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Interstate Power and Light Company
Burlington Generation Station
CCR Surface Impoundment Structural Stability Assessment
154.018.029.001
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Executive Summary

This Structural Stability Assessment (Report) for the former Burlington Generating Station (BGS) has been prepared in accordance with the requirements of the United States Environmental Protection Agency rules for Hazardous and Solid Waste Management System – Disposal of CCR from Electric Utilities (40 CFR Parts 257 and 261, also known as CCR Rule).

This Report serves as the second update of the structural stability assessment for the CCR impoundments in Burlington, Iowa in accordance with §257.73(b) and §257.73(d) of the CCR Rule. Primarily, this Report is focused on documenting whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded within each CCR unit.

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1. INTRODUCTION

The owner or operator of Coal Combustion Residual (CCR) units must conduct an initial and periodic structural stability assessment and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. Revision 2 of this Report has been prepared in accordance with the requirements of §257.73(b) and §257.73(d) of the CCR Rule.

1.1 CCR Rule Requirements

The CCR Rule requires an initial and periodic structural stability assessment by a qualified professional engineer (PE) for existing and legacy CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more; or the existing CCR surface impoundment has a height of 20 feet or more (40 CFR § 257.73(b), 257.73(d) and 257.83(b)).

1.2 Structural Stability Assessment Applicability

The Interstate Power and Light Company (IPL), Burlington Generating Station (BGS) in Burlington, Iowa (Figure 1) has four existing CCR surface impoundments that meet the requirements of §257.73(b)(1) and/or §257.73(b)(2) of the CCR Rule, which are identified as follows:

- BGS Ash Seal Pond
- BGS Main Ash Pond
- BGS Economizer Pond
- BGS Upper Ash Pond

2. FACILITY DESCRIPTION

BGS is located southeast of the City of Burlington, Iowa, on the western shore of the Mississippi River in Des Moines County, at 4282 Sullivan Slough Road, Burlington, Iowa (Figure 1). BGS is a fossil-fueled electric generating station consisting of one steam electric generating unit and four combustion turbine units. Sub-bituminous coal was the primary fuel for producing steam, with the ability to use natural gas for the combustion turbines. The burning of coal produces CCR. The CCR at BGS was categorized into three types: bottom ash, economizer ash, and precipitator fly ash. As of December 30, 2021, the BGS steam electric generating unit no longer used coal as a fuel source and was converted to natural gas.

General Facility Information:

Date of Initial Facility Operations:	1968
Historical NPDES Permit Number:	IA29-00-1-01
Facility Title V Operating Permit:	98-TV-023R1-M004
Latitude / Longitude:	40°44’29”N 91°07’04”W
Unit Nameplate Ratings:	Unit 1: 212 MW
Impoundment IDNR State ID	29-SDP-13-23C

2.1 BGS Ash Seal Pond

The former BGS Ash Seal Pond was located south of the generating plant and east of the former BGS Main Ash Pond. The CCR at BGS, in 1968, was originally managed by discharging into the former BGS Ash Seal Pond for settling. In the 1970s, the former BGS Ash Seal Pond was modified to only receive stormwater runoff from the surrounding area associated with the fly ash storage silo and to receive facility process water, such as ash seal water, but only if there was an issue with the ash seal water pumps.

During closure construction activities in 2023, CCR was removed from the former BGS Ash Seal Pond and placed into the former BGS Main Ash Pond and the BGS Economizer Pond. The former BGS Ash Seal Pond has been backfilled with aggregate, finished with topsoil, seeded, and graded to drain stormwater into the condenser discharge channel without stormwater retention (Figure 2). The height and alignment of the embankments were not significantly changed during the closure construction activities.

The surface area of the former BGS Ash Seal Pond is approximately 5.7 acres and has an embankment height of approximately 12 feet from the crest to the toe of the downstream slope. The embankment crest is at elevation 534 feet, which is the same as the adjacent plant site grade and equivalent to the 100-year flood water elevation of the Mississippi River.

2.2 BGS Main Ash Pond

The former BGS Main Ash Pond was located southwest of the generating plant and west of the former BGS Ash Seal Pond. The CCR, prior to being sluiced to the former BGS Main Ash Pond, was originally managed in the former BGS Ash Seal Pond in 1968. In 1971, BGS managed CCR in the former BGS Upper Ash Pond. In 1980, the former BGS Main Ash Pond became the primary receiver of CCR, with the former BGS Upper Ash Pond becoming a downstream receiver.

Historically, the former BGS Main Ash Pond received bottom ash that was sluiced from the generating plant to the northeast corner of the former BGS Main Ash Pond. Most of the bottom ash settled out near the northeast corner and this bottom ash was recovered for beneficial reuse. Hydrated fly ash was also stored within the former BGS Main Ash Pond area prior to being sold as aggregate material for beneficial reuse.

The process water that was used to sluice the bottom ash into the former BGS Main Ash Pond was routed in a channel towards the west end of the former BGS Main Ash Pond. In the northwest corner of the Main Ash Pond the channel widened into a ponded area. From this ponded area the water discharged through two 15-inch diameter corrugated metal culverts beneath the generating plant entrance road and into a small channel in the southwest corner of the former BGS Upper Ash Pond, located on the north side of the generating plant entrance road.

During closure construction activities in 2023, the CCR was consolidated, leveled, graded, capped, finished with topsoil, and seeded. Stormwater from the former Main Ash Pond area sheet drains overland toward the west where it is discharged into the western ditch line without stormwater retention (Figure 2). The height and alignment of the embankments were not significantly changed during the closure construction activities.

The surface area of the former BGS Main Ash Pond is approximately 18.7 acres and has an embankment height of approximately 12 feet from the crest to the toe of the downstream slope. The embankment crest is at elevation 534, the same as the plant site grade and equivalent to the 100-year flood water elevation in the Mississippi River.

2.3 BGS Economizer Pond

The former BGS Economizer Pond was located west of the generating plant and north of the former BGS Main Ash Pond. In 1986, BGS constructed the former BGS Economizer Pond in the southern and eastern portions of the original footprint of the former BGS Upper Ash Pond. The Economizer Ash Pond impoundment was created from economizer ash that was deposited between 1986 and 2021, when coal use ceased. During operations, the embankment was at

approximately elevation 548, which was higher than the embankments of the former BGS Upper Ash Pond.

Historically, the former BGS Economizer Pond received economizer ash. The economizer ash was sluiced from the generating plant to the east end of the former BGS Economizer Pond via a 10-inch diameter polyvinyl chloride pipe. The economizer ash settled out through the water column of the 0.4-acre BGS Economizer Pond while the water flowed to the west. The water discharged from the west side of the BGS Economizer Pond through an 18-inch diameter high-density polyethylene pipe into a stormwater and process water treatment channel located along the south side of the economizer embankment.

The stormwater and process water treatment channel received runoff from 8 acres surrounding the generating plant. The collected stormwater drained into a pump vault located at the toe of the downstream slope of the east embankment of the BGS Economizer Pond. Plant process water flowed through an oil/water separator and received influent flows from the plant floor drains and water treatment process water. After the oil/water separator, the process water discharged into the pump vault. The stormwater and process water were then pumped from the vault up to the stormwater treatment channel. The stormwater treatment channel flowed to the west along the south side of the economizer embankment until it discharged through an 18-inch diameter high-density polyethylene pipe located in the southwest corner of the economizer embankment. The water from the stormwater treatment channel discharged into a small channel in the southwest corner of the former BGS Upper Ash Pond located north of the generating plant entrance road.

During closure construction activities in 2023, the footprint of the former BGS Economizer Pond increased in size and height due to the consolidation of CCR materials from the former BGS Upper Ash Pond and the former BGS Ash Seal Pond. The CCR materials were graded, capped, finished with topsoil, and seeded. Stormwater runoff is now shed into a newly constructed stormwater basin within the former BGS Upper Ash Pond. There is no stormwater retention in the Economizer Ash Pond area. (Figure 2). The stormwater from the stormwater and process water pump vault has been rerouted to directly discharge into the BGS Lower Pond.

Currently, the total surface area of the former BGS Economizer Pond is approximately 14.6 acres and has an embankment height of approximately 30 feet from the crest to the toe of slope. The embankment crest maximum elevation is 564 feet.

2.4 BGS Upper Ash Pond

The former BGS Upper Ash Pond was located northwest of the generating plant and north of the former BGS Main Ash Pond. In 1971, BGS began managing CCR in the former BGS Upper Ash Pond. In 1980, the former BGS Main Ash Pond became the primary receiver of CCR and the former BGS Upper Ash Pond became a downstream receiver of the former BGS Main Ash Pond.

Historically, the former BGS Upper Ash Pond received influent flows from the former BGS Main Ash Pond, BGS Economizer Pond, and stormwater and process water flow from the generating plant. The influent flows all discharged into a small channel located in the southwest corner of the former BGS Upper Ash Pond. The channel was routed northeasterly along the south side of the gravel dike of the former BGS Upper Ash Pond until it discharged into the water body in the north side of the former BGS Upper Ash Pond.

From this water body, water discharged through a 24-inch wide precast concrete Parshall flume, where flow was measured, and into a concrete catch basin. The water in the catch basin flows through a 15-inch diameter polyvinyl chloride pipe and discharges into the BGS Lower Pond. The Lower Pond contains the facility's National Pollutant Discharge Elimination System (NPDES) Outfall 001. The water flowed through the NPDES Outfall 001 hydraulic structure, which consisted of cast-in-place weir box.

During closure construction activities in 2023, the footprint of the former BGS Upper Ash Pond was decreased in size due to the increase of footprint of the former BGS Economizer Pond. The CCR was removed from the majority of the former BGS Upper Ash Pond and consolidated into the former BGS Economizer Pond and the former BGS Main Ash Pond. The remaining area of the former BGS Upper Ash Pond is now a stormwater detention pond which has been reinforced with rip rap on the upstream and downstream embankments. The Parshall flume discharge structure remains in place (Figure 2 & Appendix B). The height and alignment of the external embankments were not significantly changed during the closure construction activities.

Currently, the total surface area of the former BGS Upper Ash Pond is approximately 10.6 acres and has an embankment height of approximately 10 feet from the crest to the toe of the downstream slope. The elevation of the embankments is 531 feet, 3 feet lower than the 100-year flood elevation of the Mississippi River. The embankment is armored with cobble size stone on the crest and both outer and inner embankment slopes to prevent erosion of the embankment during overtopping from extreme flood stage of the Mississippi River.

3. STRUCTURAL STABILITY ASSESSMENT- §257.73(d)

This Report documents whether the design, construction, operation, and maintenance of the BGS CCR units are consistent with recognized and generally accepted good engineering practices for maximum volume of CCR and CCR wastewater which can be impounded.

3.1 BGS Ash Seal Pond

The former BGS Ash Seal Pond receives surface water runoff from an approximate area of 2 acres south of the main generating station complex including the former dry fly ash handling silo and truck loading area. During construction closure activities in 2023, CCR was removed from the former BGS Ash Seal Pond and placed into the former BGS Main Ash Pond and the BGS Economizer Pond. The former BGS Ash Seal Pond was backfilled with aggregate, finished with topsoil, seeded, and graded to drain stormwater into the condenser discharge channel without stormwater retention.

Soil borings and testing taken for plant construction activities and for determination of embankment properties as illustrated on Figure 3 and presented in Appendices A, B, C and D. The results indicate the embankments are constructed of clay compacted over naturally occurring sand and clay. Strength properties of the soils were measured by Standard Split Spoon Penetration (ASTM D 1586) or Cone Penetrometer testing (ASTM D 5778).

Based on the annual inspections conducted by Hard Hat Services, there have been no significant changes regarding settlement, instability, or reconfiguration of the former BGS Ash Seal Pond since the closure construction activities in 2023.

3.1.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The partial excavation and construction of embankments for the former BGS Ash Seal Pond occurred during the original construction of the plant. The south and west sides of the impoundment were constructed embankments. The embankments consist of a mixture of on-site soils from excavation in the sandy levee deposits and off-site clay imported from higher land west of the site. Deep borings taken for construction in the plant area show that the subsurface soils below elevation 510 feet is medium dense sand. Medium dense sand is a strong subbase for the impoundment embankments. Soil between elevation 510 and the bottom of the impoundment at elevation 520 is generally loose sand and silty sand that remained in place and is partially below the normal water elevation of the Mississippi River elevation 518. The foundations and abutments are adequate to support the impoundment infrastructure and contents.

3.1.2 Slope Protection - §257.73(d)(1)(ii)

The former BGS Ash Seal Pond is incised on the east, north and west sides. The south side faces the condenser discharge channel for the generating station where non-contact cooling water is released in a channel back to the Mississippi River. The crest of the south embankment is approximately 12 feet wide, and the downstream slope of the exposed embankment is a 3:1, armored with revetment stone. Well established and managed vegetation minimizes erosion on the upstream slope and for stormwater runoff from within the impoundment. The impoundment configuration protects against surface erosion.

Wave erosion potential is reduced from the revetment stone of the downstream slope within the condenser discharge channel. Wave action is unlikely to produce erosive forces that would affect the former BGS Ash Seal Pond embankment.

Sudden drawdown is addressed in Section 3.1.7.

3.1.3 CCR Embankment Density- §257.73(d)(1)(iii)

In 2011, soil borings and penetration tests were taken in the south embankment of the BGS Ash Seal Pond. The results indicate the embankment is low plasticity silty clay (CL) with some layers of loose to medium dense sand. The in-place embankment densities identified within the Safety Factor Assessment Report – Revision 2 are sufficient to withstand the range of loading conditions that were analyzed.

3.1.4 Vegetation Management - §257.73(d)(1)(iv)

Vegetation management has been conducted on a periodic basis. Annual inspections and 7-day inspections have been conducted according to the CCR Rule. Based on those inspections, the facility has continued to routinely manage vegetation, minimizing animal activity and deep rooting vegetation. The vegetation management has been maintained with recognized and generally accepted good engineering practices.

3.1.5 Spillway Management - §257.73(d)(1)(v)

In 2023, all process water and water detention were eliminated from the impoundment during the construction closure activities. Stormwater runoff is the only remaining discharge from the impoundment. The former BGS Ash Seal Pond has two 36-inch diameter HDPE pipes which discharge stormwater onto a concrete spillway and into the Mississippi River. The pipes are constructed of non-erodible material and designed to carry sustained flows. The pipes are checked for malfunction (e.g., blockages, deformations) during the routine inspections by the facility personnel.

3.1.6 Hydraulic Structures - §257.73(d)(1)(vi)

The former BGS Ash Seal Pond has two 36-inch diameter HDPE pipes which discharge stormwater onto a concrete spillway. The discharge pipes were inspected by video camera on May 22, 2026, and showed no signs of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris which may negatively affect the operation of the hydraulic structure.

3.1.7 Sudden Drawdown - §257.73(d)(1)(vii)

A Mississippi River flood of 100-year elevation will rise to the crest elevation of the south embankment. Rise of flood waters on the Mississippi River is often rapid, but drawdown is slower. In the event of drawdown, drainage would occur through discharge pipes and the sandy base, but not through the embankment, which is mainly clay. Some sand intervals in the embankment shown on the borings in Appendix B were sealed in 2007 by the construction of a soil-bentonite wall through the embankment to prevent seepage through the sand seams. Additionally, geotextile and revetment stone were added in 2016 on the southern embankment and at the toe-of-slope.

There are no factors that would result in slumping of the embankment toe as the flood recedes and the embankment has been exposed to multiple cycles of drawdown since construction that have not impacted the downstream slope.

3.2 BGS Main Ash Pond

The former BGS Main Ash Pond was constructed in 1972 to replace the BGS Upper Ash Pond as the main receiver of CCR at the BGS. The impoundment was constructed on soft clay deposits in the backwater areas between the plant site and high ground to the west. The embankments are constructed of imported clay from a borrow site just west of the BGS. During construction closure

activities in 2023, CCR was consolidated from the former BGS Ash Seal Pond and the former BGS Upper Ash Pond in the Main Ash Pond. The former BGS Main Ash Pond was capped, finished with topsoil, seeded, and graded to drain stormwater into the lowland south of the impoundment without stormwater retention.

Borings and penetration tests performed in 2011 and presented in Appendices B, C, and D indicate that the embankment is low plasticity silty clay (CL). The underlying foundation of the embankment is a soft clay deposited in backwater flooding of the Mississippi. Beneath the soft clay is a medium dense sand layer common to the Mississippi River valley.

Based on the annual inspections conducted by Hard Hat Services, there have been no significant changes regarding settlement, instability, or reconfiguration of the former BGS Main Ash Pond since the closure construction activities in 2023.

3.2.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The former BGS Main Ash Pond foundation soils for the embankments are soft clay that is surcharged by the weight of the embankment soil. Below the clay is a medium dense sand layer that is typical of the Mississippi River valley. The test results in Appendix D indicate that the foundation soils are low plasticity clay that is not subject to liquefaction during earthquake events. The foundations and abutments are adequate to support the impoundment infrastructure and contents.

3.2.2 Slope Protection - §257.73(d)(1)(ii)

The impoundment is incised on the north and east sides. The south embankment faces a large wetland classified by the U.S. Fish and Wildlife Service National Wetlands Inventory as a “Freshwater Forested/Shrub Wetland” with Classification Codes: PF01A (135 acres) and PF01C

(559 acres). Additionally, IPL has performed a wetland delineation which indicates that no wetlands meeting the definition of 40 CFR 232.2 are in close proximity to the impoundment. The wetland area is nearly flat, where drainage flows east and ultimately ends up in the discharge channel for the facility where non-contact cooling water is released in a channel back to the Mississippi River. The crest of the embankments is approximately 12-feet wide, and the downstream slope of the embankment varies between a 3:1 and 2:1 vegetated slope. Well established and managed vegetation will minimize surface erosion on both the upstream and downstream slopes. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore the impoundment configuration protects against surface erosion.

Erosion due to wave action will have minimal impacts on the embankments as the 25-year flood event or greater of the Mississippi River will cause backwater to approach the embankments.

Sudden drawdown is addressed in Section 3.2.7.

3.2.3 CCR Embankment Density- §257.73(d)(1)(iii)

The former BGS Main Ash Pond embankment soil is silty clay typical of the surrounding uplands and as shown by the data in Appendix C. The in-place embankment densities identified within the Safety Factor Assessment Report – Revision 2 are sufficient to withstand the range of loading conditions that were analyzed.

3.2.4 Vegetation Management - §257.73(d)(1)(iv)

Vegetation management has been conducted on a periodic basis. Annual inspections and 7-day inspections have been conducted according to the CCR Rule. Based on those inspections, the facility has continued to routinely manage vegetation, minimizing animal activity and deep

rooting vegetation. The vegetation management has been maintained with recognized and generally accepted good engineering practices.

3.2.5 Spillway Management - §257.73(d)(1)(v)

In 2023, all process water and water detention were eliminated from the impoundment during the construction closure activities. Stormwater runoff is the only remaining discharge from the impoundment. The former BGS Main Ash Pond has two sets of two 20-inch diameter HDPE pipes of which one set discharges stormwater onto the lowlands south of the impoundment, while the other set discharges stormwater into the former BGS Ash Seal Pond area. The pipes are constructed of non-erodible material and designed to carry sustained flows. The pipes are checked for malfunction (e.g., blockages, deformations) during the routine inspections by the facility personnel.

3.2.6 Hydraulic Structures - §257.73(d)(1)(vi)

The former BGS Main Ash Pond has two sets of two 20-inch diameter HDPE pipes which discharge stormwater to the lowlands south of the impoundment. The discharge pipes were inspected by video camera on May 22, 2026, and showed no signs of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris which may negatively affect the operation of the hydraulic structure.

3.2.7 Sudden Drawdown - §257.73(d)(1)(vii)

The south embankment of the former BGS Main Ash Pond is subject to the rise and fall of flood water from the Mississippi River as high as the crest of the embankment. These water elevations have occurred during major floods of the Mississippi River at least four times since construction of the impoundment and many smaller river floods have created sudden drawn down conditions

on the embankment without detrimental effect. The embankments and the subsurface are both soft to medium stiff low plasticity clay and are not subject to rapid drawdown impacts.

3.3 BGS Economizer Pond

The former BGS Economizer Pond was constructed on top of the southern part of the former BGS Upper Ash Pond. It was constructed by raising the clay embankment of the BGS Upper Ash Pond on the south and east sides of the impoundment and by building a clay embankment on top of the CCR in the BGS Upper Ash Pond on the west side and the western end of the north side of the impoundment. On the eastern end of the north side of the impoundment, the embankment on top of the CCR in the BGS Upper Ash Pond is constructed entirely of CCR.

When the facility was burning coal, the former BGS Economizer Pond received both economizer ash and fly ash. The impoundment was a piled CCR embankment with surface water only on the southern edge of the impoundment where there was a clay embankment. The northern slope of the embankment has a toe that sits on CCR in the BGS Upper Ash Pond and was regraded in 2011 to have a lessor slope of 5 horizontal to 1 vertical to limit the effects of poor embankment foundation soils. During construction closure activities in 2023, CCR was consolidated from the former BGS Ash Seal Pond and the former BGS Upper Ash Pond into the Economizer Pond area. Clay buttresses were installed along the west and north sides of the impoundment which were tied into the soils below the BGS Upper Ash Pond to provide stability to the consolidated CCR materials. The former BGS Economizer Pond was capped, finished with topsoil, seeded, and graded to drain stormwater into the former BGS Upper Ash Pond without stormwater retention.

Soil borings, penetration tests and laboratory tests on the impoundment embankments or slopes are shown in Appendices B, C and D. The boring locations are shown in Figure 3. The results

indicate clay embankments and native clays that are classified as soft to medium stiff low plasticity clay (CL) and CCR with friction angles from 30 to 34 degrees. The CCR is very loose to medium dense cohesionless soil. The layer density varies in the unsaturated parts of the embankment (likely from cementation).

Based on the annual inspections conducted by Hard Hat Services, there have been no significant changes regarding settlement, instability, or reconfiguration of the former BGS Economizer Pond since the closure construction activities in 2023.

3.3.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

Prior to construction closure activities in 2023, the saturated, very loose CCR in the north embankment of the former BGS Economizer Pond was potentially an unstable foundation under earthquake loading conditions. Clay buttresses were constructed along the north side to provide stability during the consolidation of the CCR in 2023. The native clay soils are a stable foundation.

3.3.2 Slope Protection - §257.73(d)(1)(ii)

The former BGS Economizer Pond is approximately 32 feet above the surrounding grade at the tallest point. The side slopes are vegetated and vary from 4:1 to 3:1 slopes with well-established and managed vegetation will minimize erosion on both the upstream and downstream slopes. Additionally, the storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore, the impoundment configuration protects against surface erosion.

The former BGS Economizer Pond is located where the embankments will likely not be inundated by water which eliminates the potential for wave erosion.

Sudden drawdown is addressed in Section 3.3.7.

3.3.3 CCR Embankment Density- §257.73(d)(1)(iii)

The former BGS Economizer Pond constructed clay embankments are soft to medium stiff low plasticity clay and have adequate strength to contain the CCR contents. The dry parts of the embankment constructed of CCR is loose to medium dense and cemented in certain layers. It will not move unless the foundation layers below the water table displace as described in 3.3.1. The in-place embankment densities identified within the Safety Factor Assessment Report – Revision 2 are sufficient to withstand the range of loading conditions that were analyzed.

3.3.4 Vegetation Management - §257.73(d)(1)(iv)

Vegetation management has been conducted on a periodic basis. Annual inspections and 7-day inspections have been conducted according to the CCR Rule. Based on those inspections, the facility has continued to routinely manage vegetation, minimizing animal activity and deep rooting vegetation. The vegetation management has been maintained with recognized and generally accepted good engineering practices.

3.3.5 Spillway Management - §257.73(d)(1)(v)

In 2023, all process water and water detention were eliminated from the impoundment during the construction closure activities. Stormwater runoff is the only remaining discharge from the impoundment. The former BGS Economizer Pond has two sets of dual 24-inch diameter HDPE pipes which discharge stormwater into the former BGS Upper Ash Pond. The pipes are constructed of non-erodible material and designed to carry sustained flows. The pipes are checked for malfunction (e.g., blockages, deformations) during the routine inspections by the facility personnel.

3.3.6 Hydraulic Structures - §257.73(d)(1)(vi)

The former BGS Economizer Pond has two sets of dual 24-inch diameter HDPE pipes which discharge stormwater into the former BGS Upper Ash Pond. The discharge pipes were inspected by video camera on May 22, 2026, and showed no signs of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris which may negatively affect the operation of the hydraulic structure.

3.3.7 Sudden Drawdown - §257.73(d)(1)(vii)

The former BGS Economizer Pond is not subject to flood rise and fall on the toe of the embankment. The only variation is the change in ground water elevation in the embankment as the BGS Upper Ash Pond rises from its normal elevation of 524 to 530.5 feet during flood conditions of the Mississippi River. Therefore the outer embankments slopes of the former BGS Economizer Pond are not subject to rapid drawdown conditions.

3.4 BGS Upper Ash Pond

The former BGS Upper Ash Pond was originally constructed of imported clay embankment placed over natural clay and sand deposited by the Mississippi River. During construction closure activities in 2023, CCR was removed from the former BGS Upper Ash Pond and placed into the BGS Main Ash Pond and the former BGS Economizer Pond. The former BGS Upper Ash Pond now functions as a stormwater retention pond without any process water flows. Stormwater exits at an overflow flume at the northeast corner. The flume discharges into a manhole with a 15-inch diameter PVC discharge pipe which carries the water to the Lower Pond. The impoundment also contains a 14-inch diameter steel secondary overflow pipe that has a manual gate valve at the discharge end of the pipe.

Test boring locations on the former BGS Upper Ash Pond are shown in Figure 3. The boring results and laboratory test results are presented in Appendices B, C, and D. The embankment soil is a low plasticity clay (CL) of medium stiff consistency. The native clay under the embankment is soft and the sand below the clay is medium dense.

Based on the annual inspections conducted by Hard Hat Services, there have been no significant changes regarding settlement, instability, or reconfiguration of the former BGS Main Ash Pond since the closure construction activities in 2023. In the fall of 2025, Hard Hat Services was requested to conduct a non-routine inspection of a seepage location found on the downstream side of the embankment approximately 100 feet west of the discharge pipe into the Lower Pond. The seepage was approximately about halfway up the slope. The conclusion was to increase monitoring of the seepage to determine if embankment materials were being eroded or if the discharge rate increased over time. At the time of the non-routine inspection, the embankment appeared to be stable.

3.4.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The former BGS Upper Ash Pond foundation soils are clays and sands deposited by the Mississippi River. The test results in Appendix D indicate that the foundation soils are low plasticity clay that is not subject to liquefaction during earthquake events. The foundations and abutments are adequate to support the impoundment infrastructure and contents.

3.4.2 Slope Protection - §257.73(d)(1)(ii)

The former BGS Upper Ash Pond upstream and downstream slopes and crest of the embankment are covered with gravel, cobble, and revetment stone, which allow overtopping of the embankment by flood waters of the Mississippi River. The crest elevation of 531 feet on the

embankment creates overtopping whenever the Mississippi River flood elevation exceeds the 25-year return event. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore, the impoundment configuration protects against surface erosion, while the stone on either slope protects against erosion from wave action.

Sudden drawdown is addressed in Section 3.4.7.

3.4.3 CCR Embankment Density- §257.73(d)(1)(iii)

The former BGS Upper Ash Pond clay embankment is medium stiff clay and is stronger than the foundation soils. The in-place embankment densities identified within the Safety Factor Assessment Report – Revision 2 are sufficient to withstand the range of loading conditions that were analyzed.

3.4.4 Vegetation Management - §257.73(d)(1)(iv)

Vegetation management has been conducted on a periodic basis. Annual inspections and 7-day inspections have been conducted according to the CCR Rule. Based on those inspections, the facility has continued to routinely manage vegetation, minimizing animal activity and deep rooting vegetation. The vegetation management has been maintained with recognized and generally accepted good engineering practices.

3.4.5 Spillway Management - §257.73(d)(1)(v)

In 2023, all process water was eliminated from the impoundment during the construction closure activities. The former BGS Upper Pond discharge structure is equipped with a 24-inch wide precast concrete Parshall flume that discharges into a concrete catch basin. The water in the catch basin flows through a 15-inch diameter polyvinyl chloride pipe and discharges into the BGS

Lower Pond. The pipes are constructed of non-erodible materials and designed to carry sustained flows. The pipes are checked for malfunction (e.g., blockages, deformations) during the weekly inspections by the facility personnel.

This impoundment currently has a hazard potential classification of "Low," which in turn requires an evaluation of the impacts of a 100-year rainfall event. The Inflow Flood Control Plan – Revision 2, shows that the precipitation from this event will be contained without overtopping the embankments of the impoundment under normal conditions.

3.4.6 Hydraulic Structures - §257.73(d)(1)(vi)

The discharge structure from the BGS Upper Ash Pond is comprised of one 15-inch diameter PVC pipe, a 24-inch Parshall flume, and one 14-inch diameter emergency overflow pipe. The discharge pipes were inspected by video camera on May 22, 2026, and showed no signs of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris which may negatively affect the operation of the hydraulic structure.

3.4.7 Sudden Drawdown - §257.73(d)(1)(vii)

The northern embankment of the former BGS Upper Ash Pond is subject to the rise and fall of flood water from the Mississippi River as high as the crest of the embankment. These water elevations have occurred during major floods of the Mississippi River at least four times since construction of the impoundment and many smaller river floods have created sudden drawn down conditions on the embankment without detrimental effect. The embankment and foundation are constructed of clay and are not subject to rapid drawdown impacts.

4. QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

To meet the requirements of 40 CFR 257.73(d)(3), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Iowa; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.73(b) and 40 CFR 257.73(d).

By: _____

Name: Mark Loerop

Date: June 15, 2026

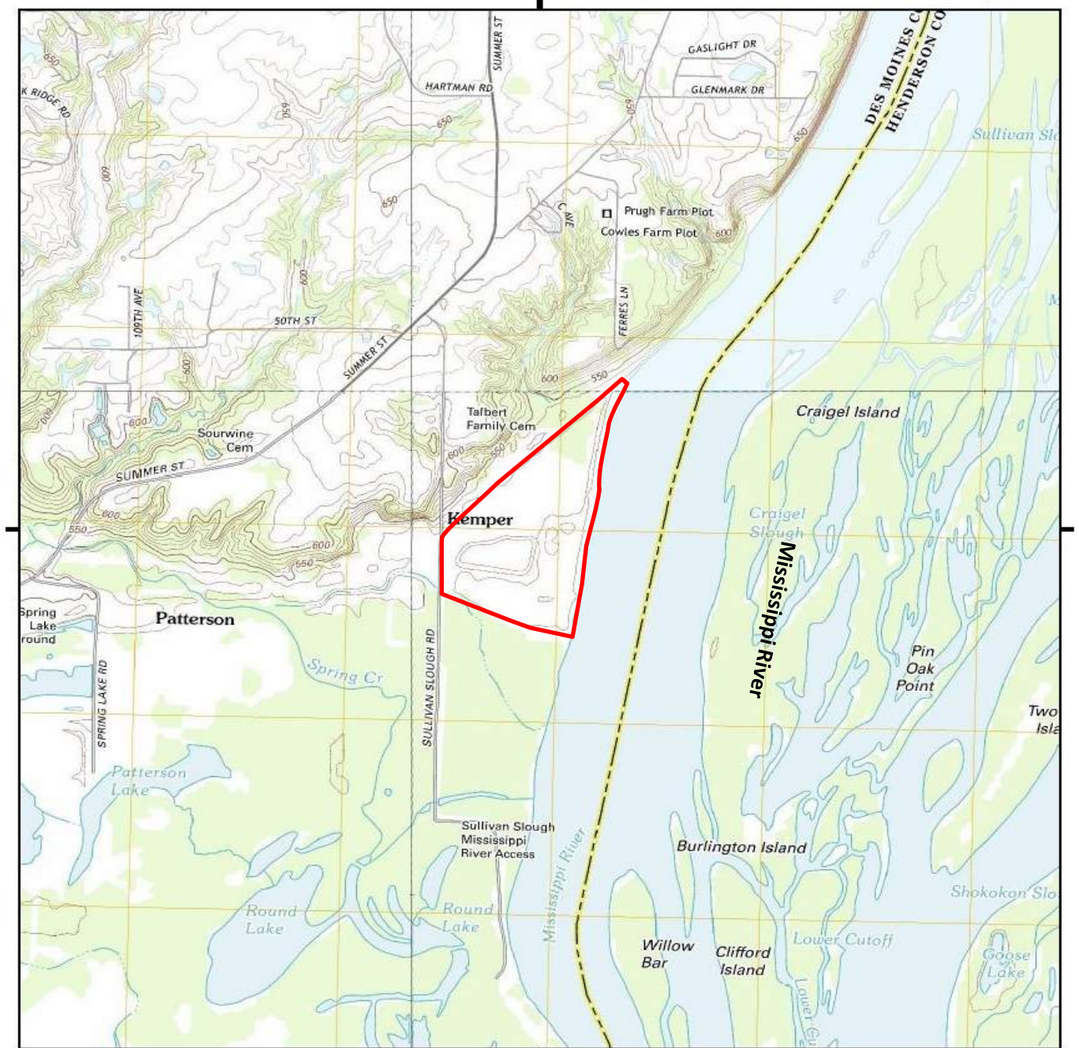
FIGURES

Alliant Energy
Interstate Power and Light Company
Burlington Generating Station
Burlington, Iowa

Structural Stability Assessment

Historical Topo Map

2012, 2013



Miles 0.25 0.5 1 1.5

This report includes information from the following map sheet(s).

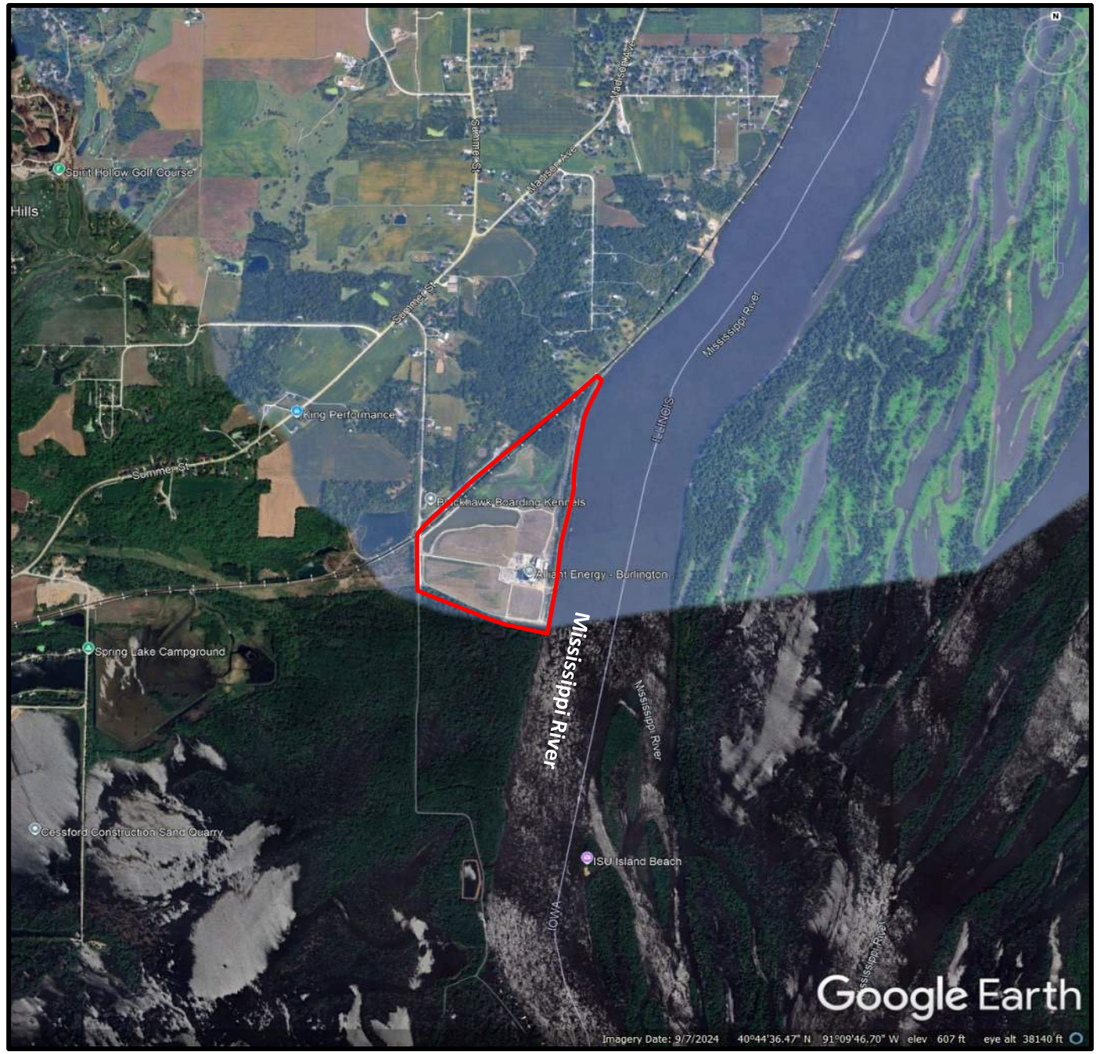
NW N NE
W E
SW S SE

TP, Lomax, 2012, 7.5-minute
NE, Burlington, 2013, 7.5-minute
SW, Dallas City, 2012, 7.5-minute
NW, West Burlington, 2013, 7.5-minute

SITE NAME: Burlington Generating Station
ADDRESS: 4282 Sullivan Slough Road
Burlington, IA 52601
CLIENT: Environmental Site Assessors

4555570 - 3 page 4

Aerial Photo 9/7/2024



Approximate Property Boundary

hard hat SERVICES	**Interstate Power and Light Company** Facility Location Map Burlington Generating Station; Burlington, Iowa no scale	Drawing Figure 1 Date 5/13/2026

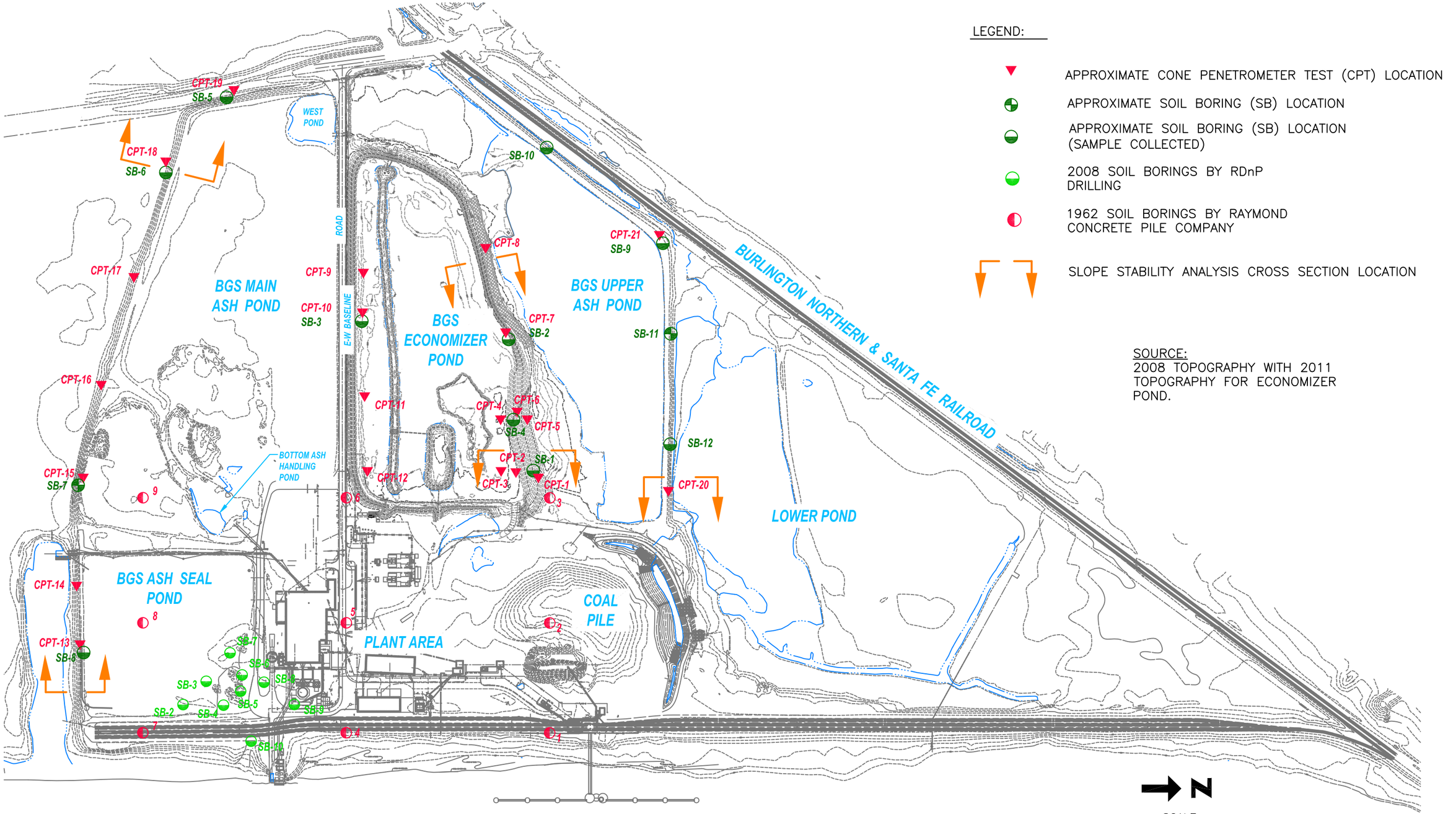
Stormwater Route

hard hat SERVICES

Interstate Power and Light Company
Stormwater Routing Plan
Burlington Generating Station; Burlington, Iowa
no scale

Drawing
Figure 2

Date
5/13/2026



LEGEND:

- APPROXIMATE CONE PENETROMETER TEST (CPT) LOCATION
- APPROXIMATE SOIL BORING (SB) LOCATION
- APPROXIMATE SOIL BORING (SB) LOCATION (SAMPLE COLLECTED)
- 2008 SOIL BORINGS BY RDnP DRILLING
- 1962 SOIL BORINGS BY RAYMOND CONCRETE PILE COMPANY
- SLOPE STABILITY ANALYSIS CROSS SECTION LOCATION

SOURCE:
2008 TOPOGRAPHY WITH 2011 TOPOGRAPHY FOR ECONOMIZER POND.

REV	DATE	BY	DESCRIPTION
5			
4			
3			
2			
1			

SCALE: AS SHOWN | DATE: 5-13-16
DRAWN BY: JFD | CHECKED BY: TJH | APPROVED BY: MWL

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CLIENT / LOCATION
ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

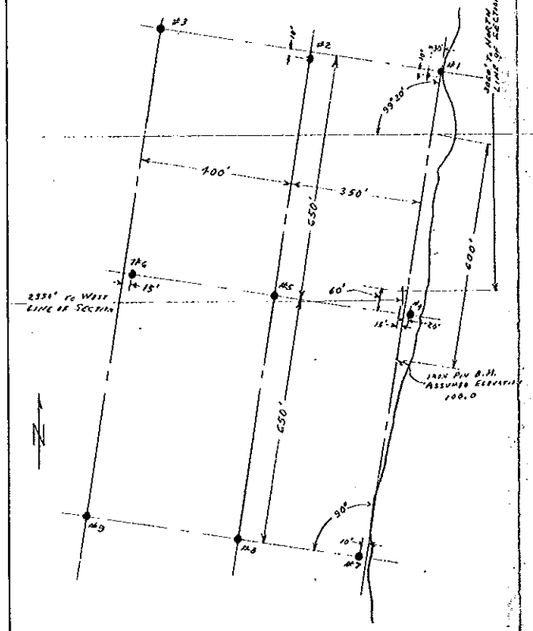
DRAWING DESCRIPTION
SOIL BORINGS, CPT, AND SLOPE STABILITY CROSS SECTION LOCATIONS

JOB 154.018.012.001
SHT. FIGURE 2
DWG. 154.018.012.001-D2

APPENDIX A – Deep Soil Borings

Alliant Energy
Interstate Power and Light Company
Burlington Generating Station
Burlington, Iowa

Structural Stability Assessment



No. 1

Ground Surface — Elev. 99.8

Brown and Grey Silt and Clay		11	3'0"
Brown Silty Fine Sand		10	
		2	8'0"
Brown & Grey Silty Clay		4	11'0"
Grey Fine And Medium Sand	f	8	
		4	22'0"
Grey Fine And Medium To Coarse Sand Trace Small Gravel	f	4	
		3	33'0"
Same		13	
More	f	11	
		16	
Dense			98'0"
Grey Fine To Medium Sand	f	3	
		3	37'6"
Brown Fine Medium To Coarse Sand	f	6	65'0"
Brown Fine Medium And Coarse Sand Trace Small Gravel	f	11	68'0"
Brown Dense Fine To Medium Sand	f	35	72'6"
Brown Coarse Sand Trace Fine To Medium Sand	f	11	
		17	92'6"
Brown Compact Fine Medium To Coarse Sand Tr. To Small Gravel		34	89'6"
Compact Silt With Small Gravel		52	88'0"
Same		100	
More			
Dense		100/0	98'10"

Used 86' of 2-1/2" Casing

Water Level 4' on Completion

1/25/62

No. 2

Ground Surface — Elev. 99.7

Grey Silty Clay		3	
		2	
		2	
		2	12'0"
Grey Fine Medium To Coarse Sand		8	17'0"
Grey Fine Sand	f	6	23'6"
Grey Fine Medium To Coarse Sand Trace Small Gravel	f	3	
		6	
		9	
		6	
		9	42'6"
Grey Fine To Medium Sand	f	12	48'0"
Grey Fine Sand	f	16	
		16	55'0"
Brown Fine Medium To Coarse Sand Trace Small Gravel	f	9	
		9	
		8	
			70'0"
Some More Dense		15	74'6"
Grey Compact Silty Fine Sand With Small Seams Of Fine Sand		100/11	
		73	
		102	86'0"

Used 89' of 2-1/2" Casing

Water Level 2' on Completion

1/27/62

No. 3

Ground Surface — Elev. 98.4

Brown Silty Clay		3	3'0"
Grey Silty Clay		4	7'0"
Grey and Brown Fine Sand	f	11	18'0"
Brown Silty Fine Sand	f	15	33'0"
Grey and Brown Fine Medium to Coarse Sand Trace Small Gravel	f	6	39'0"
Brown Fine Medium To Coarse Sand Trace Small Gravel	f	9	
		6	21'0"
Brown Silty Fine Sand	f	11	33'0"
Brown Fine Medium To Coarse Sand	f	6	
		6	45'0"
Brown Fine To Medium Sand	f	3	48'0"
Brown Fine To Medium Sand	f	7	
		15	
		20	
		41	
			68'0"
Brown and Grey Compact Silty Fine Medium To Coarse Sand, Trace Small Gravel		110	
		100	79'0"
Grey Compact Silty Fine To Medium Sand		100/8	80'2"

Used 78' of 2-1/2" Casing

Water Level 3' on Completion

1/31/62

No. 4

Ground Surface — Elev. 99.1

Silt		2	2'0"
Fine Grey Sand Some Silt		2	
		5	Sandy Silt 3'6"
Coarse Br. Sand Some Small To Medium Gravel		22	13'0"
Fine To Coarse Grey Sand		5	
		15	
		16	
		13	
		16	
		14	
		13	
		18	
		17	
		18	
		13	61'0"
Fine Grey Sand		23	74'0"
Fine to Coarse Gr. Sand Sm. to Med. Gravel & Trace of Clay		21/6	75'6"

Used 73' of 2-1/2" Casing

Water Level 7' on Completion

1/10/62

No. 5

Ground Surface — Elev. 98.7

Grey Silty Clay		5	
		6	
		1	
		3	11'6"
Grey Fine To Coarse Sand Trace Small Gravel	f	10	
		3	
		6	
		5	
		19	
		13	
		6	43'6"
Grey Silty Fine Sand	f	7	53'0"
Grey Fine To Medium Sand Trace Small Gravel	f	5	
		11	
		13	
		14	
			75'5"
Grey Compact Silt And Fine Sand		48	77'6"
Grey Compact Silt, Fine To Medium Sand, Trace Clay, Trace Small Gravel		97	83'0"
Grey Compact Fine To Medium Sand Trace Clay		53	90'0"
Gray Compact Fine To Medium Sand		16/11	
		100/0	
			103'2"

Used 93'6" of 2-1/2" Casing

Water Level 3' Below Ground Surface

1/15/62

No. 6

Ground Surface — Elev. 97.4

Gray Silty Clay		2	
		2	
		2	
		2	10'6"
Grey Fine To Coarse Sand		5	
		5	
		11	
		10	
		2	
		5	
		6	
Gravel		6	52'0"
Grey Fine Medium To Coarse Sand	f	10	58'0"
Grey Fine Medium To Coarse Sand Trace Sm. Gravel Trace Small Gravel	f	8	
		5	69'0"
Grey Fine Medium To Coarse Sand Trace Lignite Fragments		50	74'6"
Compact Silt With Some Sand		70	78'0"
Grey Compact Silt, Fine Sand, Trace Medium Sand		100/10	80'11"

Used 75' of 2-1/2" Casing

Water Level 3' Below Ground Surface

1/22/62

No. 7

Ground Surface — Elev. 100.4

Brown Silty Trace Clay		5	
		6	6'0"
Grey Silty Clay		4	9'0"
Brown Silty Fine And Medium Sand		17	13'0"
Brown Silty Fine Sand	f	11	17'0"
Grey Fine To Medium Sand Trace Small Gravel	f	9	
		15	
		3	33'0"
Grey Silty Fine Sand Trace Mica		8	37'0"
Grey Silty Fine Medium & Coarse Sand	f	11	43'6"
Grey And Brown Fine To Coarse Sand	f	11	
		8	
		13	
		15	63'6"
Grey Compact Silty Fine Medium And Coarse Sand Trace Small Gravel, Trace Clay		31	
			75'6"
Same More Dense		100/11	
Soil Note A		91	82'0"

Used 78' of 2-1/2" Casing

Used 82' of 70' Casing

Water Level 1'6" Below Ground Surface

Hole A — Grey Compact Fine to Medium Sand Trace Coarse Sand & Silt

1/1/62

No. 8

Ground Surface — Elev. 98.1

Brown Silty Clay		3	3'0"
Gray & Brown Silty Clay		2	
		2	7'9"
Brown Fine Medium And Coarse Sand		11	12'0"
Brown & Grey Fine To Coarse Medium Sand Trace Silt		3	17'6"
Grey Fine Medium To Coarse Sand Trace Silt		8	
		6	
		3	
		3	
		6	37'0"
Grey Fine To Medium Sand, Trace Coarse Sand	f	4	43'0"
Grey	f	10	
Fine		6	
Medium To Coarse Sand	f	6	
Trace Small Gravel	f	9	
			64'0"
Grey Compact Fine Sand And Silt Tr. Medium Gravel		100/9	68'0"
Grey Compact Fine Sand		65	70'6"
Grey Compact Fine Sand And Silt Trace Medium To Coarse Sand		100/9	75'0"

Used 75' of 70' Casing

Used 70' of 2-1/2" Casing

Water Level 3'6" Below Ground Surface

2/2/62

No. 9

Ground Surface — Elev. 98.1

Brown Silty Clay		2	
		2	7'0"
Bk. Sty. f/ Sand		2	9'6"
Same More Dense		8	
		9	17'6"
Grey Silty Fine To Medium Sand Trace Mica	f	2	
		3	29'0"
Grey Silty Fine Sand, Trace Medium Sd. & Dec. Wood	f	5	33'0"
Grey Fine Medium To Coarse Sand Tr. Sm. Gravel	f	5	38'0"
Grey Fine And Medium Sand	f	5	42'0"
Grey Fine To Medium Sand	f	6	48'0"
Grey Fine Medium To Coarse Sand Tr. Sm. Gravel	f	3	53'0"
Same	f	11	
More	f	24	
Dense	f	26	67'0"
Grey Compact Medium To Coarse Sand Trace Small Gravel	f	100/6	
		100/10	73'10"

Used 73'10" of 70' Casing

Used 10' of 2-1/2" Casing

Water Level 2'6" Below Ground Surface

2/5/62

Figures in right hand column shown as fraction — Numerator = No. of Blows / Denominator = Penetration in Inches

† Indicates Wash Sample Recovered

Classifications are made by visual inspection. Figures in right hand column indicate number of blows required to drive 2" O.D. sampling pipe one foot, using 140-lb. weight falling 30 inches.

References:
See D-461 for Boring Locations.
† Test Boring Report - February 13, 1962, By Raymond Concrete Pile Company, Gow Division, Job No. CB-948-KC Sheets 1 through 4

			IOWA SOUTHERN UTILITIES CO. CENTERVILLE, IOWA
			Proposed Burlington Plant Site Test Boring Reports
			SCALE 1"=8' VERTICAL DATE 3-15-62
			SKETCH DWN. BY TRCD LL A CHKD
			D-484 APPROVED

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-2**
LOGGED BY LES
PAGE No. 1 of 2

PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.13
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/11/2008 FINISH 12/12/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
													CL	Frozen ground
	SS-1	2.0	4.0	2	3	4	4	14.0		0.75	4'3"	529.88		Black and brown mottled SILTY CLAY, little fine to medium sand, medium plasticity, medium stiff, wet
5	SS-2	4.0	6.0	1	6	5	3	17.0					ML	Grey SILT, trace fine sand, medium dense, moist
	SS-3	6.0	8.0	1	8	15	7	17.5						medium dense
	SS-4	8.0	10.0	1	6	50/5		18.0						very dense
10														
	SS-5	13.0	15.0	1	1	1	1	13.0	49	0.75	13'5"	520.71	CH	Dark brown and black mottled CLAY, trace silt, high plasticity, medium stiff, wet
15														
	SS-6	18.0	20.0	2	2	3	3	15.0	48	0.25 0.50				soft (LL=52, PI=27)
20														
	SS-7	23.0	25.0	4	5	7	12	20.0			23'6"	510.63		Brown fine to medium SAND, medium dense, wet
25														
	SS-8	28.0	30.0	3	12	17	18	9.0						brownish-grey
30													SP	
	SS-9	33.0	35.0	8	10	11	12	11.5						
35														
	SS-10	38.0	40.0	7	7	10	12	10.0						some coarse sand and wood pieces
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-2**
LOGGED BY LES
PAGE No. 2 of 2

PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.13
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/11/2008 FINISH 12/12/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Brownish-grey fine to medium sand, some coarse sand, medium dense, wet (cont.)
	SS-11	43.0	45.0	3	6	12	14	15.5					SP	2" of black silt at 44'1"
45											46'6"	487.63		
	SS-12	48.0	50.0	6	7	8	12	16.0						Brownish-grey fine to coarse SAND, medium dense, wet
50														
	SS-13	53.0	55.0	10	11	12	19	21.0					SW	
55														
	SS-14	58.0	60.0	15	22	32	42	24.0						medium to coarse sand, trace fine sand and fine gravel, very dense
60											60'	474.13		EOB 60' - Sand was causing hole to collapse and would have needed to be cased to 60' to continue.
65														
70														
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BORING LOG

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PROJECT No. 154.002.008.001
BORING No. BH-B-1 **(BH-3)**
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PAGE No. 1 of 2

PROJECT NAME Alliant Energy - Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa
DRILLER RDnP Drilling - Chris DATE: START 7/15/2008 FINISH 7/21/2008

DEPTH	SAMPLE No.	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	USCS SOIL TYPE	SOIL DESCRIPTION
	SS-1	0.0	2.0	5	10	10	12	12	23				Brown and black silty clay FILL, medium dense, dry
	SS-2	2.0	4.0	10	11	11	15	9.5		2.0			Coarse sand and fine gravel FILL, trace grey fines, medium dense, dry
5	SS-3	4.0	6.0	5	10	2	2	10	14	4.0		FILL	some silt
	SS-4	6.0	8.0	1	10	16	12	22		6.0			Grey-black sand and gravel FILL with silt, medium dense wet.
	SS-5	8.0	10.0	6	10	22	32	24	24		10.0		
10	SS-6	10.0	12.0	3	8	3	2	14					Grey sandy SILT, trace coarse sand, loose, saturated
	SS-7	12.0	14.0	1	0	1	0	18	50				Grey SILT, little fine sand, very loose, saturated
15	SS-8	14.0	16.0	Rod Weight				17				ML	
	SS-9	18.0	20.0	1	1	1	1	16	33				trace low plasticity clay, trace fine sand
20											22'6"		
	SS-10	23.0	25.0	1	2	2	1	18				CL	Dark grey SILTY CLAY, trace fine sand, medium to high plasticity, soft, wet
25											26.5		
	SS-11	28.0	30.0	1	0	0	0	3	18				Grey fine to medium grained SAND, trace coarse sand, very loose, saturated
30													
	SS-12	33.0	35.0	5	8	12	14	11				SP	medium dense
35													
	SS-13	38.0	40.0	8	10	11	12	11	13				
40													

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-3.XLS

BORING LOG

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PROJECT No. 154.002.008.001
BORING No. BH-B-1 **(BH-3)**
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PAGE No. 2 of 2

PROJECT NAME Alliant Energy - Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa
DRILLER RDnP Drilling - Chris DATE: START 7/15/2008 FINISH 7/21/2008

DEPTH	SAMPLE No.	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	18"-24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	USCS SOIL TYPE	SOIL DESCRIPTION
													Grey fine to medium SAND, trace coarse sand, medium dense, saturated
	SS-14	43.0	45.0	5	10	14	22	11					
45													
	SS-15	48.0	50.0	9	14	16	16	12	15				
50													
	SS-16	53.0	55.0	8	12	14	15	11				SP	
55													
	SS-17	58.0	60.0	10	11	18	24	10	13				several pieces of coarse grained gravel at 58.5'
60													
	SS-18	63.0	65.0	15	24	26	36	10					dense
65											66.5		
	SS-19	68.0	70.0	32	32	38		12	9				Grey fine to coarse SAND and fine grained gravel, very dense, saturated
70												SW	
	SS-20	73.0	75.0	32	75/3			4					
75											76.5		
	SS-21	78.0	80.0	50	100/3			4	8		79.5	GP	Fine GRAVEL with fine to coarse sand, very dense, saturated Spoon bounced at 79.5'
80													EOB at 80'

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-4**
LOGGED BY LES
PAGE No. 1 of 2

PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.43
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/2/2008 FINISH 12/3/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNTS 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	3	4	5	15	16.0					FILL	Black and brown silty clay FILL, some fine sand, dry
5	SS-2	4.0	6.0	9	8	11	12	17.0						Black and brown fine to coarse sand and fine gravel FILL, trace fines, wet
	SS-3	6.0	8.0	10	5	12	15	20.0			6'6"	527.93		Grey SILT, little fine sand, medium dense, saturated
	SS-4	8.0	10.0	2	2	3	20	24.0					ML	loose 4" fine sand seam at 9'6"
10											11'6"	522.93		Grey SILTY-CLAY, trace fine sand, medium plasticity, soft, moist to wet
	SS-5	13.0	15.0	2	2	3	4	14.0	50	2.00			CL	
15														
	SS-6	18.0	20.0	7	9	8	11	15.0			18'4"	516.10		Grey-brown fine to coarse SAND, medium dense, wet
20														
	SS-7	23.0	25.0	10	11	15	15	12.0	18					
25													SP	
	SS-8	28.0	30.0	6	10	12	14	11.0						
30														
	SS-9	33.0	35.0	6	7	9	11	11.0	19					trace fine gravel
35											36'6"	497.93		Brown fine to coarse SAND, little fine gravel, trace silt, medium dense, wet
	SS-10	38.0	40.0	7	9	7	10	10.0					SW	
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-4.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-4**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.43
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/2/2008 FINISH 12/3/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														(cont.) Brown fine to coarse SAND, little fine gravel, medium dense, wet
	SS-11	43.0	45.0	5	6	6	8	11.0	14					
45														
	SS-12	48.0	50.0	12	12	16	19	10.0						
50														
	SS-13	53.0	55.0	8	9	11	14	12.0	13				SW	
55														
	SS-14	58.0	60.0	10	8	10	13	12.0						
60														
	SS-15	63.0	65.0	18	21	32	50/5	16.0	11					very dense
65											64'6"	469.93		
														Grey silty CLAY, trace fine sand, medium plasticity, hard, wet
	SS-16	68.0	70.0	21	32	42	44	24.0		+4.5				
70													CL	
	SS-17	73.0	75.0	10	17	22	23	20.0	25					
75											75'	459.43		EOB 75'
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-4.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-5**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.71
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/4/2008 FINISH 12/5/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	15	19	22	23	12.0						Black and brown sand and gravel FILL, some fines, wet
5	SS-2	4.0	6.0	10	19	34	50/3	16.0					FILL	
	SS-3	6.0	8.0	32	32	22	8	18.0						Brown-grey silt with sand FILL
	SS-4	8.0	10.0	9	12	23	14	20.0						6" brown-red fine to coarse sand FILL
10											10'	524.71		
	SS-5	10.0	12.0	1	2	4	1	24.0					ML	Grey SILT, little fine sand, loose, wet
											13'	521.71		
	SS-6	13.0	15.0	1	1	2	3	21.0	36					Mottled green, black, and light grey SILTY CLAY, little fine sand, trace silt and wood pieces, medium stiff, wet
15														
	SS-7	18.0	20.0	2	2	3	3	13.0	34	1.00			CL	
20														
	SS-8	23.0	25.0	5	7	7	9	14.5			23'2"	511.54		
25														Black and brown fine to medium SAND, trace coarse sand, medium dense, wet 23'7" grey
	SS-9	28.0	30.0	3	4	6	7	13.0	19					
30														
	SS-10	33.0	35.0	7	7	9	11	12.0					SP	
35														
	SS-11	38.0	40.0	7	10	11	14	14.0	22					5" fine sand seam 2" coarse sand and fine gravel seam
40														

Drilled with Dietrich -120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-5.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-5**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.71
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/4/2008 FINISH 12/5/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														(cont.) Grey fine to medium SAND, trace coarse sand, wet
	SS-12	43.0	45.0	12	15	22	26	13.5						dense
45														
	SS-13	48.0	50.0	10	12	12	15	12	17				SP	medium dense
50														
	SS-14	53.0	55.0	5	15	21	15	13						dense, 53'6" - 1" gravel piece
55														
	SS-15	58.0	60.0	6	8	11	15	10	12		58'7"	476.13		medium dense
60														Grey fine to coarse SAND, some fine gravel, very dense
	SS-16	63.0	65.0	50/0				0					SW	
65														(rig was grinding heavily to get from 65' to 68')
	SS-17	68.0	70.0	50/4				4						
70											70'	464.71		EOB 70'
75														
80														

Drilled with Dietrich -120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-5.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-6**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.33
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/4/2008 FINISH 12/5/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	10	11	15	17	17.0						Brown silty sand FILL, trace medium sand, medium dense
5	SS-2	4.0	6.0	1	3	5	11	13.0					FILL	
	SS-3	6.0	8.0	50/5				7.5						(possibly gravel inhibiting sampling)
	SS-4	8.0	10.0	41	50/3			5.5						
10											10'	524.33		
	SS-5	10.0	12.0	3	2	1	4	20.0	49				ML	Brownish-grey SILT, trace fine sand, very loose, saturated
	SS-6	13.0	15.0	3	4	4	5	24.0	53					loose
15											16'6"	517.83		
	SS-7	18.0	20.0	1	1	1	2	17.0	49	0.50			CL	Brownish-grey SILTY CLAY, trace fine sand, soft, wet
20														
	SS-8	23.0	25.0	1	3	4	5	16.0			24'	510.33		
25													SP	Brown fine to medium SAND, trace coarse sand, medium dense, wet
	SS-9	28.0	30.0	6	7	9	11	15.5	18					
30														
	SS-10	33.0	35.0	10	11	14	14	12.0						
35											36'6"	497.83		
	SS-11	38.0	40.0	6	8	9	12	12.5	9				SW	Brown fine to coarse SAND, little fine gravel, medium dense, wet
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-6**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.33
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/4/2008 FINISH 12/5/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
											42'6"	491.83	SW	Brown fine to coarse SAND, little fine gravel, medium dense, wet (cont.)
	SS-12	43.0	45.0	8	10	14	17	12.0						Brown fine to medium sand, trace fine sand, medium dense to dense, wet (cont.)
45														
	SS-13	48.0	50.0	8	9	12	14	12.0	14					little coarse sand
50													SP	
	SS-14	53.0	55.0	10	17	17	15	12.5						
55														
	SS-15	58.0	60.0	10	12	14	14	10.0	14					
60											62' 6"	472.00		
	SS-16	63.0	65.0	17	31	36	42	22.0	14	4.5+ 4.5+			CL	Grey SILTY CLAY, little fine to medium sand, medium plasticity, hard, wet 1" fine to medium sand seam at 63'6" 1" gravel piece at 6'8"
65														
	SS-17	68.0	70.0	21	50/3			9.0		4.5+				
70											70'	464.33		EOB 70'
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-6.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-7**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa SURFACE ELEVATION 536.51
DRILLER RDnP Drilling - Kris Norwick DATE: START 12/5/2008 FINISH 12/8/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	6	7	10	12	22.5		1.00			FILL	Black sand, gravel, and silt FILL 6" alternating brown and black fine sand and silt at 3' 6"grey clay, medium stiff, moist at 4'
5	SS-2	4.0	6.0	1	3	10	14	15.0		0.75				
	SS-3	6.0	8.0	10	31	21	33	18.0			6'	530.51		Dark grey SILT, some fine sand, very dense, wet
	SS-4	8.0	10.0	15	21	18	15	17.0						
10	SS-5	10.0	12.0	10	22	32	44	21.0					ML	trace fine sand
	SS-6	13.0	15.0	3	4	1	5	23.0	67					loose
15														
											16'6"	520.01		
	SS-7	18.0	20.0	1	2	1	2	24.0					CL	Grey SILTY CLAY, trace fine sand, very soft, wet
20														
											23'6"	513.01		
	SS-8	23.0	25.0	1	2	4	12	16.0	19				SP-SC	Grey fine to medium SAND with clay, loose, wet
25														
											26'6"	510.01		
	SS-9	28.0	30.0	2	5	8	8	18.0						Grey fine to medium SAND, medium dense, wet
30														
	SS-10	33.0	35.0	8	14	16	15	12.0	17				SP	trace coarse sand
35														
	SS-11	38.0	40.0	8	14	10	8	12.0						medium dense
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-7**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 536.51
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/5/2008 FINISH 12/8/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Grey fine to medium SAND, trace coarse sand medium dense, wet
	SS-12	43.0	45.0	5	8	10	11	12.0	15					
45														
	SS-13	48.0	50.0	8	10	15	18	14.0					SP	
50														
	SS-14	53.0	55.0	10	12	15	16	10.0	15					
55											56'6"	480.01		
	SS-15	58.0	60.0	8	11	15	17	24.0						Brown fine to coarse SAND, trace fine gravel, medium dense, wet
60													SW	
	SS-16	63.0	65.0	18	23	50/4		10.0	7					very dense
65											65'	471.51		EOB 65'
70														
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-7.XLS

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-8**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa SURFACE ELEVATION 534.72
DRILLER RDnP Drilling - Kris Norwick DATE: START 12/15/2008 FINISH 12/17/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	8	12	10	12	18.0						Brown and grey mottled silty clay FILL, little fine to coarse sand, medium dense, frozen
5	SS-2	4.0	6.0	3	4	6	6	16.0		1.75			FILL	
	SS-3	6.0	8.0	3	5	7	10	10.0						fine gravel pieces mixed in clay
	SS-4	8.0	10.0	3	4	6	9	15.0	17	2.50				
10	SS-5	10.0	12.0	4	5	7	4	14.0	23	3.00	10'6"	524.22		Grey SILT, trace fine sand, medium dense to loose, wet
	SS-6	13.0	15.0	2	3	3	3	8.0	26				ML	alternating silt and brown silty clay, stiff
15											16'6	518.22		
	SS-7	18.0	20.0	1	2	3	2	10.0	34	1.25			CL	Grey SILTY CLAY, medium plasticity, medium stiff, mois to wet (LL=46, PI=24)
20														
											23'3"	511.47		
	SS-8	23.0	25.0	5	6	7	7	12.0						Brown fine to medium SAND, loose, wet
25														
	SS-9	28.0	30.0	2	5	4	5	24.0	20					
30													SP	
	SS-10	33.0	35.0	2	3	4	5	12.0						trace coarse sand
35														
	SS-11	38.0	40.0	4	5	5	7	11.5	12					
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-8**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.72
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/15/2008 FINISH 12/17/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Brown fine to medium SAND, trace coarse sand, medium dense, wet (cont.)
	SS-12	43.0	45.0	9	10	11	15	11.0						
45													SP	
	SS-13	48.0	50.0	14	17	9	7	13.0	16					
50														
											49'6"	485.22		
	SS-14	53.0	55.0	4	8	7	6	13.0						Brown fine to coarse SAND, trace fine gravel, medium dense, wet
55														
	SS-15	58.0	60.0	8	15	19	22	15.0	8					dense
60													SW	
	SS-16	63.0	65.0	5	15	24	26	17.0						little fine gravel
65														
											66'6"	468.22		
	SS-17	68.0	70.0	48	50/4			13.0	14				CL	Grey sandy SILTY CLAY, hard, moist to wet
70											70'	464.72		EOB 70'
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

HARD HAT SERVICES™
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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-9**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 534.67
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/17/2008 FINISH 12/18/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	3	4	2	2	14.0		2.50				Grey and brown mottled silty clay FILL, some fine to medium sand, very stiff, moist
5	SS-2	4.0	6.0	3	4	6	5	17.0		4.00			FILL	
	SS-3	6.0	8.0	4	5	5	8	17.0		2.50				Alternating grey, brown, and orange clay and silt
	SS-4	8.0	10.0	4	5	10	10	17.0		2.00	8'11"	525.75		
10	SS-5	10.0	12.0	5	7	9	12	16.0		4.00			CL	Grey SILTY CLAY, trace fine sand, medium plasticity, very stiff, moist
											13'	521.67		
	SS-6	13.0	15.0	3	4	6	6	21.0						Dark grey CLAY, high plasticity, stiff, wet
15														
	SS-7	18.0	20.0	3	3	4	5	21.0	51	1.00				(LL=64, PI=34)
20													CH	
	SS-8	23.0	25.0	5	6	8	9	0.0						
25														(hole is taking a lot of water)
											24'6"	510.17		
	SS-9	28.0	30.0	8	10	12	14	10.0	25					Grey fine to medium SAND, medium dense, wet
30														
	SS-10	33.0	35.0	8	15	19	22	16.0						trace coarse sand, dense
35													SP	
	SS-11	38.0	40.0	10	16	17	19	11.0	18					
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

HARD HAT SERVICES™
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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-9**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa SURFACE ELEVATION
DRILLER RDnP Drilling - Kris Norwick DATE: START 12/17/2008 FINISH 12/18/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Grey fine to medium SAND, trace coarse sand, dense, wet
	SS-12	43.0	45.0	10	17	24	29	8.0						trace fine gravel
45														
	SS-13	48.0	50.0	8	16	20	21	12.0	17				SP	
50														
	SS-14	53.0	55.0	9	11	15	19	13.0						
55														
											56'6"	478.17		Grey-brown fine to coarse SAND, trace fine gravel, dense, wet
	SS-15	58.0	60.0	10	12	18	17	16.0	17					
60													SW	
	SS-16	63.0	65.0	12	15	24	26	15.0						dense
65														
											66'6"	468.17		
	SS-17	68.0	70.0	37	50/4			10.0					CL	Grey CLAY, little fine to medium sand, medium plasticity, hard, moist to wet
70											70'	464.67		EOB 70'
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

BH-9.XLS

HARD HAT SERVICES ™
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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-10**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 531.92
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/12/2008 FINISH 12/15/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Frozen ground
	SS-1	2.0	4.0	4	5	5	4	13.0	17	2.00				Grey and brown mottled SILTY CLAY, trace fine sand, medium plasticity, stiff, moist
5	SS-2	4.0	6.0	3	4	5	6	15.0	15	2.50				little fine to coarse sand, very stiff
	SS-3	6.0	8.0	4	4	5	6	15.0	13	2.50			CL	
	SS-4	8.0	10.0	3	6	8	8	15.0	24	2.50 1.50				Brown, silt content increasing, thin brown silt seams
10														
	SS-5	13.0	15.0	1	2	3	4	15.0		0.75 1.00	13'	518.92		Dark grey CLAY, high plasticity, medium stiff, wet
15														
	SS-6	18.0	20.0	4	6	5	7	13.5		1.25				stiff
20													CH	
	SS-7	23.0	25.0	3	4	5	5	6.0		1.00				
25														
	SS-8	28.0	30.0	8	9	11	12	0.0			29'	502.92		Grey-brown fine to medium SAND, medium dense, wet
30														
	SS-9	33.0	35.0	6	8	5	5	10.0						
35														
	SS-10	38.0	40.0	8	9	11	12	11.0						trace coarse sand
40														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

HARD HAT SERVICES™
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BORING LOG

PROJECT No. 154.002.008.001
BORING No. **BH-10**
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PROJECT NAME Alliant Energy - December 2008 Baghouse Geotechnical Investigation
BORING LOCATION Burlington, Iowa — SURFACE ELEVATION 531.92
DRILLER RDnP Drilling - Kris Norwick — DATE: START 12/12/2008 FINISH 12/15/2008

DEPTH	SAMPLE No.	INTERVAL (ft) FROM	TO	BLOW COUNT 0" to 6"	6" to 12"	12" to 18"	18" to 24"	REC (in)	WC (%)	qu (TSF)	CONTACT DEPTH	ELEV. (MSL)	USCS SOIL TYPE	SOIL DESCRIPTION
														Grey-brown fine to medium SAND, trace coarse sand, medium dense, wet (cont.)
	SS-11	43.0	45.0	3	6	9	15	15.0						
45														dense
	SS-12	48.0	50.0	8	15	21	30	15.0						
50													SP	
	SS-13	53.0	55.0	50/0				0.0						(spoon bouncing, possibly on a cobble or boulder)
55														
	SS-14	58.0	60.0	14	17	17	15	16.0						trace fine gravel
60														
	SS-15	63.0	65.0	50/1				0.0			64'	467.92		Grey CLAY, little fine sand, hard, moist to wet
65													CL	
	SS-16	68.0	70.0	32	50/3			10.0		4.5+				(spoon bouncing)
70											70'	461.92		EOB 70'
75														
80														

Drilled with Dietrich-120
Method: auger and mud rotary
Hole was backfilled with bentonite slurry

APPENDIX B – Geoprobe Soil Borings on CCR Embankments

Alliant Energy
Interstate Power and Light Company
Burlington Generating Station
Burlington, Iowa

Structural Stability Assessment

Boring Log Legend

Sample
No: (Number) Soil samples are numbered consecutively from the ground surface. Core samples are numbered consecutively from the first core run.

Type: A= Auger Cuttings CR= Core Run MS= Modified Spoon PB= Pitcher Barrel
PT= Piston Tube ST= Shelby Tube SS= Split Spoon (2" O.D.) WC= Wash Cuttings

Interval: The depth of sampling interval in feet below ground surface

Blow Count
The number of blows required to drive a 2-inch O.D. split-spoon sampler with a 140 pound hammer falling 30-inches. When appropriate, the sampler is driven 18 inches and blow counts are reported for each 6-inch interval. The sum of blow counts for the last two 6-inch intervals is designated as the standard penetration resistance (N) expressed as blows per foot.

Recovery in Inches
The length of sample recovered by the sampling device.

U.S.C.S. Soil Type
The Unified Soil Classification System symbol for recovered soil samples determined by visual examination or laboratory tests. Refer to ASTM D2487-69 for a detailed description of procedure and symbols. Underlined symbols denote classifications based on laboratory tests (i.e. ML), all others are based on visual classification only.

Percent Moisture
Natural moisture content of sample expressed as percent of dry weight.

q_u TSF
Unconfined compressive strength in tons per square foot obtained by hand penetrometer. Laboratory compression test values are indicated by underlining.

Contact Depth
The contact depth between soil layers is interpreted from significant changes in recovered samples and observations during drilling. Actual changes between soil layers often occur gradually and the contact depths shown on the boring logs should be considered as approximate.

Soil Description and Remarks
Soil descriptions include consistency or density, color, predominant soil types and modifying constituents.

Cohesive Soils			Cohesionless Soils	
Consistency	q_u (TSF)	Blows/ft.	Density	Blows/ft.
Very Soft	less than 0.25	0-1	Very Loose	4 or less
Soft	0.25 to 0.50	2-4	Loose	5 to 10
Medium Stiff	0.50 to 1.00	5-8	Medium Dense	11 to 30
Stiff	1.00 to 2.00	9-15	Dense	30 to 50
Very Stiff	2.00 to 4.00	15-30	Very Dense	Over 50
Hard	more than 4.00	Over 30		

Particle Size Description

Boulder =	Larger than 12 inches
Cobble =	3 to 12 inches
Gravel =	0.187 to 3 inches
Sand =	0.074 to 4.76 mm
Silt and Clay =	smaller than 0.074 mm

Definition of Terms

Trace =	5 to 12 percent by weight
Some =	12 to 30 percent by weight
And =	Approximately equal fractions
( ) =	Driller's observation

Piezo.
(Piezometer) Screened interval of the piezometer installation is denoted by cross-hatching.

General Note
The boring log and related information depicted subsurface conditions only at the specified locations and date indicated. Soil conditions and water levels at other locations may differ from conditions occurring at these boring locations. Also the passage of time may result in a change in the conditions at these boring locations.

Soil Test Boring Refusal
Defined as any material causing a blow count greater that 50 blows/6 inches. Such material may include bedrock, "floating" rock slabs, boulders, dense gravel seams, hard pan clay, or cemented soils. Refusal is usually indicated in fractional notation showing number of blows as the numerator and inches of penetration as the denominator.

CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB1 (CPT1)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-11-11*
DATE FINISHED: *05-11-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	2.5'/5'				0		ASH; brown; poorly graded; fine grained; moist. (Fill)
	SP2	5'/5'				-5		
	SP3	5'/5'				-10		
	SP4	5'/5'				-15		@ 14' grades dark gray to black.
	SP5	0'/5'				-20		Clayey SILT; black to gray; non-plastic to low plasticity; moist to wet; some organic matter. (OL) @ too soft for pocket penn from 19.5' to 31', no hammer required to push sampler.
	SP6	5'/5'				-25		
	SP7	1.5'/5'		2.75 2.75 3.25 3.75 1.5		-30		CLAY; gray to black; high plasticity; soft to firm; moist; trace organic. (OH)
	SP8	5'/5'				-35		Sandy SILT; gray; non-plastic; wet. (ML)
						-40		SAND; gray; well graded; fine to coarse grained; rounded to sub-rounded; wet. (SW) Bottom of boring @ 40' Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-11-11.

CABENO

Environmental Field Services, LLC

BORING LOG

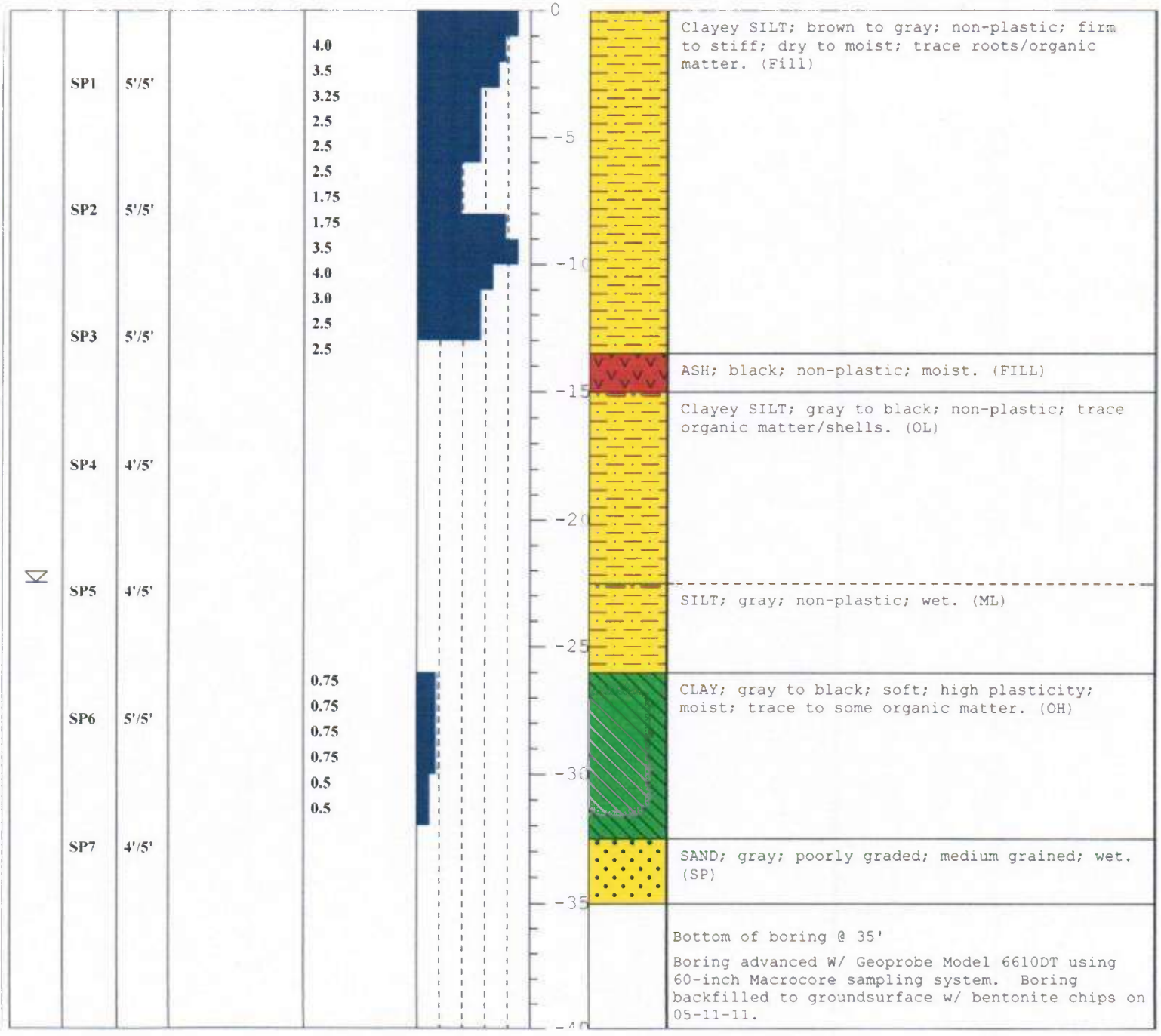
CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB2 (CPT7)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-11-11*
DATE FINISHED: *05-11-11*
GROUND SURFACE ELEVATION:



CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB3 (CPT10)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-11-11*
DATE FINISHED: *05-11-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	3.5'/5'		2.25 2.25 2.25 2.25 2.25 2.0		0		ASH; brown; non-plastic; moist. (FILL)
	SP2	5'/5'		0.75 1.25 1.0 2.75 1.5		-5		Clayey SILT; brown to gray; non-plastic; firm to stiff; dry to moist; trace roots/organic matter. (Fill)
	SP3	5'/5'		2.0 2.0		-10		ASH; gray; non-plastic; moist. (FILL)
	SP4	5'/5'				-15		Silty SAND; dark gray to light gray; poorly graded; fine grained; wet. (SP)
	SP5	5'/5'				-20		
	SP6	5'/5'		2.0 2.5 0.5 0.5		-25		SILT; gray; non-plastic; wet. (ML)
	SP7	5'/5'		0.75 1.0 1.0 1.25		-30		Silty CLAY; gray to black; soft; low plasticity; moist; trace to some organic matter. (OH)
	SP8	5'/5'		1.0 1.0 1.0		-35		SAND; gray; poorly graded; fine grained; wet. (SP)
						-40		Bottom of boring @ 40' Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-11-11.

BORING LOG

CABENO

Environmental Field Services, LLC

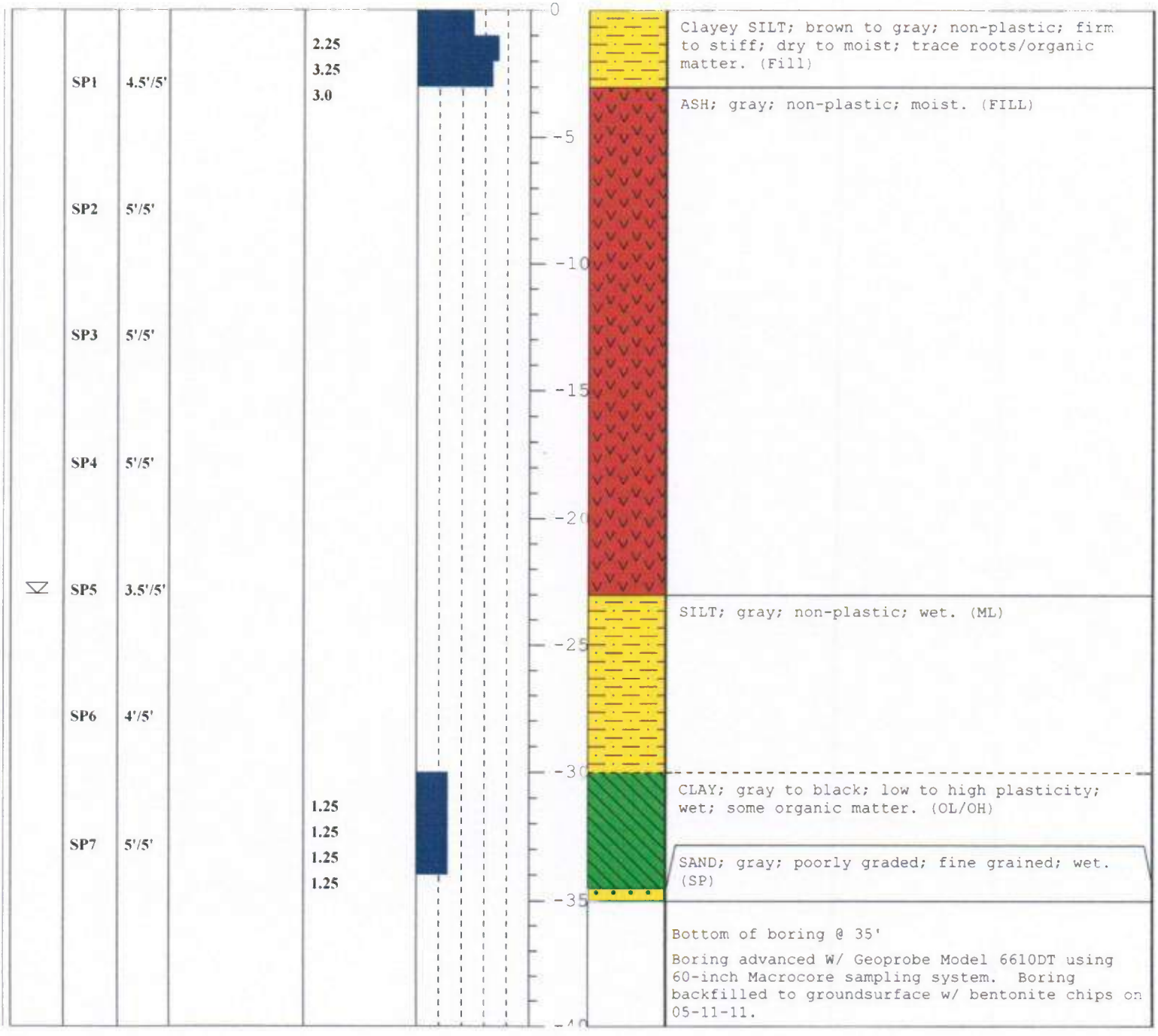
CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB4 (CPT6)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-11-11*
DATE FINISHED: *05-11-11*
GROUND SURFACE ELEVATION:



CABENO

Environmental Field Services, LLC

BORING LOG

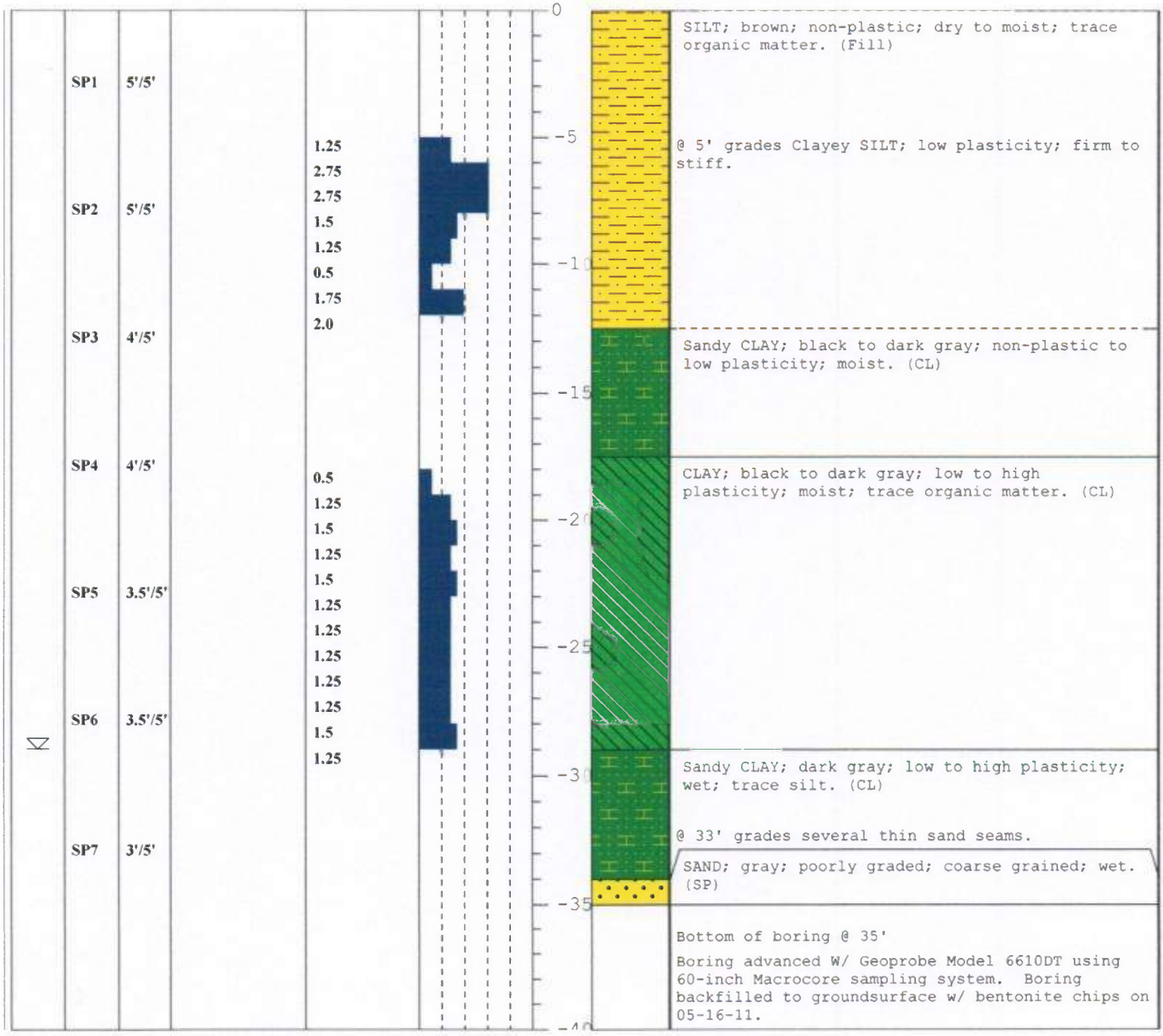
CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB5 (cpt19)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:



CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB6 (cpt18)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	5'/5'		2.5		0		SILT; brown; non-plastic; dry to moist; trace organic matter (FILL)
				2.0		-5		@ 5' grades Clayey SILT; low plasticity; very stiff.
	SP2	5'/5'		3.5				
				3.5				
				4.0		-10		CLAY; gray to olive; low to high plasticity; stiff to very stiff; moist; trace organic matter (Fill)
				2.25				
				2.25				
	SP3	5'/5'		2.5				
				2.5				
				2.5		-15		Clayey SAND; gray; poorly graded; medium grained; wet. (SP)
				2.5				
				1.5				
	SP4	4.5'/5'		0.5				CLAY; gray to olive; high plasticity; very soft to firm; moist to wet. (CL)
				1.5				@ 19' is a thin 1" sand seam, wet.
				2.25		-20		
				1.25				
				1.25				
	SP5	2.5'/5'		1.0				
				0.5				
				1.5		-25		
				1.0				
				0				
	SP6	3.8'/5'		0				
				0				
	SP7	2.5'/2.5'				-30		SAND; gray; well graded; fine to coarse grained; wet. (SW)
								Bottom of boring @ 32.5'
						-35		Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-16-11.
						-40		

CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB7 (cpt15)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	3.8'/5'		2.5		0		ASH; gray; fine grained; moist. (Fill)
				3.75		-5		CLAY; black; low plasticity; stiff to very stiff; moist; trace organic matter (Fill)
	SP2	5'/5'		>4.5				
				1.75				
				1.5		-10		
				1.25				
				1.75				
	SP3	5'/5'		4.0				
				4.25				
				4.5		-15		
				4.5				
				>4.5				
	SP4	5'/5'		3.0				
				2.0				@ 18' grades (OH)
				3.0		-20		@ 19' is a 6-inch SAND seam; fine grained; wet. @ 20' grades high plasticity.
				3.5				SAND; gray; poorly graded; fine grained; wet. (SW)
	SP5	3'/5'				-25		Bottom of boring @ 25'
								Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-16-11.
						-30		

CABENO

Environmental Field Services, LLC

BORING LOG

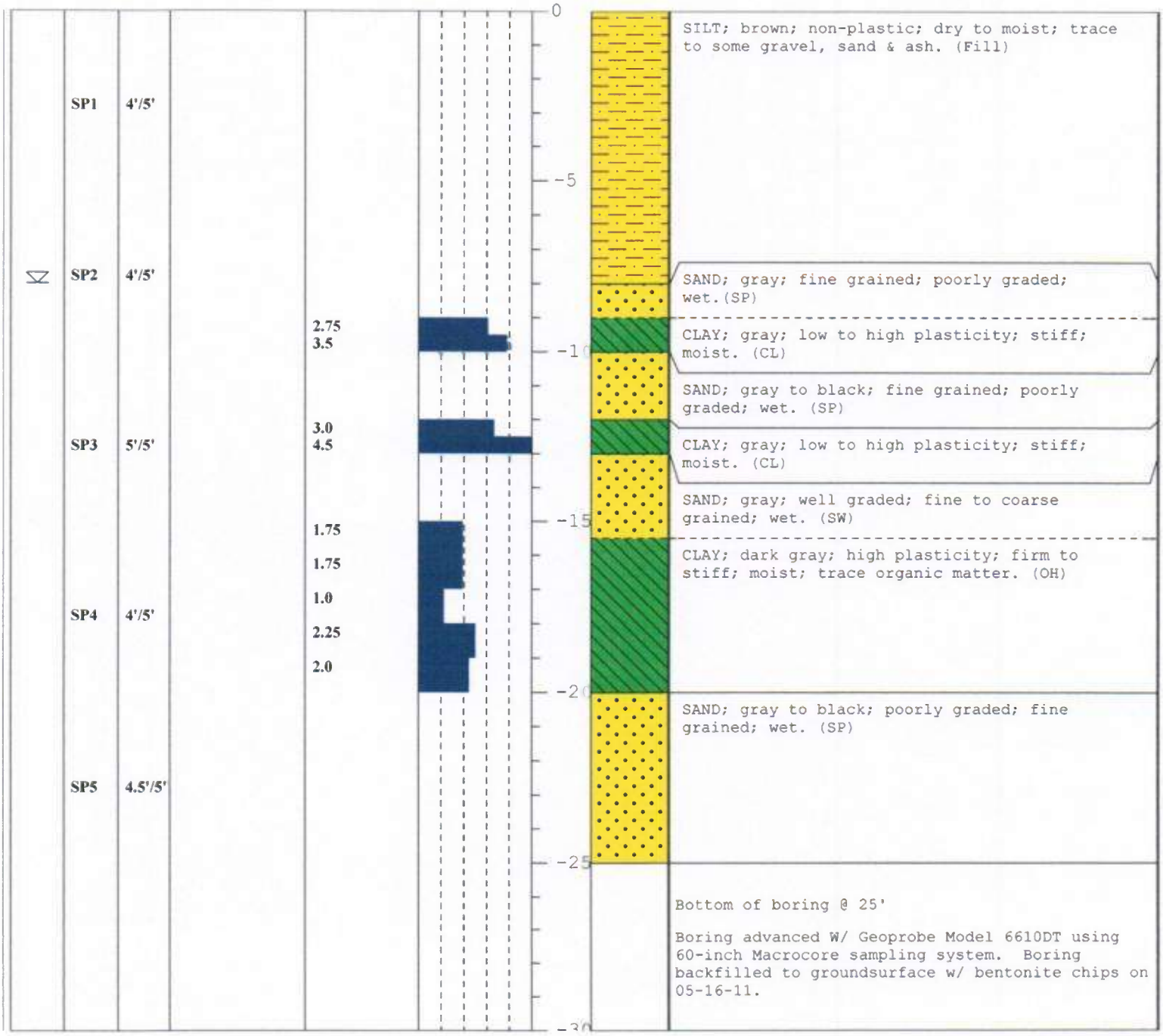
CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB8 (cpt13)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:



CABENO

Environmental Field Services, LLC

BORING LOG

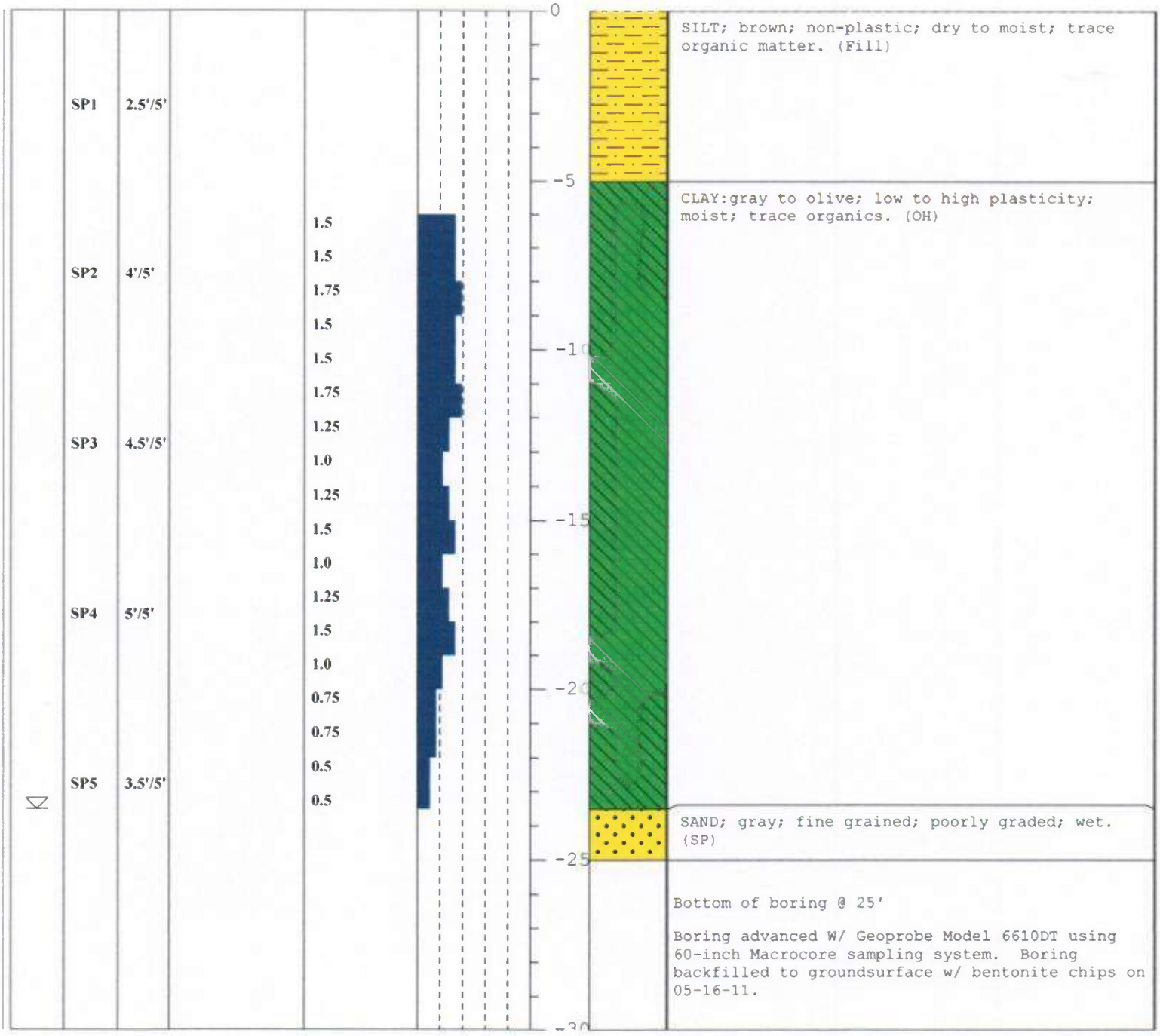
CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB9 (cpt21)*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:



CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB10*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	2.5'/5'		>4.5 3.5 3.25 1.25		0 -5		Silty CLAY; brown; low plasticity; firm to very stiff; moist; trace organics and gravels. (CL - OH)
	SP2	4'/5'		1.75 2.0 2.0 1.75 1.5		-10		
	SP3	4.5'/5'		2.75 2.5 2.0 2.5 1.75		-15		
	SP4	5'/5'		0.5 1.0 2.5 2.25 2.75		-20		
	SP5	3.5'/5'		3.25 2.5 2.5 2.25		-25		SAND; gray to brown; well graded; fine to coarse grained; wet. (SW) CLAY; gray; high plasticity; moist. (CL) LIMESTONE; gray; thinly bedded; highly weathered. (Bedrock) Bottom of boring @ 25' Boring advanced W/ Geoprobe Model 6610DT using
	SP6	2'/3'				-30		

CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB11*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	2.5'/5'		2.25		0		Gravely SILT; brown; non-plastic; dry to moist. (Fill)
				2.5		-5		CLAY; brown; high plasticity; moist; stiff to soft; trace sand & gravel. (CL)
	SP2	4'/5'		2.5				
				1.75				
				1.25		-10		@ 11.5' grades black to gray, trace organics. (OH)
				2.0				
	SP3	4.5'/5'		1.25				
				1.0				
				0.5		-15		@ 14.5' are several thin, 1-inch, fine grained sand seams; wet.
				0.75				
				1.5				
	SP4	5'/5'		0.5				
				1.25		-20		SAND; gray; poorly graded; fine grained; wet. (SP)
				1.0				Bottom of boring @ 20'
						-25		Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-16-11.
						-30		

CABENO

Environmental Field Services, LLC

BORING LOG

CLIENT: Aether dbs

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Burlington, IA

BORING NO.: *SB12*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Chris Sullivan*
DATE BEGAN: *05-16-11*
DATE FINISHED: *05-16-11*
GROUND SURFACE ELEVATION:

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	POCKET PENETROMETER (TONS/FT2)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
	SP1	2.5'/5'		2.5		0		Gravely SILT; brown; non-plastic; dry to moist. (Fill)
				2.75		-5		CLAY; brown; high plasticity; moist; stiff to soft; trace sand & gravel. (CL)
	SP2	5'/5'		1.75				
				1.25		-10		
				1.25				
				1.75				
	SP3	5'/5'		1.5				
				1.25				
				0.75		-15		@ 14' grades dark gray to black; trace organics. (OH)
				0.75				
				1.25				
	SP4	4.5'/5'		1.0				
				0.75		-20		
				1.25				
				1.5				
				1.0				
	SP5	5'/5'		0.75				
▽				0.5		-25		SAND; black to dark gray; poorly graded; fine grained; wet. (SP)
								Bottom of boring @ 25'
								Boring advanced W/ Geoprobe Model 6610DT using 60-inch Macrocore sampling system. Boring backfilled to groundsurface w/ bentonite chips on 05-16-11.
						-30		

APPENDIX C – CPT Soil Probes on CCR Embankments

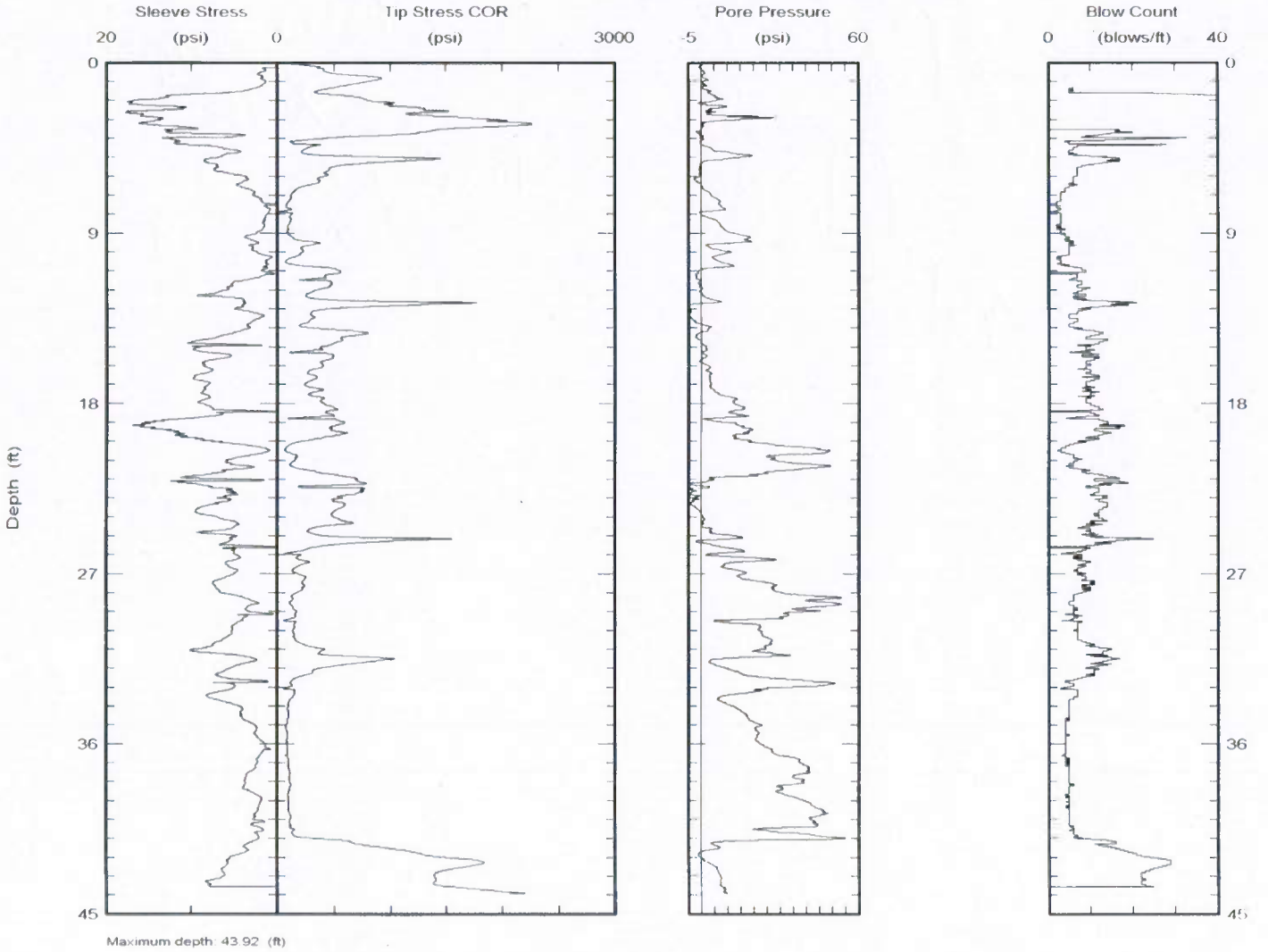
Alliant Energy
Interstate Power and Light Company
Burlington Generating Station
Burlington, Iowa

Structural Stability Assessment

CONE PENETROMETER TEST (CPT)

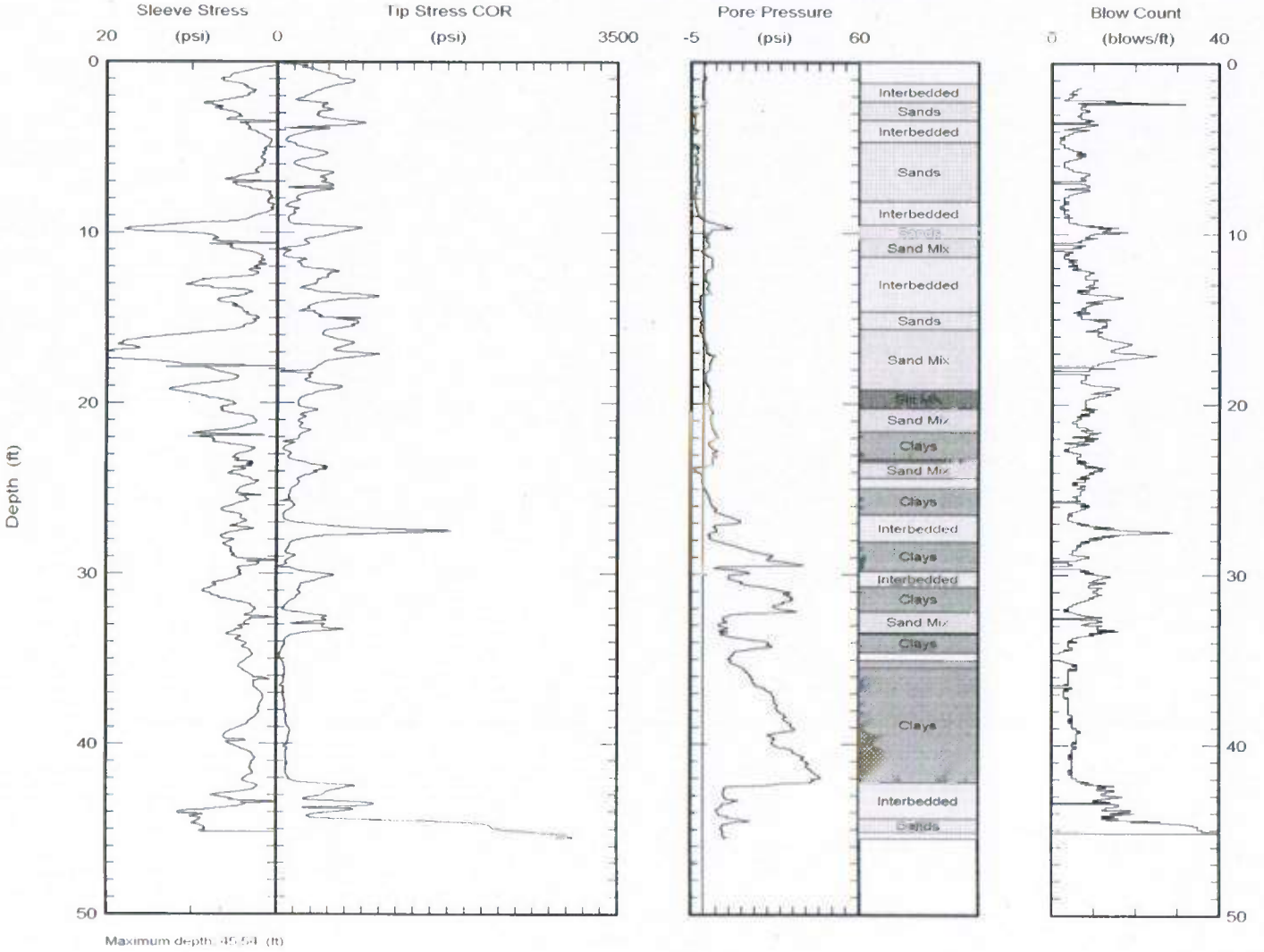
CPT I.D.	LOCATION	GROUND ELEVATION (FT)
CPT-1	Economizer Ash Pond	548.78
CPT-2	Economizer Ash Pond	550.34
CPT-3	Economizer Ash Pond	549.91
CPT-4	Economizer Ash Pond	549.65
CPT-5	Economizer Ash Pond	549.74
CPT-6	Economizer Ash Pond	550.57
CPT-7	Economizer Ash Pond	545.78
CPT-8	Economizer Ash Pond	546.26
CPT-9	Economizer Ash Pond	549.48
CPT-10	Economizer Ash Pond	549.42
CPT-11	Economizer Ash Pond	547.86
CPT-12	Economizer Ash Pond	548.25
CPT-13	Ash Seal Water Pond	534.22
CPT-14	Ash Seal Water Pond	533.67
CPT-15	Main Ash Pond	536.75
CPT-16	Main Ash Pond	534.84
CPT-17	Main Ash Pond	534.52
CPT-18	Main Ash Pond	533.89
CPT-19	Main Ash Pond	535.32
CPT-20	Upper Ash Pond	530.47
CPT-21	Upper Ash Pond	530.42

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 09/May/2011 Test ID: cpt1 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



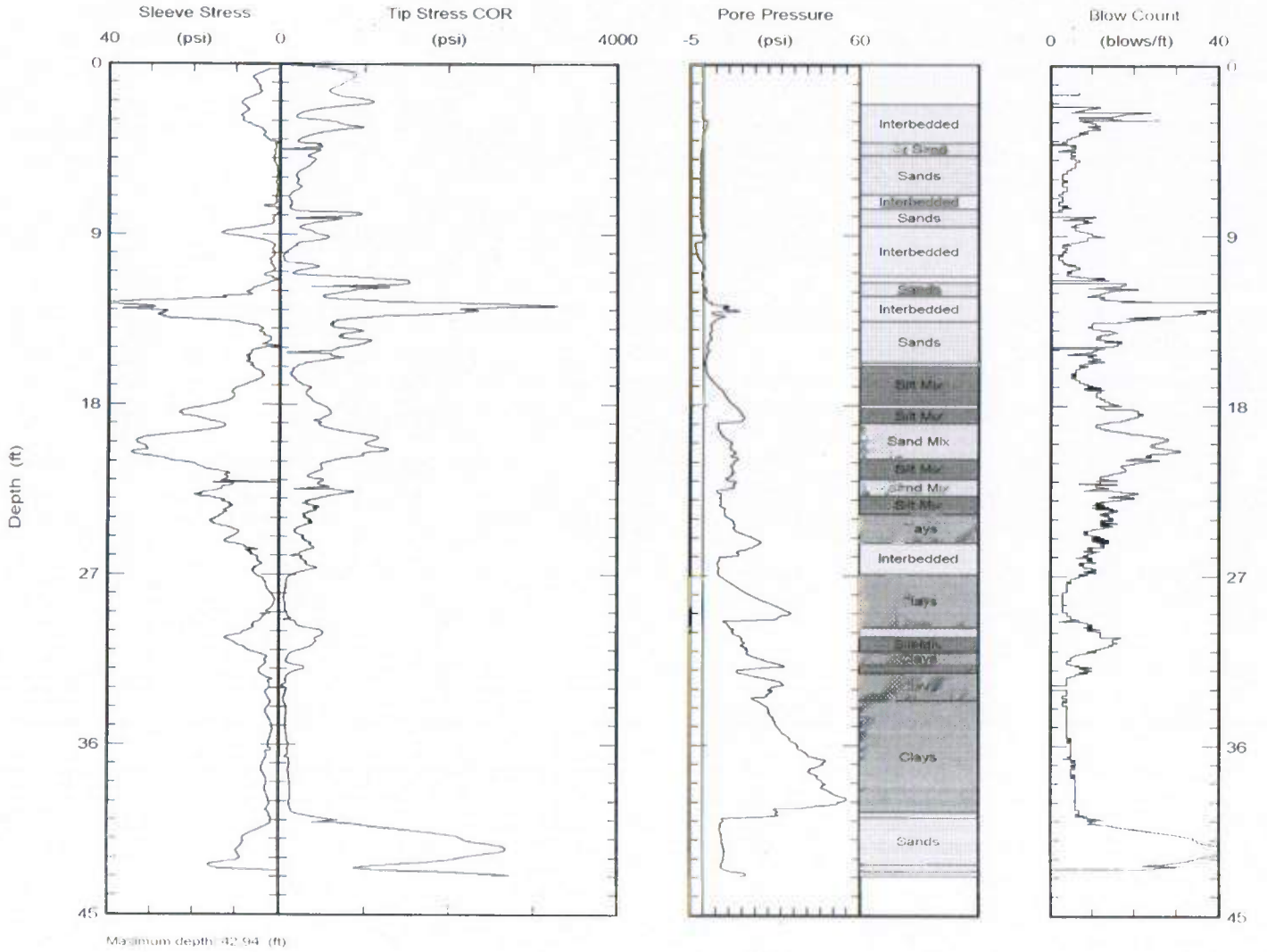
Applied Research Associates, Inc.
South Royalton, VT 05068
802-763-8348
cpt@ned.ara.com
www.ara.com

Northing:	Date: 09/May/2011
Easting:	Test ID: cpt2
Elevation:	Project: Alliant
Client: Aetherdbs	
Job Site: Burlington	

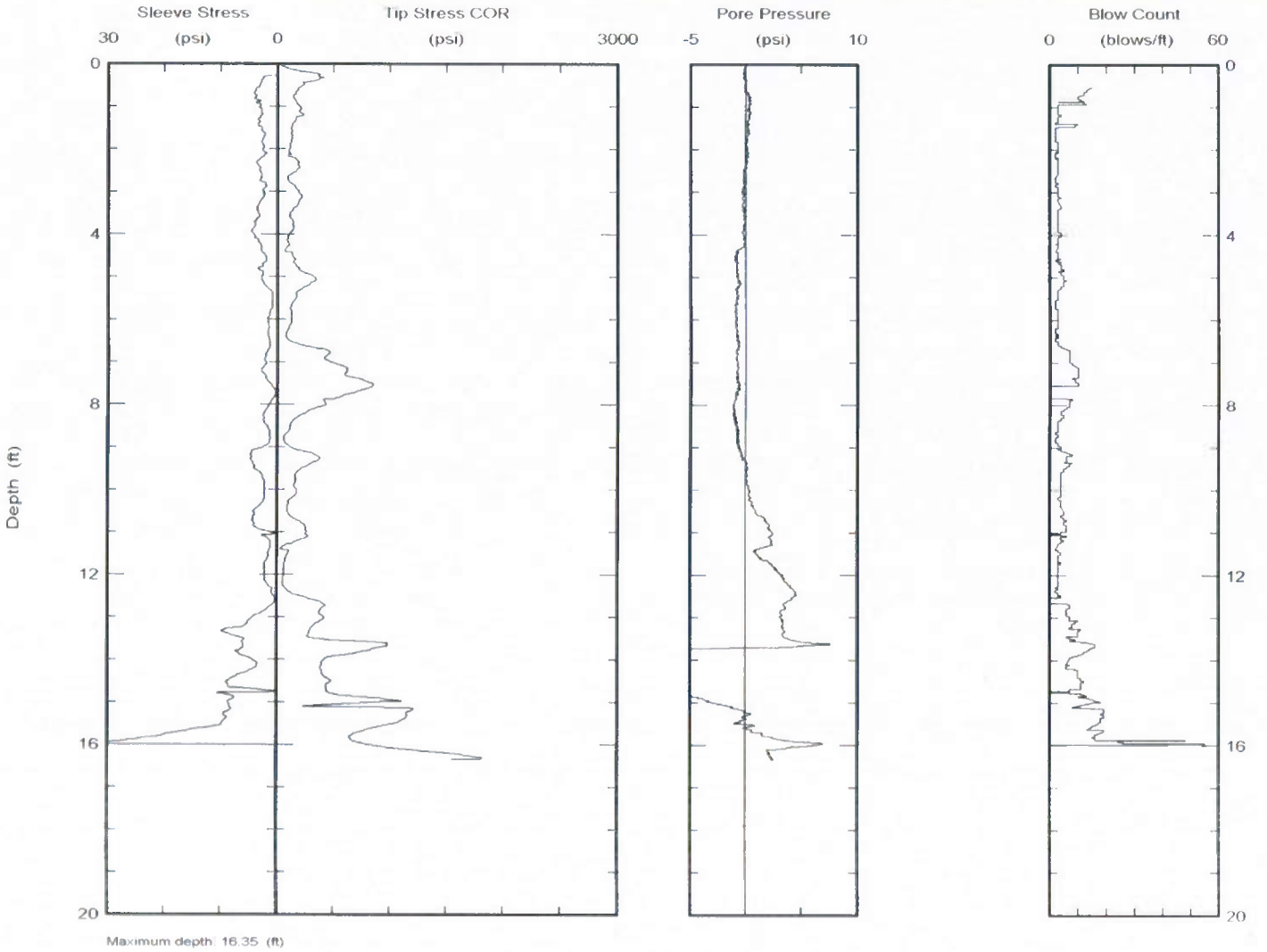


Applied Research Associates, Inc.
South Royalton, VT 05068
802-763-8348
cpt@ned.ara.com
www.ara.com

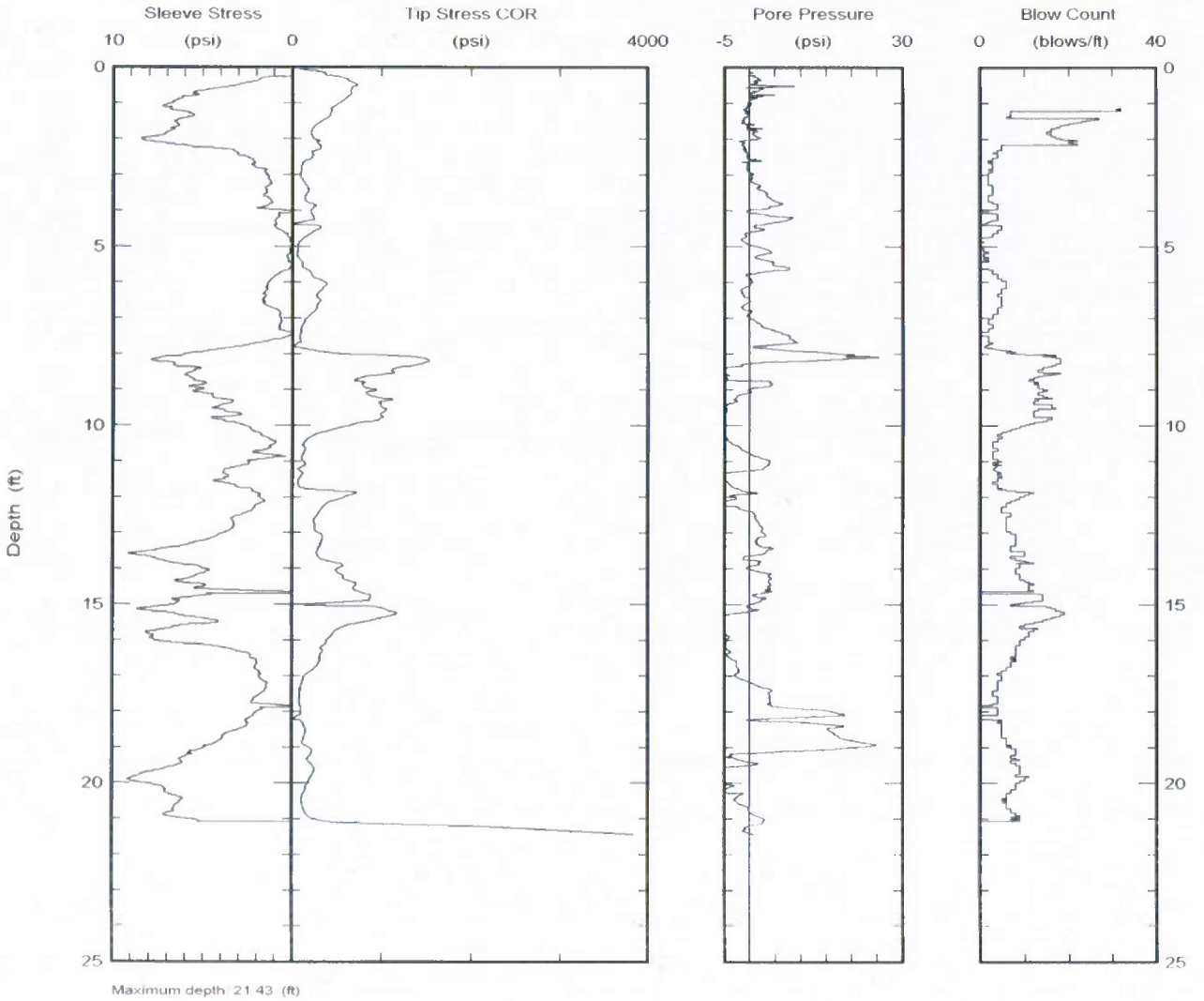
Northing:	Date: 09/May/2011
Easting:	Test ID: cpt3
Elevation:	Project: Alliant
Client: Aetherdbs	
Job Site: Burlington	



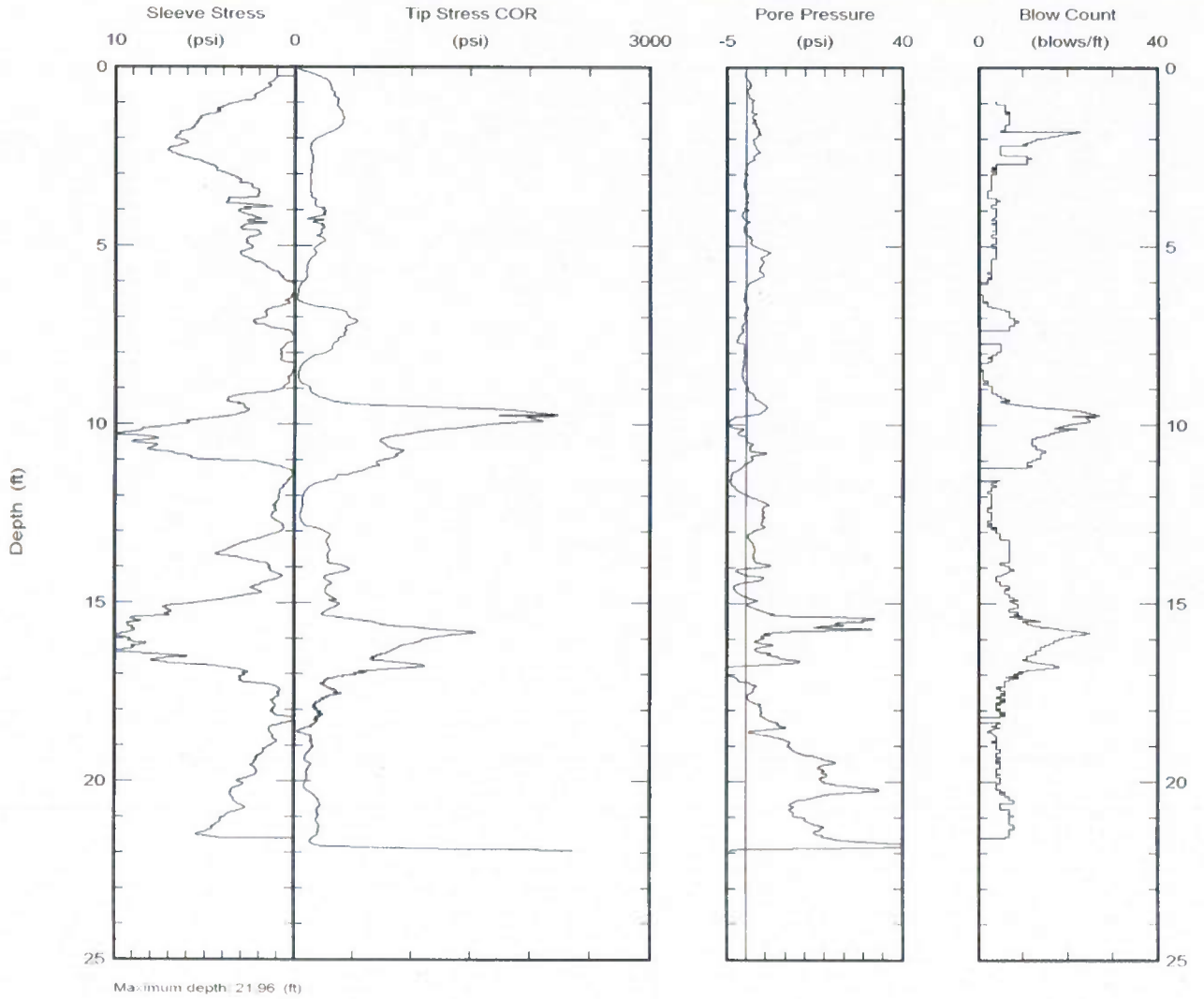
Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 09/May/2011 Test ID: cpt4 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



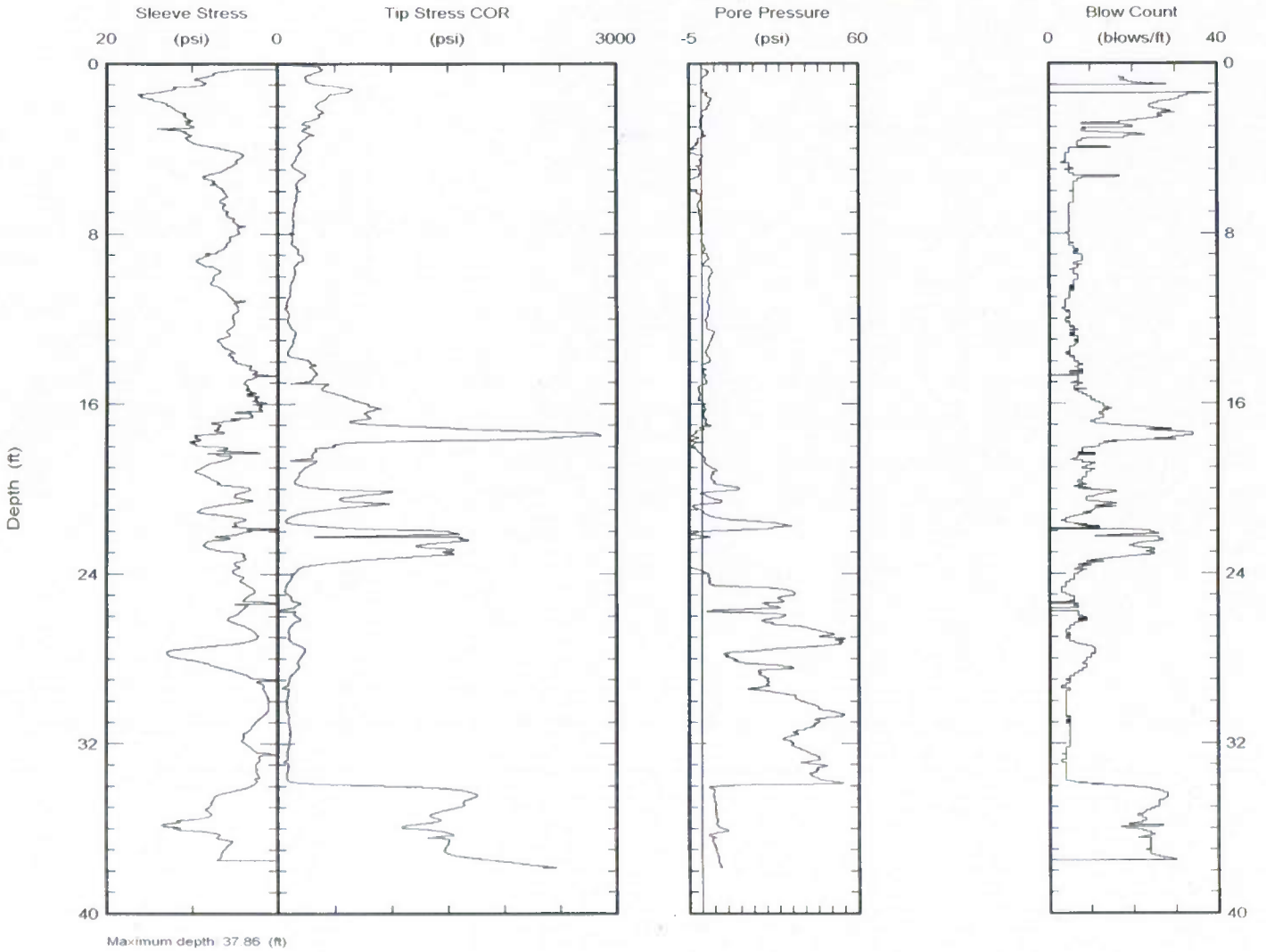
Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt5 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt6 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	

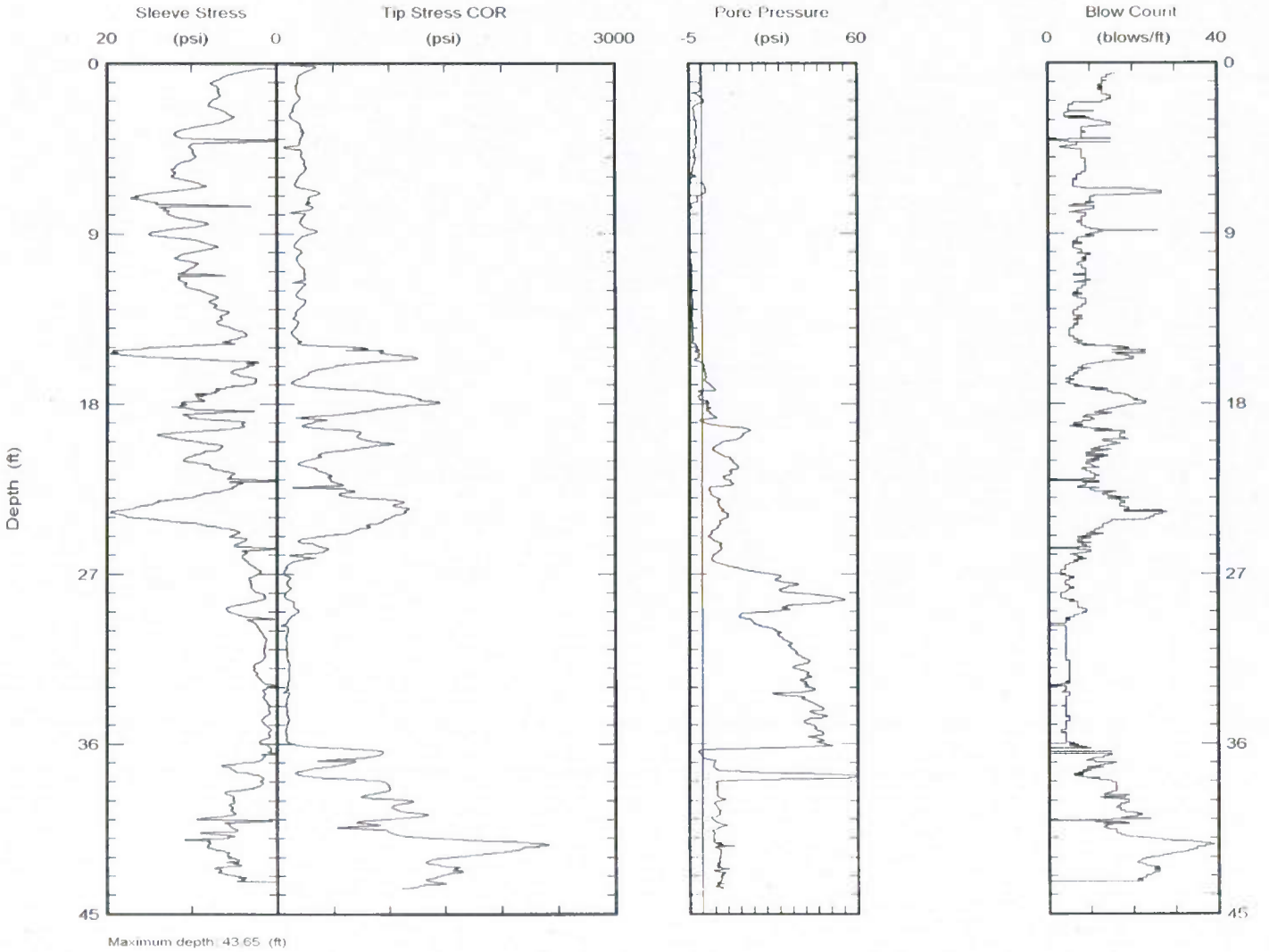


Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt7 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



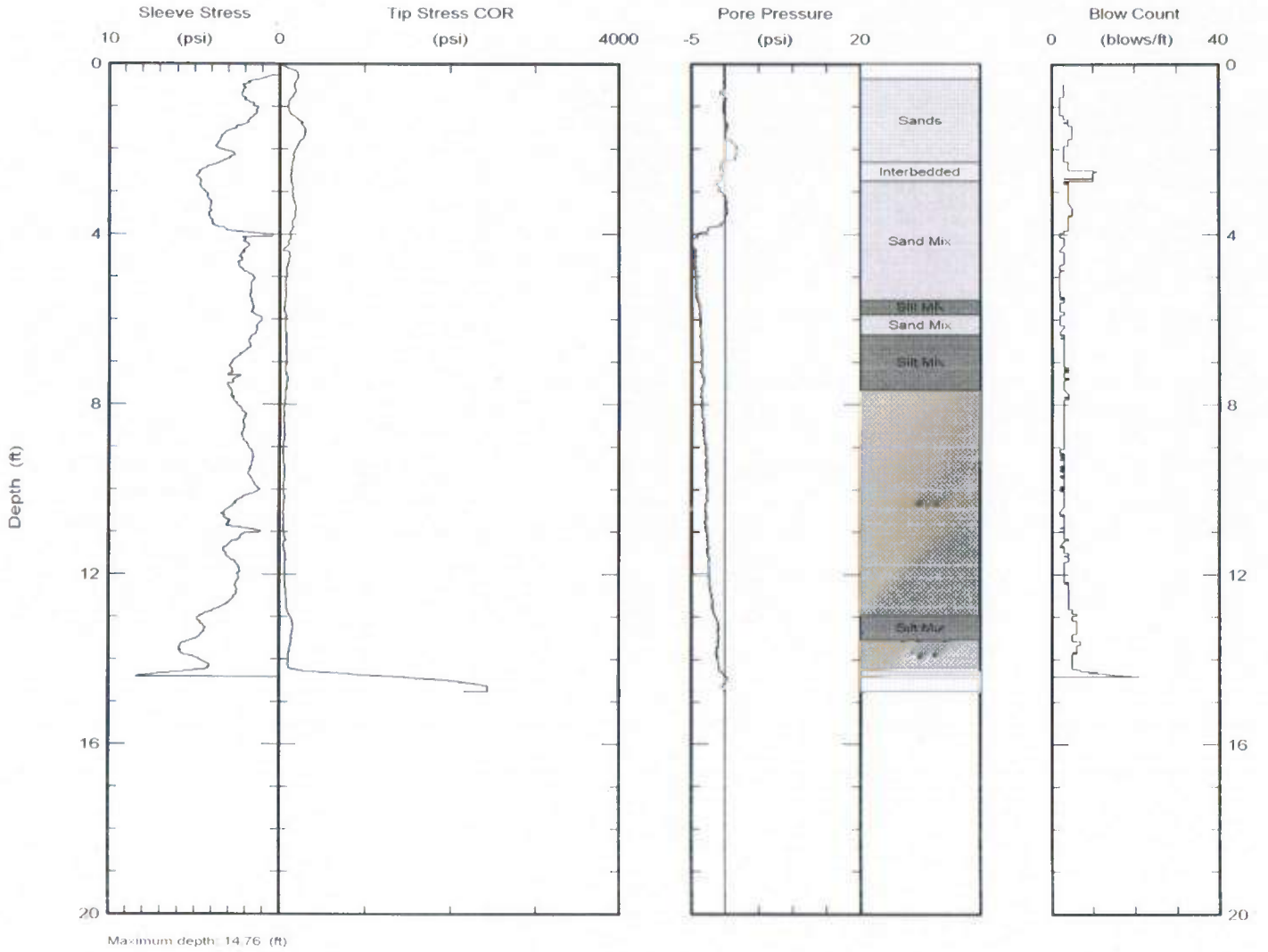
Test ID: cpt7
File: A10Y1103C.ECP

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt8 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



Test ID: cpt8
File: A10Y1104C.ECP

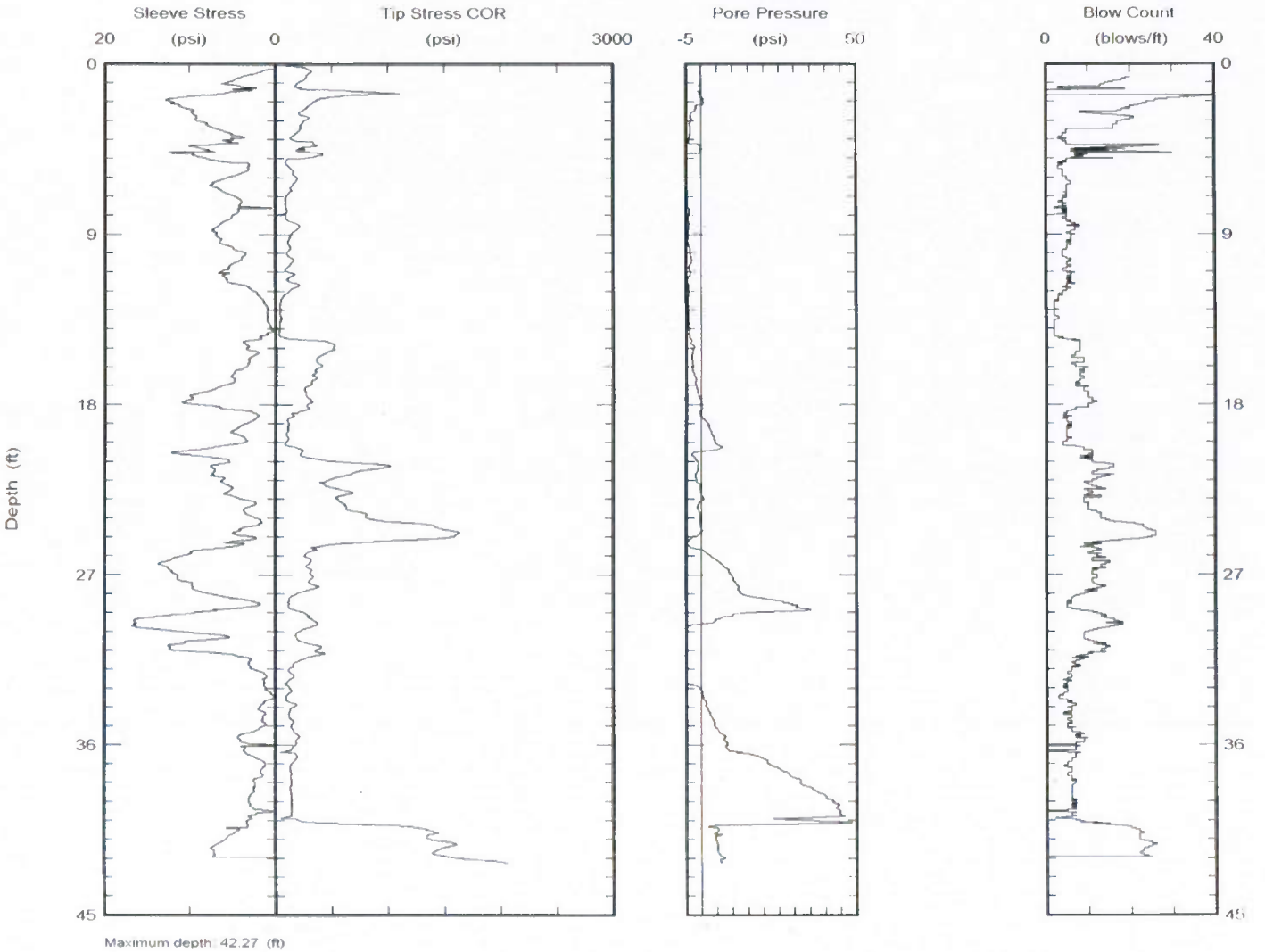
Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt9 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



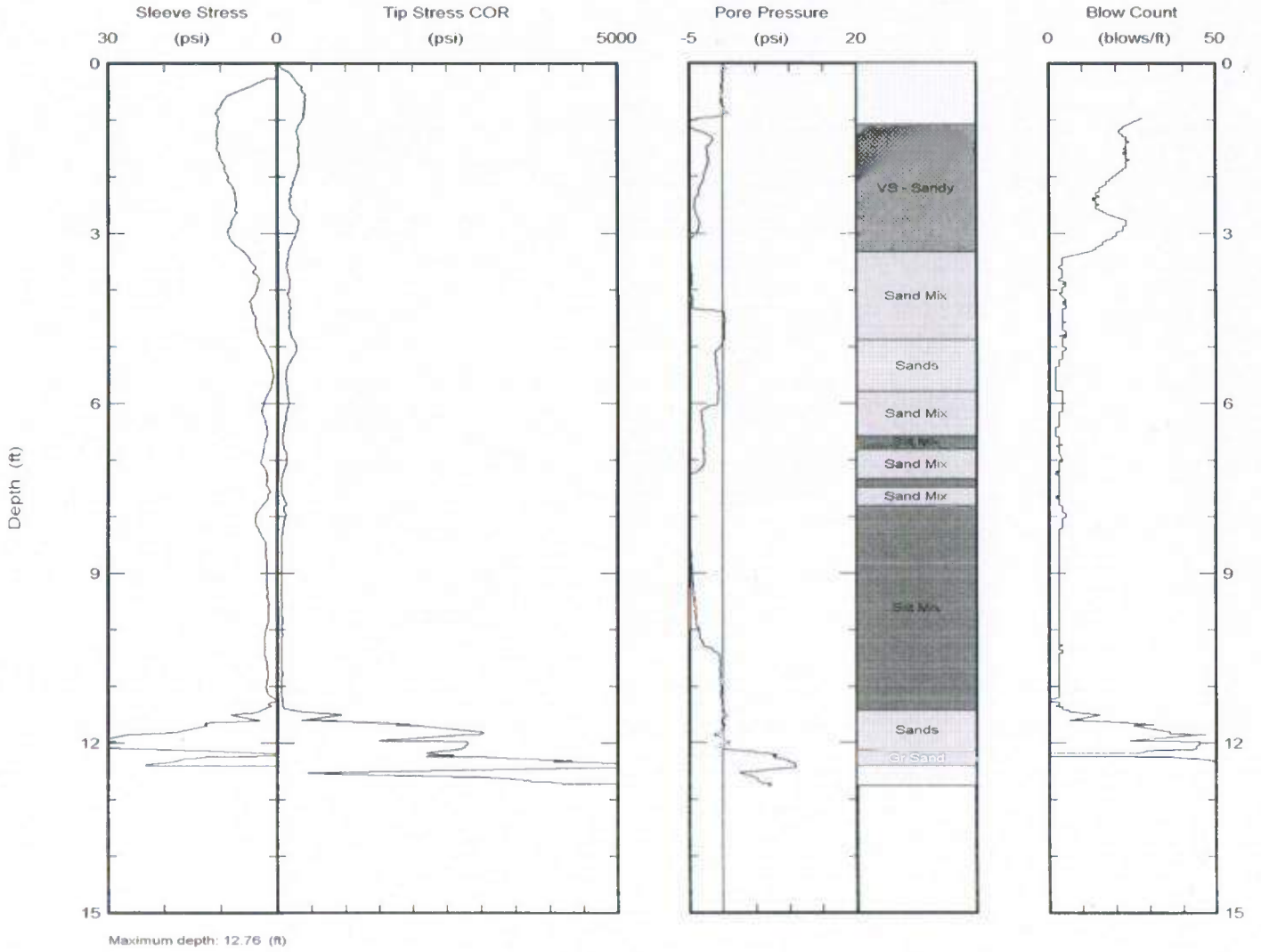
Test ID: cpt9
File: A10Y1105C.ECP

Applied Research Associates, Inc.
South Royalton, VT 05068
802-763-8348
cpt@ned.ara.com
www.ara.com

Northing:	Date: 10/May/2011
Easting:	Test ID: cpt10
Elevation:	Project: Alliant
Client: Aetherdbs	
Job Site: Burlington	

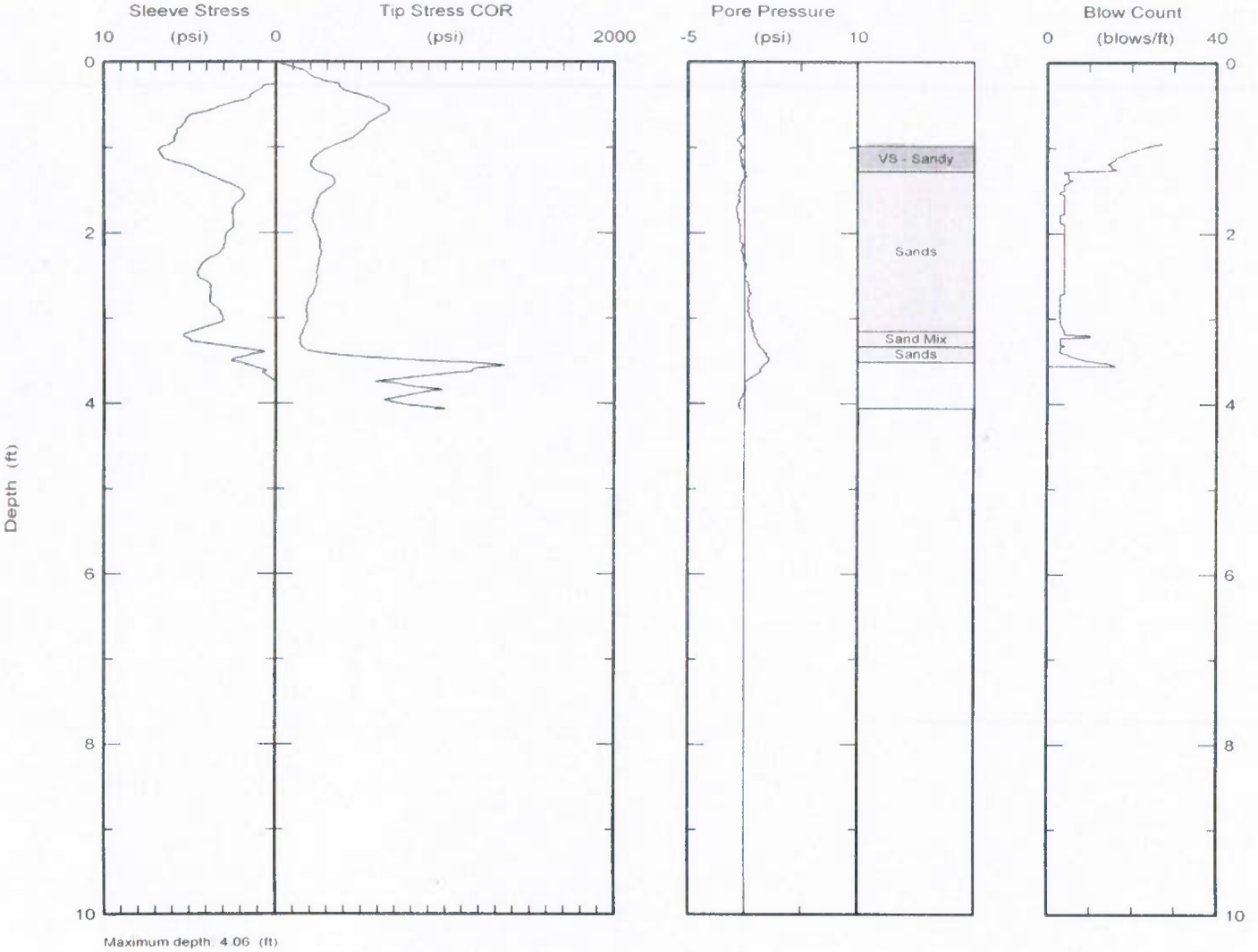


Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt11 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



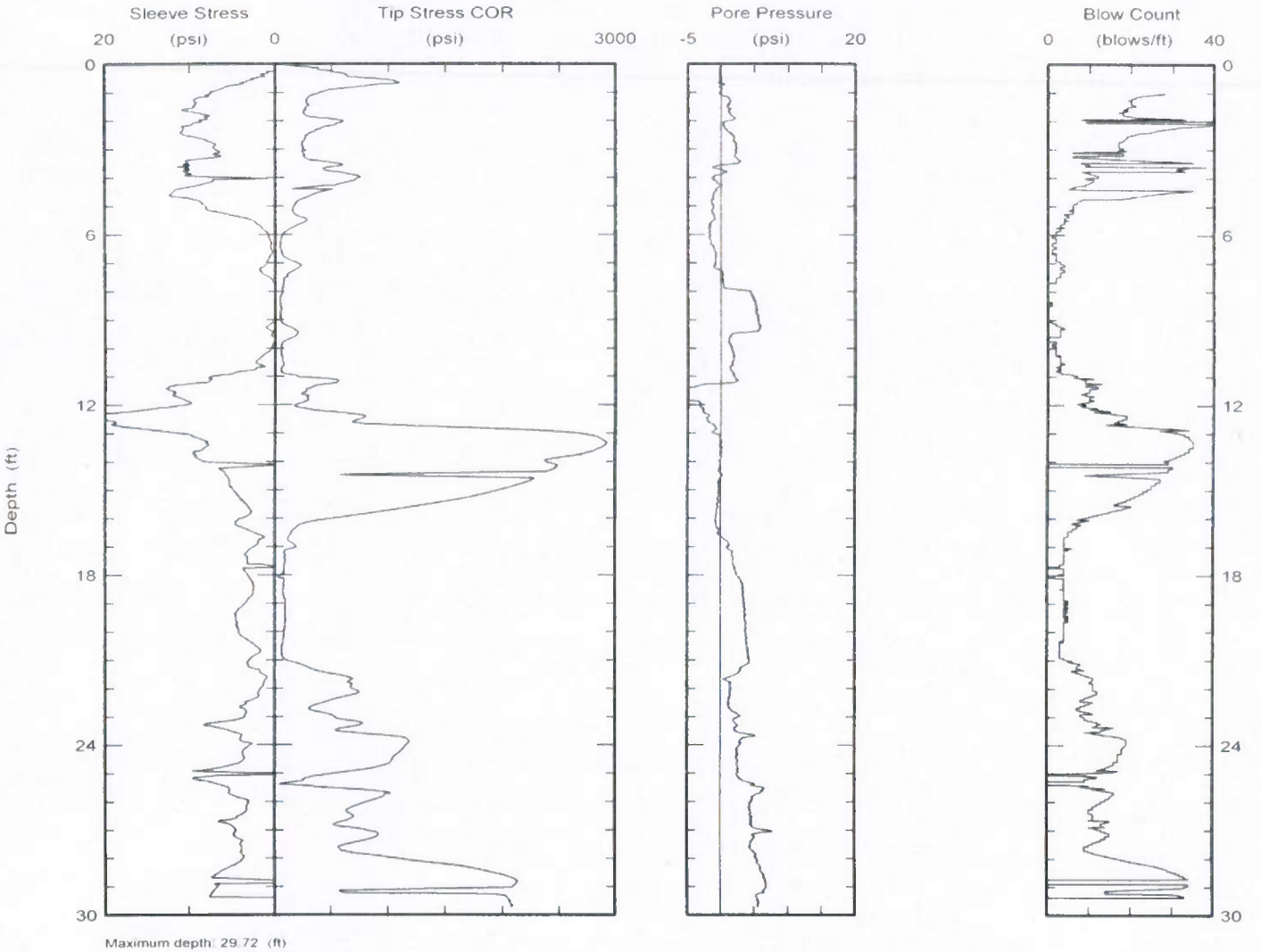
Test ID: cpt11
File: A10Y1107C.ECP

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt12 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	

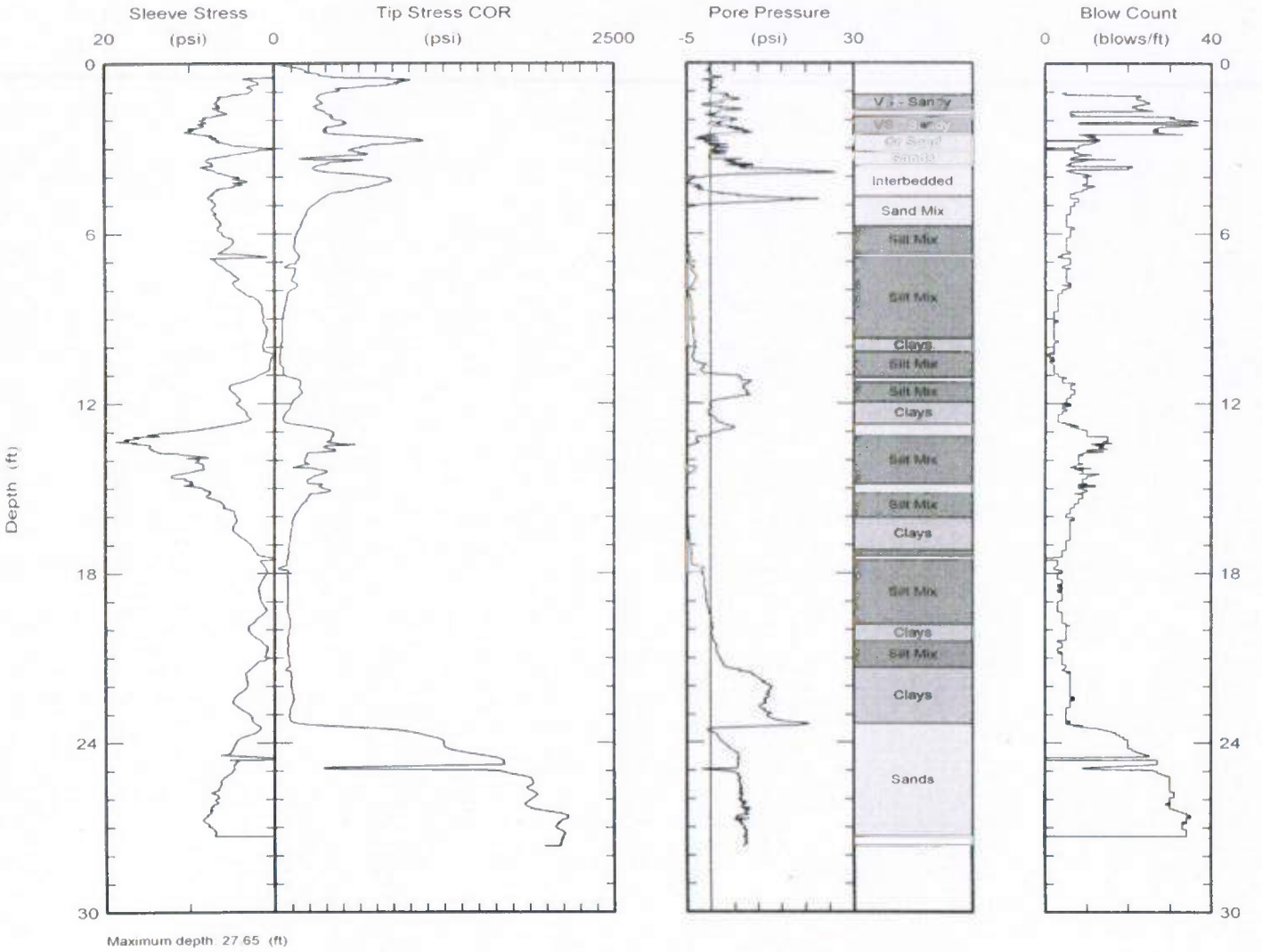


Test ID: cpt12
File: A10Y1108C.ECP

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 10/May/2011 Test ID: cpt13 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	

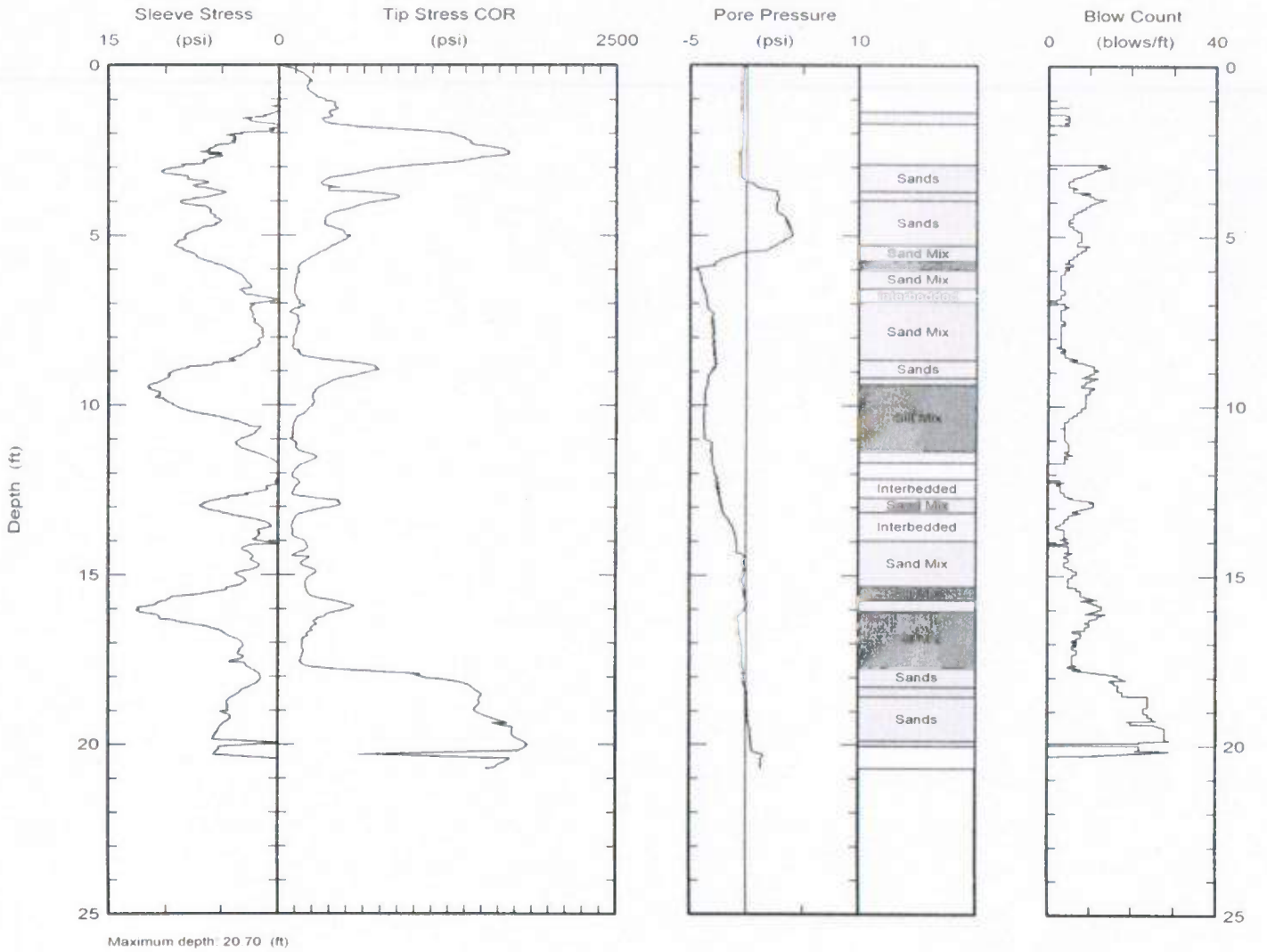


Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 15/May/2011 Test ID: cpt14 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



Test ID: cpt14
File: A15Y1101C.ECP

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 15/May/2011 Test ID: cpt15 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



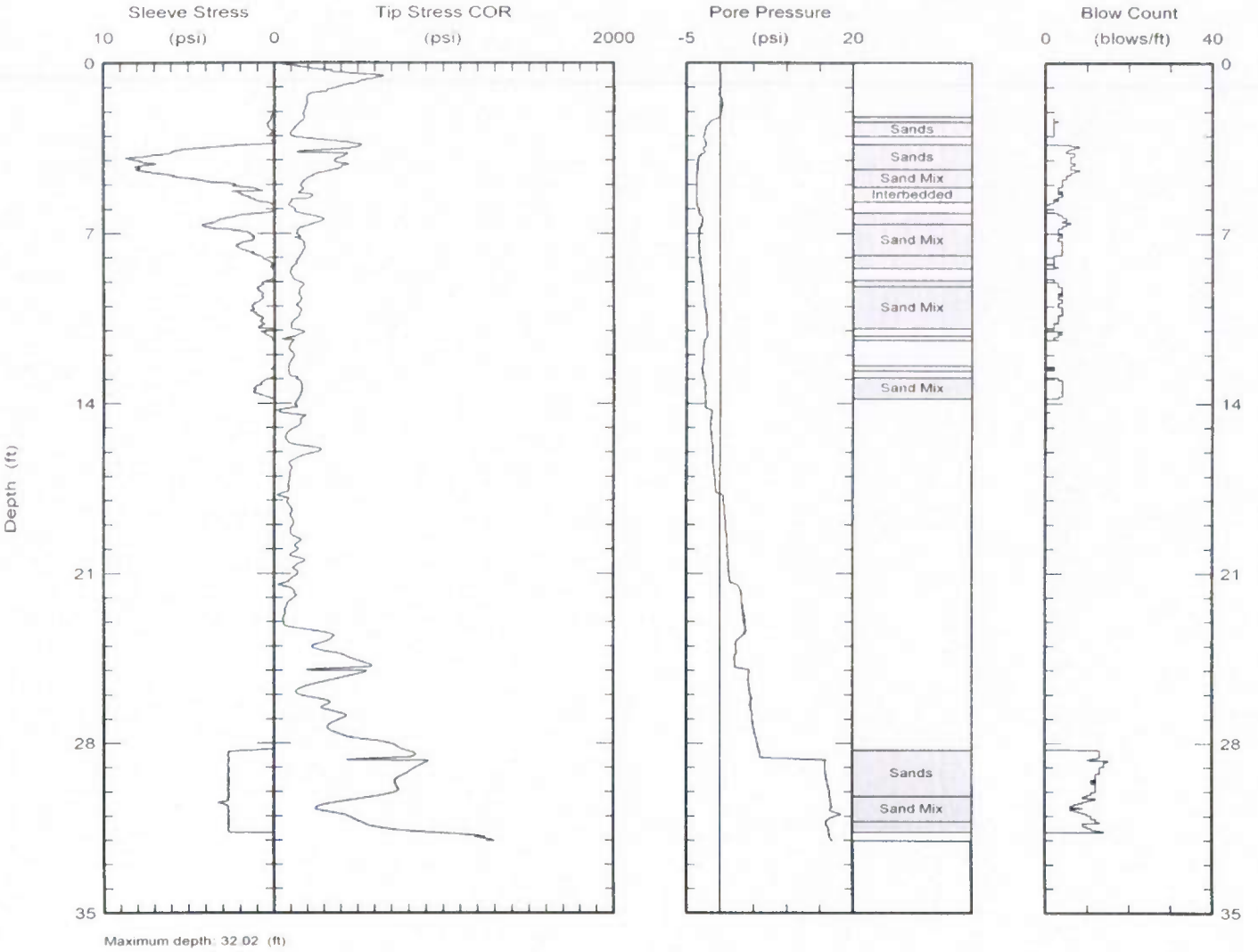
Test ID: cpt15
File: A15Y1102C.ECP

Applied Research Associates, Inc.
South Royalton, VT 05068
802-763-8348
cpt@ned.ara.com
www.ara.com

Northing:
Easting:
Elevation:

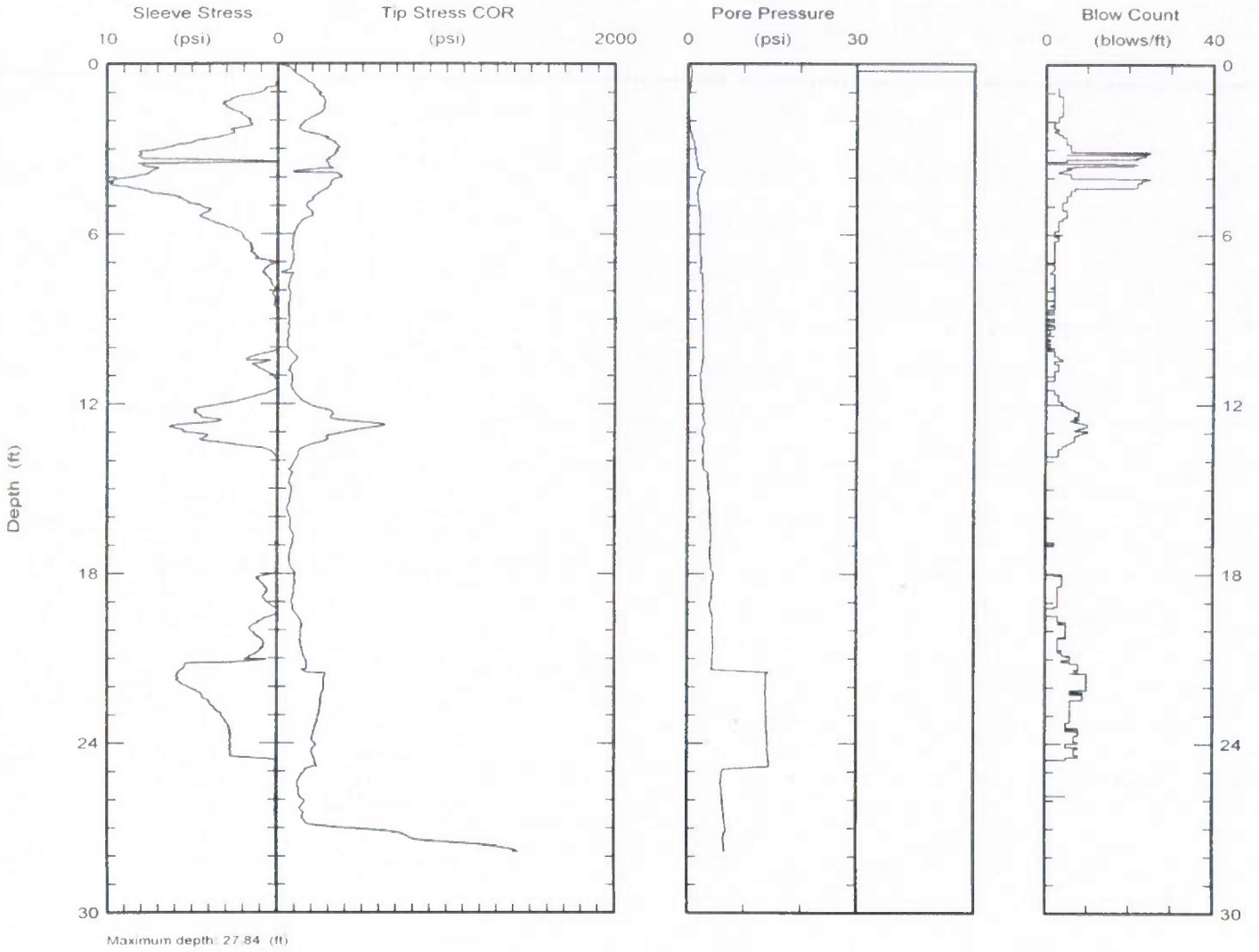
Date: 15/May/2011
Test ID: cpt16
Project: Alliant

Client: Aetherdbs
Job Site: Burlington

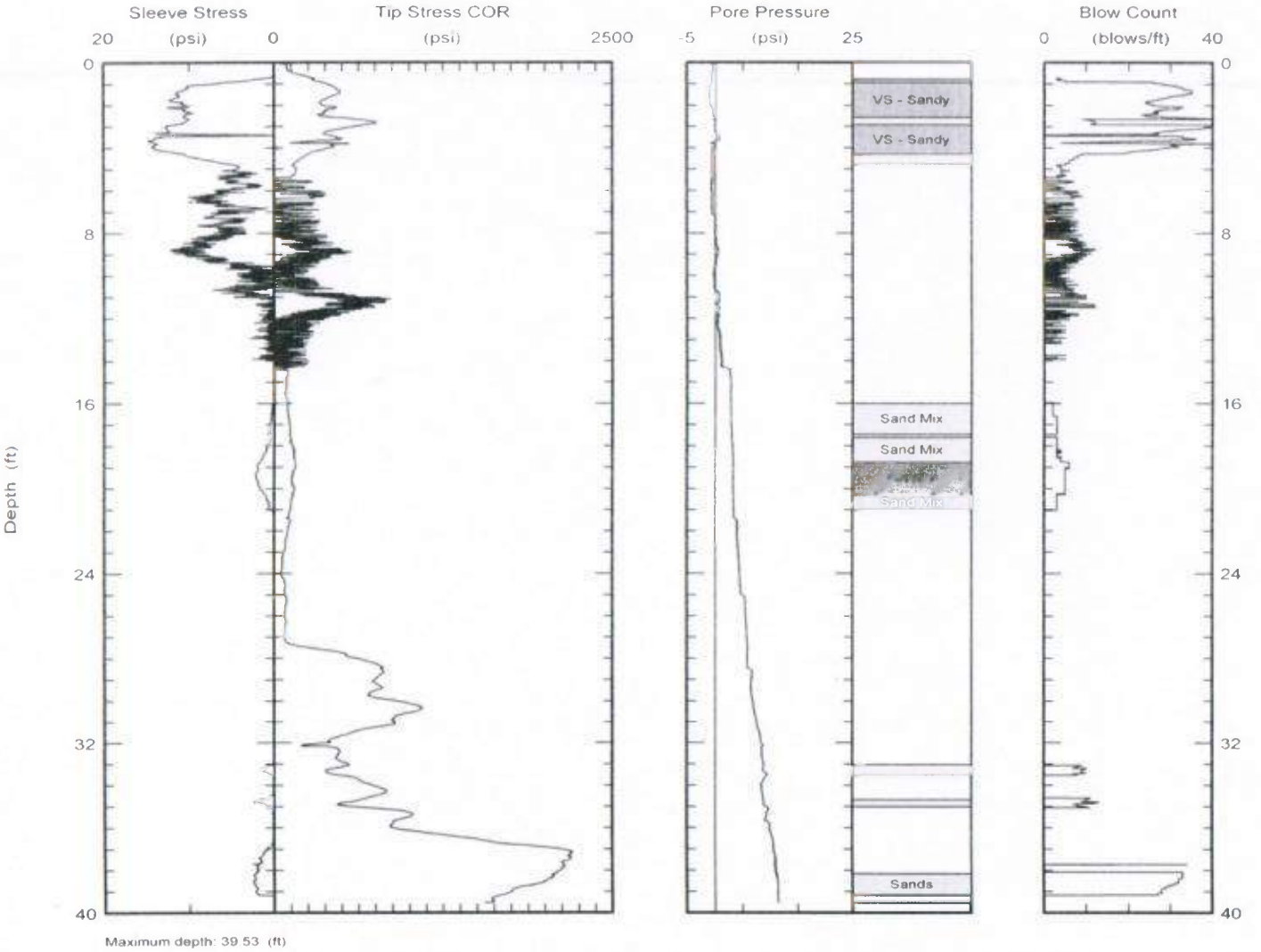


Test ID: cpt16
File: A15Y1103C.ECP

Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 15/May/2011 Test ID: cpt17 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	

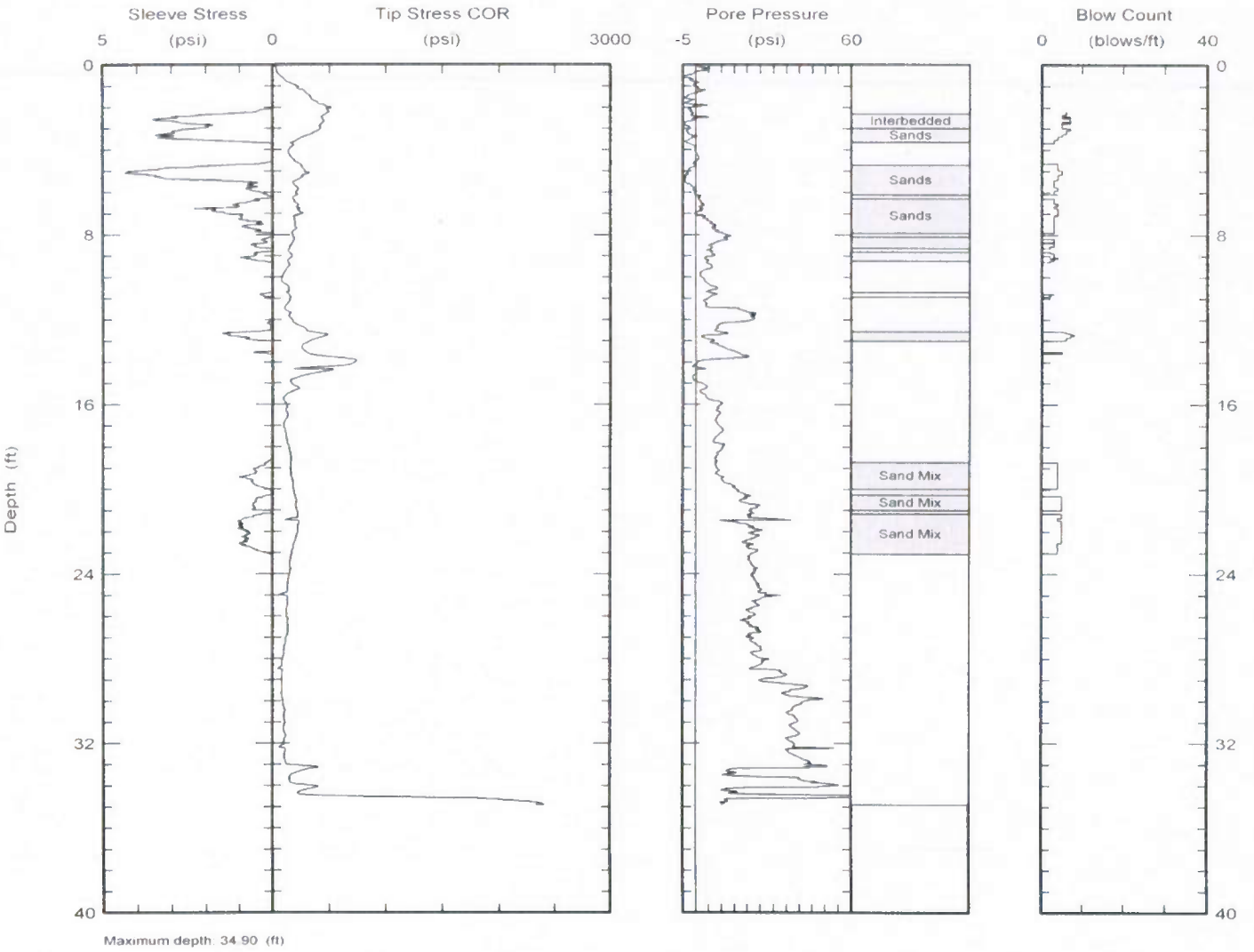


Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 15/May/2011 Test ID: cpt18 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	

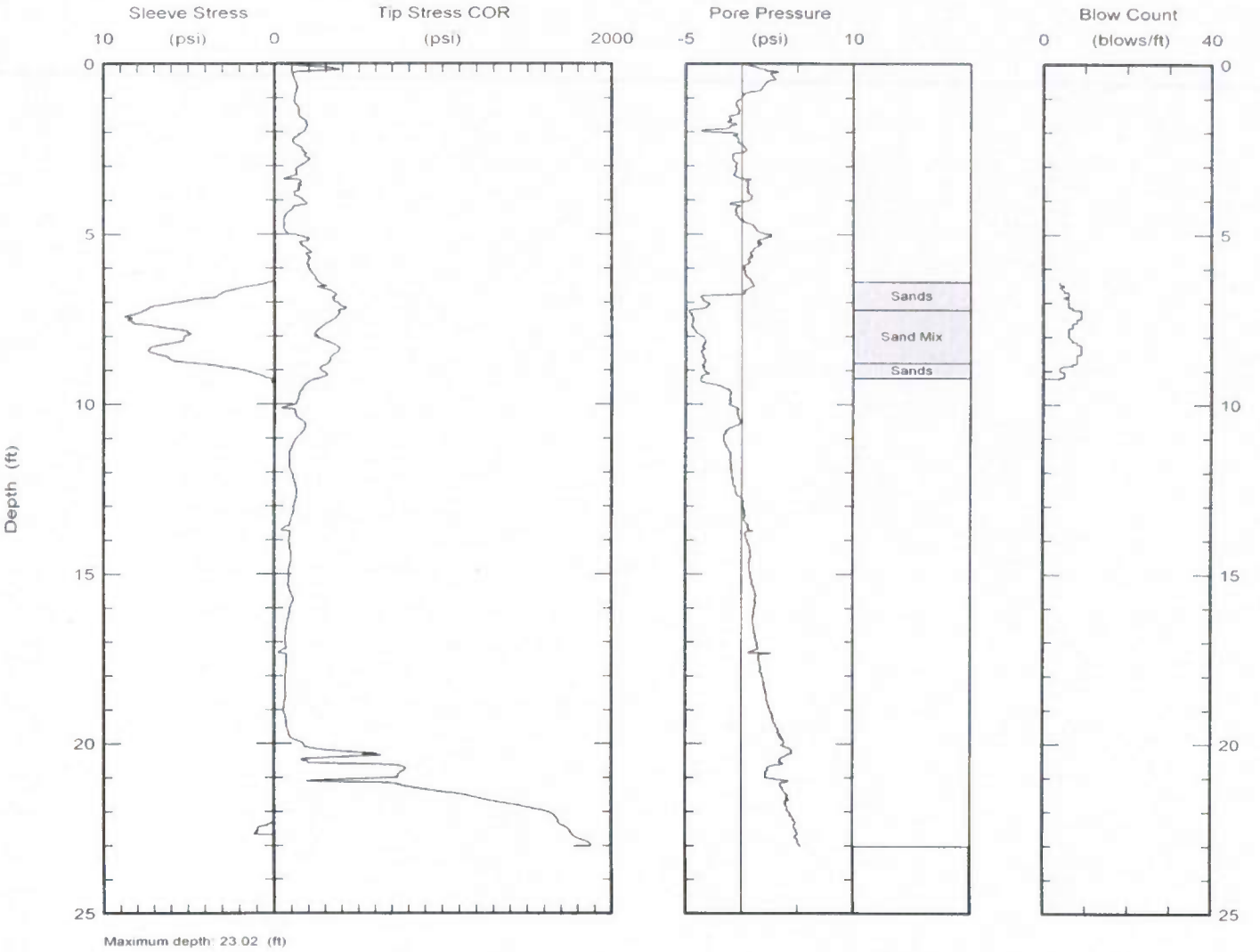


Test ID: cpt18
File: A15Y1105C.ECP

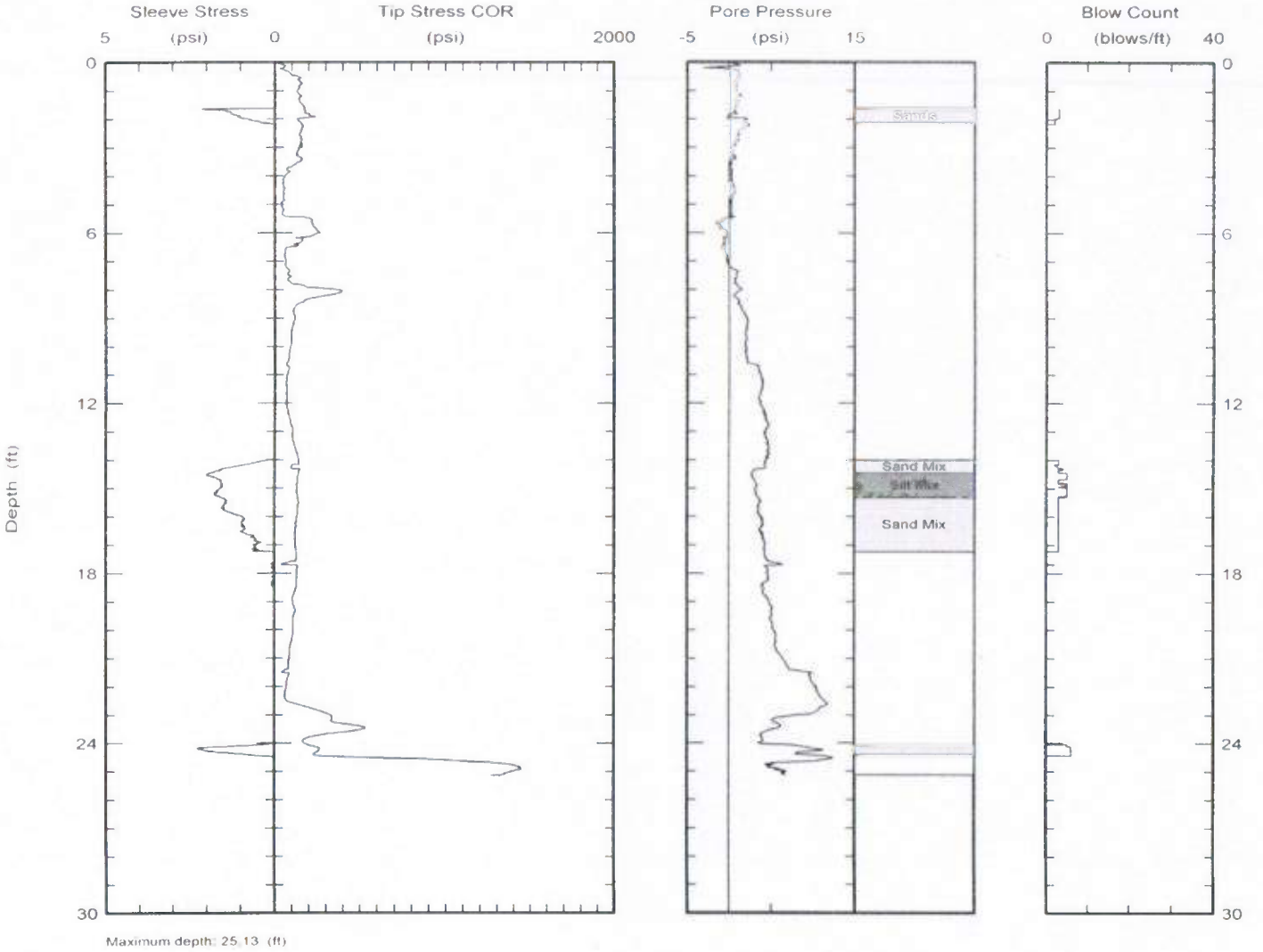
Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 16/May/2011 Test ID: cpt19 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



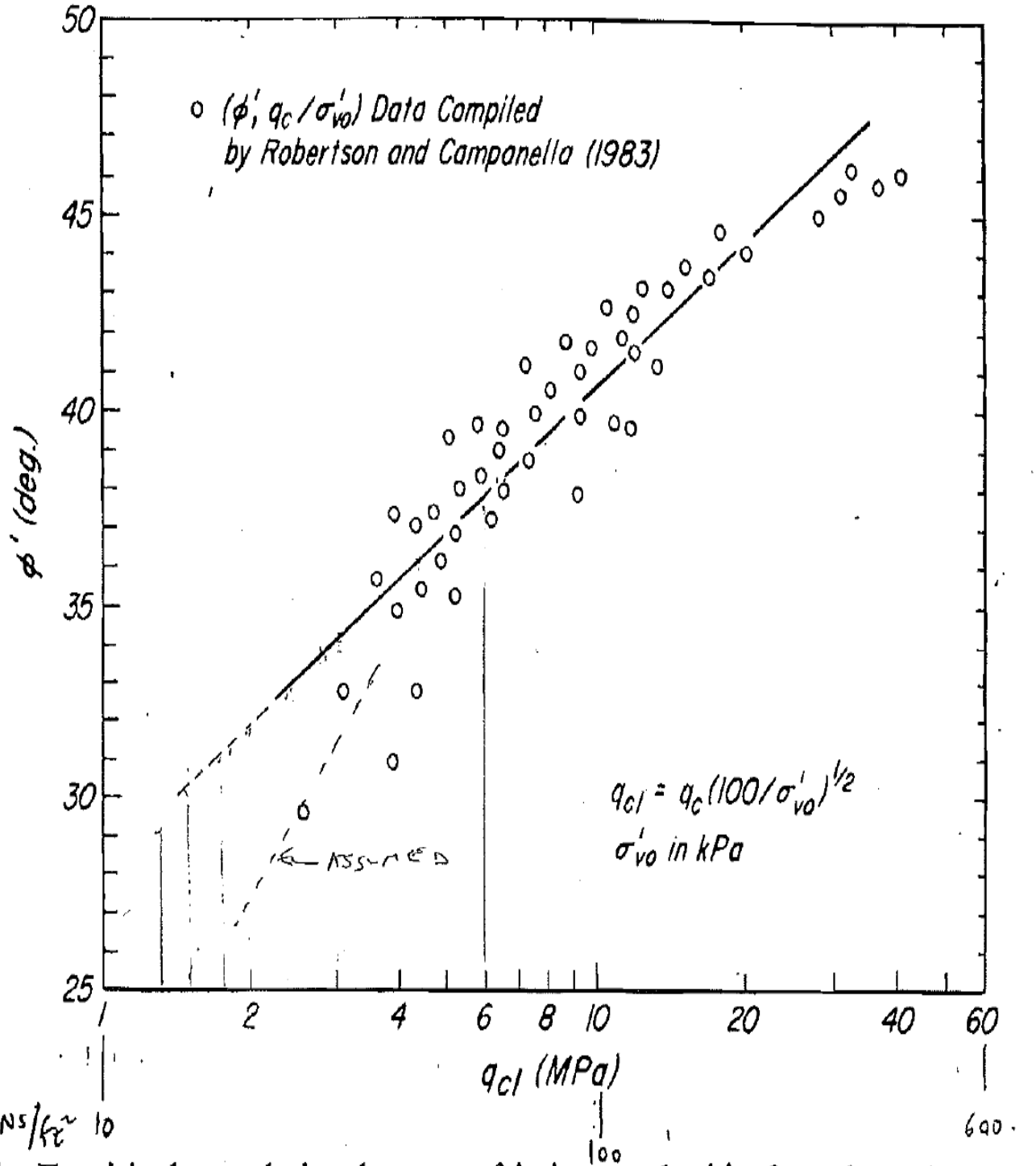
Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 16/May/2011 Test ID: cpt20 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



Applied Research Associates, Inc. South Royalton, VT 05068 802-763-8348 cpt@ned.ara.com www.ara.com	Northing: Easting: Elevation:	Date: 16/May/2011 Test ID: cpt21 Project: Alliant
	Client: Aetherdbs Job Site: Burlington	



Test ID: cpt21
File: A16Y1103C.ECP



19.5 Empirical correlation between friction angle ϕ' of sands and norma penetration resistance.

Re: TERZAGHI PECK & MESRI (1996), SOIL MECHANICS IN ENG. PRACTICE, 3RD ED., JOHN WILEY & SONS, INC

APPENDIX D – Laboratory Testing on CCR Embankment Soils

Alliant Energy
Interstate Power and Light Company
Burlington Generating Station
Burlington, Iowa

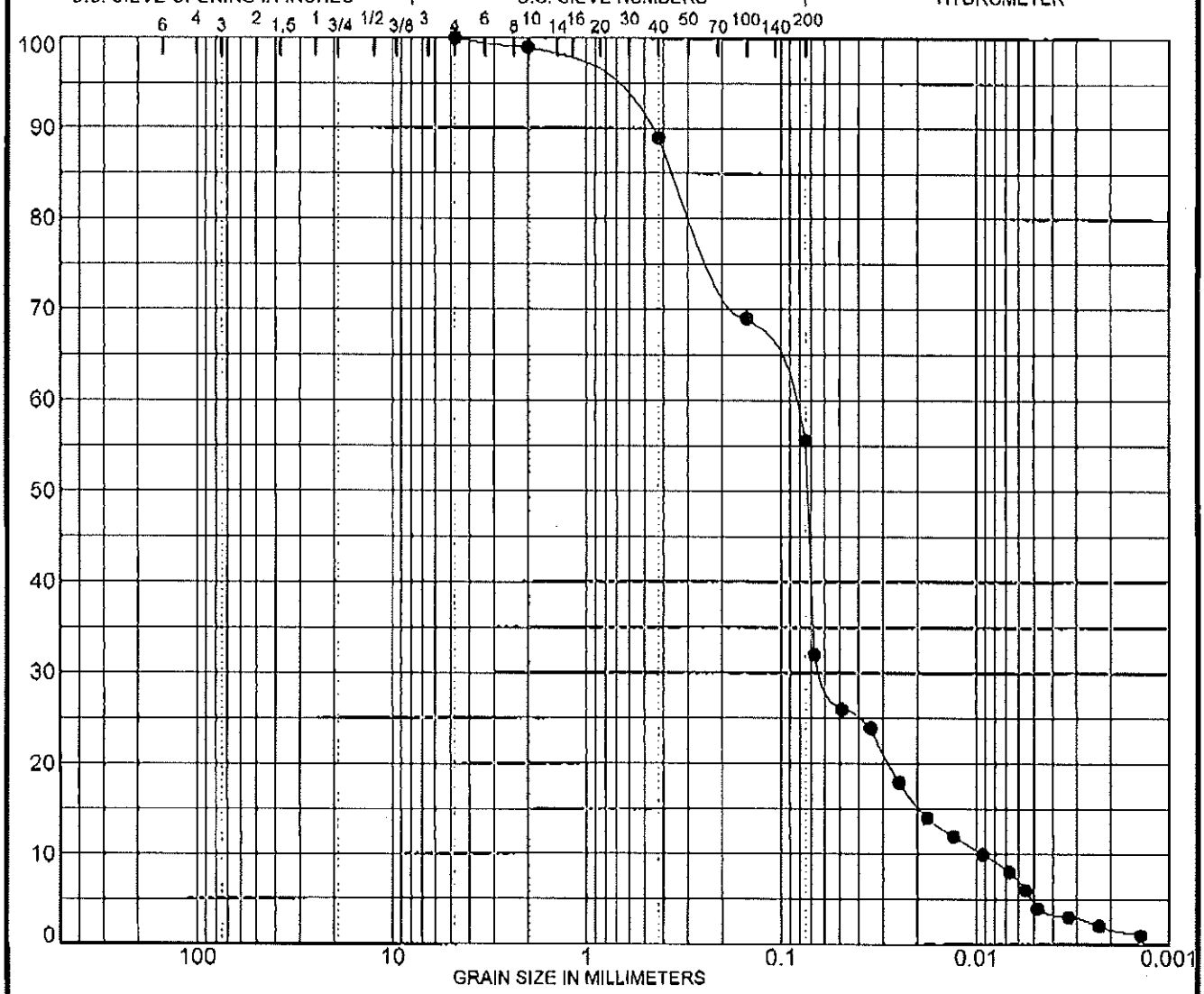
Structural Stability Assessment

Attachment C

Soil Laboratory Results

Burlington Generating Station

Source: Testing Service Corporation, May 2011



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Broing: SB-1	3 inch	100
Sample: Ash	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	99
	# 40	89
	# 100	69
	# 200	56

SOIL CLASSIFICATION: Brown ASH

%GRAVEL	%SAND	%SILT	%CLAY
0	44	54	2

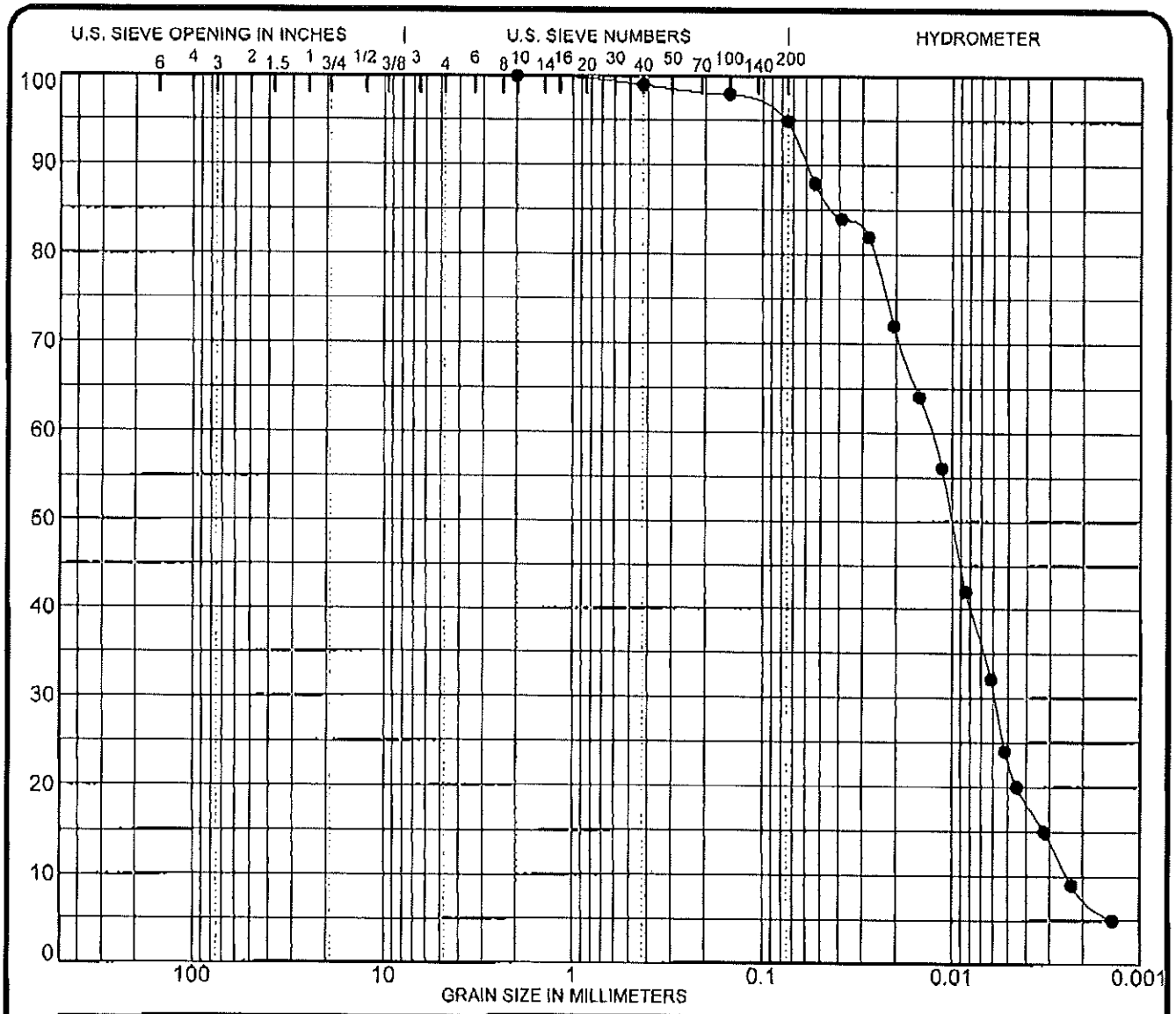
MC%		LL	PL	PI
44.0		NP	NP	NP

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 20, 2011

SB1

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-1	3 inch	100
Sample: A	2	100
Depth: 25.0'-26.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	99
	# 100	96
	# 200	95

SOIL CLASSIFICATION: Gray clayey SILT, trace sand (ML)

%GRAVEL	%SAND	%SILT	%CLAY
0	5	87	8

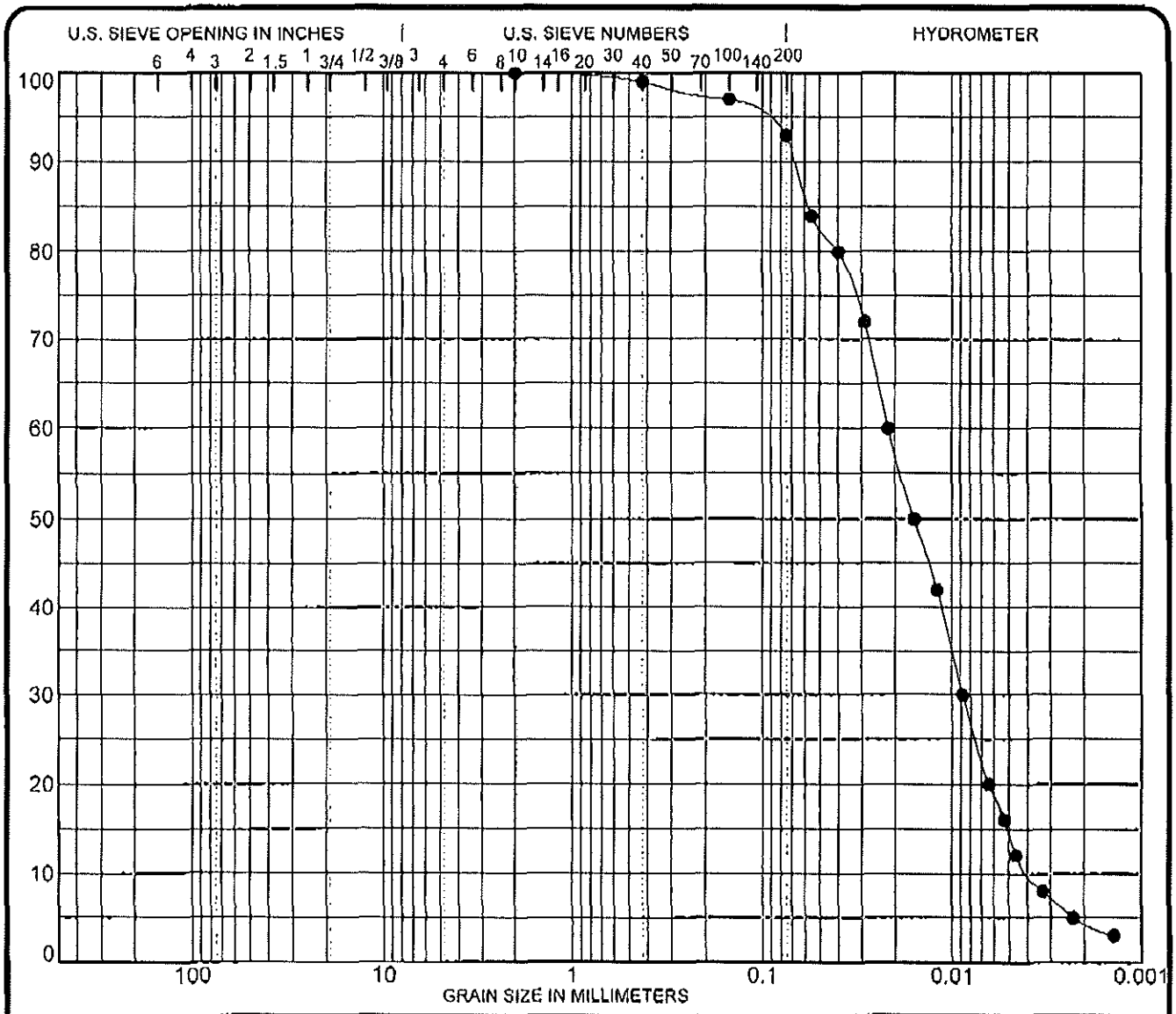
MC%		LL	PL	PI
69.4		36	31	5

PROJECT Geotechnical Testing
LOCATION ,
SB1

JOB NO. L - 76,757
DATE May 20, 2011

SOILGENR 76757.GPJ TSC ALL.GDT 5/20/11

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-1	3 inch	100
Sample: B	2	100
Depth: 29.0'-30.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	99
	# 100	97
	# 200	93

SOIL CLASSIFICATION: Gray clayey SILT, trace sand (ML)

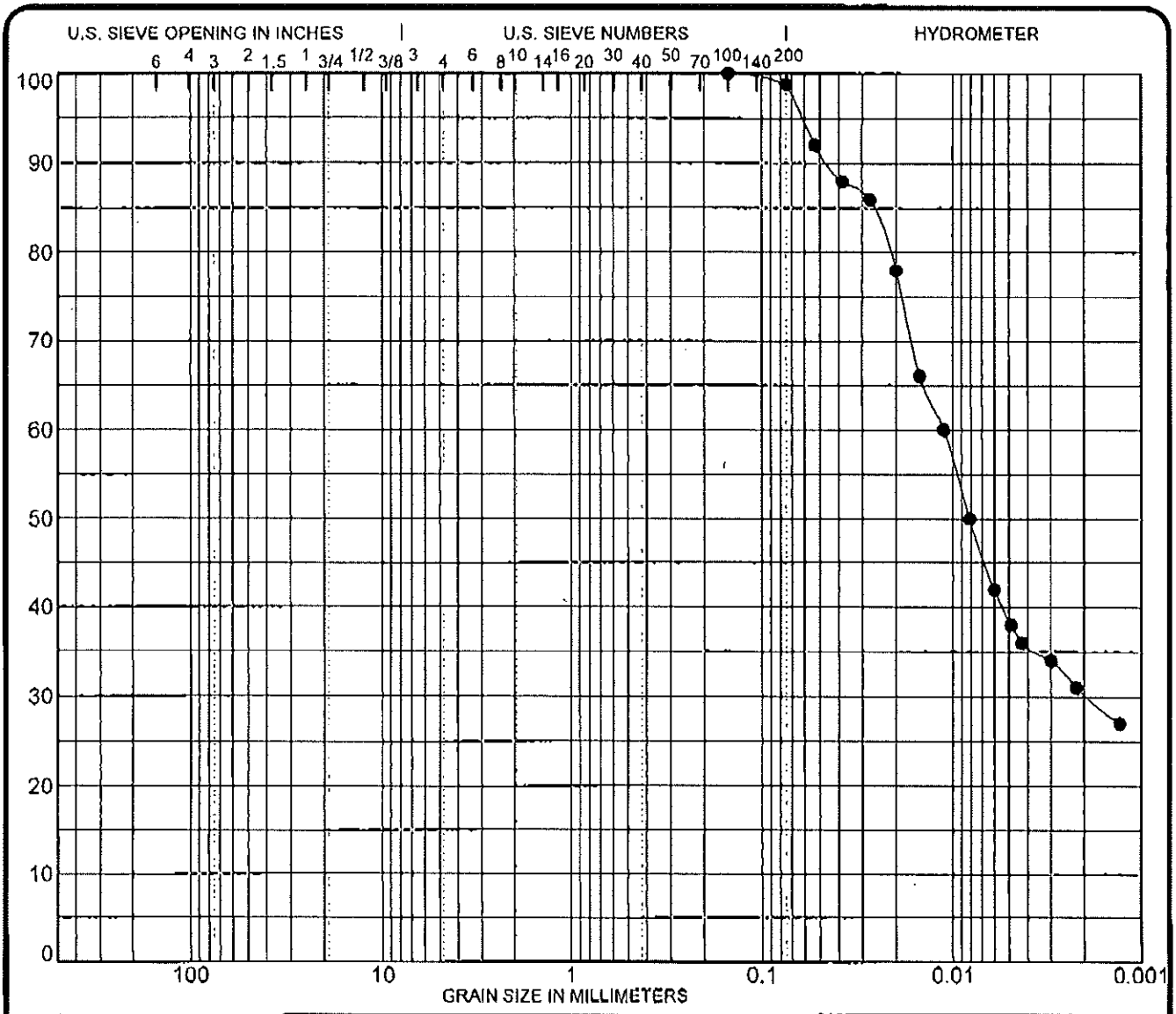
%GRAVEL	%SAND	%SILT	%CLAY
0	7	89	4

MC%		LL	PL	PI
58.6		40	37	3

PROJECT Geotechnical Testing
LOCATION SB1
JOB NO. L - 76,757
DATE May 20, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-1	3 inch	100
Sample: C	2	100
Depth: 34.0'-35.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	100
	# 200	99

SOIL CLASSIFICATION

Gray silty CLAY, trace sand (CH)

%GRAVEL	%SAND	%SILT	%CLAY
0	1	69	30

MC%		LL	PL	PI
31.3		52	17	35

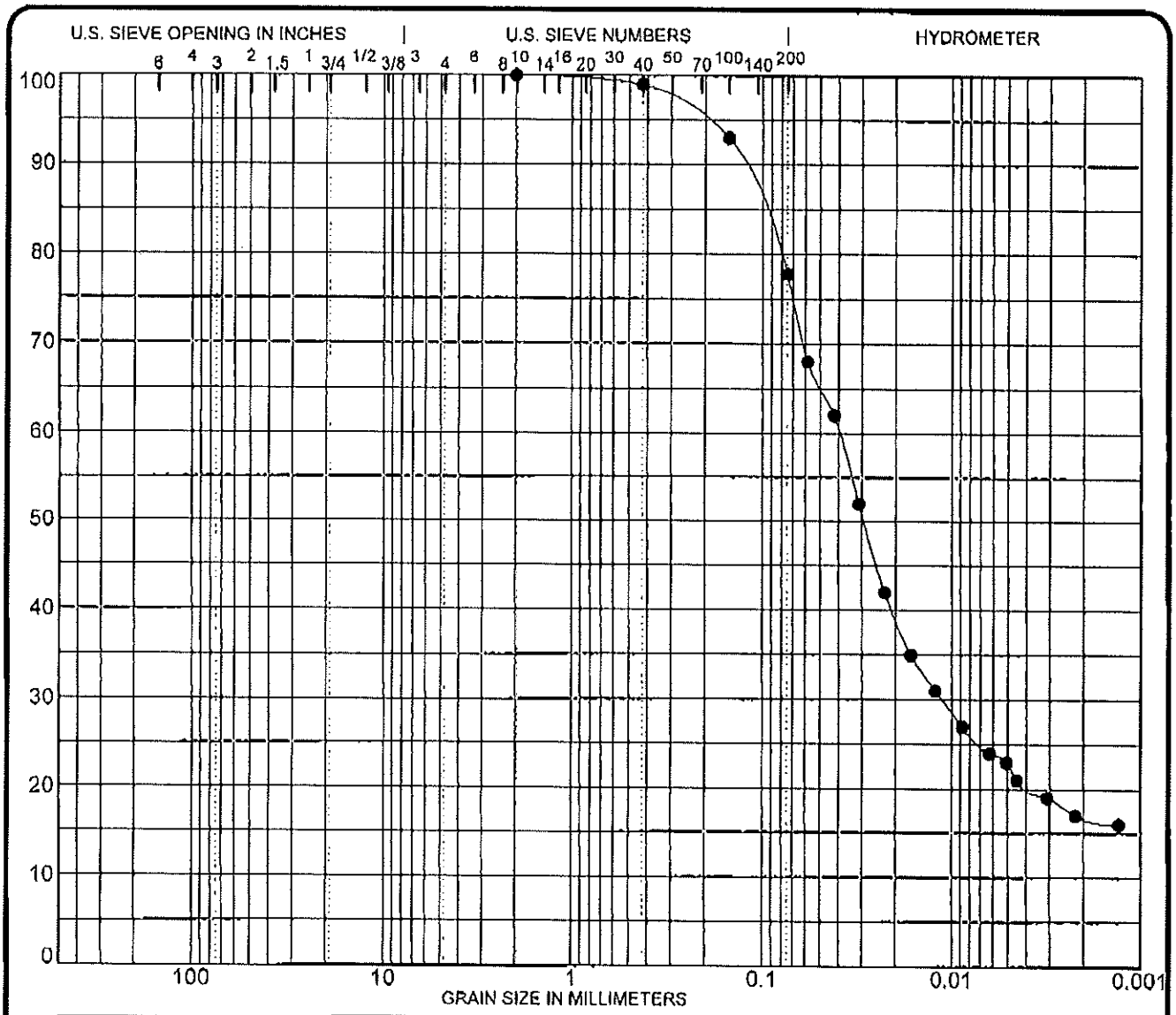
PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 20, 2011

SB1

SOILGENR 76757.GPJ TSC ALL.GDT 5/20/11

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: SB-1	3 inch	100	Gray very silty CLAY, some sand (CL)
Sample: D	2	100	
Depth: 36.0'-37.0'	1 1/2	100	
	1	100	
NOTES:	3/4	100	
	3/8	100	
	# 4	100	
	# 10	100	
	# 40	99	
	# 100	93	
	# 200	78	

%GRAVEL	%SAND	%SILT	%CLAY
0	22	61	17

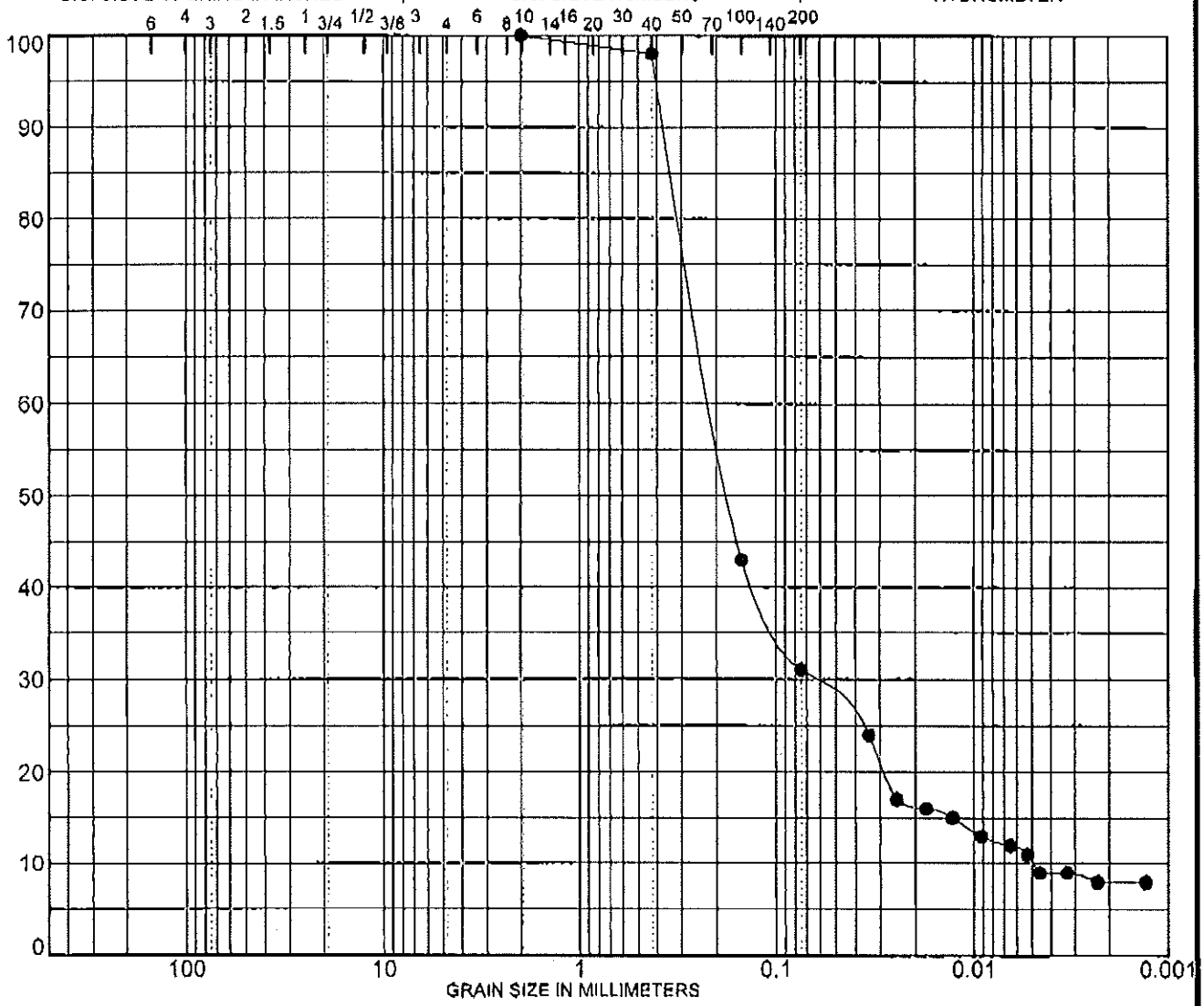
MC%		LL	PL	PI
29.1		36	16	20

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 20, 2011

SB1

SOILGENR 76757.GPJ TSC ALL.GDT 5/20/11

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-1	3 inch	100
Sample: E	2	100
Depth: 37.0'-38.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	98
	# 100	43
	# 200	31

SOIL CLASSIFICATION: Gray clayay SAND (SC)

%GRAVEL	%SAND	%SILT	%CLAY
0	69	23	8

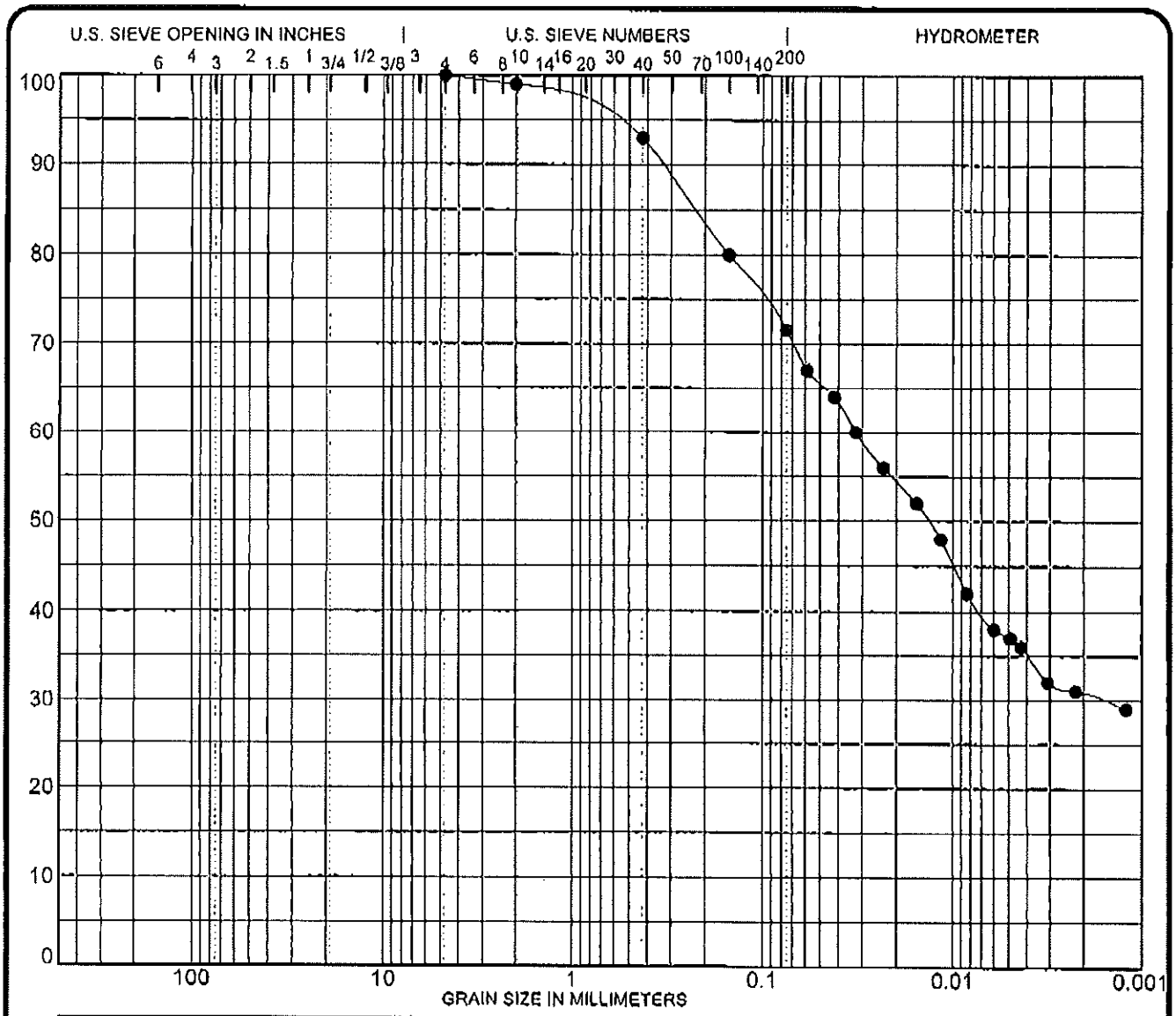
MC%		LL	PL	PI
30.4		22	14	8

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 20, 2011

SB1

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 7675?.GPJ TSC ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-2	3 inch	100
Sample: A	2	100
Depth: 8.0'-9.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	99
	# 40	93
	# 100	80
	# 200	72

SOIL CLASSIFICATION

Brownish gray silty CLAY, some sand

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	28	41	31

MC%		LL	PL	PI
15.7		46	12	34

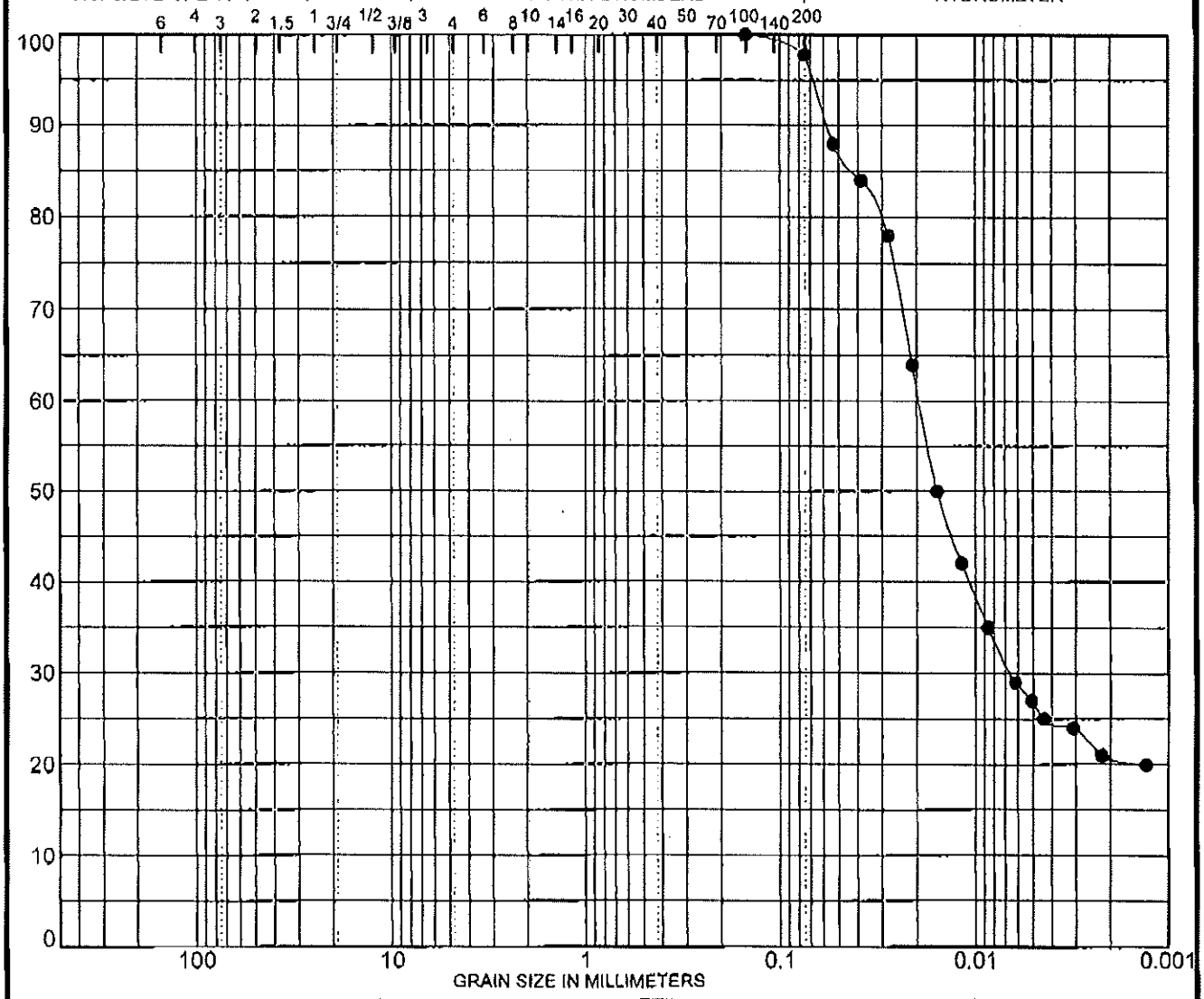
PROJECT Geotechnical Testing
LOCATION ,
SB2

JOB NO. L - 76,757
DATE May 20, 2011

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGEN2 76757.GPJ TSC ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-2	3 inch	100
Sample: B	2	100
Depth: 28.0'-29.0	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	100
	# 200	98

SOIL CLASSIFICATION

Dark gray very silty CLAY, trace sand

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	2	77	21

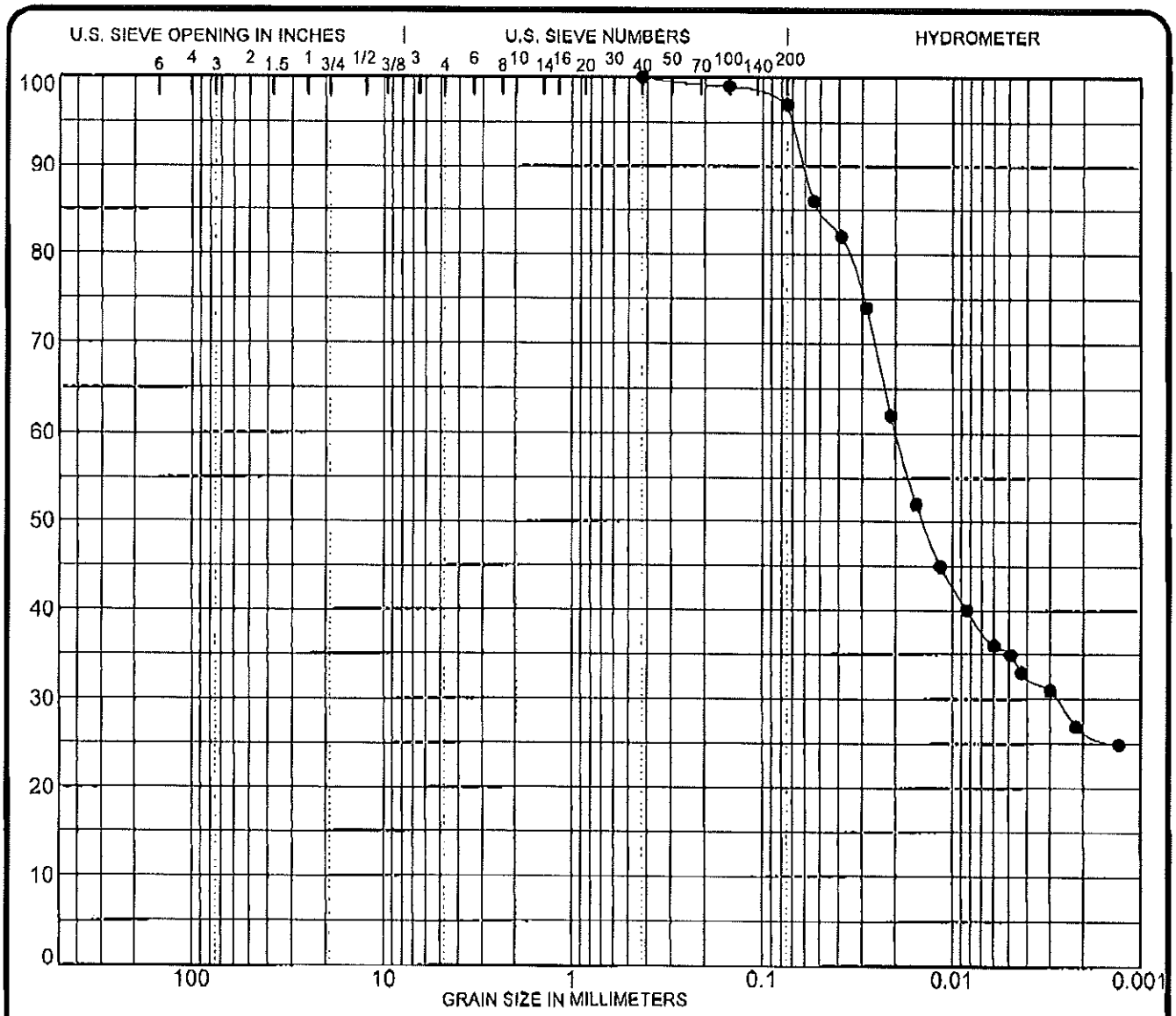
MC%		LL	PL	PI
35.1		42	18	24

PROJECT Geotechnical Testing
LOCATION
SB2

JOB NO. L - 76,757
DATE May 20, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: SB-2	3 inch	100	Dark gray silty CLAY, trace sand (CH)
Sample: C	2	100	
Depth: 32.0'	1 1/2	100	
	1	100	
NOTES:	3/4	100	
	3/8	100	
	# 4	100	
	# 10	100	
	# 40	100	
	# 100	99	
	# 200	97	

%GRAVEL	%SAND	%SILT	%CLAY
0	3	70	27

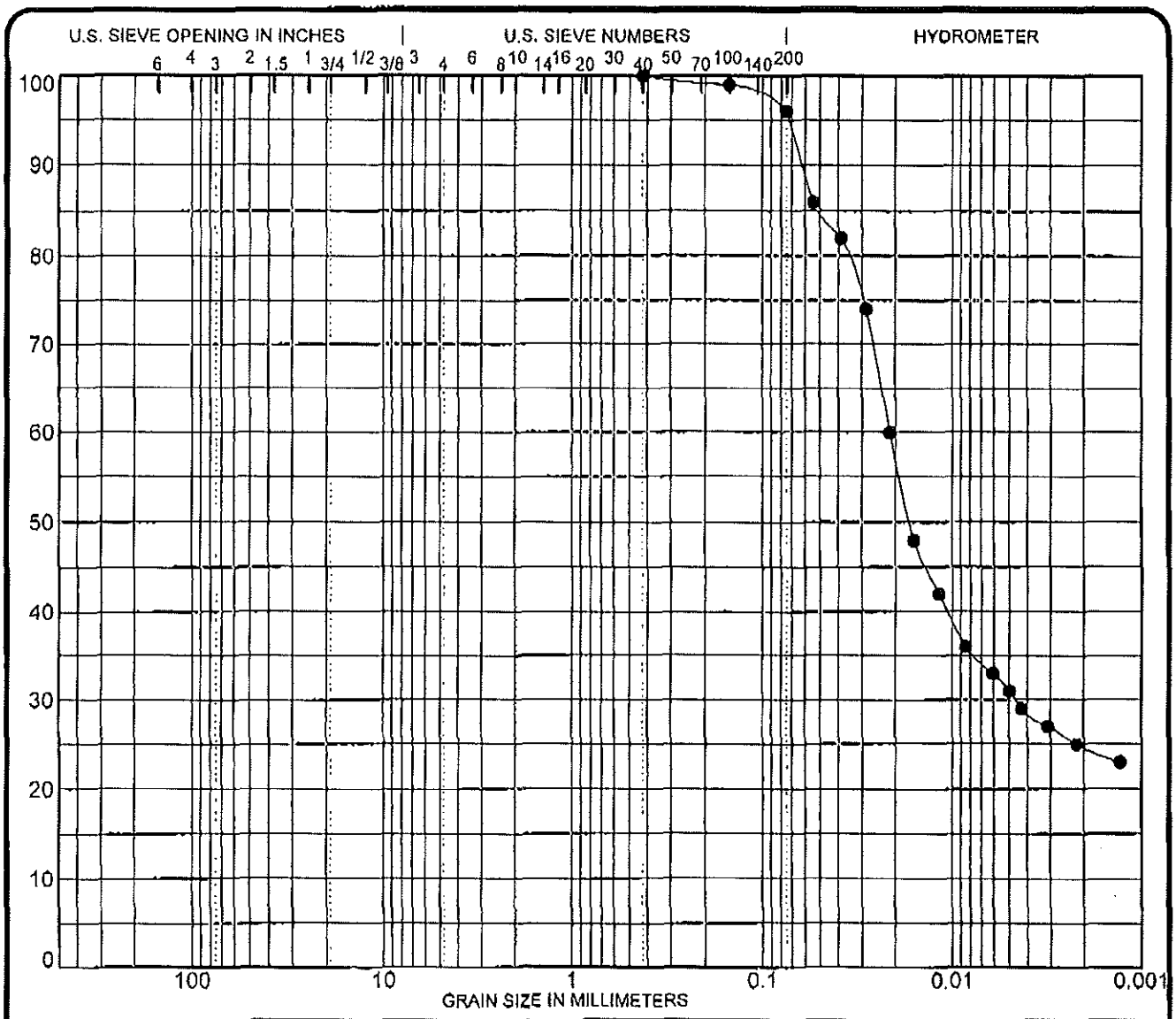
MC%		LL	PL	PI
32.9		51	16	35

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 20, 2011

SB2

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILSENR 76757.GPJ TSC_ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-3	3 inch	100
Sample: A	2	100
Depth: 38.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	99
	# 200	96

SOIL CLASSIFICATION

Dark gray very silty CLAY, trace sand

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	4	71	25

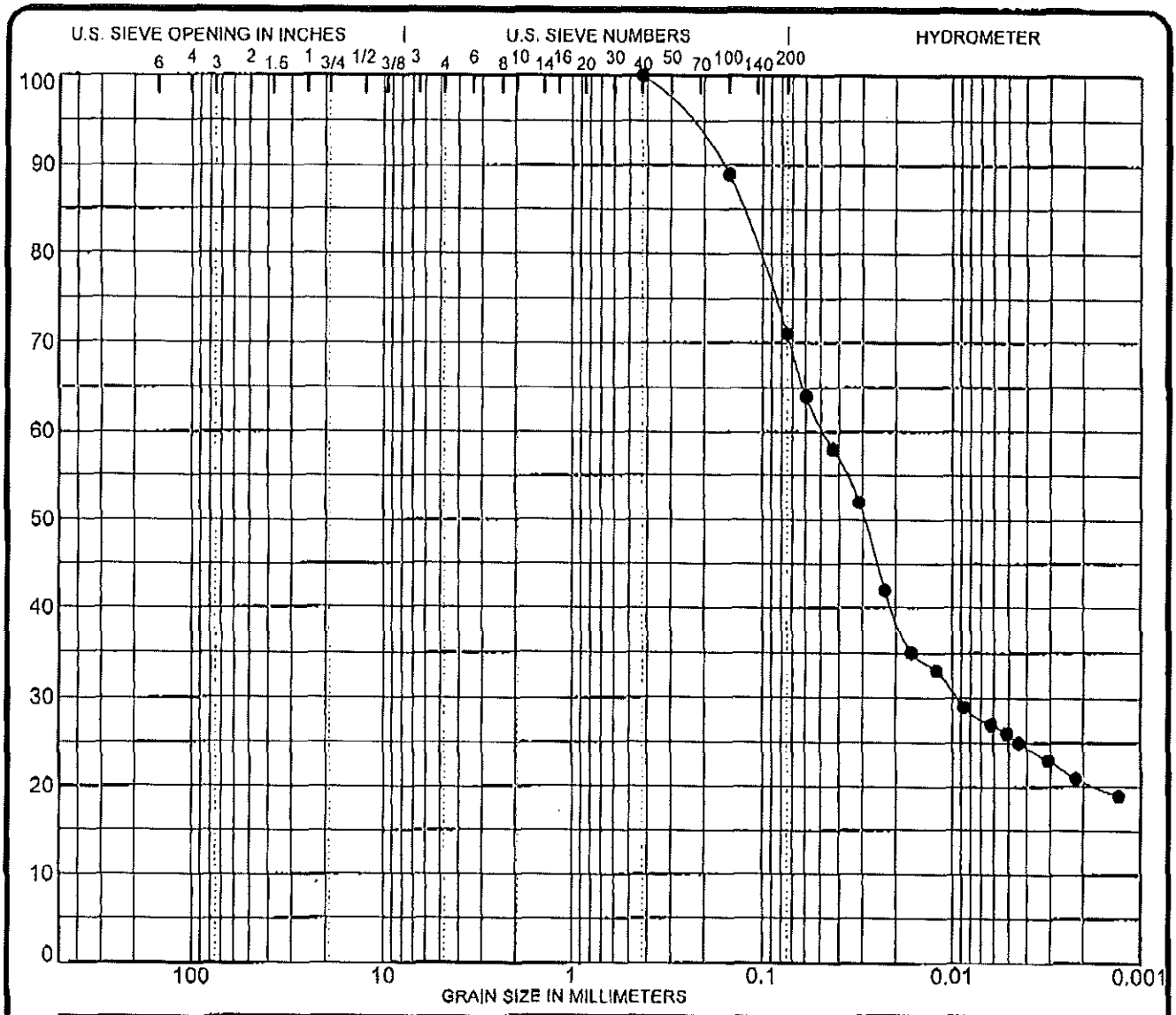
MC%		LL	PL	PI
34.4		46	15	31

PROJECT Geotechnical Testing
LOCATION ,
SB3

JOB NO. L - 76,757
DATE May 20, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-4	3 inch	100
Sample: A	2	100
Depth: 34.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	89
	# 200	71

SOIL CLASSIFICATION: Dark gray silty CLAY, some sand (CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	29	50	21

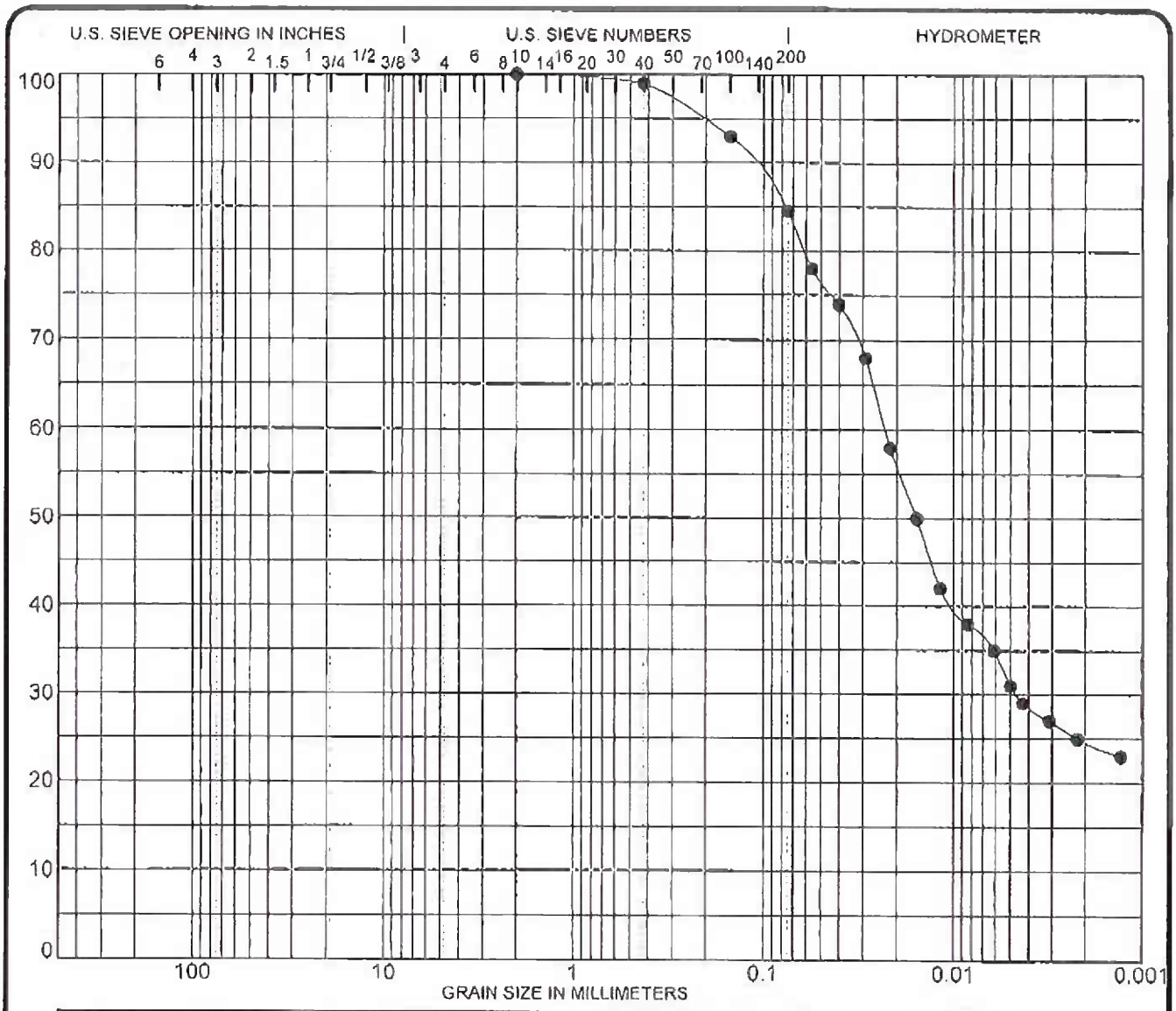
MC%		LL	PL	PI
24.1		41	12	29

PROJECT Geotechnical Testing
LOCATION ,
SB4

JOB NO. L - 76,757
DATE May 20, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/20/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: SB-5	3 inch	100	Gray very silty CLAY, little sand (CL)
Sample: A	2	100	
Depth: 34.0'	1 1/2	100	
	1	100	
NOTES:	3/4	100	
	3/8	100	
	# 4	100	
	# 10	100	
	# 40	99	
	# 100	93	
	# 200	85	

%GRAVEL	%SAND	%SILT	%CLAY
0	15	60	25

MC%		LL	PL	PI
23.3		43	16	27

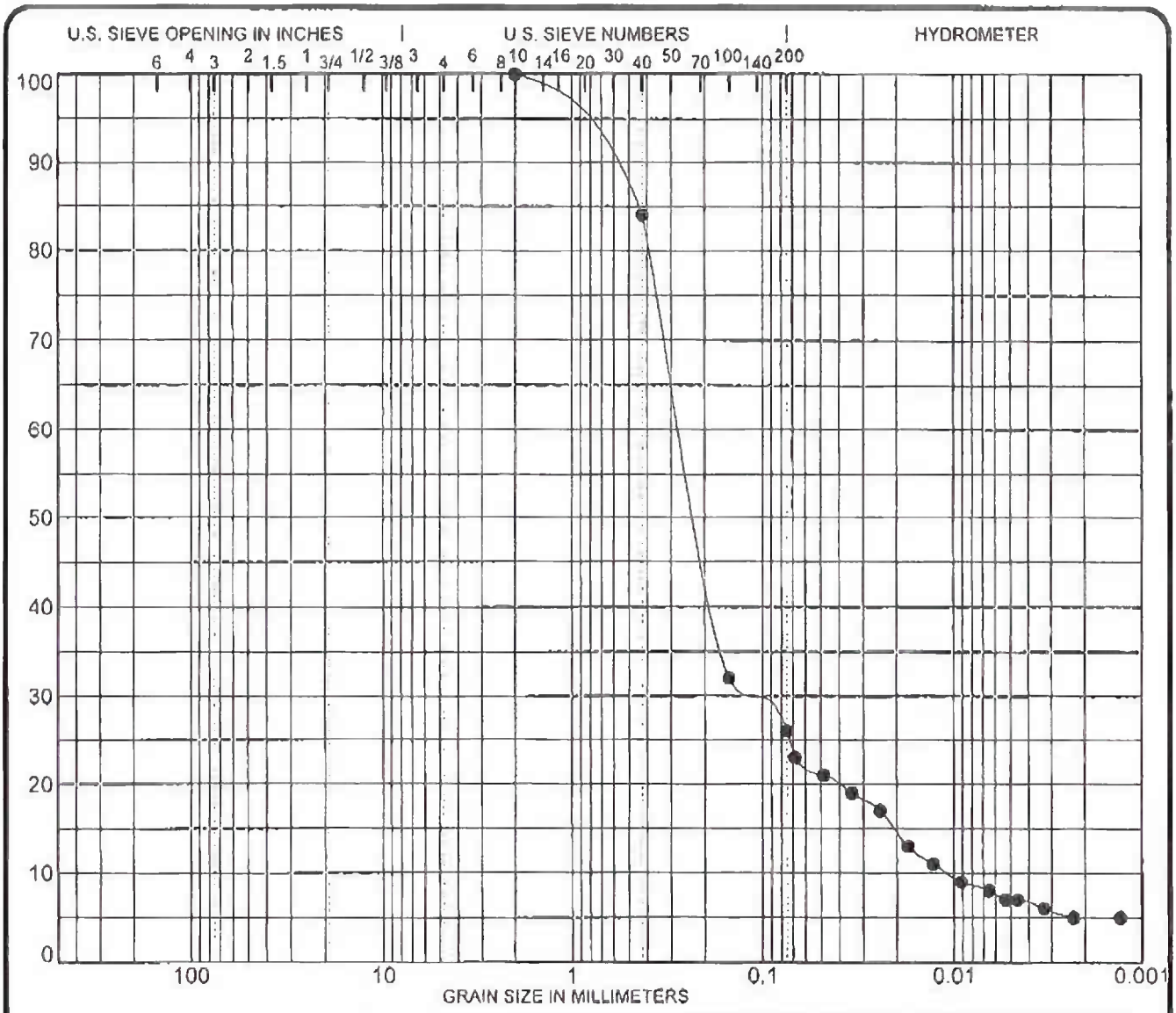
PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 23, 2011

SB5

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-6	3 inch	100
Sample: A	2	100
Depth: 16.0'-17.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	84
	# 100	32
	# 200	26

SOIL CLASSIFICATION: Gray clayey SAND (SC)

%GRAVEL	%SAND	%SILT	%CLAY
0	74	21	5

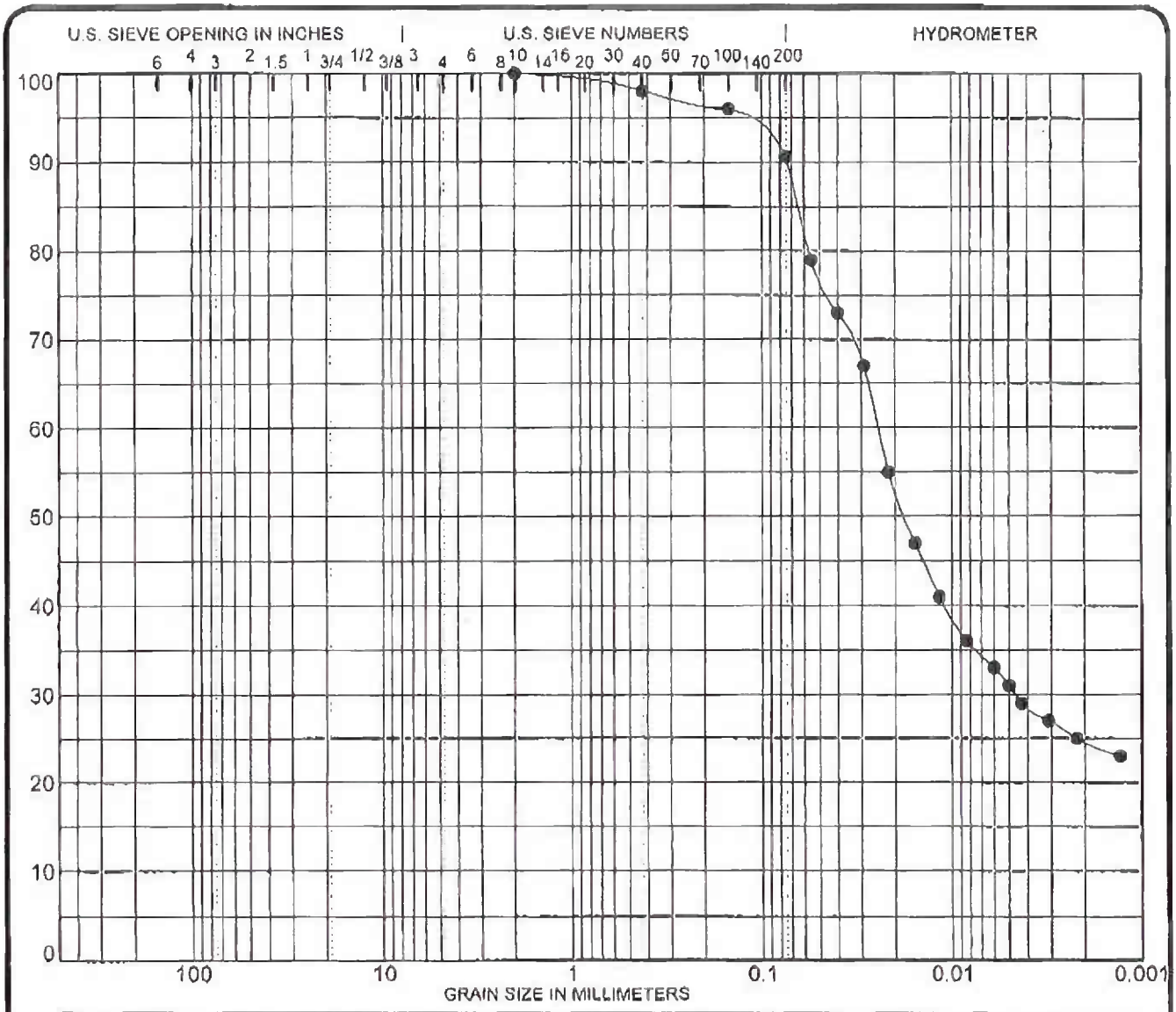
MC%		LL	PL	PI
24.6		16	13	3

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 23, 2011

SB6

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC ALL.GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-6	3 inch	100
Sample: B	2	100
Depth: 28.0'-29.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	98
	# 100	96
	# 200	91

SOIL CLASSIFICATION

Brownish gray very silty CLAY, trace sand

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	9	66	25

MC%		LL	PL	PI
28.3		43	13	30

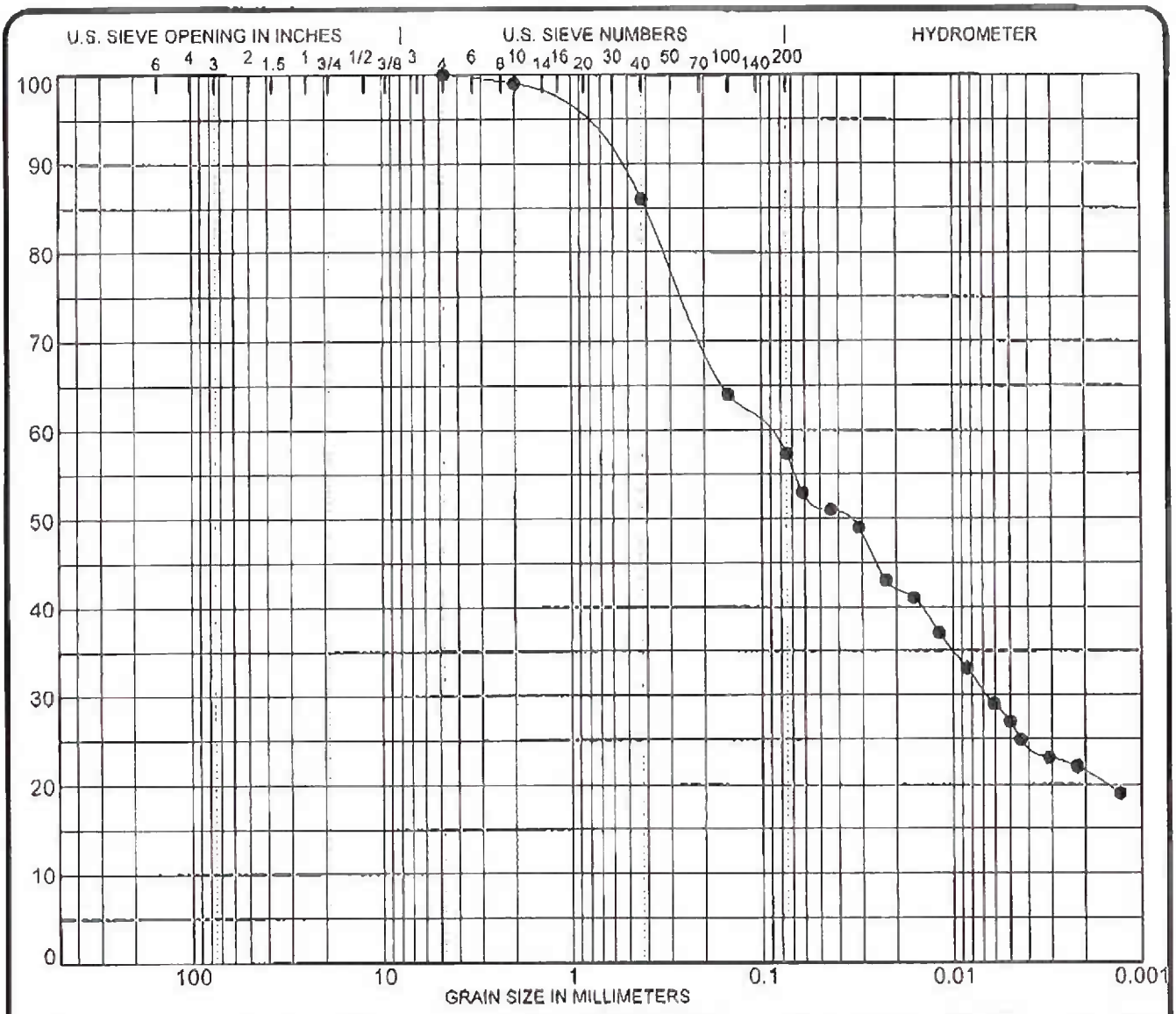
PROJECT Geotechnical Testing
LOCATION ,
SB6

JOB NO. L - 76,757
DATE May 23, 2011

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-8	3 inch	100
Sample: A	2	100
Depth: 10.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	99
	# 40	86
	# 100	64
	# 200	57

SOIL CLASSIFICATION: Gray sandy CLAY (CL)

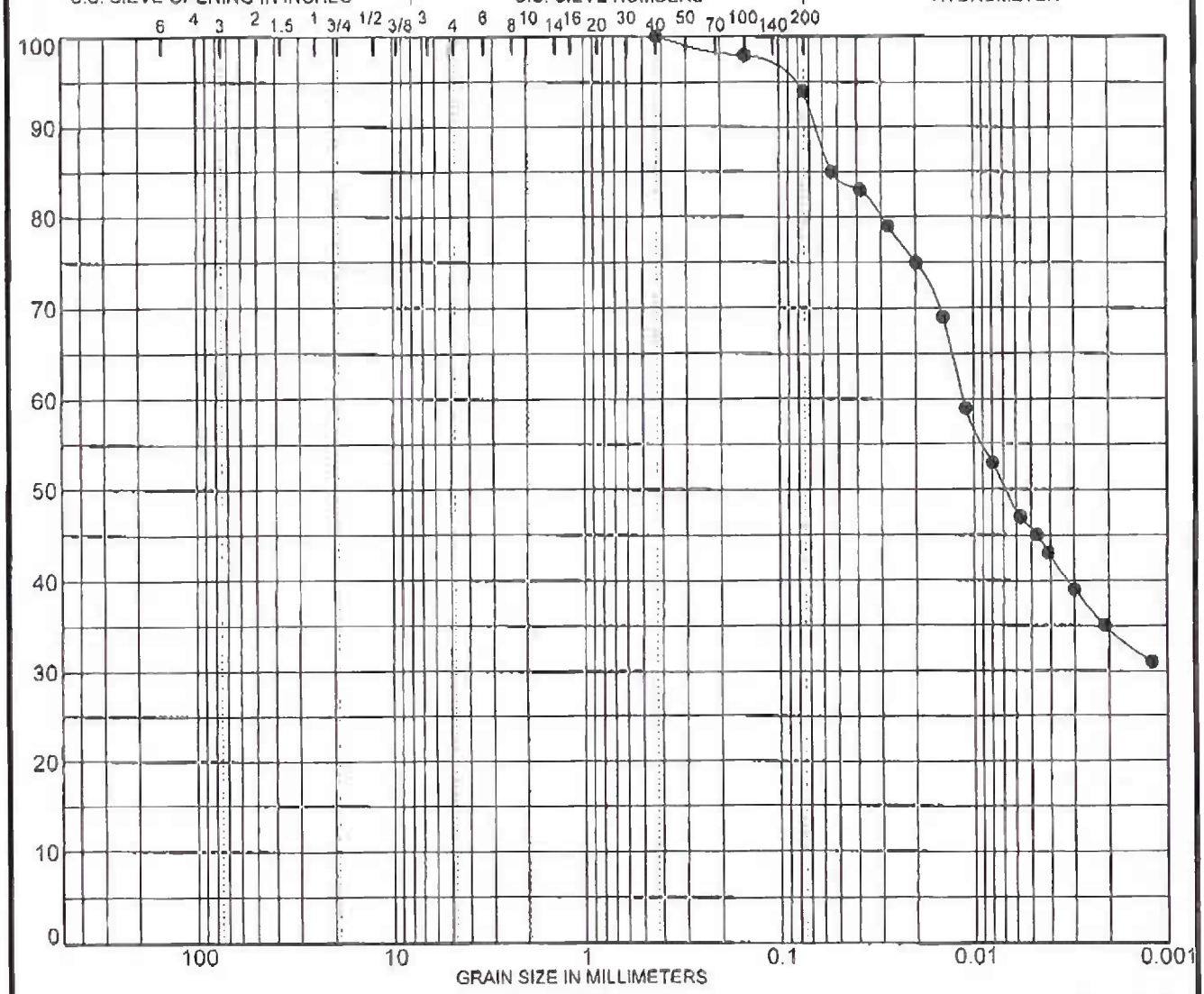
%GRAVEL	%SAND	%SILT	%CLAY
0	43	36	21

MC%		LL	PL	PI
21.6		36	12	24

PROJECT Geotechnical Testing
LOCATION SB8
JOB NO. L - 76,757
DATE May 23, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757 GPJ TSC_ALL GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-8	3 inch	100
Sample: B	2	100
Depth: 20.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	98
	# 200	94

SOIL CLASSIFICATION

Gray very silty CLAY, trace sand (CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	6	59	35

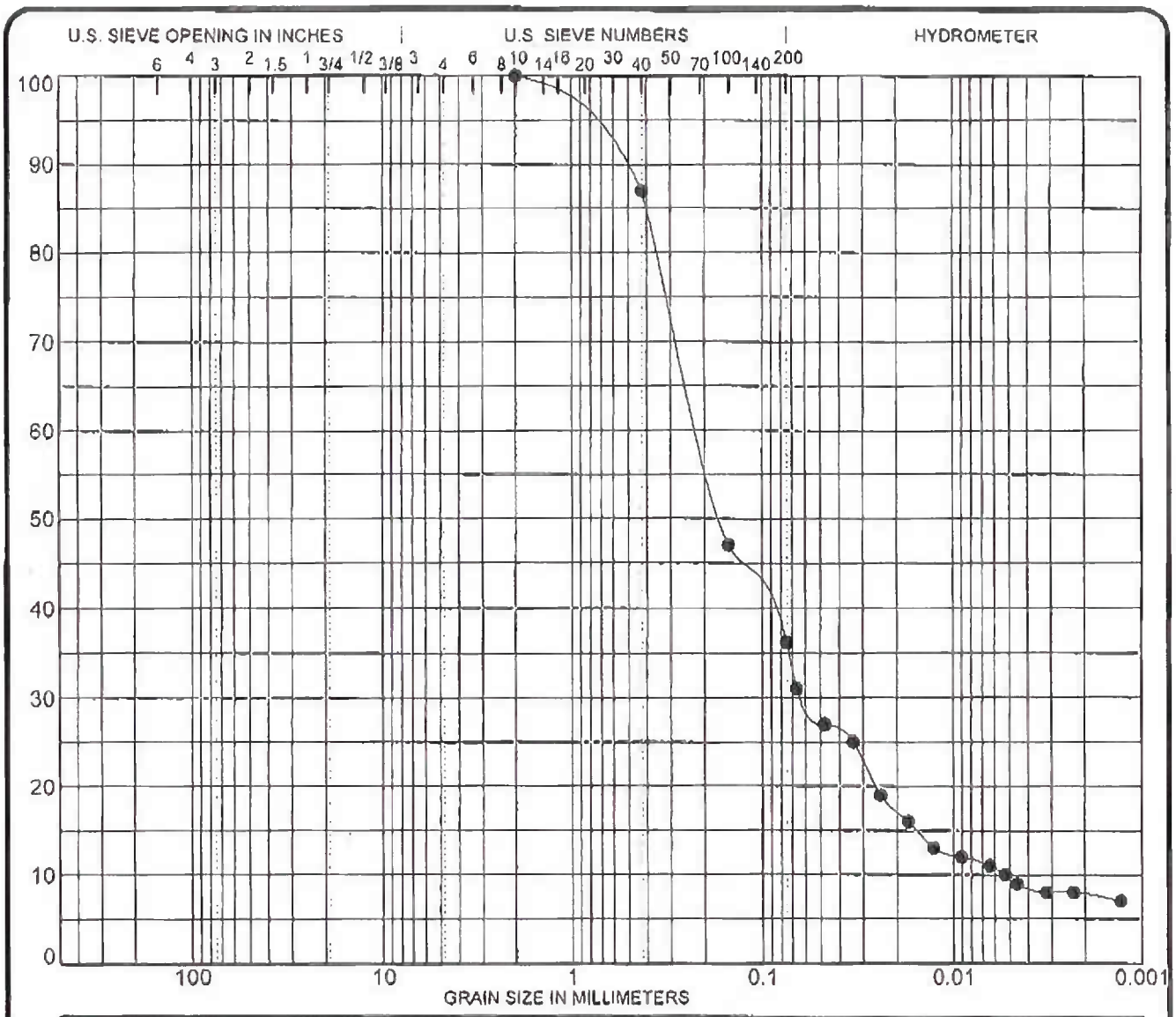
MC%		LL	PL	PI
31.1		56	19	37

PROJECT Geotechnical Testing
LOCATION ,
SB8

JOB NO. L - 76,757
DATE May 23, 2011

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

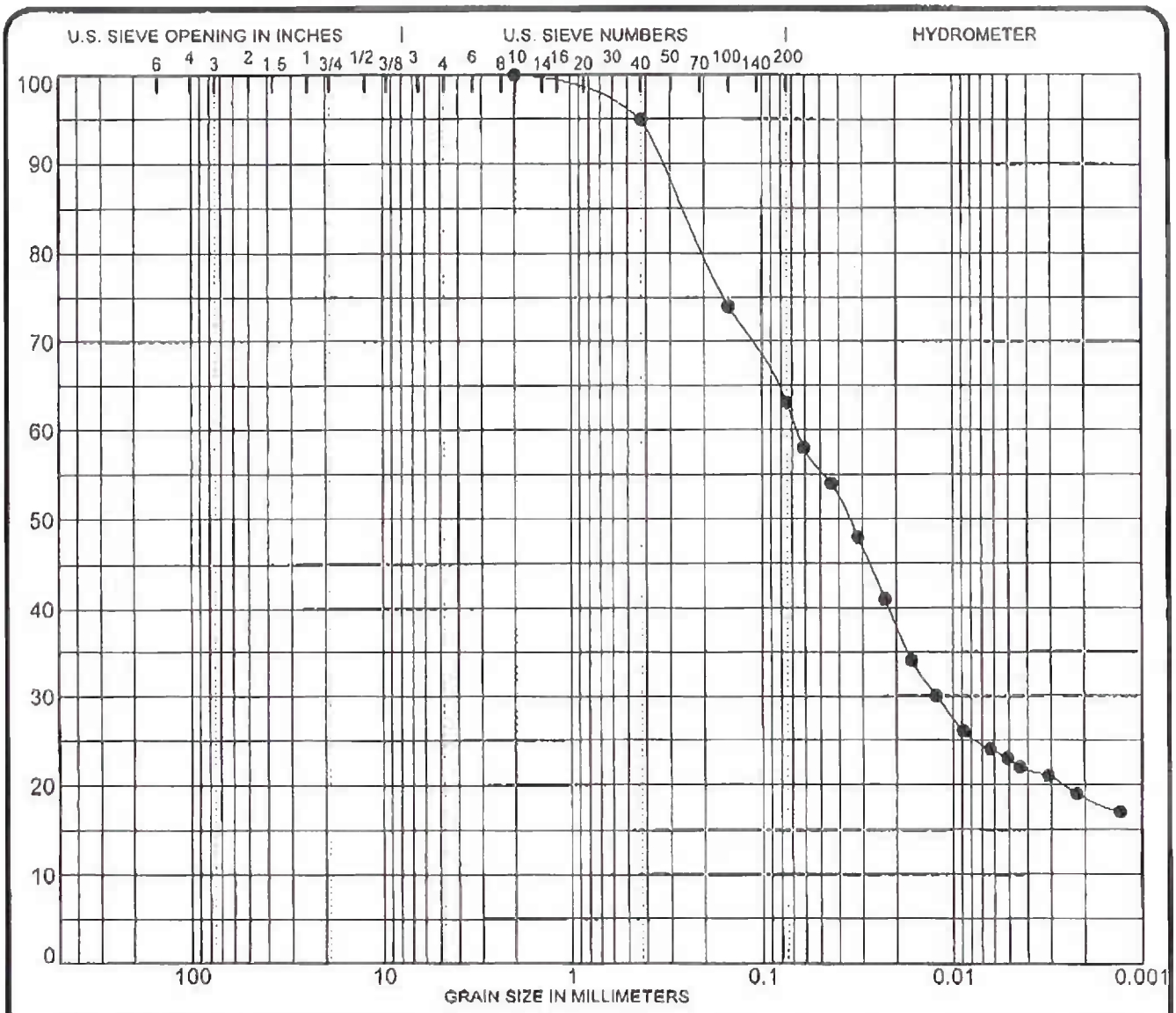
SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: SB-8	3 inch	100	Gray clayey SAND (SC)
Sample: C	2	100	
Depth: 22.0'	1 1/2	100	
	1	100	%GRAVEL: 0 | %SAND: 64 | %SILT: 28 | %CLAY: 8
NOTES:	3/4	100	
	3/8	100	
	# 4	100	MC%: 26.9 | LL: 21 | PL: 13 | PI: 8
	# 10	100	
	# 40	87	
	# 100	47	
	# 200	36	

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 23, 2011

SB8

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-9	3 inch	100
Sample: A	2	100
Depth: 18.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	95
	# 100	74
	# 200	63

SOIL CLASSIFICATION: Brownish gray sandy CLAY (CL)

%GRAVEL	%SAND	%SILT	%CLAY
0	37	44	19

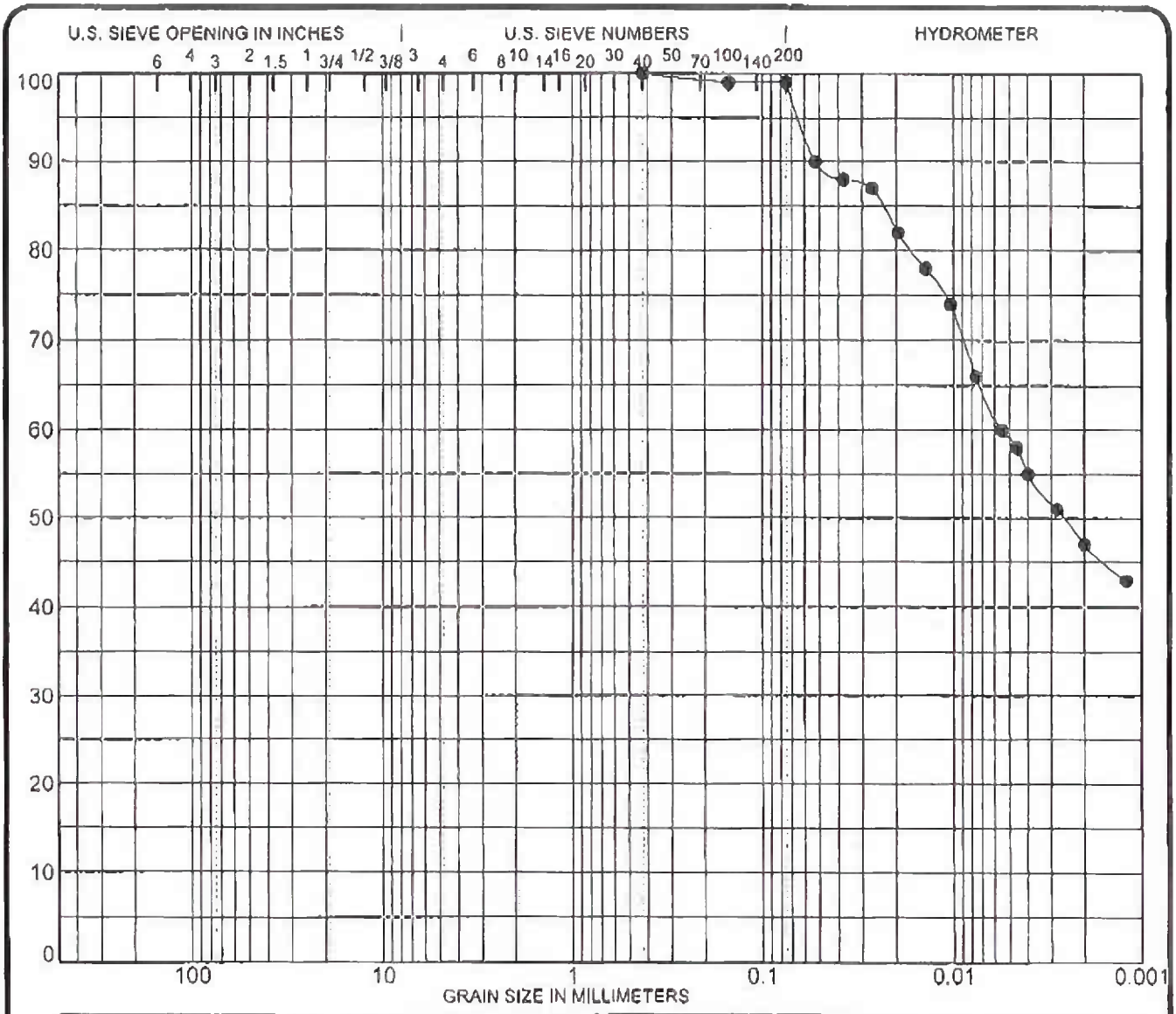
MC%		LL	PL	PI
34.0		35	13	22

PROJECT Geotechnical Testing
LOCATION ,
JOB NO. L - 76,757
DATE May 23, 2011

SB9

SOIL DATA SHEET
Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-10	3 inch	100
Sample: A	2	100
Depth: 20.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	100
	# 10	100
	# 40	100
	# 100	99
	# 200	99

SOIL CLASSIFICATION

Brownish gray silty CLAY, trace sand

(CH)

%GRAVEL	%SAND	%SILT	%CLAY
0	1	52	47

MC%		LL	PL	PI
26.9		74	15	59

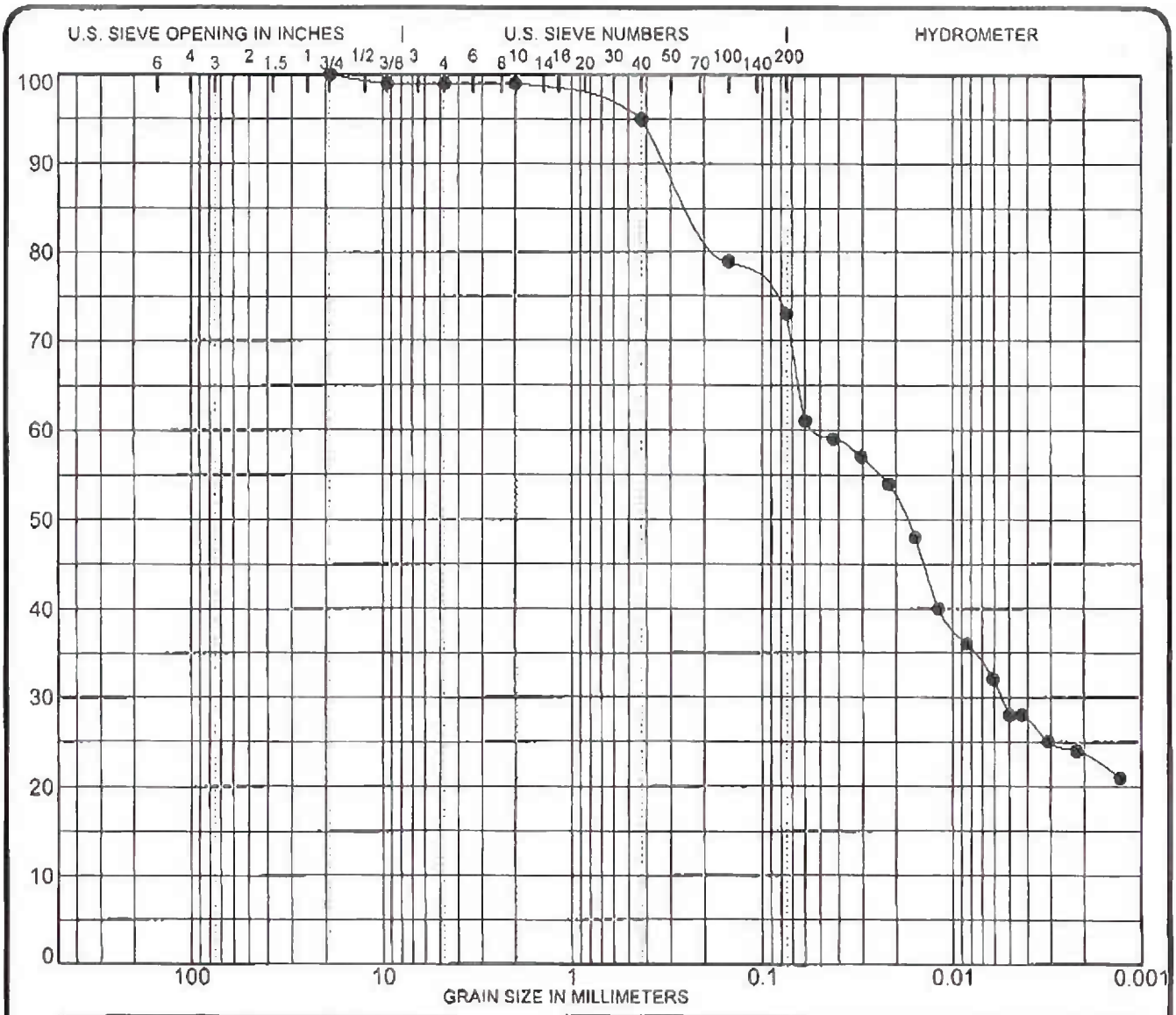
PROJECT Geotechnical Testing
LOCATION ,
SB10

JOB NO. L - 76,757
DATE May 23, 2011

SOILGENR 76757.GPJ TSC ALLCOT 5/23/11

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: SB-12	3 inch	100
Sample: A	2	100
Depth: 23.0'-24.0'	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	99
	# 4	99
	# 10	99
	# 40	95
	# 100	79
	# 200	73

SOIL CLASSIFICATION

Gray silty CLAY, some sand, trace gravel

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
1	26	50	23

MC%		LL	PL	PI
35.9		42	16	26

PROJECT Geotechnical Testing
LOCATION ,
SB12

JOB NO. L - 76,757
DATE May 23, 2011

SOILGENR 76757.GPJ TSC_ALL.GDT 5/23/11

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188