volume (cm^3)	385.64	Proctor MDD	82.5	Volume (cm^3)	298.76	B-Parameter:	
		Proctor Opt Moist.	34.9%				
Wet weight (grams)	655.6	**Percent Compaction**	**93.8%**	Wet weight (grams)	674.0	Void Ratio:	
Dry Weight (grams)	477.8	Void Ratio:		Dry Weight (grams)	477.8	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	41.0%		
Test Parameters:	Effective Consolidation Stress (psi):		3.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:07	8:35	1680	23.0	23.0	23.0	0.9312	22.40	3.30	21.00	4.70	160.1	157.2	22.27	21.87	9.08E-07	8.46E-07
8:35	9:00	1500	23.0	23.0	23.0	0.9312	21.00	4.70	19.70	6.00	157.2	154.6	21.87	21.50	9.61E-07	8.95E-07
9:00	9:24	1440	23.0	23.0	23.0	0.9312	19.70	6.00	18.50	7.20	154.6	152.1	21.50	21.16	9.39E-07	8.75E-07
9:24	9:50	1560	23.0	23.0	23.0	0.9312	18.50	7.20	17.20	8.50	152.1	149.5	21.16	20.79	9.55E-07	8.90E-07
													Averages:		***9.41E-07***	***8.76E-07***

Notes:

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH	A-7-5(25)	41.6	2.65	59	29	1.9	77.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 79.2 pcf Optimum moisture = 36.4 %	Reddish Brown and Yellowish Brown Silty Clay

Project No. 52-21103 **Client:**
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

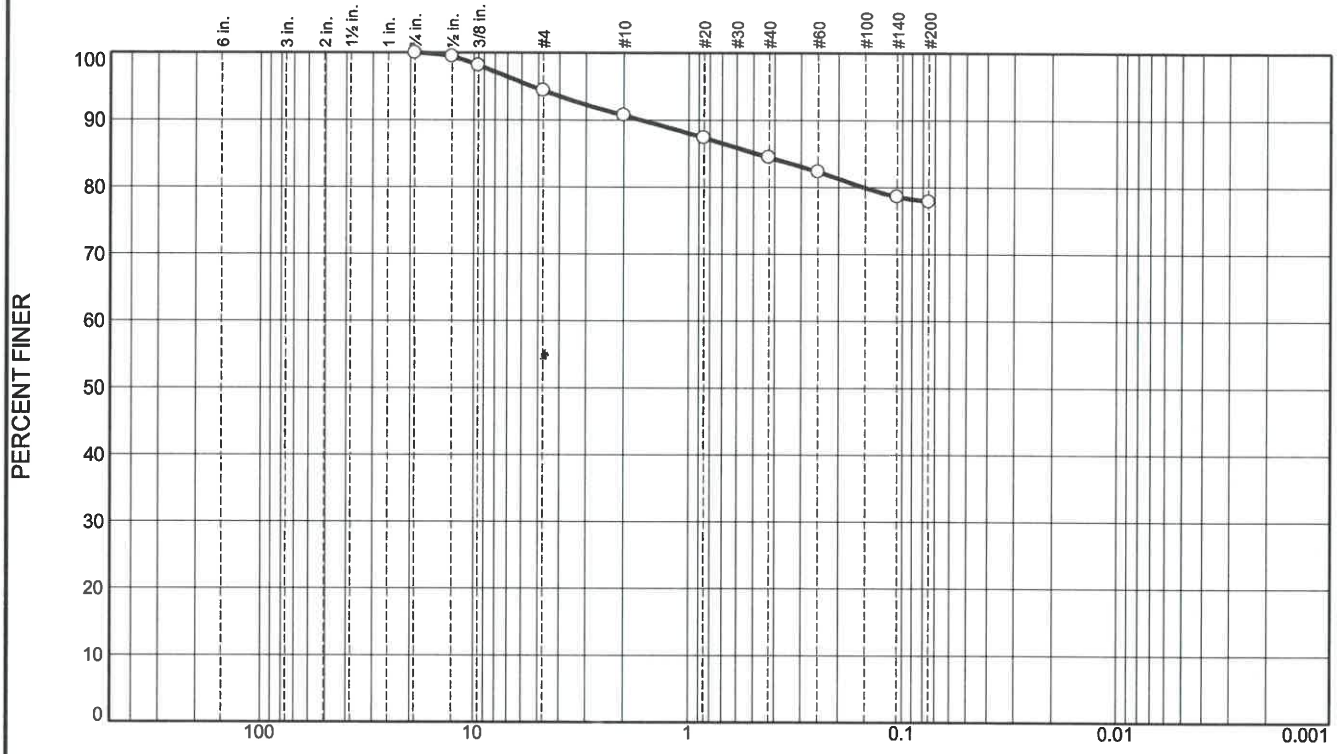
○**Source:** American Environmental Borrow Site **Sample No.:** CB-3 / Bulk

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.6	3.7	6.3	6.5	77.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	99.4		
.375	98.1		
#4	94.4		
#10	90.7		
#20	87.4		
#40	84.4		
#60	82.3		
#140	78.6		
#200	77.9		

* (no specification provided)

Soil Description

Reddish Brown and Yellowish Brown Silty Clay

Atterberg Limits

PL= 30 LL= 59 PI= 29

Coefficients

D_{90}= 1.6752 D_{85}= 0.4877 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(25)

Remarks

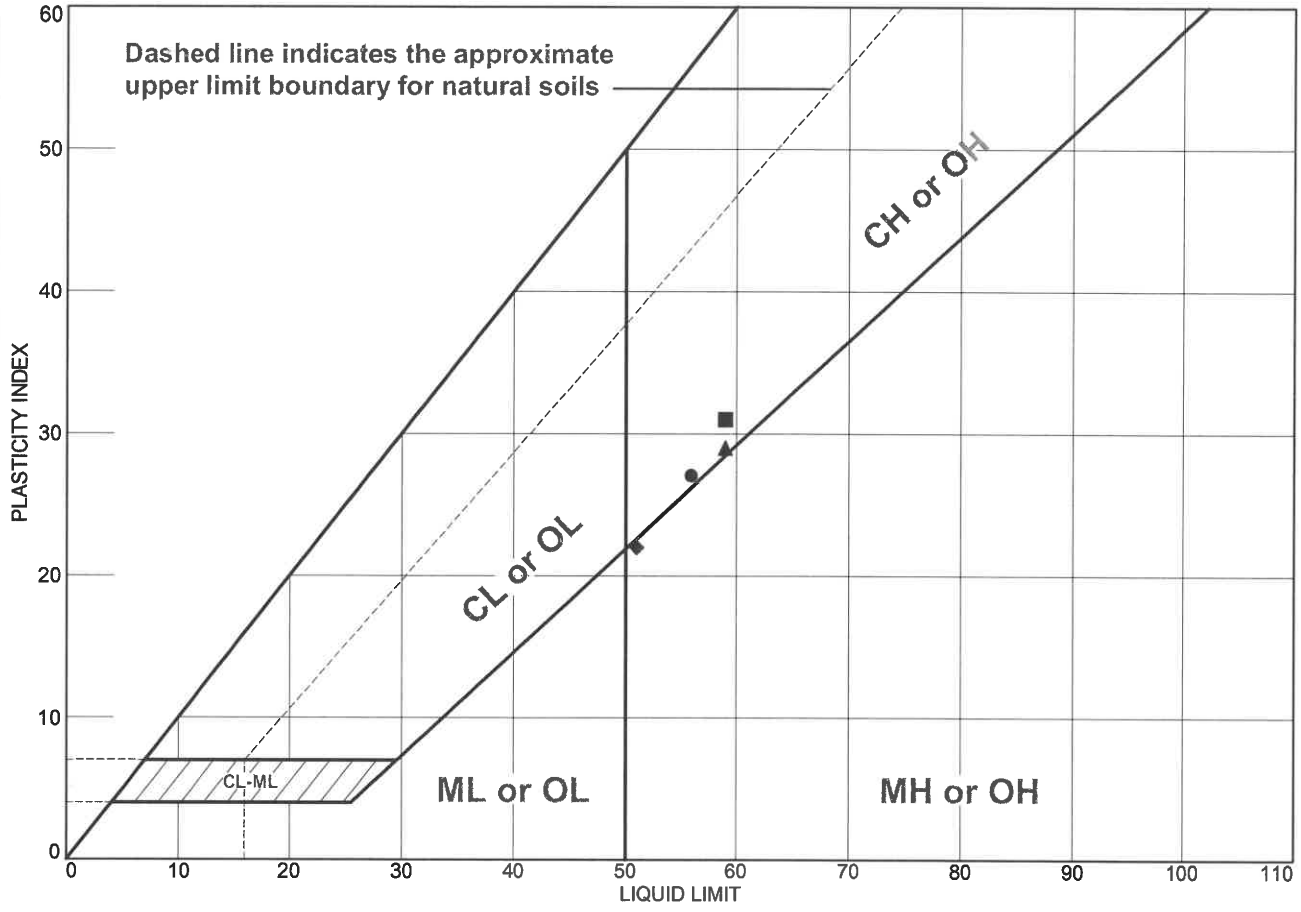
Source of Sample: American Environmental Borrow Site
Sample Number: CB-3 / Bulk

Date: 5/6/21

GEOServices, LLC, Knoxville, Tennessee

Client:
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing
Project No: 52-21103 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Yellowish Tan Silty Clay	56	29	27	86.8	83.7	CH
■	Reddish Brown and Tan Clay	59	28	31	89.8	86.8	CH
▲	Reddish Brown and Yellowish Brown Silty Clay	59	30	29	84.4	77.9	CH
◆	Yellowish Tan Clayey Silt	51	29	22	93.6	88.3	MH

Project No. 52-21103 **Client:**

Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

●**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-1 / Bulk
■**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-2 / Bulk
▲**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-3 / Bulk
◆**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-4 / Bulk

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **5/10/2021**
Test Date: **5/6 - 5/9**
Date Recieved:
Log No: **NA**
Sample Type: **Remolded**

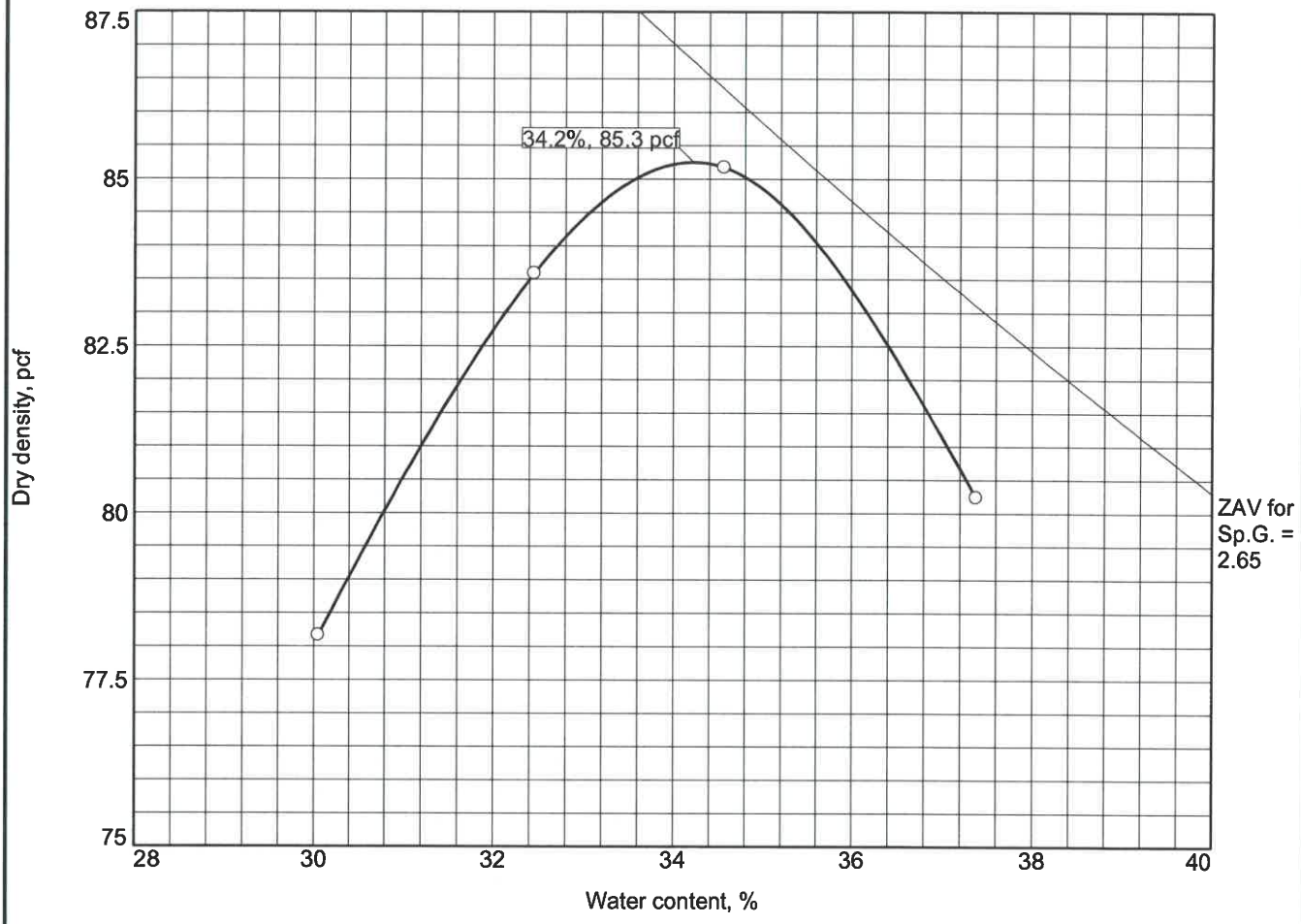
Sample Location: **CB-3 American Enviro. Borrow**
Depth: **NA**
mple Description: **Reddish Brown and Yellowish Brown Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	10.29	Wet Density (PCF):	103.9	Length (cm):	10.29	Wet Density (PCF):	105.2
Diameter (cm):	7.29	Dry Density (PCF):	74.5	Diameter (cm):	7.27	Dry Density (PCF):	74.8
Area (cm^2)	41.69	Act. Moist. %	39.4%	Area (cm^2)	41.53	Percent Saturation:	
Volume (cm^3)	428.99	Proctor MDD	79.2	Volume (cm^3)	427.36	B-Parameter:	
		Proctor Opt Moist.	36.4%				
Wet weight (grams)	713.8	Percent Compaction	94.1%	Wet weight (grams)	720.3	Void Ratio:	
Dry Weight (grams)	511.9	Void Ratio:		Dry Weight (grams)	511.9	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	40.7%		
Test Parameters:	Effective Consolidation Stress (psi):		3.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:12	8:35	1380	23.0	23.0	23.0	0.9312	22.40	5.90	21.90	6.40	157.4	156.4	15.30	15.20	5.72E-07	5.32E-07
8:35	10:05	5400	23.0	23.0	23.0	0.9312	21.90	6.40	20.00	8.30	156.4	152.5	15.20	14.82	5.64E-07	5.25E-07
10:05	10:58	3180	23.0	23.0	23.0	0.9312	20.00	8.30	18.90	9.40	152.5	150.3	14.82	14.61	5.66E-07	5.27E-07
10:58	11:48	3000	23.0	23.0	23.0	0.9312	18.90	9.40	17.90	10.40	150.3	148.3	14.61	14.41	5.53E-07	5.15E-07
													Averages:		***5.64E-07***	***5.25E-07***

Notes:

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	MH	A-7-6(22)	39.4	2.65	51	22	3.2	88.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 85.3 pcf Optimum moisture = 34.2 %	Yellowish Tan Clayey Silt

Project No. 52-21103 **Client:**
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

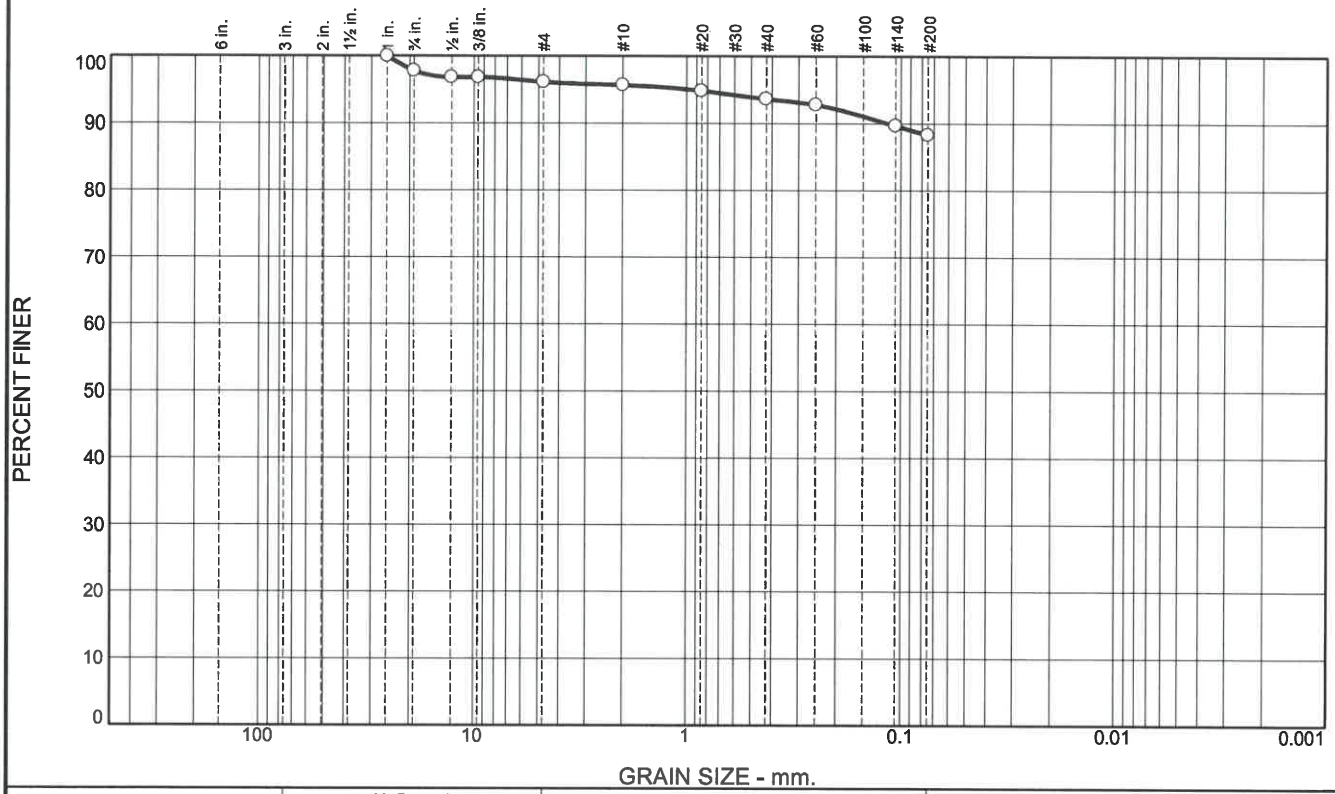
○**Source:** American Environmental Borrow Site **Sample No.:** CB-4 / Bulk

Remarks:

GEOServices, LLC, Knoxville, Tennessee

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.2	1.7	0.4	2.1	5.3	88.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	97.8		
.5	96.8		
.375	96.8		
#4	96.1		
#10	95.7		
#20	94.8		
#40	93.6		
#60	92.8		
#140	89.6		
#200	88.3		

* (no specification provided)

Soil Description

Yellowish Tan Clayey Silt

Atterberg Limits

PL= 29 LL= 51 PI= 22

Coefficients

D_{90}= 0.1155 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= MH AASHTO= A-7-6(22)

Remarks

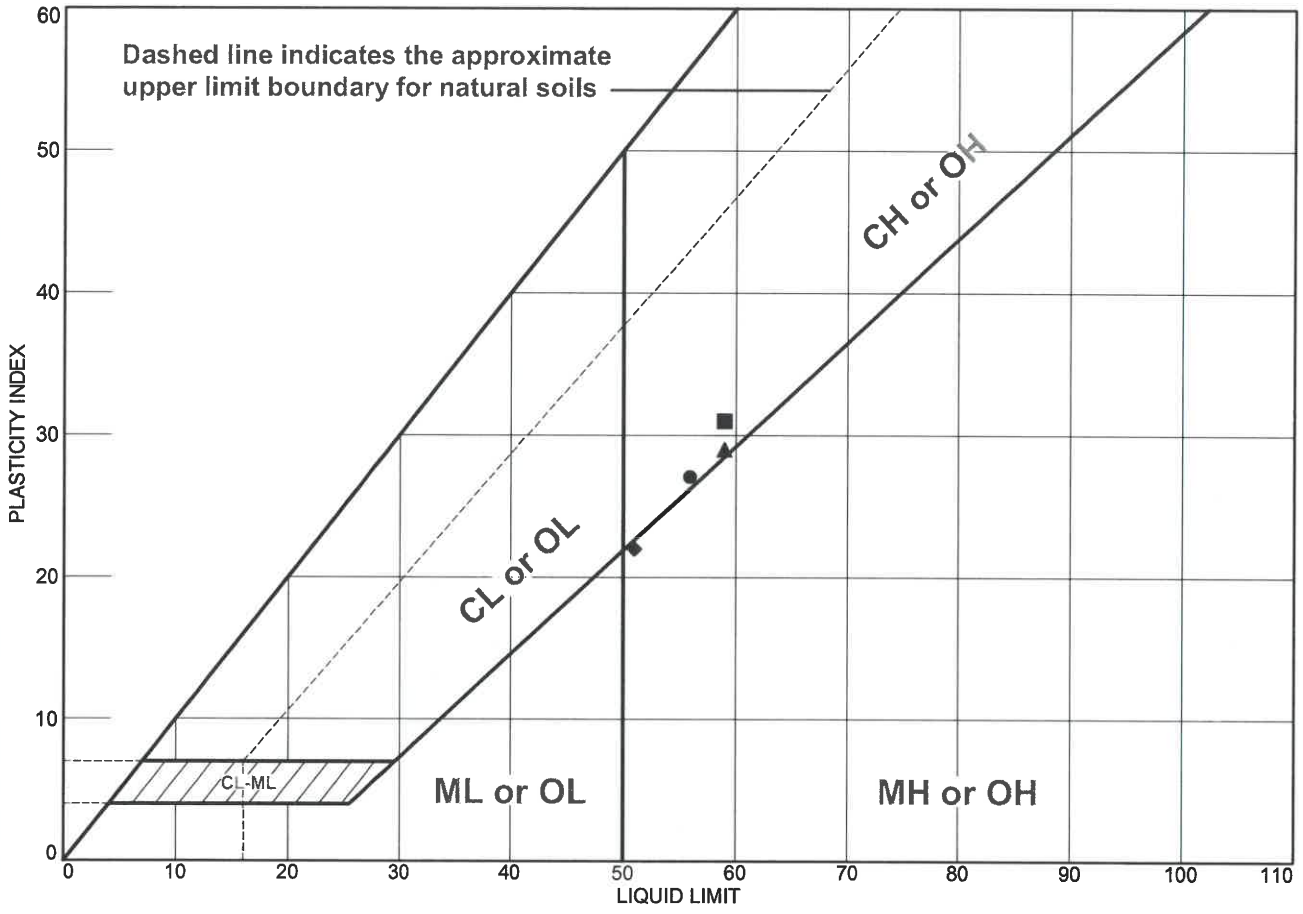
Source of Sample: American Environmental Borrow Site
Sample Number: CB-4 / Bulk

Date: 5/5/21

GEOServices, LLC, Knoxville, Tennessee

Client:
Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing
Project No: 52-21103 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Yellowish Tan Silty Clay	56	29	27	86.8	83.7	CH
■	Reddish Brown and Tan Clay	59	28	31	89.8	86.8	CH
▲	Reddish Brown and Yellowish Brown Silty Clay	59	30	29	84.4	77.9	CH
◆	Yellowish Tan Clayey Silt	51	29	22	93.6	88.3	MH

Project No. 52-21103 **Client:**

Project: City of Kingsport C&D Landfill Area 2 Closure Soil Qualification Testing

●**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-1 / Bulk
■**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-2 / Bulk
▲**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-3 / Bulk
◆**Source of Sample:** American Environmental Borrow Site **Sample Number:** CB-4 / Bulk

GEOServices, LLC, Knoxville, Tennessee

Remarks:

Figure

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **5/10/2021**
Test Date: **5/5 - 5/7**
Date Recieved:
Log No: **NA**
Sample Type: **Remolded**

Sample Location: **CB-4 American Enviro. Borrow**
Depth: **NA**
mple Description: **Yellowish Tan Silty Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	9.00	Wet Density (PCF):	109.3	Length (cm):	7.19	Wet Density (PCF):	142.1
Diameter (cm):	7.31	Dry Density (PCF):	79.6	Diameter (cm):	7.27	Dry Density (PCF):	100.7
Area (cm^2)	42.00	Act. Moist. %	37.3%	Area (cm^2)	41.56	Percent Saturation:	
Volume (cm^3)	378.17	Proctor MDD	85.3	Volume (cm^3)	298.76	B-Parameter:	
		Proctor Opt Moist.	34.2%				
Wet weight (grams)	662.0	Percent Compaction	93.3%	Wet weight (grams)	680.0	Void Ratio:	
Dry Weight (grams)	482.1	Void Ratio:		Dry Weight (grams)	482.1	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	41.0%		
Test Parameters:		Effective Consolidation Stress (psi):	3.0		Permeant Liquid Used:	water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:05	9:05	3600	23.0	23.0	23.0	0.9312	22.40	3.30	19.50	5.80	160.1	154.6	22.27	21.50	8.24E-07	7.67E-07
9:05	9:38	1980	23.0	23.0	23.0	0.9312	19.50	5.80	18.10	7.20	154.6	151.7	21.50	21.11	7.98E-07	7.43E-07
9:38	10:05	1620	23.0	23.0	23.0	0.9312	18.10	7.20	16.90	8.40	151.7	149.3	21.11	20.77	8.51E-07	7.92E-07
10:05	10:48	2580	23.0	23.0	23.0	0.9312	16.90	8.40	15.20	10.10	149.3	145.8	20.77	20.28	7.72E-07	7.19E-07
													Averages:		8.11E-07	7.56E-07

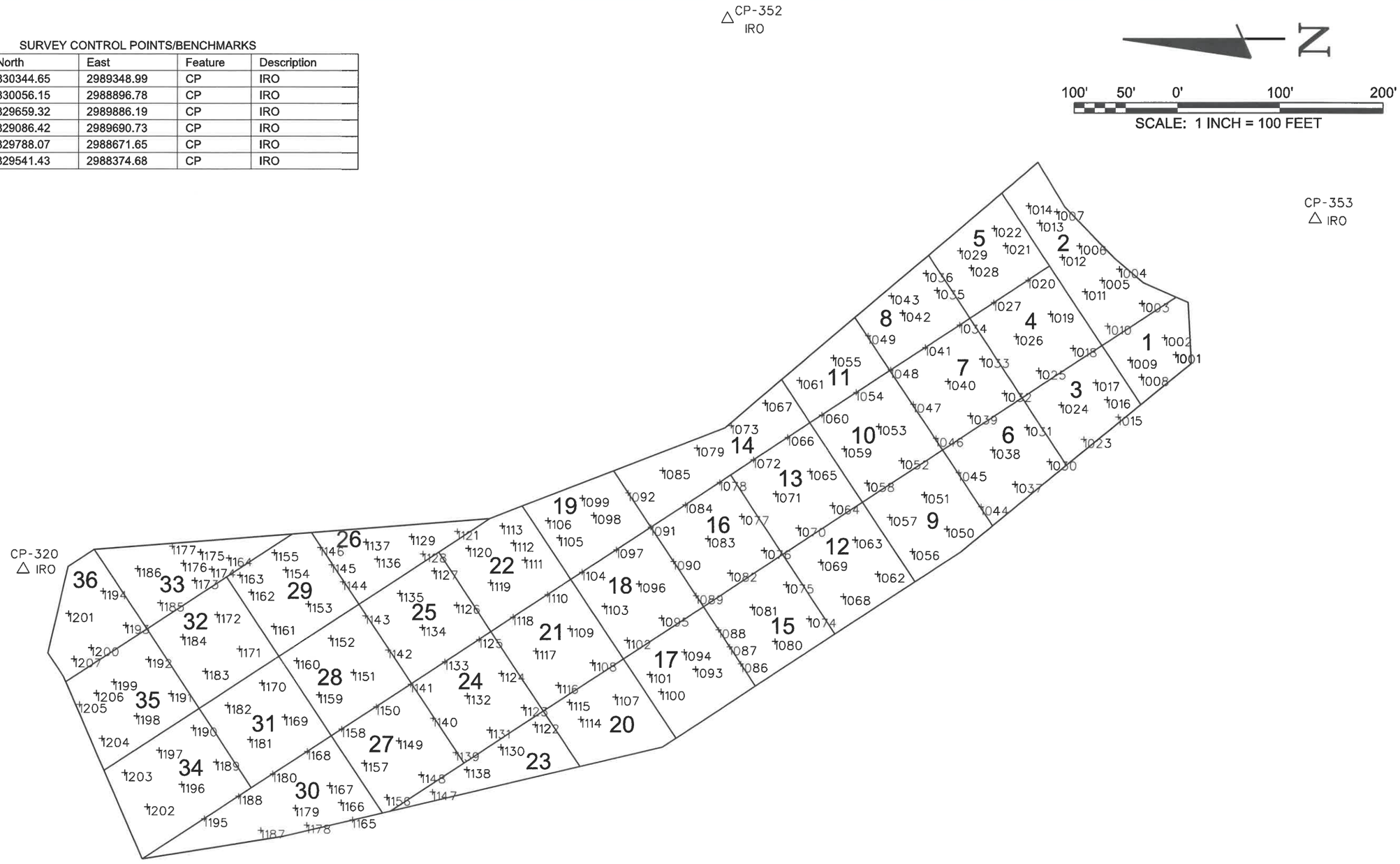
Notes:

Appendix D

Clay Cap and Topsoil Installation Logs

SURVEY CONTROL POINTS/BENCHMARKS

Point	North	East	Feature	Description
320	830344.65	2989348.99	CP	IRO
351	830056.15	2988896.78	CP	IRO
352	829659.32	2989886.19	CP	IRO
353	829086.42	2989690.73	CP	IRO
354	829788.07	2988671.65	CP	IRO
355	829541.43	2988374.68	CP	IRO



BARGE
DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-8233

WILLIAM E. LAWRENCE — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE

PROJECT GRID SYSTEM WITH SURVEY POINTS

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)
CITY OF KINGSPORT DEMOLITION LANDFILL
KINGSPORT, TENNESSEE

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	9-20-2021	ISSUED FOR RECORD

C1.05

FILE NO. 36793-04

STLeonard
LandRes,pen Workspace: LandRes

F:\36\36793\3679304\04_CAD\CIVL\Compaction Test Drawings\Grid Point Locations.dgn

Cap Clay Installation Log

Day	Date	Grid Placement	Loads	Tons	Sample No
Tuesday	5/25/2021	5, 2, 4, 6, 3, 1, 7, 8	56	1,269	CB1, CB2, CB3, Log812
Wednesday	5/26/2021	6, 3, 1, 8, 7, 4, 5, 2	56	1,323	CB1, Log812
Thursday	5/27/2021	10, 11, 7, 8, 4, 5, 2, 9	56	1,277	CB1, CB3
Friday	5/28/2021	6, 7, 3, 4, 2, 1	56	1,240	CB2
Monday	5/31/2021	No Clay - Holiday			
Tuesday	6/1/2021	9, 10, 6, 7, 3, 4, 11, 8, 5	56	1,324	CB1, CB2, CB3
Wednesday	6/2/2021	14, 13, 10, 9, 11	56	1,305	CB1, CB2
Thursday	6/3/2021	No Clay - Rain			
Friday	6/4/2021	No Clay - Previous Day's Rain			
Monday	6/7/2021	14, 16, 13, 12	56	1,330	CB1, CB2
Tuesday	6/8/2021	No Clay - Previous Day's Rain			
Wednesday	6/9/2021	No Clay - Previous Day's Rain			
Thursday	6/10/2021	No Clay - Overnight Rain			
Friday	6/11/2021	No Clay - Overnight Rain			
Monday	6/14/2021	No Clay - Overnight Rain at Borrow Site			
Tuesday	6/15/2021	14, 16, 13, 12	48	1,128	CB1, CB2
Wednesday	6/16/2021	12, 13, 1, 2, 19, 22, 18, 16, 15	60	1,410	CB2, CB3
Thursday	6/17/2021	19, 22, 18, 16, 15	61	1,415	CB1, CB2
Friday	6/18/2021	17, 18, 26, 22, 21, 20	53	1,240	CB3
Monday	6/21/2021	20, 21, 22, 23, 24, 25	64	1,522	CB1, CB2
Tuesday	6/22/2021	No Clay - Overnight Rain			
Wednesday	6/23/2021	No Clay - Overnight Rain at Borrow Site			
Thursday	6/24/2021	23, 24, 25, 26	62	1,440	CB1, CB2, CB3
Friday	6/25/2021	26, 29, 25, 28, 24, 27, 23	64	1,480	CB1, CB2
Monday	6/28/2021	33, 29, 28, 31, 27, 30	56	1,279	CB3, Log812
Tuesday	6/29/2021	29, 33, 36, 35, 34, 30	56	1,298	CB3
Wednesday	6/30/2021	36, 35, 34, 30	55	1,268	CB3, Log812
Thursday	7/1/2021	31, 32, 33, 36	56	1,259	CB1, CB2, CB3
Friday	7/2/2021	No Clay - Overnight Rain			
Monday	7/5/2021	No Clay - Holiday			
Tuesday	7/6/2021	33, 32, 31, 30	56	1,231	CB3, Log812
		Total Cap Clay Tonnage		**25,038**	**Tons**
		Total Cap Clay Volume using an Average Wet Density = 115.7-lbs/cf		**16,030**	**CY**

Topsoil Installation Log

Day	Date	Grid Placement
Wednesday	6/23/2021	1, 2, 3, 4, 5
Thursday	6/24/2021	3, 4, 5, 6, 7, 8, 9, 10, 11
Tuesday	7/13/2021	10, 11, 14, 9, 12, 15, 17
Wednesday	7/14/2021	9, 12, 13, 14, 15, 16
Thursday	7/15/2021	12, 15, 13, 16, 14
Friday	7/16/2021	15, 17, 16, 18, 14, 19
Monday	7/19/2021	30, 34, 35, 36, 33, 32, 31
Tuesday	7/20/2021	33, 32, 17, 18
Wednesday	7/21/2021	14, 19, 22, 20, 21, 23
Thursday	7/22/2021	21, 22, 24, 25, 26
Friday	7/23/2021	24, 25, 26, 27, 28, 30, 31
Monday	7/26/2021	25, 28, 31, 26, 29
Tuesday	7/27/2021	26, 29, 1, 3, 4
Wednesday	7/28/2021	3, 4, 5, 6, 7, 8, 9
Thursday	7/29/2021	7, 8, 10, 11, 13, 14
Friday	7/30/2021	31, 30, 5, 1, 4

Appendix E

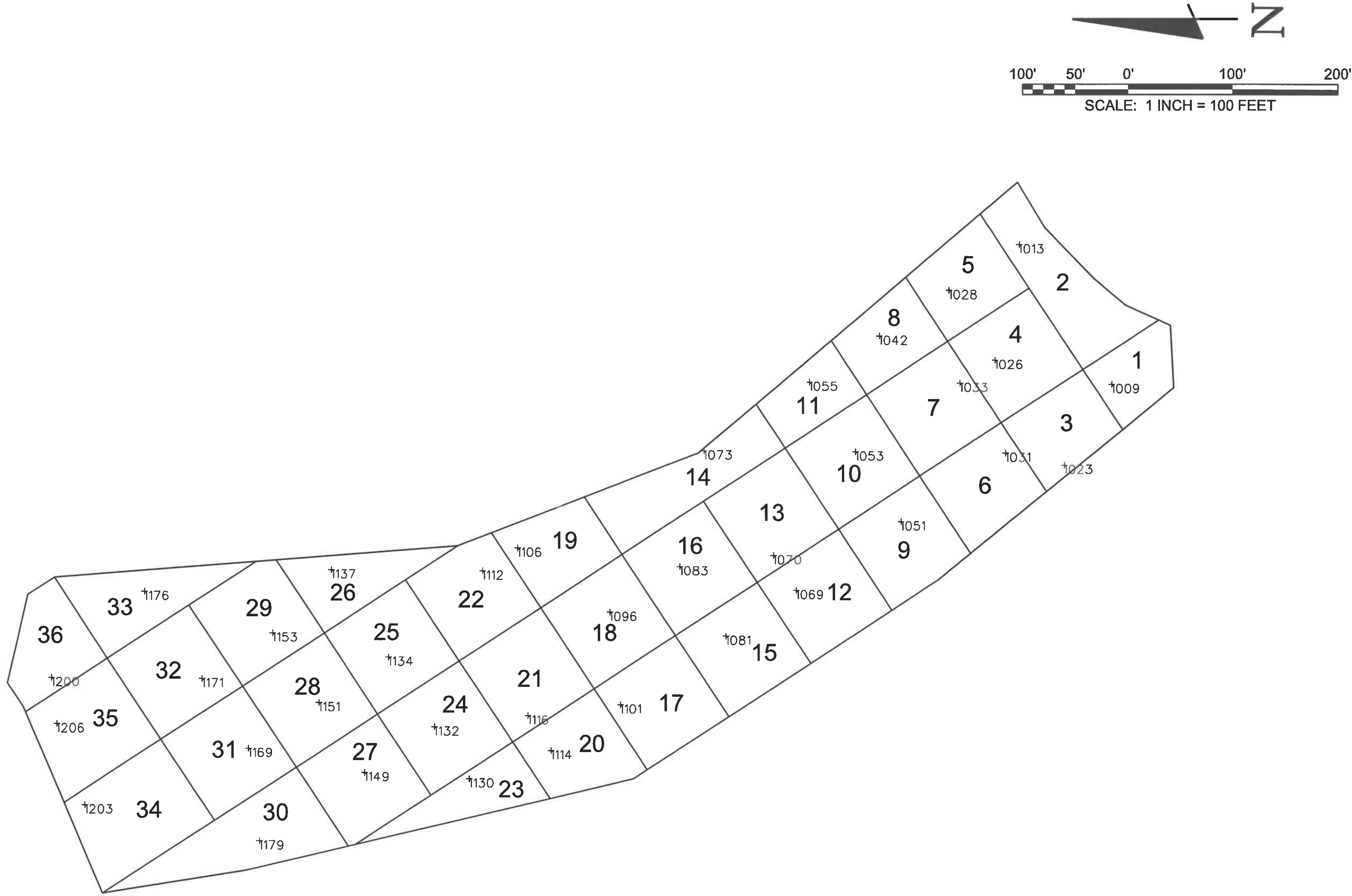
Clay Cap Compaction and Moisture Content Testing

Compaction and Moisture Content Tests

Test No	Day	Date	Grid	Point	Lift	Sample No	In-Place Dry Density	In-Place Moisture	Max Dry Density	Optimum Moisture Content	Percent from Optimum	Percent Compaction
1	Tuesday	5/25/2021	5	1028	1	CB2	76.7	38.2	82.5	34.9	3.3	93%
2	Tuesday	5/25/2021	2	1013	1	CB1	81.9	32.8	87.7	29.4	3.4	93%
3	Tuesday	5/25/2021	7	1033	1	CB3	73.6	39.0	79.2	36.4	2.6	93%
4	Tuesday	5/25/2021	4	1026	1	Log812	81.4	35.9	85.3	32.4	3.5	95%
5	Wednesday	5/26/2021	6	1031	1	CB1	81.4	32.9	87.7	29.4	3.5	93%
6	Wednesday	5/26/2021	3	1023	1	CB1	81.9	33.5	87.7	29.4	4.1	93%
7	Wednesday	5/26/2021	1	1009	1	Log812	79.4	33.6	85.3	32.4	1.2	93%
8	Thursday	5/27/2021	8	1042	1	CB3	73.4	40.2	79.2	36.4	3.8	93%
9	Thursday	5/27/2021	7	1034	2	CB1	81.6	33.8	87.7	29.4	4.4	93%
10	Thursday	5/27/2021	11	1055	1	CB1	81.8	34.3	87.7	29.4	4.9	93%
11	Thursday	5/27/2021	10	1053	1	CB1	82.0	33.1	87.7	29.4	3.7	94%
12	Friday	5/28/2021	1	1009	2	CB2	76.8	36.2	82.5	34.9	1.3	93%
13	Friday	5/28/2021	2	1011	2	CB2	76.7	36.4	82.5	34.9	1.5	93%
14	Tuesday	6/1/2021	6	1037	2	CB2	76.4	36.9	82.5	34.9	2.0	93%
15	Tuesday	6/1/2021	3	1024	2	CB1	81.7	33.9	87.7	29.4	4.5	93%
16	Tuesday	6/1/2021	4	1026	2	CB3	74.1	38.2	79.2	36.4	1.8	94%
17	Wednesday	6/2/2021	8	1042	2	CB2	76.6	36.9	82.5	34.9	2.0	93%
18	Wednesday	6/2/2021	5	1028	2	CB2	76.4	36.6	82.5	34.9	1.7	93%
19	Wednesday	6/2/2021	14	1073	1	CB1	82.1	33.8	87.7	29.4	4.4	94%
20	Wednesday	6/2/2021	9	1051	1	CB2	77.2	35.9	82.5	34.9	1.0	94%
21	Friday	6/4/2021	14	1072	2	CB1	82.0	34.2	87.7	29.4	4.8	94%
22	Friday	6/4/2021	13	1065	2	CB2	76.9	36.5	82.5	34.9	1.6	93%
23	Friday	6/4/2021	11	1060	2	CB1	81.9	33.3	87.7	29.4	3.9	93%
24	Friday	6/4/2021	10	1059	2	CB2	76.8	35.9	82.5	34.9	1.0	93%
25	Friday	6/4/2021	9	1057	2	CB1	81.5	33.1	87.7	29.4	3.7	93%
26	Monday	6/7/2021	12	1069	1	CB1	82.2	33.9	87.7	29.4	4.5	94%
27	Monday	6/7/2021	13	1070	1	CB2	76.9	36.9	82.5	34.9	2.0	93%
28	Monday	6/7/2021	16	1083	1	CB1	81.6	33.2	87.7	29.4	3.8	93%
29	Tuesday	6/15/2021	12	1068	2	CB1	79.8	32.3	87.7	29.4	2.9	91%
30	Tuesday	6/15/2021	16	1076	2	CB2	76.3	38.5	82.5	34.9	3.6	92%
31	Wednesday	6/16/2021	22	1112	1	CB2	76.5	38.9	82.5	34.9	4.0	93%
32	Wednesday	6/16/2021	19	1106	1	CB2	76.4	39.1	82.5	34.9	4.2	93%
33	Wednesday	6/16/2021	18	1096	1	CB2	76.9	39.3	82.5	34.9	4.4	93%
34	Wednesday	6/16/2021	15	1081	1	CB3	73.8	40.8	79.2	36.4	4.4	93%
35	Thursday	6/17/2021	15	1088	2	CB2	76.3	36.5	82.5	34.9	1.6	92%
36	Thursday	6/17/2021	18	1103	2	CB1	80.1	32.6	87.7	29.4	3.2	91%
37	Thursday	6/17/2021	19	1105	2	CB1	80.4	32.5	87.7	29.4	3.1	92%
38	Thursday	6/17/2021	22	1111	2	CB1	81.2	32.2	87.7	29.4	2.8	93%
39	Friday	6/18/2021	17	1101	1	CB3	72.5	40.9	79.2	36.4	4.5	92%
40	Friday	6/18/2021	17	1100	2	CB3	73.0	39.8	79.2	36.4	3.4	92%
41	Monday	6/21/2021	21	1116	1	CB2	76.7	38.1	82.5	34.9	3.2	93%

Compaction and Moisture Content Tests

Test No	Day	Date	Grid	Point	Lift	Sample No	In-Place Dry Density	In-Place Moisture	Max Dry Density	Optimum Moisture Content	Percent from Optimum	Percent Compaction
42	Monday	6/21/2021	20	1114	1	CB2	76.4	36.4	82.5	34.9	1.5	93%
43	Monday	6/21/2021	21	1109	2	CB1	81.2	32.3	87.7	29.4	2.9	93%
44	Monday	6/21/2021	20	1107	2	CB2	76.6	36.1	82.5	34.9	1.2	93%
45	Thursday	6/24/2021	25	1134	1	CB3	72.7	38.6	79.2	36.4	2.2	92%
46	Thursday	6/24/2021	24	1132	1	CB1	80.4	32.9	87.7	29.4	3.5	92%
47	Thursday	6/24/2021	23	1130	1	CB1	80.6	33.5	87.7	29.4	4.1	92%
48	Thursday	6/24/2021	26	1137	1	CB2	75.5	37.1	82.5	34.9	2.2	92%
49	Friday	6/25/2021	24	1124	2	CB1	80.8	33.4	87.7	29.4	4.0	92%
50	Friday	6/25/2021	23	1130	2	CB1	80.4	32.8	87.7	29.4	3.4	92%
51	Friday	6/25/2021	25	1134	2	CB1	80.6	33.3	87.7	29.4	3.9	92%
52	Friday	6/25/2021	26	1128	2	CB1	80.7	33.2	87.7	29.4	3.8	92%
53	Friday	6/25/2021	28	1151	1	CB2	75.4	36.3	82.5	34.9	1.4	91%
54	Friday	6/25/2021	27	1149	1	CB2	75.1	36.2	82.5	34.9	1.3	91%
55	Monday	6/28/2021	29	1153	1	CB3	73.0	38.5	79.2	36.4	2.1	92%
56	Monday	6/28/2021	28	1159	2	CB3	73.3	38.6	79.2	36.4	2.2	93%
57	Monday	6/28/2021	30	1167	2	Log812	78.4	34.8	85.3	32.4	2.4	92%
58	Monday	6/28/2021	27	1148	2	Log812	78.6	34.6	85.3	32.4	2.2	92%
59	Tuesday	6/29/2021	29	1154	2	CB3	72.9	38.5	79.2	36.4	2.1	92%
60	Tuesday	6/29/2021	36	1200	1	CB3	72.6	38.6	79.2	36.4	2.2	92%
61	Tuesday	6/29/2021	35	1206	1	CB3	72.9	38.8	79.2	36.4	2.4	92%
62	Tuesday	6/29/2021	34	1203	1	CB3	72.8	38.6	79.2	36.4	2.2	92%
63	Tuesday	6/29/2021	30	1179	1	CB3	73.0	39.2	79.2	36.4	2.8	92%
64	Wednesday	6/30/2021	36	1201	2	Log812	78.0	35.4	85.3	32.4	3.0	91%
65	Wednesday	6/30/2021	35	1198	2	CB3	72.4	38.9	79.2	36.4	2.5	91%
66	Wednesday	6/30/2021	34	1202	2	CB3	72.7	38.6	79.2	36.4	2.2	92%
67	Thursday	7/1/2021	31	1169	1	CB1	80.2	33.8	87.7	29.4	4.4	91%
68	Thursday	7/1/2021	32	1171	1	CB2	76.1	36.7	82.5	34.9	1.8	92%
69	Thursday	7/1/2021	33	1176	1	CB3	72.4	39.2	79.2	36.4	2.8	91%
70	Tuesday	7/6/2021	33	1185	2	CB3	73.7	38.2	79.2	36.4	1.8	93%
71	Tuesday	7/6/2021	32	1184	2	CB3	74.0	38.6	79.2	36.4	2.2	93%
72	Tuesday	7/6/2021	31	1182	2	Log812	79.4	35.5	85.3	32.4	3.1	93%



BARGE
DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

WILLIAM E. LAWRENCE — STATE OF TENNESSEE (seal)

FIRST LIFT CLAY CAP COMPACTION TEST LOCATIONS

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REVISION INFORMATION

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	09-20-2021	ISSUED FOR RECORD

C1.06

FILE NO. 36793-04

9/28/2021
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STLeonard
LandRes.pen Workspace: LandRes

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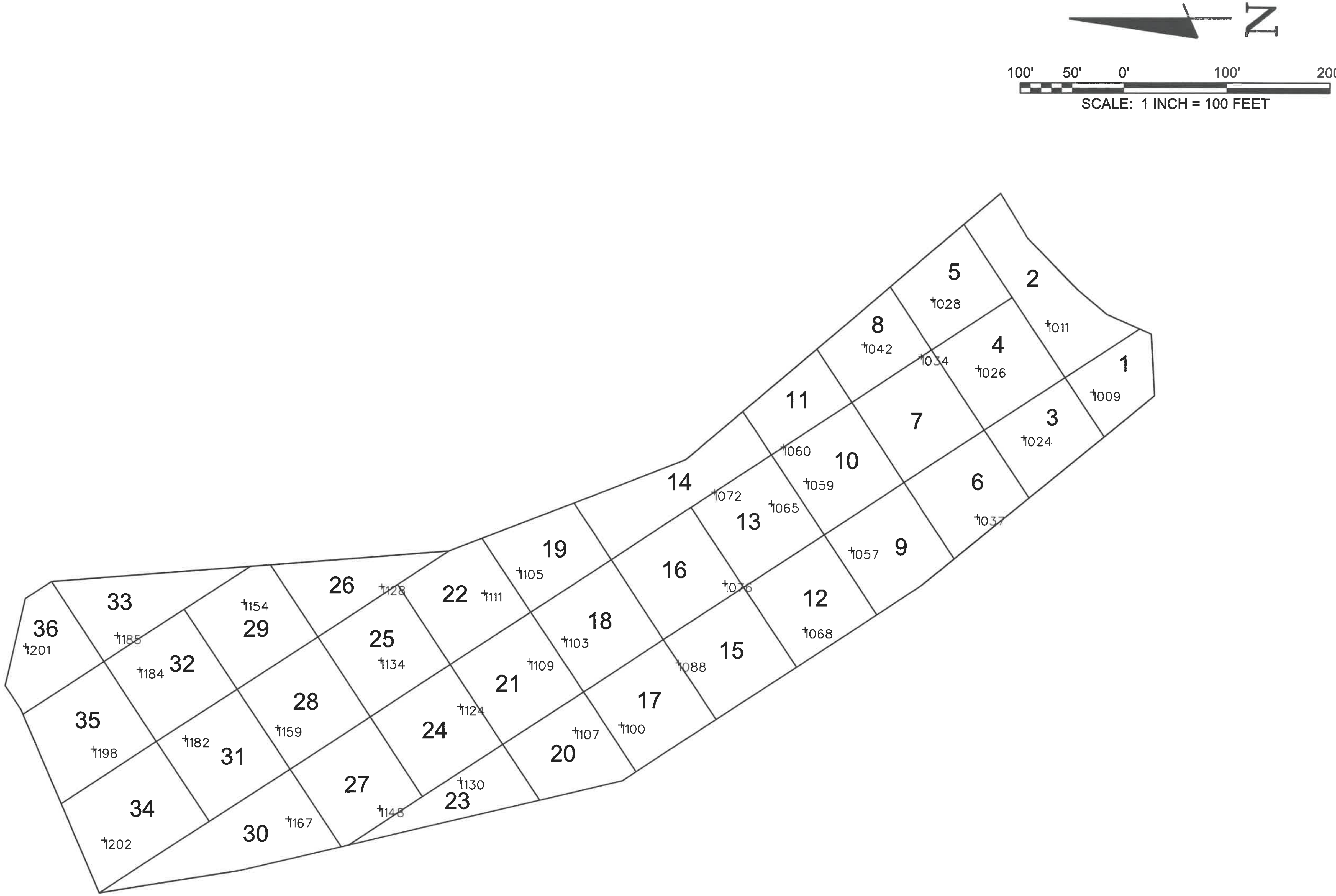

BARGE DESIGN SOLUTIONS

Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

WILLIAM E. LAWRENCE REGISTERED ENGINEER STATE OF TENNESSEE

SECOND LIFT CLAY CAP COMPACTION TEST LOCATIONS

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REVISION INFORMATION

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	09-20-2021	ISSUED FOR RECORD

C1.07

FILE NO. 36793-04

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9/28/2021
9:35:52 AM
STLeonard
LandRes.pen Workspace: LandRes

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: May 25, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 5/25/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	05/25/21	76.7	38.2	82.5	34.9	93%	91-94%	Barge Design Grid #5 (.1028)	-9"
2	05/25/21	81.9	32.8	87.7	29.4	93%	91-94%	Barge Design Grid #2 (.1013)	-9"
3	05/25/21	73.6	39.0	79.2	34.2	93%	91-94%	Barge Design Grid #7 (.1033)	-9"
4	05/25/21	81.4	35.9	85.3	32.4	95%	91-94%	Barge Design Grid #4 (.1026)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: May 26, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 5/26/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	05/26/21	81.4	32.9	87.7	29.4	93%	91-94%	Barge Design Grid #6 (.1031)	-9"
2	05/26/21	81.9	33.5	87.7	29.4	93%	91-94%	Barge Design Grid #3 (.1023)	-9"
3	05/26/21	79.4	33.6	85.3	32.4	93%	91-94%	Barge Design Grid #1 (.1009)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 70s °F **Weather:** Sunny

GEOS Personnel: Nathan Turner

Date: May 27, 2021

Time: 3.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Nathan Turner with GEOServices traveled to referenced site above to collect samples for permeability testing. Upon arrival to the site Mr. Turner met with Mr. Lawrence to discuss the locations of the permeability samples. Mr. Turner collected two permeability samples on this day, one from the first lift at Grid 11 near .1055 and one from the second lift at Grid 7 near .1034. Mr. Turner returned the samples to GEOServices and the samples will be transported to GEOServices Knoxville Branch Laboratory the following day for permeability testing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: May 27, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 5/27/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	05/27/21	73.4	40.2	79.2	36.4	93%	91-94%	Barge Design Grid #8 (.1042)	-9"
2	05/27/21	81.6	33.8	87.7	29.4	93%	91-94%	Barge Design Grid #7 (.1034)	SG
3	05/27/21	81.8	34.3	87.7	29.4	93%	91-94%	Barge Design Grid #11 (.1055)	-9"
4	05/27/21	82.0	33.1	87.7	29.4	94%	91-94%	Barge Design Grid #10 (.1053)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: May 28, 2021

Time: 4.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 5/28/2021

GEOS Project No: 52-21103

GEOS Personnel:

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	05/28/21	76.8	36.2	82.5	34.9	93%	91-94%	Barge Design Grid #1 (.1009)	-9"
2	05/28/21	76.7	36.4	82.5	34.9	93%	91-94%	Barge Design Grid #2 (.1011)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 1, 2021

Time: 5.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/1/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/01/21	76.4	36.9	82.5	34.9	93%	91% to 94%	Barge Design Grid #6 (.1037)	SG
2	06/01/21	81.7	33.9	87.7	29.4	93%	91% to 94%	Barge Design Grid #3 (.1024)	SG
3	06/01/21	74.1	38.2	79.2	36.4	94%	91% to 94%	Barge Design Grid #4 (.1026)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 2, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/2/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/02/21	76.6	36.9	82.5	34.9	93%	91% to 94%	Barge Design Grid #8 (.1042)	SG
2	06/02/21	76.4	36.6	82.5	34.9	93%	91% to 94%	Barge Design Grid #5 (.1028)	SG
3	06/02/21	82.1	33.8	87.7	29.4	94%	91% to 94%	Barge Design Grid #14 (.1073)	-9"
4	06/02/21	77.2	35.9	82.5	34.9	94%	91% to 94%	Barge Design Grid #9 (.1051)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 3, 2021

Time: 2.0 hours

A. Description of Work and Locations:
At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site. Mr. Moody was notified by Mr. Lawrence that no activities would take place on this day due to inclement over night weather.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 4, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/4/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/04/21	82.0	34.2	87.7	29.4	94%	91% to 94%	Barge Design Grid #14 (.1072)	SG
2	06/04/21	76.9	36.5	82.5	34.9	93%	91% to 94%	Barge Design Grid #13 (.1065)	SG
3	06/04/21	81.9	33.3	87.7	29.4	93%	91% to 94%	Barge Design Grid #11 (.1060)	SG
4	06/04/21	76.8	35.9	82.5	34.9	93%	91% to 94%	Barge Design Grid #10 (.1059)	SG
5	06/04/21	81.5	33.1	87.7	29.4	93%	91% to 94%	Barge Design Grid #9 (.1057)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 75 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 7, 2021

Time: 5.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/7/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/07/21	82.2	33.9	87.7	29.4	94%	91% to 94%	Barge Design Grid #12 (.1069)	-9"
2	06/07/21	76.9	36.9	82.5	34.9	93%	91% to 94%	Barge Design Grid #13 (.1070)	-9"
3	06/07/21	81.6	33.2	87.7	29.4	93%	91% to 94%	Barge Design Grid #16 (.1083)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80s °F **Weather:** Sunny

GEOS Personnel: Mr. Tracy Young

Date: June 15, 2021

Time: 4.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Tracy Young with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Young observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Young observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Young periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Young verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Young with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/15/2021

GEOS Project No: 52-21103

GEOS Personnel: Mr. Tracy Young

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/15/21	79.8	32.3	87.7	29.4	91%	91% to 94%	Barge Design Grid 12 (.1068)	SG
2	06/15/21	76.3	38.5	82.5	34.9	92%	91% to 94%	Barge Design Grid 16 (.1076)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 16, 2021

Time: 5.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/16/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/16/21	76.5	38.9	82.5	34.9	93%	91% to 94%	Barge Design Grid #22 (.1112)	-9"
2	06/16/21	76.4	39.1	82.5	34.9	93%	91% to 94%	Barge Design Grid #19 (.1106)	-9"
3	06/16/21	76.9	39.3	82.5	34.9	93%	91% to 94%	Barge Design Grid #18 (.1096)	-9"
4	06/16/21	73.8	40.8	79.2	36.4	93%	91% to 94%	Barge Design Grid #15 (.1081)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 60s °F **Weather:** Sunny

GEOS Personnel: Nathan Turner

Date: June 17, 2021

Time: 2.5 hours

A. Description of Work and Locations:
At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Nathan Turner with GEOServices traveled to referenced site above to collect a sample for permeability testing. Upon arrival to the site Mr. Turner met with Mr. Lawrence to discuss the location of the permeability sample. Mr. Turner collected one permeability sample on this day, from the first lift at Grid 15 near .1081. Mr. Turner returned the sample to GEOServices and the sample will be transported to GEOServices Knoxville Branch Laboratory for permeability testing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80s °F **Weather:** Sunny

GEOS Personnel: Mr. Tracy Young

Date: June 17, 2021

Time: 8.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Tracy Young with GEOServices traveled to the GEOServices lab in Knoxville to take a permeability sample for further processing. After delivering the sample, Mr. Young travelled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Young observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Young observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Young periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Young verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Young with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/17/2021

GEOS Project No: 52-21103

GEOS Personnel: Mr. Tracy Young

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/17/21	76.3	36.5	82.5	34.9	92%	91% to 94%	Barge Design Grid 15 (.1088)	SG
2	06/17/21	80.1	32.6	87.7	29.4	91%	91% to 94%	Barge Design Grid 18 (.1103)	SG
3	06/17/21	80.4	32.5	87.7	29.4	92%	91% to 94%	Barge Design Grid 19 (.1105)	SG
4	06/17/21	81.2	32.2	87.7	29.4	93%	91% to 94%	Barge Design Grid 22 (.1111)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 60s °F **Weather:** Sunny

GEOS Personnel: Nathan Turner

Date: June 18, 2021

Time: 2.5 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Nathan Turner with GEOServices traveled to referenced site above to collect a sample for permeability testing. Upon arrival to the site Mr. Turner met with Mr. Lawrence to discuss the location of the permeability sample. Mr. Turner collected one permeability sample on this day, from the second lift at Grid 18 near .1103. Mr. Turner returned the sample to GEOServices and the sample will be transported to GEOServices Knoxville Branch Laboratory for permeability testing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 18, 2021

Time: 5.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/18/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/18/21	72.5	40.9	79.2	36.4	92%	91% to 94%	Barge Design Grid #17 (.1101)	-9"
2	06/18/21	73.0	39.8	79.2	36.4	92%	91% to 94%	Barge Design Grid #17 (.1100)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80s °F **Weather:** Sunny

GEOS Personnel: Mr. Tracy Young

Date: June 18, 2021

Time: 5.0 hours

A. Description of Work and Locations:
At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Tracy Young with GEOServices traveled to the Knoxville offices of GEOServices to deliver a permeability sample for further processing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 21, 2021

Time: 6.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/21/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/21/21	76.7	38.1	82.5	34.9	93%	91% to 94%	Barge Design Grid #21 (.1116)	-9"
2	06/21/21	76.4	36.4	82.5	34.9	93%	91% to 94%	Barge Design Grid #20 (.1114)	-9"
3	06/21/21	81.2	32.3	87.7	29.4	93%	91% to 94%	Barge Design Grid #20 (.1107)	SG
4	06/21/21	76.6	36.1	82.5	34.9	93%	91% to 94%	Barge Design Grid #21 (.1109)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 24, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/24/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/24/21	72.7	38.6	79.2	36.4	92%	91% to 94%	Barge Design Grid #25 (.1134)	-9"
2	06/24/21	80.4	32.9	87.7	29.4	92%	91% to 94%	Barge Design Grid #24 (.1132)	-9"
3	06/24/21	80.6	33.5	87.7	29.4	92%	91% to 94%	Barge Design Grid #23 (.1130)	-9"
4	06/24/21	75.5	37.1	82.5	34.9	92%	91% to 94%	Barge Design Grid #26 (.1137)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 25, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/25/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/25/21	80.8	33.4	87.7	29.4	92%	91% to 94%	Barge Design Grid #24 (.1124)	SG
2	06/25/21	80.4	32.8	87.7	29.4	92%	91% to 94%	Barge Design Grid #23 (.1130)	SG
3	06/25/21	80.6	33.3	87.7	29.4	92%	91% to 94%	Barge Design Grid #25 (.1134)	SG
4	06/25/21	80.7	33.2	87.7	29.4	92%	91% to 94%	Barge Design Grid #26 (.1128)	SG
5	06/25/21	75.4	36.3	82.5	34.9	91%	91% to 94%	Barge Design Grid #28 (.1151)	-9"
6	06/25/21	75.1	36.2	82.5	34.9	91%	91% to 94%	Barge Design Grid #27 (.1149)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 28, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/28/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/28/21	73.0	38.5	79.2	36.4	92%	91% to 94%	Barge Design Grid #29 (.1153)	-9"
2	06/28/21	73.3	38.6	79.2	36.4	93%	91% to 94%	Barge Design Grid #28 (.1159)	SG
3	06/28/21	78.4	34.8	85.3	32.4	92%	91% to 94%	Barge Design Grid #30 (.1167)	SG
4	06/28/21	78.6	34.6	85.3	32.4	92%	91% to 94%	Barge Design Grid #27 (.1148)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 70s °F **Weather:** Sunny

GEOS Personnel: Nathan Turner

Date: June 29, 2021

Time: 2.5 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Nathan Turner with GEOServices traveled to referenced site above to collect a sample for permeability testing. Upon arrival to the site Mr. Turner met with Mr. Lawrence to discuss the location of the permeability sample. Mr. Turner collected one permeability sample on this day, from the second lift at Grid 28 near .1159. Mr. Turner returned the sample to GEOServices and the sample will be transported to GEOServices Knoxville Branch Laboratory for permeability testing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 29, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/29/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/29/21	72.9	38.5	79.2	36.4	92%	91% to 94%	Barge Design Grid #29 (.1154)	SG
2	06/29/21	72.6	38.6	79.2	36.4	92%	91% to 94%	Barge Design Grid #36 (.1200)	-9"
3	06/29/21	72.9	38.8	79.2	36.4	92%	91% to 94%	Barge Design Grid #35 (.1206)	-9"
4	06/29/21	72.8	38.6	79.2	36.4	92%	91% to 94%	Barge Design Grid #34 (.1203)	-9"
5	06/29/21	73.0	39.2	79.2	36.4	92%	91% to 94%	Barge Design Grid #30 (.1179)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 70s °F **Weather:** Sunny

GEOS Personnel: Nathan Turner

Date: June 30, 2021

Time: 2.5 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Nathan Turner with GEOServices traveled to referenced site above to collect a sample for permeability testing. Upon arrival to the site Mr. Turner met with Mr. Lawrence to discuss the location of the permeability sample. Mr. Turner collected one permeability sample on this day, from the first lift at Grid 35 near .1206. Mr. Turner returned the sample to GEOServices and the sample will be transported to GEOServices Knoxville Branch Laboratory for permeability testing.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☐ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: June 30, 2021

Time: 5.5 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 6/30/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	06/30/21	78.0	35.4	85.3	32.4	91%	91% to 94%	Barge Design Grid #36 (.1201)	SG
2	06/30/21	72.4	38.9	79.2	36.4	91%	91% to 94%	Barge Design Grid #35 (.1198)	SG
3	06/30/21	72.7	38.6	79.2	36.4	92%	91% to 94%	Barge Design Grid #34 (.1202)	SG

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

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Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: July 1, 2021

Time: 5.5 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 7/1/2021

GEOS Project No: 52-21103

GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	07/01/21	80.2	33.8	87.7	29.4	91%	91% to 94%	Barge Design Grid #31 (.1169)	-9"
2	07/01/21	76.1	36.7	82.5	34.9	92%	91% to 94%	Barge Design Grid #32 (.1171)	-9"
3	07/01/21	72.4	39.2	79.2	36.4	91%	91% to 94%	Barge Design Grid #33 (.1176)	-9"

GEOServices, LLC, Geotechnical and Materials Engineers

Daily Field Report

GEOServices, LLC | 10368 Wallace Alley Street, Suite 5, Kingsport, TN, 37663 | Phone (423) 212-2163 | www.geoservicesllc.com

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

GEOS Project No: 52-21103

Client: City of Kingsport

Contractor(s): City of Kingsport

Temperature: 80 °F **Weather:** Clear

GEOS Personnel: Robert Moody

Date: July 6, 2021

Time: 7.0 hours

A. Description of Work and Locations:

At the request of Mr. Eddie Lawrence, P.E. with Barge Design Solutions, Mr. Robert Moody with GEOServices traveled to the project site to perform field density testing during soil fill placement for the proposed closure. Upon arrival to site, Mr. Moody observed the City of Kingsport placing soil for the area two closure. During fill placement, Mr. Moody observed contractor placing soil utilizing on-road trucks, spread with a dozer and compacted with a sheeps foot roller. The soil was placed in loose lifts and compacted to approximately 9 inches. Mr. Moody periodically tested the soil with a nuclear density gauge and recorded the results on the attached summary. Mr. Moody verbally reported test results to Mr. Lawrence. Mr. Lawrence provided Mr. Moody with locations for each test conducted.

B. Observations/Test Results Reported to:	Eddie Lawrence/Barge Design Solutions				
C. Plans/Specs Available Onsite:	☑	**Yes**	☐	**No**	

Forms Attached (check all that apply):

- ☐ Structural Fill Observations
- ☑ Summary of Field Density Tests
- ☐ Footing Excavation Observations
- ☐ Reinforcing Steel Observations
- ☐ Concrete Placement Observations
- ☐ Concrete Truck Field Log
- ☐ Structural Masonry -CMU and Grout
- ☐ Structural Masonry -CMU and Mortar
- ☐ Grout Truck Field Log
- ☐ Asphalt Field Density Tests
- ☐ Site Photographs
- ☐ Other: _____

Version 05-01-20

GEOS
GEOServices, LLC, Geotechnical and Materials Engineers

Summary of Field Density Tests

Project Name: The City of Kingsport C&D Landfill Area 2 Closure

Date: 7/6/2021

GEOS Project No: 52-21103

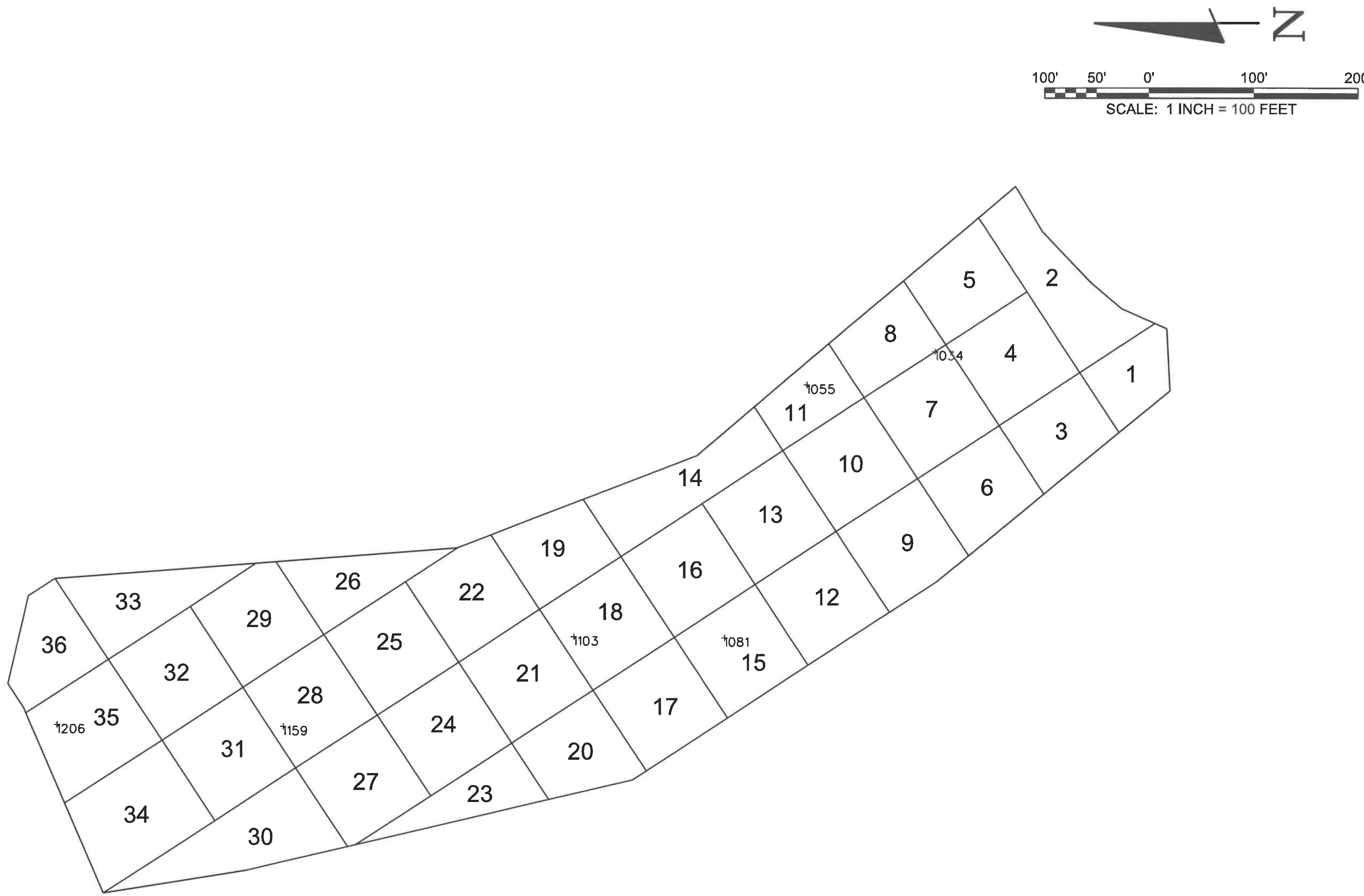
GEOS Personnel: Robert Moody

Grading Contractor: City of Kingsport

Test No.	Date	In-Place Dry Density (PCF)	In-Place Moisture (%)	Laboratory Proctor Data		In-Place Compaction (%)	Target Compaction (%)	Approximate Location of Test (Grid Coordinate/Station No.)	Elevation (ft.)
				MDD (PCF)	Opt. Moisture (%)				
1	07/06/21	73.7	38.2	79.2	36.4	93%	91% to 94%	Barge Design Grid #33 (.1185)	SG
2	07/06/21	74.0	38.6	79.2	36.4	93%	91% to 94%	Barge Design Grid #32 (.1184)	SG
3	07/06/21	79.4	35.5	85.3	32.4	93%	91% to 94%	Barge Design Grid #31 (.1182)	SG

Appendix F

Clay Cap Hydraulic Conductivity Testing



BARGE
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HYDRAULIC CONDUCTIVITY TEST LOCATIONS

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	09-20-2021	ISSUED FOR RECORD

C1.08

FILE NO. 36793-04

STLeonard
LandRes.pen Workspace: LandRes

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GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification
Project No: 52-21103

Report Date: 6/8/2021
Test Date: 6/2 - 6/4
Date Recieved: 5/28/2021
Log No:
Sample Type: In-Situ

Sample Location: First Lift / Grid 11 / 1055
Depth: NA
Description: Yellowish Tan Silty Clay

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	5.79	Wet Density (PCF):	113.4	Length (cm):	5.79	Wet Density (PCF):	114.8
Diameter (cm):	7.24	Dry Density (PCF):	85.8	Diameter (cm):	7.24	Dry Density (PCF):	85.8
Area (cm^2)	41.16	Act. Moist. %	32.2%	Area (cm^2)	41.16	Percent Saturation:	
Volume (cm^3)	238.35	Proctor MDD	87.7	Volume (cm^3)	238.35	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	433.0	Percent Compaction	97.8%	Wet weight (grams)	438.2	Void Ratio:	
Dry Weight (grams)	327.5	Void Ratio:		Dry Weight (grams)	327.5	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	33.8%		
Test Parameters:	Effective Consolidation Stress (psi):		5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements								K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2	Initial Gradient	Final Gradient	Uncorrected K-Value	Corrected K-Value
8:55	9:57	3720	23.0	23.0	23.0	0.9312	21.50	11.40	15.70	13.80	150.9	142.5	26.06	24.61	1.06E-06	9.84E-07
9:57	11:00	3780	23.0	23.0	23.0	0.9312	15.70	13.80	10.00	14.60	142.5	135.9	24.61	23.47	8.69E-07	8.09E-07
11:00	11:33	1980	23.0	23.0	23.0	0.9312	10.00	14.60	7.20	15.30	135.9	132.3	23.47	22.85	9.27E-07	8.63E-07
11:33	12:47	4440	23.0	23.0	23.0	0.9312	7.20	15.30	2.40	17.70	132.3	125.0	22.85	21.58	8.87E-07	8.26E-07
													Averages:		*9.35E-07*	*8.70E-07*

Notes:

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification
Project No: 52-21103

Report Date: 6/8/2021
Test Date: 6/2 - 6/4
Date Recieved: 5/28/2021
Log No:
Sample Type: In-Situ

Sample Location: Second Lift / Grid 7 / 1034
Depth: NA
Description: Yellowish Tan Silty Clay

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	11.97	Wet Density (PCF):	113.1	Length (cm):	11.97	Wet Density (PCF):	113.8
Diameter (cm):	7.26	Dry Density (PCF):	85.8	Diameter (cm):	7.26	Dry Density (PCF):	85.8
Area (cm^2)	41.35	Act. Moist. %	31.8%	Area (cm^2)	41.36	Percent Saturation:	
Volume (cm^3)	495.07	Proctor MDD	87.7	Volume (cm^3)	495.22	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	897.1	Percent Compaction	97.8%	Wet weight (grams)	903.1	Void Ratio:	
Dry Weight (grams)	680.5	Void Ratio:		Dry Weight (grams)	680.5	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	32.7%		
Test Parameters:	Effective Consolidation Stress (psi):		5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:03	8:19	960	23.0	23.0	23.0	0.9312	16.10	10.80	15.70	11.30	146.0	145.1	12.19	12.12	9.32E-07	8.68E-07
8:19	8:33	840	23.0	23.0	23.0	0.9312	15.70	11.30	15.30	11.70	145.1	144.3	12.12	12.05	9.52E-07	8.87E-07
8:33	9:22	2940	23.0	23.0	23.0	0.9312	15.30	11.70	14.00	13.00	144.3	141.6	12.05	11.83	8.95E-07	8.34E-07
9:22	11:31	7740	23.0	23.0	23.0	0.9312	13.40	13.50	10.00	17.00	140.5	133.5	11.73	11.15	9.42E-07	8.77E-07
													Averages:		9.30E-07	8.66E-07

Notes:

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **6/25/2021**
Test Date: **6/21 - 6/23**
Date Recieved: **6/17/2021**
Log No:
Sample Type: **In-Situ**

Sample Location: **First Lift, Grid I5, (.1081)**
Depth: **NA**
Description: **Yellowish Tan Silty Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	6.96	**Wet Density (PCF):**	**113.6**	Length (cm):	6.96	Wet Density (PCF):	115.6
Diameter (cm):	7.19	**Dry Density (PCF):**	**87.2**	Diameter (cm):	7.19	Dry Density (PCF):	87.1
Area (cm^2)	40.58	**Act. Moist. %**	**30.4%**	Area (cm^2)	40.58	Percent Saturation:	
Volume (cm^3)	282.43	Proctor MDD	87.7	Volume (cm^3)	282.43	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	514.1	**Percent Compaction**	**99.4%**	Wet weight (grams)	523.3	Void Ratio:	
Dry Weight (grams)	394.3	Void Ratio:		Dry Weight (grams)	394.3	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	32.7%		
Test Parameters:	Effective Consolidation Stress (psi):		5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements								K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2	Initial Gradient	Final Gradient	Uncorrected K-Value	Corrected K-Value
1:45	1:55	600	23.0	23.0	23.0	0.9312	22.00	4.00	21.60	4.20	159.0	158.3	22.84	22.75	5.40E-07	5.03E-07
1:55	2:00	300	23.0	23.0	23.0	0.9312	21.60	4.20	21.40	4.30	158.3	158.0	22.75	22.71	5.42E-07	5.05E-07
2:00	2:05	300	23.0	23.0	23.0	0.9312	21.40	4.30	21.30	4.50	158.0	157.7	22.71	22.66	5.43E-07	5.06E-07
2:05	2:47	2520	23.0	23.0	23.0	0.9312	21.30	4.50	20.10	5.60	157.7	155.4	22.66	22.33	5.00E-07	4.65E-07
													Averages:		***5.31E-07***	***4.95E-07***

Notes:

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **6/29/2021**
Test Date: **6/23 - 6/25**
Date Recieved: **6/18/2021**
Log No:
Sample Type: **In-Situ**

Sample Location: **Grid 18 / .1103 / 2nd Lift**
Depth: **NA**
Description: **Yellowish Tan Silty Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	8.01	Wet Density (PCF):	113.4	Length (cm):	8.01	Wet Density (PCF):	114.8
Diameter (cm):	7.15	Dry Density (PCF):	84.2	Diameter (cm):	7.15	Dry Density (PCF):	84.2
Area (cm^2)	40.20	Act. Moist. %	34.7%	Area (cm^2)	40.20	Percent Saturation:	
Volume (cm^3)	321.88	Proctor MDD	87.7	Volume (cm^3)	321.88	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	584.7	Percent Compaction	96.0%	Wet weight (grams)	592.0	Void Ratio:	
Dry Weight (grams)	434.0	Void Ratio:		Dry Weight (grams)	434.0	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	36.4%		
Test Parameters:	Effective Consolidation Stress (psi):		5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
9:16	10:51	5700	23.0	23.0	23.0	0.9312	22.50	6.60	19.20	9.90	156.8	150.1	19.59	18.74	7.51E-07	7.00E-07
10:51	12:54	7380	23.0	23.0	23.0	0.9312	19.20	9.90	14.60	14.50	150.1	140.7	18.74	17.57	8.54E-07	7.95E-07
12:54	14:12	4680	23.0	23.0	23.0	0.9312	14.60	14.50	12.10	17.00	140.7	135.6	17.57	16.94	7.70E-07	7.17E-07
14:12	15:38	5160	23.0	23.0	23.0	0.9312	12.10	17.00	9.50	19.60	135.6	130.3	16.94	16.27	7.55E-07	7.03E-07
													Averages:		*7.82E-07*	*7.29E-07*

Notes:

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **7/13/2021**
Test Date: **7/6 - 7/8**
Date Recieved: **6/29/2021**
Log No:
Sample Type: **In-Situ**

Sample Location: **Grid 28 / .1159 / 2nd Lift**
Depth: **NA**
Description: **Yellowish Tan Silty Clay**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	8.97	Wet Density (PCF):	111.6	Length (cm):	8.97	Wet Density (PCF):	112.8
Diameter (cm):	7.24	Dry Density (PCF):	86.0	Diameter (cm):	7.24	Dry Density (PCF):	86.0
Area (cm^2)	41.20	Act. Moist. %	29.8%	Area (cm^2)	41.19	Percent Saturation:	
Volume (cm^3)	369.37	Proctor MDD	87.7	Volume (cm^3)	369.28	B-Parameter:	
		Proctor Opt Moist.	29.4%				
Wet weight (grams)	660.2	Percent Compaction	98.0%	Wet weight (grams)	667.5	Void Ratio:	
Dry Weight (grams)	508.7	Void Ratio:		Dry Weight (grams)	508.7	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	31.2%		
Test Parameters:		Effective Consolidation Stress (psi):	5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
8:50	9:22	1920	23.0	23.0	23.0	0.9312	23.10	4.70	21.90	5.90	159.4	156.9	17.77	17.50	8.60E-07	8.01E-07
9:22	10:10	2880	23.0	23.0	23.0	0.9312	21.90	5.90	20.10	7.70	156.9	153.2	17.50	17.09	8.77E-07	8.17E-07
10:10	10:45	2100	23.0	23.0	23.0	0.9312	20.10	7.70	18.80	9.00	153.2	150.6	17.09	16.80	8.87E-07	8.26E-07
10:45	11:25	2400	23.0	23.0	23.0	0.9312	18.80	9.00	17.40	10.40	150.6	147.7	16.80	16.48	8.51E-07	7.92E-07
												Averages:			8.69E-07	8.09E-07

Notes:

GEOServices, LLC, Geotechnical and Materials Engineers

HYDRAULIC CONDUCTIVITY BY FLEX WALL PERMEAMETER
ASTM D 5084 METHOD C

Project Name: **City of Kingsport C&D Landfill, Area 2 Closure, Soil Qualification**
Project No: **52-21103**

Report Date: **7/20/2021**
Test Date: **7/13 - 7/15**
Date Recieved: **6/30/2021**
Log No:
Sample Type: **In-Situ**

Sample Location: **Grid 35 / .1206 / 1st Lift**
Depth: **NA**
Description: **Yellowish Tan Clayey Silt**

Initial Remolded Specimen Conditions				Final Specimen Conditions			
Length (cm):	7.25	Wet Density (PCF):	112.3	Length (cm):	7.25	Wet Density (PCF):	113.0
Diameter (cm):	7.22	Dry Density (PCF):	82.6	Diameter (cm):	7.22	Dry Density (PCF):	82.6
Area (cm^2)	40.98	Act. Moist. %	35.9%	Area (cm^2)	40.98	Percent Saturation:	
Volume (cm^3)	297.27	Proctor MDD	85.3	Volume (cm^3)	297.28	B-Parameter:	
		Proctor Opt Moist.	34.2%				
Wet weight (grams)	534.6	Percent Compaction	96.8%	Wet weight (grams)	538.0	Void Ratio:	
Dry Weight (grams)	393.3	Void Ratio:		Dry Weight (grams)	393.3	Porosity:	
Specific Gravity		B Value	98%	Percent Moisture:	36.8%		
Test Parameters:	Effective Consolidation Stress (psi):		5.0	Permeant Liquid Used:		water	
Burette Area (cm^2):	0.980	Cell Pressure (psi):	55.0	Influent Pressure (psi):	52.0	Effluent Pressure (psi):	50.0

Time (24-hr)			Temperature (°C)				Measurements						Initial Gradient	Final Gradient	K-Value (cm/sec)	
Start	End	Time (sec)	Initial	Final	Ave.	Factor	$h_{out}1$	$h_{in}1$	$h_{out}2$	$h_{in}2$	h1	h2			Uncorrected K-Value	Corrected K-Value
10:06	10:11	300	23.0	23.0	23.0	0.9312	11.20	14.70	11.10	14.80	137.0	136.8	18.89	18.86	4.31E-07	4.01E-07
10:11	11:19	4080	23.0	23.0	23.0	0.9312	11.10	14.80	9.60	16.20	136.8	133.9	18.86	18.46	4.65E-07	4.33E-07
11:19	12:05	2760	23.0	23.0	23.0	0.9312	9.60	16.20	8.70	17.20	133.9	131.9	18.46	18.19	4.58E-07	4.27E-07
12:05	13:16	4260	23.0	23.0	23.0	0.9312	8.70	17.20	7.20	18.70	131.9	128.9	18.19	17.77	4.78E-07	4.45E-07
													Averages:		4.58E-07	4.26E-07

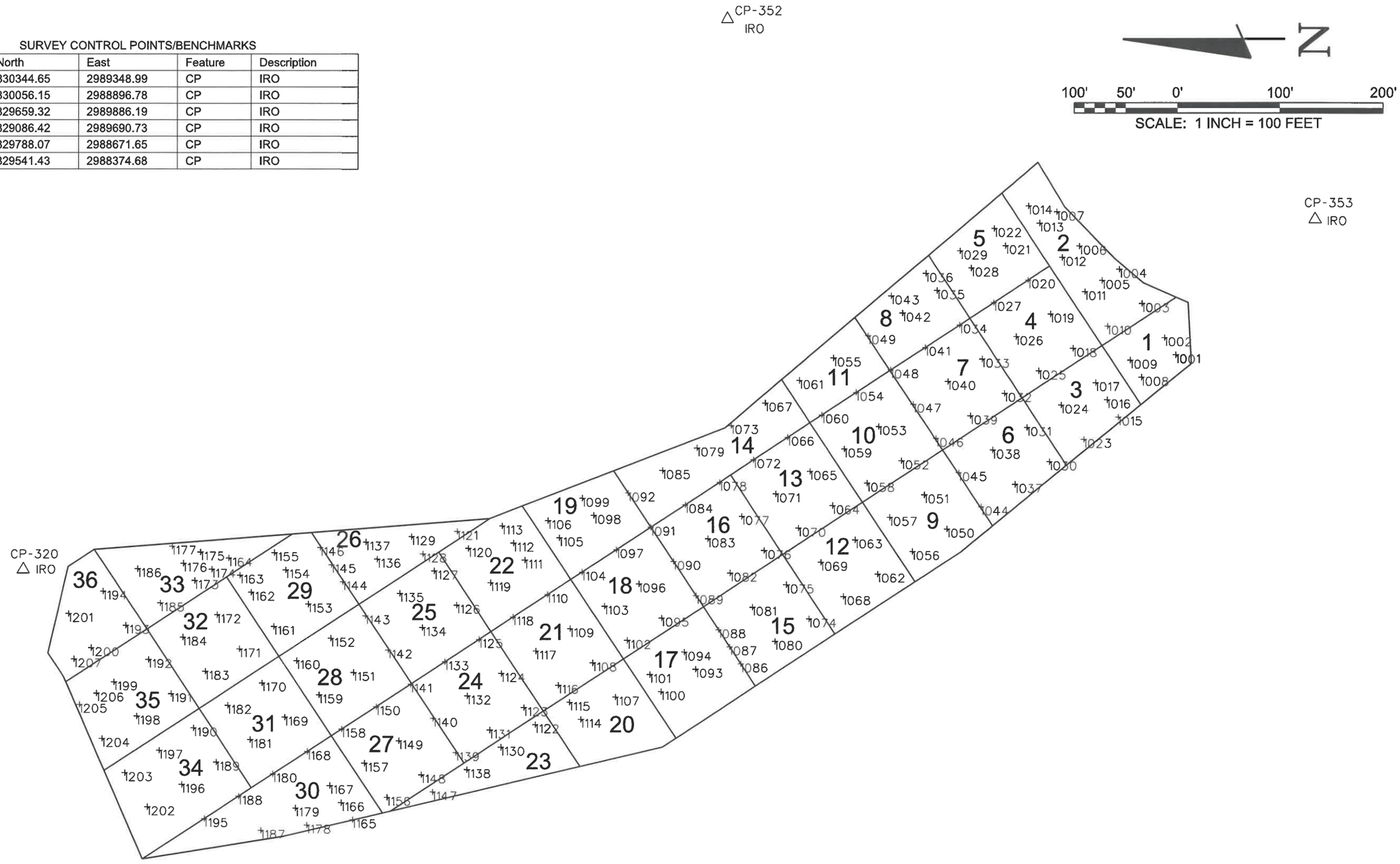
Notes:

Appendix G

As-Built Drawings

SURVEY CONTROL POINTS/BENCHMARKS

Point	North	East	Feature	Description
320	830344.65	2989348.99	CP	IRO
351	830056.15	2988896.78	CP	IRO
352	829659.32	2989886.19	CP	IRO
353	829086.42	2989690.73	CP	IRO
354	829788.07	2988671.65	CP	IRO
355	829541.43	2988374.68	CP	IRO



BARGE
DESIGN SOLUTIONS
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WILLIAM E. LAWRENCE — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE

PROJECT GRID SYSTEM WITH SURVEY POINTS

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)
CITY OF KINGSPORT DEMOLITION LANDFILL
KINGSPORT, TENNESSEE

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	9-20-2021	ISSUED FOR RECORD

C1.05

FILE NO. 36793-04

STLeonard
LandRes,pen Workspace: LandRes

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Kingsport C&D Landfill Phase 1 Area 2 Closure Fill Table										
Survey Point Number	Coordinates		Top of Waste Elevation	Top of Clay Cap Elevation	Height of Fill (FT)	Shale Elevation	Height of Fill (FT)	Topsoil Elevation	Height of Fill (FT)	Notes
1001	829222.71	2989558.60	1280.10	1281.54	1.44			1282.47	0.93	
1002	829233.70	2989575.18	1276.71	1278.18	1.47			1279.19	1.01	
1003	829255.53	2989608.58	1269.30	1270.72	1.42			1271.74	1.01	
1004	829277.54	2989642.03	1264.46	1266.00	1.54			1267.02	1.02	
1005	829294.31	2989631.16	1270.79	1272.26	1.46			1273.31	1.06	
1006	829316.20	2989664.50	1268.49	1269.98	1.49			1270.97	0.99	
1007	829338.30	2989697.96		1267.91				1268.94	1.02	A
1008	829256.12	2989536.53	1285.41	1286.97	1.56			1287.87	0.90	
1009	829267.15	2989553.12	1283.73	1285.25	1.52			1287.46	2.21	B
1010	829289.08	2989586.65	1280.26	1281.75	1.48			1282.71	0.97	
1011	829310.91	2989620.14	1275.79	1277.37	1.58			1278.43	1.06	
1012	829332.88	2989653.55	1273.98	1275.43	1.45			1276.46	1.03	
1013	829354.87	2989687.02	1272.89	1274.33	1.44			1275.39	1.06	
1014	829365.78	2989703.72	1271.85	1273.34	1.49			1274.38	1.03	
1015	829278.73	2989497.82		1292.85				1293.81	0.96	C
1016	829289.67	2989514.60	1290.48	1291.96	1.48			1292.88	0.92	
1017	829300.52	2989531.32	1289.38	1290.84	1.45			1291.90	1.07	
1018	829322.54	2989564.79	1287.66	1289.19	1.53			1290.16	0.97	
1019	829344.55	2989598.14	1286.62	1288.11	1.48			1290.43	2.33	B
1020	829366.42	2989631.62	1286.45	1288.00	1.55			1289.01	1.01	
1021	829388.29	2989665.08	1286.08	1287.56	1.48			1288.58	1.02	
1022	829399.32	2989681.82	1284.79	1286.31	1.52			1287.28	0.97	
1023	829312.10	2989475.84	1294.99	1296.51	1.52			1297.53	1.01	
1024	829334.01	2989509.36	1294.13	1295.71	1.58			1296.71	1.01	
1025	829355.94	2989542.86	1294.03	1295.57	1.54			1296.57	1.00	
1026	829377.84	2989576.26	1295.38	1296.82	1.45			1297.87	1.05	
1027	829399.81	2989609.72	1297.04	1298.53	1.49			1299.55	1.02	
1028	829421.72	2989643.03	1297.03	1298.56	1.53			1299.55	0.99	
1029	829432.68	2989659.84	1295.53	1297.06	1.53			1298.02	0.96	
1030	829345.58	2989453.95	1299.00	1300.44	1.44			1301.40	0.96	
1031	829367.55	2989487.50	1299.00	1300.57	1.58			1301.50	0.92	
1032	829389.42	2989520.91	1300.40	1301.96	1.56			1302.88	0.92	
1033	829411.30	2989554.33	1302.74	1304.20	1.46			1305.25	1.05	
1034	829433.27	2989587.73	1304.80	1306.25	1.45			1307.27	1.03	
1035	829455.22	2989621.23	1305.50	1306.99	1.48			1307.97	0.99	
1036	829466.14	2989637.94	1304.02	1305.57	1.55			1306.48	0.91	
1037	829378.97	2989432.13	1303.22	1304.76	1.54			1305.70	0.94	
1038	829401.01	2989465.44	1304.38	1305.89	1.52			1306.91	1.02	
1039	829422.87	2989498.85	1305.87	1307.40	1.53			1308.39	0.99	
1040	829444.73	2989532.37	1308.03	1309.53	1.51			1310.52	0.99	
1041	829466.71	2989565.82	1310.12	1311.58	1.45			1312.58	1.00	
1042	829488.64	2989599.27	1310.69	1312.15	1.47			1313.17	1.02	
1043	829499.60	2989616.04	1309.74	1311.17	1.43			1312.18	1.02	
1044	829412.47	2989410.09	1310.00	1311.57	1.57			1312.53	0.96	
1045	829434.43	2989443.53	1310.23	1311.73	1.49			1312.67	0.94	
1046	829456.45	2989477.06	1311.07	1312.57	1.51			1313.47	0.90	
1047	829478.19	2989510.51	1312.83	1314.30	1.47			1315.30	1.00	
1048	829500.19	2989543.97	1314.56	1316.09	1.53			1317.07	0.98	
1049	829522.15	2989577.33	1316.22	1317.78	1.56			1318.73	0.95	
1050	829445.86	2989388.17	1314.38	1315.80	1.42			1316.78	0.98	
1051	829467.77	2989421.70	1314.27	1315.81	1.54			1316.78	0.97	
1052	829489.84	2989455.06	1315.59	1317.18	1.59			1318.09	0.91	
1053	829511.55	2989488.73	1317.59	1319.16	1.57			1320.11	0.95	
1054	829533.73	2989521.94	1319.67	1321.10	1.43			1322.13	1.02	
1055	829555.52	2989555.37	1321.92	1323.40	1.49			1324.47	1.07	
1056	829479.38	2989366.25	1318.39	1319.89	1.50			1320.89	1.00	
1057	829501.17	2989399.75	1318.90	1320.36	1.45			1321.44	1.08	
1058	829523.20	2989433.24	1320.73	1322.21	1.49			1324.35	2.13	B

Kingsport C&D Landfill Phase 1 Area 2 Closure Fill Table										
Survey Point Number	Coordinates		Top of Waste Elevation	Top of Clay Cap Elevation	Height of Fill (FT)	Shale Elevation	Height of Fill (FT)	Topsoil Elevation	Height of Fill (FT)	Notes
1059	829545.17	2989466.66	1323.04	1324.53	1.49			1325.56	1.04	
1060	829567.03	2989500.05	1325.34	1326.85	1.51			1327.86	1.01	
1061	829588.94	2989533.41	1327.59	1329.09	1.49			1330.06	0.98	
1062	829512.72	2989344.34	1322.72	1324.22	1.50			1325.19	0.97	
1063	829534.69	2989377.83	1323.90	1325.48	1.58			1326.44	0.96	
1064	829556.72	2989411.28	1325.98	1327.56	1.59			1328.51	0.94	
1065	829578.62	2989444.67	1328.02	1329.62	1.60			1330.61	0.98	
1066	829600.46	2989478.14	1330.25	1331.73	1.47			1333.91	2.19	B
1067	829622.39	2989511.61	1332.42	1333.89	1.47			1334.89	1.00	
1068	829546.20	2989322.39	1327.07	1328.64	1.57			1329.59	0.95	
1069	829568.19	2989355.73	1328.45	1329.90	1.45			1331.01	1.10	
1070	829590.10	2989389.35	1330.49	1331.96	1.48			1332.98	1.02	
1071	829612.12	2989422.75	1332.36	1333.84	1.49			1334.85	1.01	
1072	829633.94	2989456.16	1334.47	1336.03	1.56			1336.95	0.92	
1073	829655.92	2989489.59	1337.57	1339.02	1.45			1340.09	1.07	
1074	829579.69	2989300.45	1331.17	1332.71	1.53			1333.70	0.99	
1075	829601.62	2989334.02	1332.83	1334.37	1.55			1335.33	0.95	
1076	829623.59	2989367.33	1334.68	1336.16	1.47			1337.17	1.02	
1077	829645.50	2989400.82	1336.16	1337.60	1.44			1338.66	1.06	
1078	829667.51	2989434.25	1338.57	1340.08	1.51			1341.07	0.99	
1079	829689.38	2989467.68	1342.39	1343.89	1.51			1344.89	0.99	
1080	829613.18	2989278.52	1335.55	1337.02	1.47			1337.96	0.94	
1081	829635.09	2989311.97	1336.71	1338.24	1.53			1339.18	0.94	
1082	829656.98	2989345.49	1338.09	1339.59	1.50			1340.59	1.00	
1083	829678.90	2989378.84	1339.59	1341.09	1.50			1342.11	1.02	
1084	829700.96	2989412.33	1342.25	1343.77	1.52			1344.76	0.99	
1085	829722.85	2989445.79	1346.16	1347.69	1.53			1348.69	1.01	
1086	829646.57	2989256.56	1338.90	1340.38	1.49			1341.44	1.05	
1087	829657.50	2989273.30	1339.45	1340.99	1.54			1341.99	1.00	
1088	829668.55	2989290.04	1339.97	1341.56	1.59			1342.57	1.01	
1089	829690.50	2989323.54	1341.52	1342.97	1.44			1343.94	0.97	
1090	829712.25	2989356.94	1343.16	1344.73	1.58			1345.65	0.92	
1091	829734.28	2989390.34	1345.68	1347.22	1.54			1348.24	1.02	
1092	829756.24	2989423.91	1349.21	1350.66	1.45			1351.67	1.01	
1093	829690.97	2989251.40	1342.68	1344.21	1.53			1345.24	1.03	
1094	829701.98	2989268.12	1343.24	1344.83	1.59			1345.84	1.02	
1095	829723.94	2989301.57	1344.88	1346.35	1.47			1347.34	0.98	
1096	829745.84	2989334.94	1346.52	1347.98	1.45			1348.94	0.96	
1097	829767.74	2989368.43	1348.83	1350.30	1.47			1351.34	1.04	
1098	829789.84	2989401.88	1352.00	1353.59	1.60			1354.58	0.99	
1099	829800.75	2989418.58	1353.81	1355.26	1.44			1356.21	0.95	
1100	829724.43	2989229.44	1345.56	1347.06	1.50			1349.37	2.30	B
1101	829735.39	2989246.17	1346.11	1347.64	1.52			1349.69	2.06	B
1102	829757.40	2989279.58	1347.57	1349.05	1.48			1350.08	1.03	
1103	829779.36	2989313.05	1349.27	1350.82	1.54			1351.83	1.01	
1104	829801.18	2989346.47	1351.51	1353.04	1.53			1354.03	0.99	
1105	829823.25	2989379.98	1354.48	1355.98	1.50			1356.95	0.98	
1106	829834.13	2989396.68	1355.82	1357.35	1.53			1358.35	1.00	
1107	829768.86	2989224.21	1348.41	1349.96	1.55			1350.97	1.01	
1108	829790.81	2989257.65	1349.87	1351.42	1.55			1352.47	1.05	
1109	829812.72	2989291.15	1351.63	1353.09	1.46			1354.17	1.08	
1110	829834.69	2989324.63	1353.73	1355.28	1.55			1357.92	2.65	B
1111	829856.63	2989358.01	1356.49	1357.98	1.50			1360.16	2.18	B
1112	829867.55	2989374.75	1357.90	1359.39	1.50			1361.60	2.20	B
1113	829878.57	2989391.38	1359.18	1360.71	1.53			1362.45	1.75	B
1114	829802.31	2989202.27	1350.59	1352.19	1.60			1353.12	0.93	
1115	829813.26	2989219.01	1351.16	1352.67	1.50			1353.65	0.99	
1116	829824.24	2989235.75	1351.86	1353.39	1.52			1354.39	1.00	

Kingsport C&D Landfill Phase 1 Area 2 Closure Fill Table										
Survey Point Number	Coordinates		Top of Waste Elevation	Top of Clay Cap Elevation	Height of Fill (FT)	Shale Elevation	Height of Fill (FT)	Topsoil Elevation	Height of Fill (FT)	Notes
1117	829846.18	2989269.10	1353.57	1355.12	1.55			1356.11	1.00	
1118	829868.16	2989302.59	1355.65	1357.15	1.50			1358.16	1.01	
1119	829890.07	2989336.09	1358.32	1359.83	1.51			1360.84	1.02	
1120	829911.96	2989369.55	1361.28	1362.82	1.55			1363.74	0.91	
1121	829922.96	2989386.26	1362.96	1364.55	1.58			1365.50	0.96	
1122	829846.73	2989197.08	1352.81	1354.37	1.56			1355.39	1.02	
1123	829857.70	2989213.73	1353.48	1355.06	1.58			1356.05	0.99	
1124	829879.62	2989247.24	1355.18	1356.72	1.53			1357.75	1.03	
1125	829901.56	2989280.76	1357.47	1359.06	1.58			1360.02	0.96	
1126	829923.51	2989314.11	1360.43	1361.90	1.47			1362.94	1.04	
1127	829945.43	2989347.60	1363.59	1365.08	1.49			1366.12	1.04	
1128	829956.38	2989364.30	1365.28	1366.79	1.51			1367.82	1.03	
1129	829967.33	2989381.01	1367.07	1368.56	1.49			1369.56	1.00	
1130	829880.21	2989175.11	1354.33	1355.93	1.60	1356.27	0.34	1357.26	0.99	D
1131	829891.17	2989191.90	1354.92	1356.50	1.58	1356.78	0.28	1357.78	1.00	D
1132	829913.10	2989225.28	1356.81	1358.35	1.55			1359.45	1.09	
1133	829935.03	2989258.72	1359.59	1361.18	1.59			1362.17	0.99	
1134	829957.06	2989292.20	1362.58	1364.12	1.53			1365.06	0.95	
1135	829978.88	2989325.73	1365.79	1367.32	1.54			1368.33	1.01	
1136	830000.89	2989359.16	1369.23	1370.72	1.49			1371.79	1.06	
1137	830011.78	2989375.89	1370.76	1372.33	1.57			1373.27	0.94	
1138	829913.62	2989153.18	1355.45	1357.02	1.56	1358.02	1.00	1359.02	1.00	D
1139	829924.59	2989169.97	1356.20	1357.70	1.50	1358.58	0.88	1359.63	1.04	D
1140	829946.53	2989203.41	1358.75	1360.30	1.55	1360.44	0.14	1361.42	0.98	D
1141	829968.43	2989236.84	1361.75	1363.24	1.49			1364.25	1.01	
1142	829990.37	2989270.33	1364.58	1366.14	1.56			1367.12	0.99	
1143	830012.33	2989303.72	1367.94	1369.39	1.45			1370.47	1.08	
1144	830034.20	2989337.16	1371.14	1372.65	1.52			1373.67	1.02	
1145	830045.16	2989353.84	1372.60	1374.12	1.53			1375.09	0.97	
1146	830056.28	2989370.67	1373.93	1375.48	1.55			1376.46	0.99	
1147	829947.04	2989131.25	1356.23	1357.84	1.60	1359.76	1.92	1360.71	0.95	D
1148	829958.05	2989148.04	1357.05	1358.61	1.57	1360.25	1.64	1361.27	1.02	
1149	829979.97	2989181.44	1360.17	1361.70	1.52	1362.32	0.62	1363.33	1.01	
1150	830001.93	2989214.94	1363.44	1365.03	1.59			1366.12	1.09	
1151	830023.90	2989248.36	1366.55	1368.10	1.55			1369.09	0.99	
1152	830045.78	2989281.83	1369.80	1371.31	1.51			1372.31	1.00	
1153	830067.68	2989315.22	1372.66	1374.12	1.46			1375.19	1.07	
1154	830089.73	2989348.70	1375.41	1376.91	1.50			1377.95	1.04	
1155	830100.63	2989365.46	1376.95	1378.40	1.45			1379.36	0.96	
1156	829991.45	2989126.08	1357.88	1359.43	1.56	1361.89	2.46	1362.92	1.02	D
1157	830013.34	2989159.47	1361.35	1362.86	1.51	1363.43	0.58	1364.46	1.03	D
1158	830035.36	2989192.96	1364.80	1366.32	1.53			1367.41	1.09	
1159	830057.33	2989226.34	1368.16	1369.66	1.50			1370.71	1.05	
1160	830079.22	2989259.91	1371.35	1372.81	1.45			1373.85	1.04	
1161	830101.26	2989293.24	1374.09	1375.60	1.51			1376.61	1.02	
1162	830123.10	2989326.67	1376.86	1378.41	1.55			1379.31	0.91	
1163	830134.02	2989343.52	1378.28	1379.79	1.50			1380.79	1.00	
1164	830145.07	2989360.20	1379.71	1381.25	1.54			1382.23	0.98	
1165	830024.97	2989104.14	1358.33	1359.77	1.44	1363.00	3.24	1364.04	1.04	D
1166	830035.91	2989120.88	1359.98	1361.47	1.50	1363.61	2.14	1364.64	1.02	D
1167	830046.78	2989137.57	1361.91	1363.38	1.47	1364.48	1.09	1365.51	1.04	D
1168	830068.86	2989171.02	1365.38	1366.93	1.55			1367.95	1.02	
1169	830090.72	2989204.47	1369.03	1370.54	1.52			1371.53	0.98	
1170	830112.68	2989237.96	1372.22	1373.68	1.46			1374.73	1.05	
1171	830134.57	2989271.41	1375.17	1376.64	1.48			1377.65	1.00	
1172	830156.53	2989304.73	1377.85	1379.33	1.48			1380.37	1.04	
1173	830178.50	2989338.24	1380.74	1382.31	1.57			1383.24	0.93	
1174	830161.72	2989349.31	1380.40	1381.86	1.46			1382.93	1.06	

Kingsport C&D Landfill Phase 1 Area 2 Closure Fill Table										
Survey Point Number	Coordinates		Top of Waste Elevation	Top of Clay Cap Elevation	Height of Fill (FT)	Shale Elevation	Height of Fill (FT)	Topsoil Elevation	Height of Fill (FT)	Notes
1175	830172.68	2989365.93	1381.89	1383.33	1.44			1384.34	1.01	
1176	830189.47	2989354.93	1382.19	1383.69	1.51			1384.71	1.01	
1177	830200.42	2989371.68	1383.19	1384.72	1.53			1385.63	0.91	
1178	830069.29	2989098.91	1359.92	1361.42	1.50	1364.39	2.97	1365.37	0.99	D
1179	830080.28	2989115.68	1361.80	1363.29	1.49	1364.89	1.60	1365.87	0.98	D
1180	830102.24	2989149.09	1365.34	1366.93	1.59			1367.95	1.02	
1181	830124.22	2989182.61	1369.09	1370.59	1.49			1371.55	0.96	
1182	830146.14	2989216.01	1372.17	1373.63	1.46			1374.67	1.05	
1183	830168.01	2989249.50	1375.09	1376.58	1.49			1377.58	0.99	
1184	830189.90	2989282.87	1377.67	1379.20	1.53			1380.20	1.00	
1185	830211.92	2989316.37	1380.49	1382.03	1.54			1383.03	1.00	
1186	830233.85	2989349.79	1383.33	1384.89	1.55			1385.85	0.97	
1187	830113.78	2989093.73	1361.40	1362.94	1.54	1364.91	1.97	1365.89	0.98	D
1188	830135.72	2989127.09	1364.58	1366.07	1.49	1366.42	0.35	1367.37	0.94	D
1189	830157.70	2989160.64	1368.09	1369.64	1.55			1370.62	0.98	
1190	830179.64	2989194.01	1371.22	1372.78	1.56			1373.78	1.00	
1191	830201.50	2989227.55	1373.90	1375.41	1.51			1376.41	1.01	
1192	830223.46	2989261.01	1376.42	1377.91	1.50			1378.89	0.98	
1193	830245.34	2989294.43	1379.06	1380.63	1.58			1381.59	0.95	
1194	830267.34	2989327.80	1381.86	1383.44	1.58			1384.40	0.96	
1195	830169.15	2989105.15	1363.12	1364.63	1.51	1365.70	1.07	1366.70	1.00	D
1196	830191.08	2989138.72	1366.35	1367.83	1.48			1368.85	1.03	
1197	830213.04	2989172.10	1369.51	1371.04	1.54			1372.00	0.96	
1198	830234.93	2989205.54	1372.17	1373.70	1.53			1374.68	0.98	
1199	830256.84	2989238.98	1374.83	1376.34	1.52			1377.35	1.01	
1200	830278.86	2989272.50	1377.37	1378.91	1.54			1379.93	1.02	
1201	830300.74	2989305.90	1380.27	1381.78	1.51			1382.77	0.99	
1202	830224.53	2989116.71	1364.21	1365.75	1.54	1366.48	0.73	1367.48	1.00	D
1203	830246.45	2989150.14	1367.45	1368.92	1.47			1369.91	0.99	
1204	830268.40	2989183.62	1370.39	1371.87	1.48			1372.94	1.07	
1205	830290.37	2989217.09	1373.09	1374.62	1.53			1375.59	0.97	
1206	830273.56	2989228.01	1373.95	1375.49	1.54			1376.48	0.99	
1207	830295.52	2989261.48	1376.47	1378.04	1.57			1379.03	0.99	

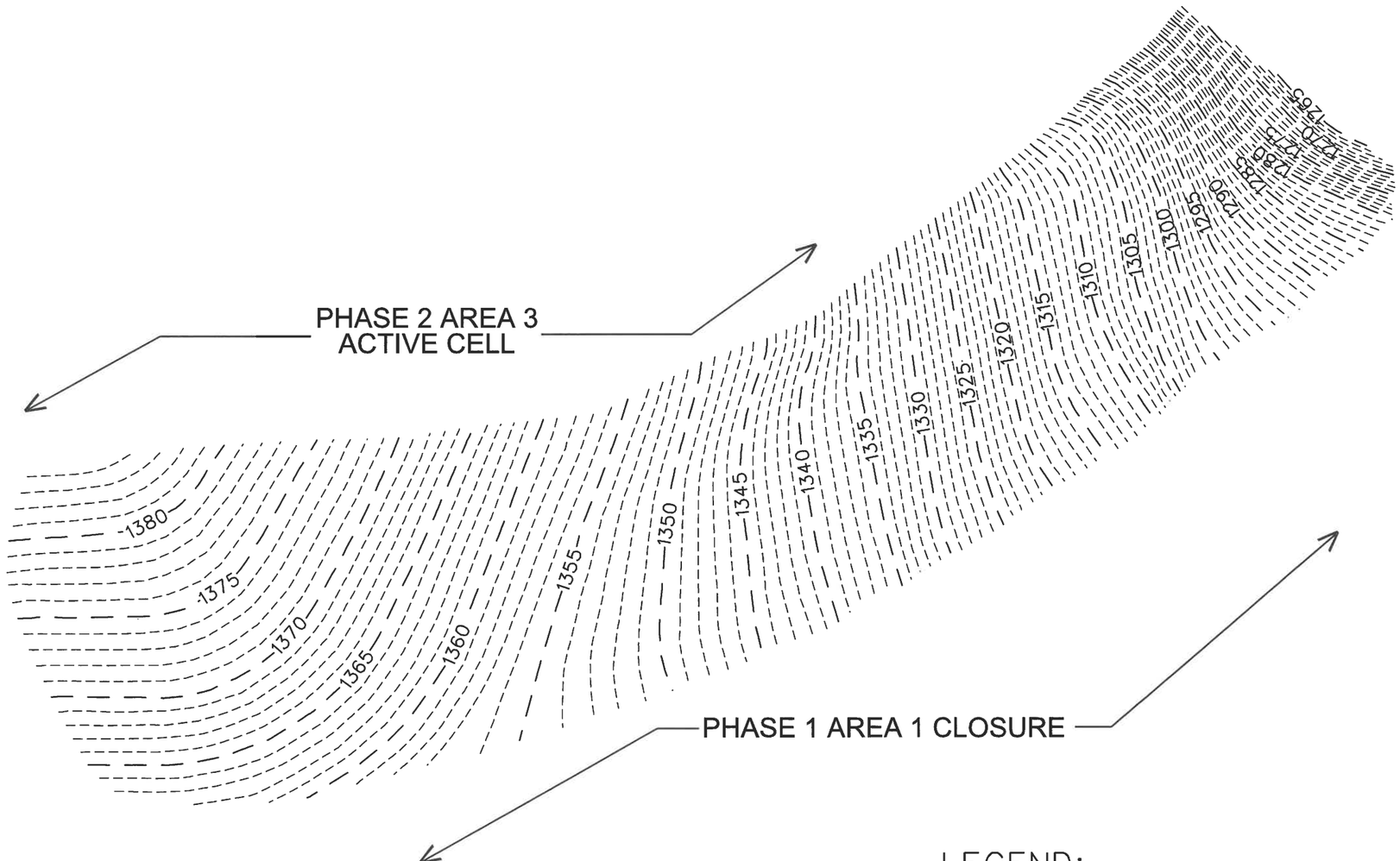
Notes:

A	POINT LOCATION FELL OUTSIDE OF THE TOP OF WASTE AND THEREFORE NO TOP OF WASTE ELEVATION WAS RECORDED
B	POINT LOCATION FOR TOPSOIL FELL WITHIN A STORMWATER DIVERSION BERM
C	POINT LOCATION WAS WITHIN PREVIOUS PHASE 1, AREA 1 CLOSURE AND THEREFORE NO TOP OF WASTE ELEVATION WAS RECORDED
D	ON-SITE SHALE WAS INSTALLED TO PROVIDE PROPER GRADE FOR STORMWATER DRAINAGE

N

100' 50' 0' 100' 200'

SCALE: 1 INCH = 100 FEET



LEGEND:

— — -1380— — — PHASE I AREA 2
TOP OF WASTE ELEVATIONS

BARGE DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-5233

WILLIAM E. LAWRENCE — REGISTERED ENGINEER — STATE OF TENNESSEE

TOP OF WASTE AS-BUILT

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)
CITY OF KINGSPORT DEMOLITION LANDFILL
KINGSPORT, TENNESSEE

REVISION NUMBER	DR	CHK	DATE	DESCRIPTION
0	TL	EL	9-20-2021	ISSUED FOR RECORD

C1.01

FILE NO. 36793-04

9/27/2021
11:06:00 AM
STLeonard
LandRes.pen Workspace: LandRes

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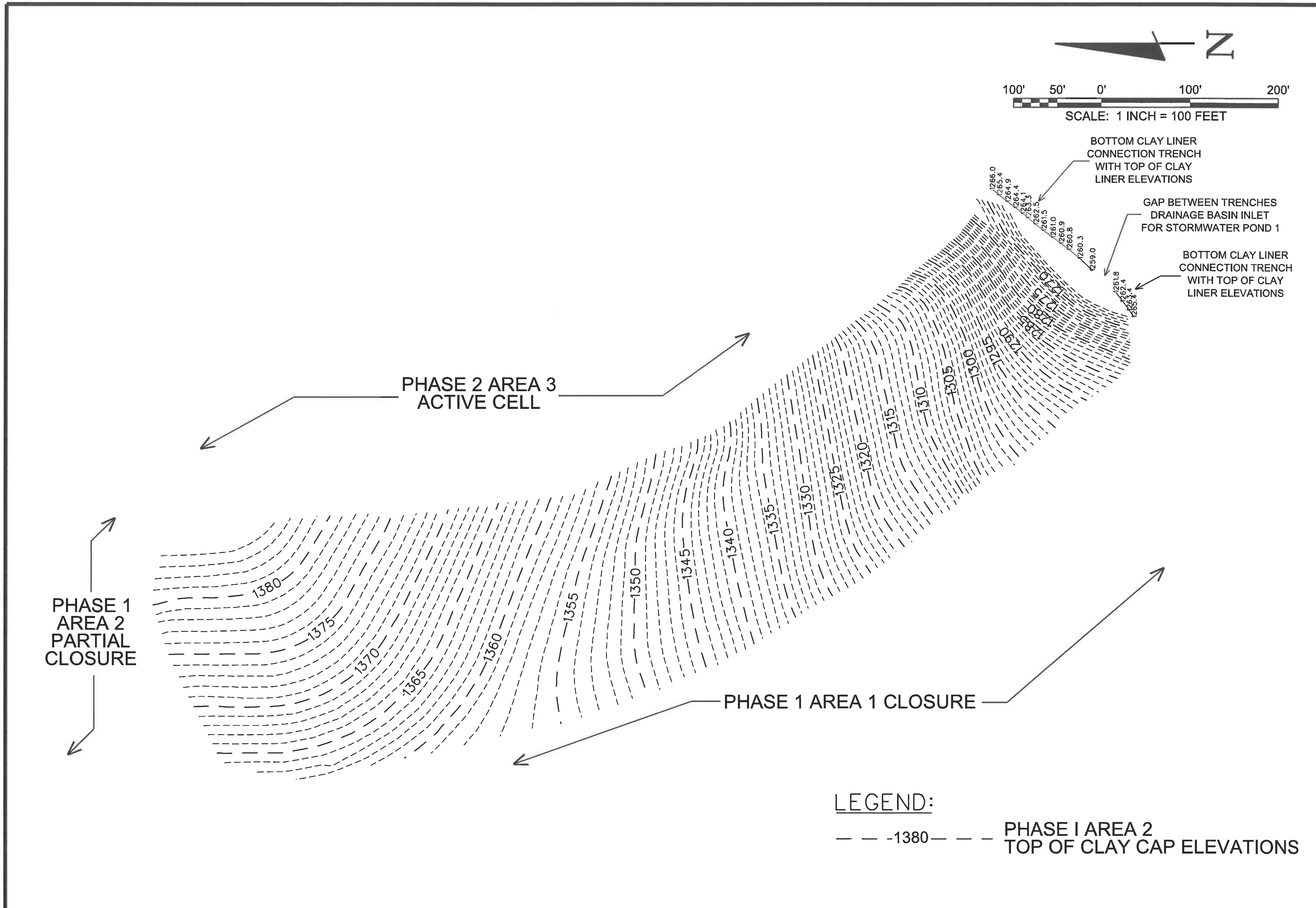


BARGE DESIGN SOLUTIONS

Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

TOP OF CLAY CAP AS-BUILT

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REVISION INFORMATION

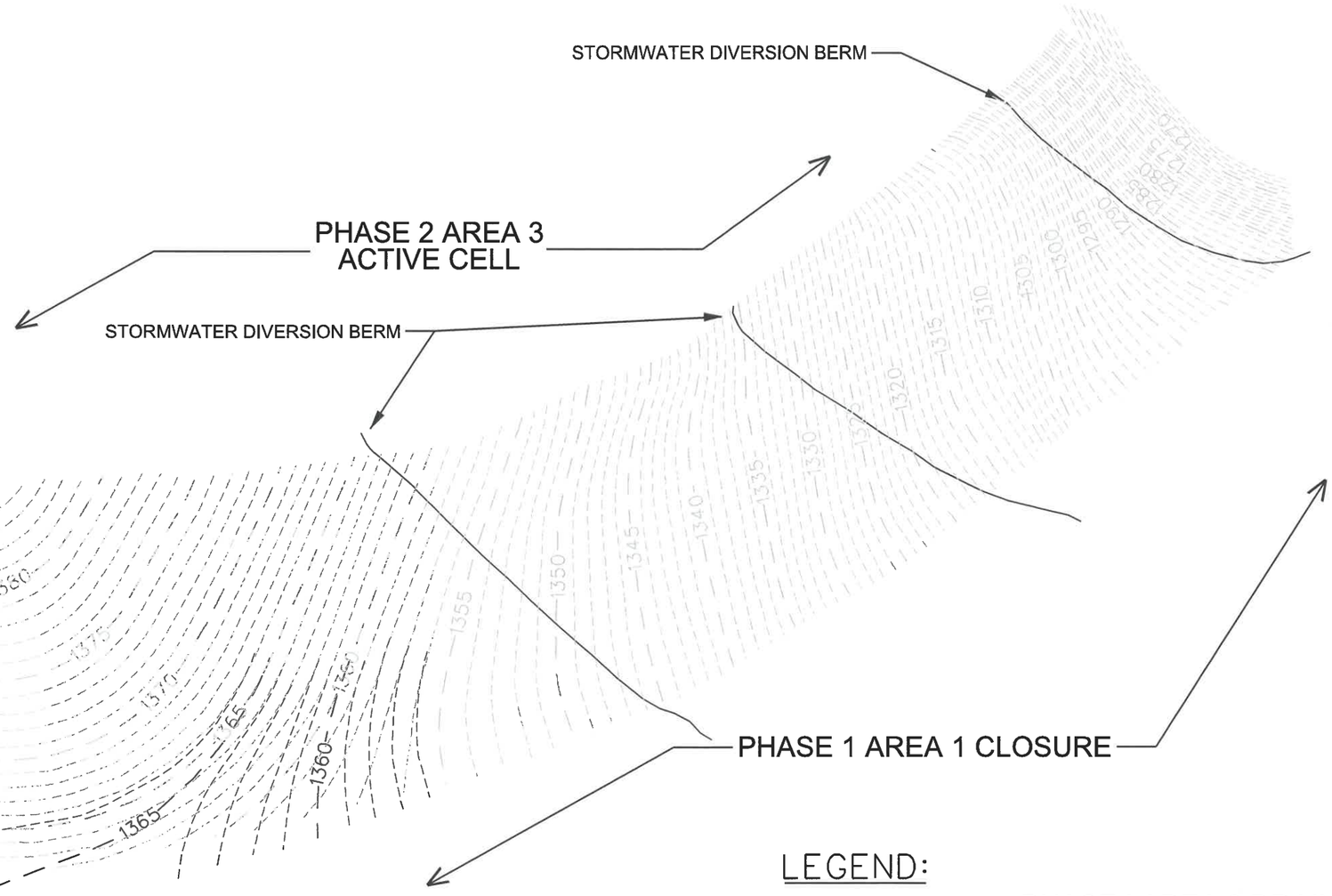
REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	9-20-2021	ISSUED FOR RECORD

FILE NO. 36793-04

N

100' 50' 0' 100' 200'

SCALE: 1 INCH = 100 FEET



LEGEND:

— — -1365— — — PHASE I AREA 2 DRAINAGE GRADING WITH SHALE ELEVATIONS

— — -1380— — — PHASE I AREA 2 TOP OF CLAY CAP ELEVATIONS

——————— STORMWATER DIVERSION DRAINAGE TOE

BARGE
DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

WILLIAM E. LAWRENCE — REGISTERED ENGINEER — No. 101931 — STATE OF TENNESSEE

DRAINAGE GRADING AS-BUILT

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REVISIONS/INTERPRETATIONS			
REV.	DR. CHK.	DATE	DESCRIPTION
0	TL EL	9-20-2021	ISSUED FOR RECORD

C1.03

FILE NO. 36793-04

11:00:36 AM
STLeonard
LandRes.pen Workspace: LandRes

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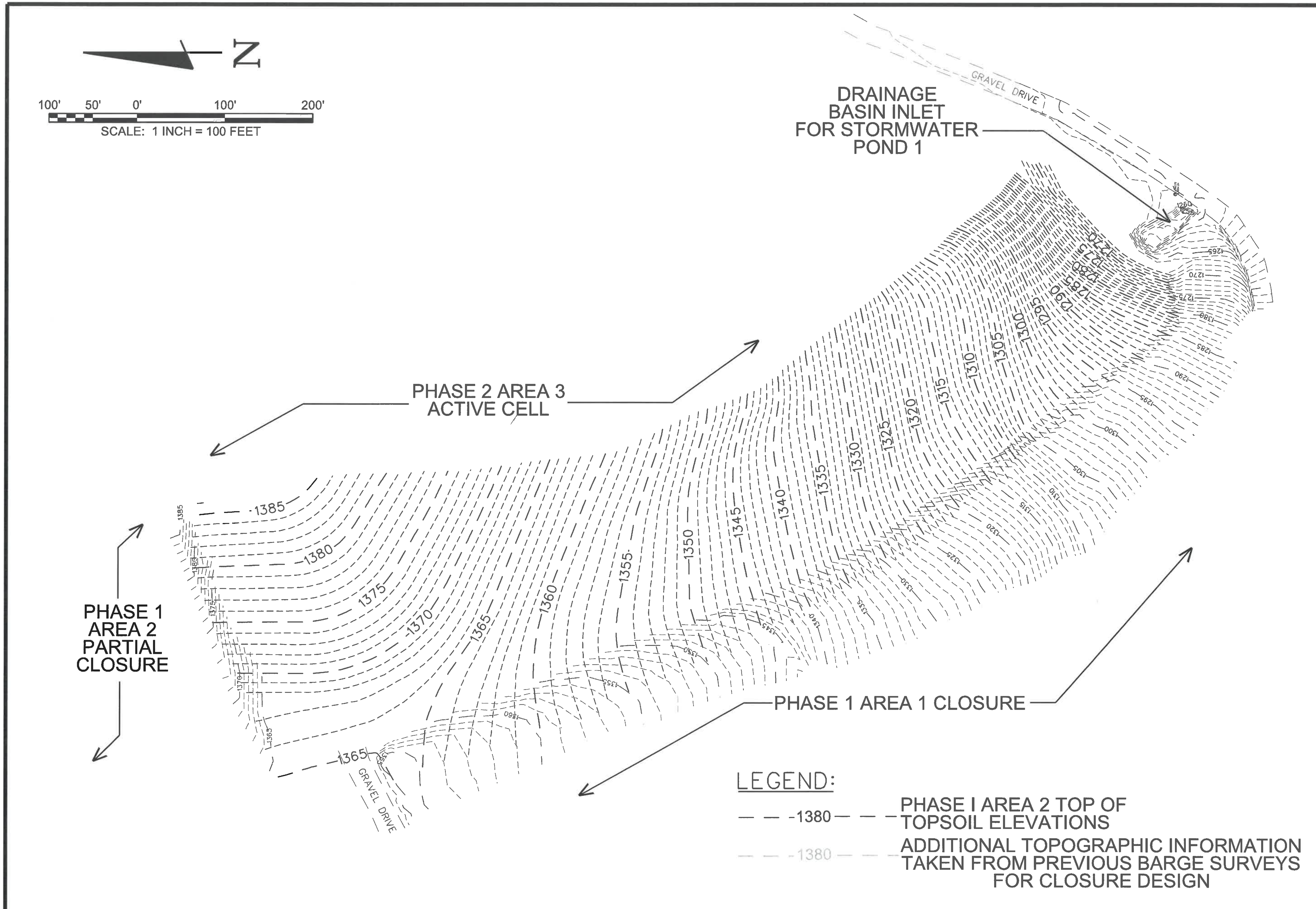

BARGE DESIGN SOLUTIONS
Four Sheridan Square // Suite 100 // Kingsport, Tennessee 37660
PHONE (423) 247-5525 // FAX (423) 247-6233

TOP OF TOPSOIL AS-BUILT

CLASS IV DISPOSAL FACILITY PHASE 1 AREA 2 (DML-82-104-0016)

CITY OF KINGSPORT DEMOLITION LANDFILL

KINGSPORT, TENNESSEE

REVISION INFORMATION

REV.	DR.	CHK.	DATE	DESCRIPTION
0	TL	EL	1-14-2022	ISSUED FOR RECORD

C1.04

FILE NO. 36793-04

1/13/2022 9:32:06 AM
STLeonard
LandRes.pen Workspace: LandRes

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Appendix H

Bottom Clay Liner Connection Photos

Photo 1: Typical Bottom of Connection Trench with Clay Liner Exposed and Protective Shale Layer along the Trench Walls

Photo 2: Excavation of the Connection Trench using an Excavator with a Two-Foot Bucket

Photo 3: Full Length of Connection Trench East of Drainage Basin inlet for Stormwater Pond 1

Photo 4: Excavation of Connection Trench West of Drainage Basin inlet for Stormwater Pond 1

Photo 5: Western Extent of Connection Trench at the Edge of the Clay Liner

Photo 6: Full Length of Connection Trenches. Gap between Trenches is the Drainage Basin inlet for Stormwater Pond 1. The bottom of the Drainage Basin is approximately four-feet below the observed Clay Liner. Stockpiled Clay for Backfilling the Trench is located to the Left of the Trench.

Photo 7: Track Loader Backfilling the Connection Trench with Clay

Photo 8: Connection Trench after Backfilling and Compacting with Track Loader

Appendix I

Seed and Fertilizer Tickets and TDOT Grass Seed Certification

10599

Delivery / Invoice

jcc

Supergro of Virginia

Bulk & Bag Feeds

DATE 8-5-21

"GROW WITH THE BEST"

SOLD TO / CUSTOMER NUMBER	REMIT TO	SHIPPED TO
Southern Seeding	Johnson City Chemical Co., Inc. Limestone Location 3202 Hwy. 11 E Limestone, TN 37681 423-257-5079	CUSTOMER PICK-UP ☐ DELIVERED ☐

LINE	ANALYSIS N	P	K	DESCRIPTION	PRODUCT CODE	BULK	NO. OF BAGS	TONS/UNITS SHIPPED	PRICE PER TONS/UNITS	AMOUNT
1										
2				15-15-15				1.100		
3				2,200 LBS						
4										
5										
6							14	700 LBS		
7				Fescue						
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
				→ TOTAL					TOTAL	

	TONS	RATE/TON	AMOUNT
TONNAGE TAX			
DELIVERY CHG.			
		% Rate	
	→	INVOICE AMOUNT	

TERMS:
ANY BALANCE OVER 30 DAYS SHALL INCUR A SERVICE CHARGE OF 1.5% MONTH (ANNUAL RATE OF 18%). ANY AMOUNT TURNED OVER FOR COLLECTION SHALL BE LIABLE FOR REASONABLE ATTORNEY'S FEE AND COST. SEE REVERSE SIDE FOR ADDITIONAL TERMS.

Agree to terms:

DEDUCT	AMOUNT	IF PAID BY	NET DUE DATE
%	$		

WHITE COPY - HOME OFFICE PINK - CUSTOMER'S FILE CANARY - FILE WHITE COPY - CUSTOMER GOLDENROD COPY - LOADING

INVOICE COPY

CORPORATE OFFICE
500 N. McLin Creek Rd.
P. O. BOX 457
CONOVER, NC 28613-0457
PHONE (828) 464-4673
FAX (828) 464-0459

HANES GEO COMPONENTS
A Leggett & Platt COMPANY

PLEASE REMIT TO:
HANES GEO COMPONENTS
L&P FINANCIAL SERVICES CO.
P O BOX 60984
CHARLOTTE, NC 28260

SOLD TO
SOUTHERN SEEDING,INC.(TN.)
1300 SHELL ROAD
JONESBOROUGH, TN 37659

SHIP TO
SOUTHERN SEEDING,INC.(TN.)
1300 SHELL ROAD
JOE 423-534-8973
JONESBOROUGH, TN 37659

INVOICE NUMBER	INVOICE DATE	TERMS	CARRIER	ROUTING	PPD/COL
64-871426	7/30/2021	NET 30	OLD DOMINION FREIGHT LI	DO NOT SHIP STRAW WET	P

CUSTOMER NO.	PO NUM	SLS. MGR	SLSMAN.	ORDER DATE	FOB	BILL OF LADING	RELEASE #
73084	LISA	649	883	7/30/2021	GOODLETTSVILLE, TN DAY8	056-32700	056 34083

PRODUCT NO.	WIDTH	DIM-2	DESCRIPTION	PUT UP	PK	QC	CS	QUANTITY	UOM	PRICE	AMOUNT	A/C
84379			TDOT CLASS C MIX 55# BAG - - - - SEED LOT(S) - - - - (4201008031I) (3201078094F)		EA			10	BG	[redacted]	[redacted]	

CERTIFICATION:
THE SELLER DOES NOT CERTIFY, EITHER IMPLICITLY OR EXPLICITLY, THESE PRODUCTS TO MEET THE REQUIREMENTS OF ANY REGULATORY AGENCY OR SPECIFICATION EXCEPT AS MAY BE CERTIFIED ABOVE OR UNDER SEPARATE WRITTEN CERTIFICATION. ALL TRANSACTIONS ARE SUBJECT TO THE CONDITIONS ON THE REVERSE SIDE OF THIS INVOICE.

OLD DOMINION FREIGHT LINES PRO# 063180915S7
****ALL RETURNS SUBJECT TO A 25% RESTOCKING FEE****

73084

COPY

790 THE LAWS OF THE STATE OF NORTH CAROLINA SHALL GOVERN THIS TRANSACTION. A LATE PAYMENT CHARGE AT A PER ANNUM RATE EQUAL TO THE PRIME RATE OF THE CHASE MANHATTAN BANK, N.A. IN EFFECT ON THE FIRST DAY OF EACH MONTH PLUS 2% OR 18% PER ANNUM WHICHEVER RATE IS HIGHER, WILL BE IMPOSED ON THE FIRST OF EACH MONTH ON ALL PAST DUE INVOICES PAID DURING THE MONTH.

TOTAL INVOICE AMOUNT 629.50

INVOICE COPY

CORPORATE OFFICE
500 N. McLin Creek Rd.
P. O. BOX 457
CONOVER, NC 28613-0457
PHONE (828) 464-4673
FAX (828) 464-0459

HANES GEO COMPONENTS
A Leggett & Platt COMPANY

PLEASE REMIT TO:
HANES GEO COMPONENTS
L&P FINANCIAL SERVICES CO.
P O BOX 60984
CHARLOTTE, NC 28260

SOLD TO
SOUTHERN SEEDING,INC.(TN.)
1300 SHELL ROAD
JONESBOROUGH, TN 37659

SHIP TO
SOUTHERN SEEDING,INC.(TN.)
1300 SHELL ROAD
JONESBOROUGH, TN 37659

INVOICE NUMBER	INVOICE DATE	TERMS	CARRIER	ROUTING	PPD/COL
64-870312	7/28/2021	NET 30	JBS SERVICES	O NOT SHIP STRAW WET	P

CUSTOMER NO.	PO NUM	SLS. MGR	SLSMAN.	ORDER DATE	FOB	BILL OF LADING	RELEASE #
73084	LISA	649	883	7/27/2021	GOODLETTSVILLE, TN DAY8	056-32685	056 34057

PRODUCT NO	WIDTH	DIM-2	DESCRIPTION	PUT UP	PK	QC	CS	QUANTITY	UOM	PRICE	AMOUNT	A/C
[redacted]			[redacted] ROUND		EA			[redacted]	B	[redacted]	[redacted]	
84379			TDOT CLASS C MIX 55# BAG - - - - SEED LOT(S) - - - - (TN DOT CMIX)		EA			6	BG	[redacted]	[redacted]	

CERTIFICATION:
THE SELLER DOES NOT CERTIFY, EITHER IMPLICITLY OR EXPLICITLY, THESE PRODUCTS TO MEET THE REQUIREMENTS OF ANY REGULATORY AGENCY OR SPECIFICATION EXCEPT AS MAY BE CERTIFIED ABOVE OR UNDER SEPARATE WRITTEN CERTIFICATION. ALL TRANSACTIONS ARE SUBJECT TO THE CONDITIONS ON THE REVERSE SIDE OF THIS INVOICE.

JBS SERVICES PRO# JBS
****ALL RETURNS SUBJECT TO A 25% RESTOCKING FEE****

73084
COPY

786 THE LAWS OF THE STATE OF NORTH CAROLINA SHALL GOVERN THIS TRANSACTION. A LATE PAYMENT CHARGE AT A PER ANNUM RATE EQUAL TO THE PRIME RATE OF THE CHASE MANHATTAN BANK, N.A. IN EFFECT ON THE FIRST DAY OF EACH MONTH PLUS 2% OR 18% PER ANNUM WHICHEVER RATE IS HIGHER, WILL BE IMPOSED ON THE FIRST OF EACH MONTH ON ALL PAST DUE INVOICES PAID DURING THE MONTH.

TOTAL INVOICE AMOUNT 7,077.70

10600

Delivery / Invoice

jcc Supergro of Virginia

Bulk & Bag Feeds

DATE 8

"GROW WITH THE BEST"

SOLD TO / CUSTOMER NUMBER	REMIT TO	SHIPPED TO
Southern Seeding	Johnson City Chemical Co., Inc. Limestone Location 3202 Hwy. 11 E Limestone, TN 37681 423-257-5079	Kingsport Landfill

CUSTOMER PICK-UP ☐ DELIVERED ☐

LINE	ANALYSIS N	P	K	DESCRIPTION	PRODUCT CODE	BULK	NO. OF BAGS	TONS/UNITS SHIPPED	PRICE PER TONS/UNITS	AMOUNT
1										
2										
3				800 LBS 15-15-15						
4										
5										
6				State C mix 220 LBS						
7										
8										
9				ky 31 Fescue 400 LBS						
10										
11										
12										
13										
14										
15										
16										
17										
18										
				→ TOTAL					TOTAL	

	TONS	RATE/TON	AMOUNT
TONNAGE TAX			
DELIVERY CHG.			
	% Rate		

TERMS:
ANY BALANCE OVER 30 DAYS SHALL INCUR A SERVICE CHARGE OF 1.5% MONTH (ANNUAL RATE OF 18%). ANY AMOUNT TURNED OVER FOR COLLECTION SHALL BE LIABLE FOR REASONABLE ATTORNEY'S FEE AND COST. SEE REVERSE SIDE FOR ADDITIONAL TERMS.

Agree to terms: → INVOICE AMOUNT

DEDUCT	AMOUNT	IF PAID BY	NET DUE DATE
%	$		

WHITE COPY - HOME OFFICE PINK - CUSTOMER'S FILE CANARY - FILE WHITE COPY - CUSTOMER GOLDENROD COPY - LOADING

Perm. Seed Mix C

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS
6601 CENTENNIAL BLVD.
NASHVILLE, TENNESSEE 37243-0360

GRASS SEED CERTIFICATION

Project Referen
Project No.
Contract No.

County
Date

Region 1

I, Jason Arnold of Tri-Star Seed (seed company) certify that the grass seed or grass seed group furnished to JOHNSON CITY CHEMICAL (seeding contractor) meets all specifications of the Tennessee Department of Agriculture.

Group	Variety	Lot No.	Lab No.	Weight Each (lbs.)	Percent of Total
C	KY 31 Fescue	M164-16-524	17C931	308	70
	English Rye	M9-16-PRG-100A	17C933	88	20
	White Clover	L175-16-191WC	17C932	44	10
440					

Number of Bags	Weight Each (lbs.)	Weight Each (lbs.)
8	55	

Signature
Title Location Manager

Sworn to and subscribed before me this 3
day of October, 20 17
My commission expires 3/03/21
Notary Public Vance Kinser

VANCE KINSER
STATE OF TENNESSEE
NOTARY PUBLIC
KNOX COUNTY

Form DT-0333 Attachment (Rev. 09-04)