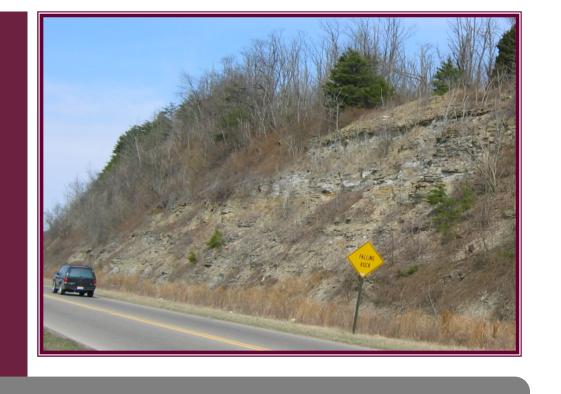
Rock Cut Slopes
Portsmouth Bypass
Project SCI-823-0.00
Phase 3 – Stage I
Scioto County, Ohio

November 16,

2007





Report of:

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Scioto County, Ohio



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DLZ Job No. 0121-3070.03 PID 77366

November 16, 2007

REPORT

OF

ROCK CUT SLOPES

FOR

PROJECT SCI-823-0.00

PHASE 3 – STAGE I

SCIOTO COUNTY, OHIO

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REPORT OF ROCK CUT SLOPES FOR PROJECT SCI-823-0.00 PHASE 3 – STAGE I SCIOTO COUNTY, OHIO

1.0 INTRODUCTION

This report presents the methodologies and findings of the cut slope design performed by DLZ Ohio, Inc. (DLZ) for the Phase 3 portion of the SCI-823-0.00 Portsmouth Bypass project located in Scioto County, Ohio. The Phase 3 portion of the project will begin at Station 0+00 and ends at Station 353+00. The proposed alignment will extend in a north/northwesterly direction for approximately 6.7 miles from existing US 52 north to a point approximately 0.5 mile north of Blake Hollow Road and 0.25 mile west of US 235. The proposed alignment is illustrated on the general location map in Appendix A.

Based on the site plans included in Appendix A, rock cut slope design was required in certain areas of the proposed alignment between Station 40+00 and Station 352+00. In considering the rock cut slopes, the areas requiring rock cut design were divided into eleven cut sections, namely, Rock Cuts #1 through #11. Rock cuts will also be located on two ramp alignments. These are State Route 140 and US Route 52. Rock cut design for Rock Cuts #11(north half) through #32 are presented in separate reports for project Phases 1 and 3. The areas requiring rock cut slope design and their corresponding station ranges are shown in the following table. The stationing for the rock cuts are approximate and are based on roadway alignment and elevation information available at the time of this report.

Rock Cut	Station Range
US 52 Ramps A&B	40+50 - 54+00 &
1	54+00 - 61+25
2	77+00 – 106+25
3	138+75 – 173+25
4	177+75 – 207+25
5	212+25 - 228+00
6	257+75 – 268+25

Rock Cut	Station Range
7	269+75 – 290+25
8	305+75 - 317+25
9	322+75 – 328+25
10	329+25 - 343+75
11	347+25 – 351+50
SR 140 Ramp A	77+00 – 105+50
SR 140 Ramp B	60+92 - 77+95

A subsurface exploration program was conducted for the proposed alignment. The purpose of the subsurface exploration was to: 1) determine the subsurface conditions to the depths of the borings, 2) evaluate the engineering characteristics of the subsurface materials, and 3) provide information to assist in designing the cut slopes, roadway embankments and pavements.

This report pertains to the rock cut slope design only. The findings of the roadway embankment and pavement evaluation are presented in separate documents. Note that information specific to soil cut slopes is also present in their respective roadway embankment reports.

The geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, has considered the findings, and has prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are made as to the professional advice included in this report.

2.0 PHYSICAL SETTING

The project is located in the Shawnee-Mississippian Plateau of the unglaciated portion of the Appalachian Plateau Physiographic Region. This area is not highly developed and contains limited secondary roadways. The area is characterized by rough, steep, broken, and severely dissected topography. The natural slopes are generally very steep, rising abruptly from the valley bottoms. The maximum topographic relief along project centerline is on the order of 275 feet and occurs between a high point at approximate Station 523+70 (approximate elevation 890 feet) and a low point near Station 353+80 (approximate elevation 615 feet). The maximum vertical relief along the proposed finished grade is approximately 130 feet, with the highest point at approximate Station 352+00 (elevation 645 feet) and the lowest point near Station 519+30 (elevation 775 feet).

3.0 GEOLOGICAL CONSIDERATIONS

3.1 Site Geology

The lithology of the project area is primarily composed of Pennsylvanian and Upper Mississippian age rocks including shale, siltstone, and sandstone.

The Pennsylvanian age rocks in the project area are in the Pottsville Group and mapped as the Pennsylvanian Breathitt Formation according to the bedrock geology maps prepared by the Ohio Department of Natural Resources' Division of Geologic Survey (ODNR-DGS). The Breathitt Formation is found as thin bands generally following the topographic contours of the higher ridgelines. Due to the regional dips, this rock formation generally exists above elevations between 760 and 850 feet in the project area. The Breathitt Formation consists of conglomerate, coal, shale, thin limestone, sandstone, and ironstone. Generally, shale and sandstone are the dominant lithologies with occasional thin, bony coal beds or blossoms.

The predominant marker beds found with the Breathitt Formation are the Harrison Ore, located immediately above the Mississipian age Maxville Limestone, the Sciotoville Clay, the Sharon Ore, and the Anthony Coal. Of these members, the Harrison Ore is the only marker bed that is relatively continuous within the project area.

The Upper Mississippian age rocks from the Waverly Series, Logan, and Cuyahoga Formations generally exist below the Pennsylvanian age Breathitt Formation. However, the Maxville Limestone, overlying the Logan Formation, marks the contact with the Breathitt Formation. The Maxville Limestone consists of isolated, discontinuous pockets of limestone. The discontinuous nature is due to an erosional unconformity at the upper

surface. Where the Maxville Limestone is absent, the Logan Formation marks the upper contact with the Breathitt Formation.

The Logan Formation varies in thickness in part due to the erosional unconformity at its upper boundary and consists primarily of gray to brown fine-grained sandstone, siltstone, and sandy shale. However, the Logan Formation is characterized by the dominance of sandstone. Three members of the Logan are identified within the project area, namely, the Byer Sandstone, the Allensville Conglomerate, and the Vinton Sandstone. Occasional iron bearing zones, identified as ironstones and ferric bands, are present within the Logan Formation, but are usually thin, isolated, and nodular. Generally, the Vinton member is a fine-grained sandstone which can be finely interbedded with sandy shale and often contains zones of fossils and ironstone concretions. The Byer member is generally a fine-grained sandstone which can be finely interbedded with sandy shale or massive sandstone. The Allensville member is a fine-grained sandstone which can be finely interbedded with sandy shale with small pebbles beds (1 to 2 inches) throughout. This member is not easily distinguishable from the Byer member and is often missing within the sequence.

The Logan Formation is the dominant rock stratum found within the project area with the exception of the Pennsylvanian Breathitt Formation capping the higher ridgelines in some areas.

Soils found within the study corridor can be divided into three groups; residual and colluvial soils derived from weathering of underlying rock and downslope transport; lacustrine and outwash deposits of glacial origin; and recent alluvial deposits. The residual and colluvial soils are found along the ridge tops and hillsides; glacial soils are typically found within the major stream valley and their tributaries; and recent alluvial deposits are found along and within stream channels and valleys.

Within the project area, residual and colluvial soils are generally thin to moderately deep, covering moderate to very steep slopes. Residual and colluvial soils on the hillsides are prone to landslides.

The two types of glacial soils encountered within the study corridor are lacustrine deposits and glacial outwash deposits. The lacustrine soils are commonly known as the 'Minford Silts' or the Minford Complex. The Minford Complex soils are generally found between elevations 650 and 780 feet. The thickness of the Minford Complex soils varies considerably throughout the project area, partially due to the nature of original deposition and geological changes since the time of formation. When present, these materials usually lie on or near bedrock. The Minford Complex soils have no regular succession. Typically sands and sandy silts are found near the bedrock and fine laminated silts and clays are found at the higher levels of the sequence. Occasionally, the Minford Complex contains sandstone cobbles and boulders or chert and quartz pebbles in the lower parts of the sequence. These cobbles, boulders and pebbles within the sequence are believed to be of local origin. The glacial deposits are late Wisconsinan in age and consist of sand

and gravel deposits with small isolated peat deposits. Generally, these deposits are saturated at shallow depths with high recharge rates.

Alluvial soils, to some extent, are found along all of the creeks and rivers within the project area. Generally alluvial deposits range from silty clay to coarse sand. Where bedrock is shallow, alluvial deposits may contain coarse sand, gravel, and cobbles.

3.2 Landslide Susceptibility

The dominant rock type along the proposed alignment is sandstone of the Mississippian aged Logan Formation. Siltstone and shale are commonly found interbedded with the sandstone. These siltstones and shales generally weather to clay with low shear strength over time. The steeper slopes are prone to gradual movement known as soil creep. The low shear strength of the residual and colluvial soils combined with the steep topography makes some of the hillsides within the proposed limits of construction prone to shallow surficial landslides and soil creep. Generally these conditions are easily corrected by removal of the unstable slope materials. No deep-seated landslides were observed along the proposed Phase 3 alignment.

In the steep terrain of Scioto County, soil creep is common. Areas of slope instability were first identified using survey data and aerial photography and then verified during the fieldwork. Three areas showed indications of significant instability near or within the limits of construction. Most slope instability appeared to be relatively shallow soil creep contained within the overburden. In most cases, these areas of slope instability were less than 10 feet deep even though drilling in several of these landslide areas indicated significantly deeper overburden. These areas of slope instability are shown on the field notes and proposed centerline in Appendix A of the *Report of Geology and Field Reconnaissance for Project SCI-823-6.81*, *Phase 3-Stage 1*, *dated November 16*, 2007. The following is a summary of those findings.

Station 136+25 to Station 137+50

This area includes the northern shore of the Little Scioto River to the edge of SR 335. Pavement cracking along the shoulder of SR 335 and displaced trees, which appeared to be indicative of recent movement, were observed. Slope movement in this area appeared to be the result of soil saturation and rapid drawdown during flood events.

Station 138+50 to Station 146+50

Mapping and field work revealed signs of a past, possibly massive landslide in this area. The slopes in this hollow are generally 1H: 1V or steeper. The terrain was hummocky and a perennial stream had eroded the lower portions of the slopes in the hollow. Bedrock was exposed in the lower portions of the hollow towards the Little Scioto River.

Station 319+75 to Station 323+75

This appeared to be a shallow landslide that might have occurred as a result of logging activities. There was a wet area at the toe of the slope and several logging roads had been cut into the slope at varying elevations.

3.3 Mining Activities

Scioto County has been mined extensively for a variety of materials including sand and gravel, sandstone, clay, and coal. However, neither large sand and gravel operations nor large clay pits were reported within the project area.

Strip and drift mining for coal are common within the Pennsylvanian rocks along the far eastern portions of the county in Bloom, Vernon, and Green Townships outside of the project area. Coal seams do not appear in significant enough thickness or quality within the study corridor to have warranted extensive mining. Small-scale local coal mining operations are suspected to have occurred historically within the Pennsylvanian Breathitt Formation found in the project area.

Quarries are found throughout Scioto County for mining dimension blocks of sandstone and limestone for aggregate or flux. However, the sandstones of the Mississippian Logan Formation, the dominant rock in the study corridor, are unsuitable for dimension stone. Consequently, quarries for sandstone or limestone were not reported or observed within the project area.

Iron deposits are found throughout the region and were reported to have been locally mined within Scioto County. The extent of ore mining within the project area is unknown, but estimated to be very small.

3.4 Seismic Considerations

Compared to seismically active areas of the United States (California or Alaska), Ohio has relatively few earthquakes. The most frequent and damaging earthquakes in the state of Ohio originated from the City of Anna, Shelby County, in the vicinity of western Ohio. During the last 100 years this area has experienced more than 30 earthquakes with the decade of the 1930's being the most active period. Among these 30 earthquakes, only 23 events were recorded, including the most severe shock ever recorded in Ohio. This severe earthquake, occurred on March 9, 1937, had a reported intensity of VIII on the modified Mercalli scale (5.4 on the Richter scale) and was felt over an area of 150,000 square miles. Considerable damage to windows and walls and extensive cracking of masonry occurred in several large buildings in Anna and nearby communities.

Earthquakes were also reported in northeastern, southeastern, and other western portions of Ohio. One earthquake, measured between 4.0 and 4.9 on the Richter scale, reportedly centered near Portsmouth, Ohio in 1901. Lesser magnitude quakes have been recorded in southern Ohio, outside of Scioto County. These earthquakes were of minor intensity (<3.9 magnitude), causing little or no damage.

This project is located in excess of 200 miles away from the City of Anna and any of the above-mentioned areas of historical earthquakes. It is estimated that the levels of seismic acceleration from any of the previous earthquake locations would be small and that the effect of seismic loadings, if any, due to the potential earthquakes from these areas can be considered minimal on the design of rock cut slope design.

3.5 Existing Cut Slope Features in the Region

Existing rock cut slopes are present along the CSX Railroad line, existing roadways, and in isolated locations of the project area. The field observations of the rock cut slopes within the project area are presented in the following paragraphs.

A large cut exists in the northwestern portion of the proposed Portsmouth Bypass corridor on Fairground Road behind M&J Welding, a moderately-sized industrial facility. The base of the cut is at an approximate elevation of 620 feet. The property behind and adjacent to the M&J Welding main building appears to be in the preliminary stages of development for an industrial park. The approximately lower two-thirds of the hillside behind the building is composed of the Portsmouth Shale member of the Cuyahoga Formation while the remaining one-third is composed of sandstone of the Logan The cut directly behind the building appears to be entirely within the Portsmouth Shale at approximately 1.5H:1V to 2H:1V slope. It is uncertain whether the cut was made for original construction of the building or to mitigate a landslide that might have developed after the building was constructed since the cut appears to be recent. The shale exposed in the cut showed evidence of moderate erosion and softening and appeared to be weathering quickly to clay. Road construction leading to a residence on the ridge top had exposed shale in the ditches that had become soft and plastic upon exposure. A prominent cut in the sandstone of the Logan Formation is present along the residential driveway at an approximate elevation of 820 feet. The sandstone exposed in this location was cut nearly vertical. Two prominent joint sets were observed in the rock cut, both nearly vertical with one trending approximately east-west and the other trending approximately north-south. The cut appeared to be performing well; however, it is suspected that the cut might have been recently constructed.

Large road cuts are present east and west of State Route 140, near the intersection of US 52. The cut to the west of State Route 140 is heavily vegetated with little rock exposure while the cut located east of State Route 140 is a sparsely vegetated slope consisting of mixed material ranging from shale to sandstone in thin to medium beds at an approximate roadway elevation of 560 feet. The rock strata in this cut belong to the Mississippian aged Logan Formation. The cut is approximately 1,500 feet long and 150 feet high, with a slope of approximately 1H:1V. A 20-foot wide horizontal bench was cut approximately 100 feet above SCI-CR503 and US 52 (Service Road Y on 1961 SCI-52-25.62 plans) and the other 20-foot wide horizontal bench at the base of the cut. At the time of the field observation, the slope appeared to be performing well with minor amounts of rock fall at the base. However, the bench at the base of the cut appeared to have been recently cleaned.

A large rock cut is also present along State Route 335 between Swauger Valley Road and the CSXT Rail Bridge over the Little Scioto River. The cut is on the north side of the road at an approximate roadway elevation of 660 feet. The exposed rock is a hard sandstone that is pitted and black in appearance overlying a medium hard siltstone layer which is just above the road elevation at the east end of the cut. The sandstone is jointed and is believed to be the Byer Member of the Logan Formation. The major joint set is trending east-west, parallel with the cut face. The cut appeared to be sloped at approximately 1/2H:1V. Overall, the cut appeared to be stable producing only occasional rockfall. At some locations the rock face appeared to slough off in large sheets probably due to freeze thaw action within the joints over time. At the intersection of Swauger Valley Road and State Route 335 the west face had been recently cut back with a high cut at an approximate roadway elevation of 530 feet. The cut appeared to be over 100 feet high consisting primarily of sandstone. A weak zone approximately 20 feet thick was evident about 40 feet above the base of the cut. The cut appeared to be approximately 1/2H:1V to 1/3H:1V with a bench approximately 40 to 50 feet wide at the base of the cut. Several large blocks of rock were present on the bench at the time of the field observation and were likely rock fall.

Along State Route 335, south of Wheelers Mill Road, a small cut was observed on the western side of the roadway around a bend at an approximate roadway elevation of 560 feet. This cut is a mixed slope of interbedded sandstone, siltstone and minor shale with a 1/2H:1V slope. The slope appeared to be performing poorly with large amounts of sloughed rock accumulating at the base of the cut.

Along State Route 139 between Minford and Clarktown, two rock cuts was observed along the north side of the roadway at an approximate roadway elevation of 640 feet. These rock cuts were at approximate mile markers 9.8 and 9.9 and were approximately 10 to 20 feet high with near vertical slopes in massive sandstone of the Logan Formation. The cuts appeared to be old with minimal or no recent maintenance. However, the cuts appeared to be performing well with very minimal rock fall along the base of the cuts.

4.0 FIELD EXPLORATION

DLZ personnel conducted an initial field reconnaissance and reviews of published data in February 2002. The results were compiled in a report titled *Phase I Subsurface Investigation*, *Portsmouth Bypass Transportation Study*, *Geotechnical Literature Review and Field Reconnaissance*, *SCI-823-0.00*, dated February 25, 2002.

A preliminary geotechnical investigation was performed by DLZ Ohio, Inc. as part of the Portsmouth Bypass Transportation Study. A total of twenty-one borings were drilled throughout the study corridor to develop preliminary geotechnical information to aid in the selection of feasible alternative alignments. A summary of the preliminary geotechnical investigation was presented in DLZ Ohio, Inc.'s report titled *Phase 1-Stage II Subsurface Investigation*, *Portsmouth Bypass Transportation Study, Preliminary Boring Program, SCI-823-0.00*, dated June 21, 2002.

Using the information collected during the geotechnical overview and the Phase 1-Stage II subsurface investigation, and upon review of preliminary plans, profiles and cross-sections, DLZ prepared a boring plan for geotechnical exploration. Upon review and approval of the boring plan by ODOT Office of Geotechnical Engineering (OGE) personnel, DLZ personnel performed the subsurface exploration between April 28, 2004 and September 1, 2006. The subsurface exploration consisted of drilling 530 mainline roadway borings, R-15 through R-2676, using both truck-mounted and ATV-mounted, rotary-type drill rigs. Drilling efforts included auger borings, sample borings, and rock core borings. The borings were generally spaced 300 to 600 feet apart and were advanced to depths between 15 and 230 feet. The borings generally were drilled a minimum of 10 feet below the anticipated finished grade of the roadway.

5.0 DESIGN PROCEDURE FOR CUT SLOPE RECOMMENDATIONS

On January 13, 2006, ODOT issued the Geotechnical Bulletin GB-3 "Rock Cut Slope & Catchment Design" to provide guidance on the design of rock cut slopes, rockfall catchment, and rockfall controls. During the February 3, 2006 project meeting with ODOT, an alternate roadside ditch design was selected to be used. The alternate road side ditch design does not strictly adhere to the GB-3 requirements but reduces the width of proposed rock cuts and lessens the amount of property to be taken by the cut excavations than the standard designs would require. As a result, the design of rock cut slopes for the Phase 3 of the Portsmouth Bypass project slightly deviate from the GB-3.

Note that information specific to soil cuts are presented in their respective roadway embankment report.

In general, the approach to the design of cut slopes consisted of four phases. The details of each of the design phases are discussed in the following sections.

5.1 Existing Data Evaluation

The first phase involved evaluations of available geologic data, which included surface mapping, data and information gathered from USGS, ODNR, and other relevant resources, and field reconnaissance. A summary of the existing data evaluation is presented in Section 3 of the report.

5.2 Field Investigation and Laboratory Testing

The second phase involved subsurface exploration, which included soil and rock sampling and laboratory testing of selected samples. Geotechnical information including, but not limited to, soil strength, rock structure, rock hardness, degree of weathering, and rock fabric were developed by visual descriptions of soil and rock cores, and hand penetration tests of soil samples. Slake durability tests (ASTM D4644) and point load strength index tests (ASTM D5731) were also performed on selected rock cores. Note that a factor of 21 was applied to the point load test result of a rock core to determine the equivalent uniaxial compressive strength of the rock core. According to a study, titled

Using the Point Load Test to Determine the Uniaxial Compressive Strength of Coal Measure Rock, performed by Mr. John Rusnak of the Peabody Group for the National Institute for Occupational Safety and Health, the conversion factor of 21 worked well for a variety of rock types and geographic regions.

5.3 Slope Evaluation, Design, and Layout

The third phase was to determine the cut slope configuration based on the information gathered from the first two phases of the design procedure. In designing the rock cut slope configurations, significant consideration was given to the point load strength, rock quality designation (RQD) values, rock structure and hardness, degree of weathering, and slake durability test, if available.

Cut slope benches were provided according to the following guidelines:

- 1. <u>Soil overburden benches</u>: Slopes in the soil overburden zone (where the zone is over 10 feet thick) typically had a slope of 2H:1V. At the interface between soil overburden and bedrock, a 10-foot wide bench was provided. If the overburden zone was less than 10 feet thick or the natural slope was 1H:1V or steeper, rounding of the top of the cut to blend into the natural slope was considered.
- 2. <u>Geotechnical benches</u>: These benches, generally 10-foot wide, were placed at locations where a competent lithologic rock overlies an incompetent/weathered rock. The slope of these benches longitudinally followed the base of the competent rock with an outslope having positive drainage at a maximum grade of 10%, and a minimum grade of 3%. Note that geotechnical benching must be field adjusted during construction to follow any changes in bedding surface.
- 3. <u>Construction benches</u>: For slopes steeper than 1H:1V, 5-foot wide horizontal construction benches were placed at a maximum of 30-foot vertical intervals of a rock cut slope where no geotechnical benches were required.

Note that variations in the actual construction bench widths are expected. Bench widths may need to be modified to maintain a temporary working bench, accommodate relief in the existing sloping face and overburden thickness, and minimize the amount of water flow across the cut slope face.

5.4 Quantitative Analysis of Rock Cut Slopes

The fourth phase was to evaluate the failure potential of the cut slope configuration using the Colorado Rockfall Simulation Program (CSRP), Version 4.0. This program uses slope and rock geometry and material properties to calculate falling rock bounce height, velocity and travel distance. Results of the CSRP analyses were used to verify the appropriateness of the cut slope configuration break in slope angles, and catchment ditch geometry. Based on the CSRP analysis, barriers were recommended in some areas to provide the necessary rockfall mitigation measure. Given the existing site conditions and

the results of the preliminary CSRP analyses, it appears that a minimum slope height of 80 feet is necessary for any falling rock to reach beyond the catchment ditch. Consequently, the CSRP analysis was performed only for the cut slopes 80 feet or higher.

6.0 SUBSURFACE CONDITIONS

The following sections present the generalized subsurface conditions encountered by the borings. For more detailed information, refer to the Rock Cut Boring Location Plans in Appendix A and the Boring Logs presented in Appendix B. Laboratory test results including the slake durability indices and uniaxial compressive strengths are shown on the Boring Logs and also included in Appendix B.

The overburden encountered in the borings primarily consisted of varying thicknesses of cohesive soils including Sandy Silt (A-4a), Silt (A-4b), Silt and Clay (A-6a), Silty Clay (A-6b), and Clay (A-7-6). Occasionally, granular materials consisting of Coarse and Fine Sand (A-3a), Gravel with Sand (A-1-b) and Gravel with Sand and Silt (A-2-4), and Gravel with Sand, Silt and Clay (A-2-6) were also encountered.

Bedrock encountered in the borings correlates well with the available geologic references. The cores obtained consisted primarily of sandstone and occasionally shale, siltstone, clayshale and coal with varying degrees of weathering and different amounts of fracturing. During the rock coring operation, some water was lost into the voids in the rock. The final water levels in the borings varied widely at the completion of rock coring.

Based on the site plans provided, rock cut slope is only required in certain areas of the proposed alignment between Station 40+00 and Station 351+50. In considering the rock cut slopes, these areas were divided into eleven cut sections, namely Rock Cuts #1 through #11, as shown in the table in Section 1.0 of this report. In addition, rock cut slopes are also necessary along the US Route 52 Ramps A and B, Rock Cut SR 140 Ramp A and Cut SR 140 Ramp B.

The sections that follow present the generalized subsurface conditions encountered by the borings within the anticipated rock cut sections, which was used to construct the rock cut profiles for the sections. For detailed information, refer to the boring logs in Appendix B. The boring logs are separated by divider tabs according to the associated rock cut number.

6.1 Rock Cut US Route 52 Ramps A and B (Station 40+50 to Station 54+00) and Rock Cut #1 (Station 54+00 to Station 61+25)

The subsurface conditions generally consisted of less than 8 inches of topsoil underlain by soils including Silt (A-4b), Silt and Clay (A-6a), Sandy Silt (A-4a), Gravel and Stone Fragments with Sand and Silt (A-2-4), and Sandy Silt (A-4a) and Fine Sand (A-3). Silt (A-4b), Silt and Clay (A-6a) and Sandy Silt (A-4a) were the most common soil types encountered. Soil overburden thickness generally ranged from less than 1 foot to 19 feet.

Below the topsoil and soils, a layer of severely weathered argillaceous sandstone, between 1 and 5 feet thick, was encountered in most of the borings. Generally the

severely weathered rock was similar to the type of intact bedrock encountered immediately below it. The competent bedrock generally consisted of sandstone.

Bedrock was confirmed by coring in all borings. Bedrock primarily consisted of medium hard to hard, very fine to fine-grained sandstone. Sandstone containing varying amounts of siltstone and shale were also encountered. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

Wet conditions were encountered during the drilling of Boring R-2014; however, seepage was not observed in the overburden. Prior to coring, 8.1 feet of water was observed in the borehole. Groundwater and seepages were not encountered in any other boreholes drilled for these rock cuts prior to coring. Noted that the water levels at completion, recorded on the boring logs, included the water used for coring.

Dominant Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	24 - 100	76-3,678	1,596-77,238	1,621-13,958	4.1-99.8
Sandstone and Shale with varying amounts of interbedding	66-91	361-728	7,581-15,288	4,352-12,960	64.9-89.8

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.2 Rock Cut #2 (Station 77+00 to Station 106+25)

Generally, the near-surface conditions consisted of a veneer of topsoil overlying the soil. Topsoil thicknesses were typically less than 0.5 foot while the underlying soils ranged in thickness from 3.0 to 10 feet. Soils including Sandy Silt (A-4a), Silty Clay (A-6b), Silt and Clay (A-6a), Silt (A-4b), Fine to Coarse Sand (A-3a) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were encountered.

Below the topsoil and soil overburden, a layer of severely weathered rock was encountered in most of the borings, ranging in thickness between 1.5 and 9.5 feet. The severely weathered rock, primarily consisted of weathered sandstone, weathered shale and siltstone were also encountered. The highly weathered bedrock generally was similar to the type of intact bedrock encountered immediately below it.

Bedrock was confirmed by coring in all borings. Bedrock primarily consisted of medium hard to hard, very fine to fine-grained sandstone. Occasionally, argillaceous laminations and finer grained zones were interspersed with the sandstone. Shale was also encountered in several borings. Additionally, several borings encountered some interbedded zones consisting of varying amounts of shale, siltstone and sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

Seepage was noted at depth of 1.0 foot in Borings R-34 and no appreciable amount of water was present in the borings prior to coring. Groundwater and seepage were not encountered in any other boreholes prior to coring drilled for this rock cut.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	8-100	43-2,042	903-42,882	2,629-13,945	39.4-99.0
Sandstone, Siltstone and Shale with varying amounts of interbedding	33-100	40-468	840-9,828	5,662-12,415	74.2-93.2
Shale	57-97	17-500	357-10,500	2332	11.7

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.3 Rock Cut #3 (Station 138+75 to Station 173+25)

The subsurface soil conditions consisted of thin topsoil layer, typically less than 8 inches, followed by up to 8 feet of soil or highly weathered bedrock. Sandy Silt (A-4a) was the most prevalent soil type identified. Silt and Clay (A-6a), Silty Clay (A-6b), Fine to Coarse Sand (A-3a) and Clay (A-7-6) were also noted. Soil thickness was generally less than ten feet with few exceptions. Boring R-72 has a soil thickness of 25 feet and Boring R-85 had a thickness of 14 feet.

The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. A layer of severely weathered sandstone was mostly encountered in the upper 1 to 2 feet of the bedrock strata. However, severely weathered bedrock layers of up to 7.5 feet thick were occasionally encountered. Below the severely weathered layer, the sandstone was mostly medium hard to hard sandstone. Shales and mixtures of siltstone, shale, sandstone and coal were found in rock strata between elevation 805 and 850. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was encountered in Borings R-81 and R-87 approximately one foot below ground surface and in Boring R-85 at a depth of 6 feet. None of the borings contained appreciable water amounts of water prior to coring. The other borings reviewed for this rock cut did not encounter any water seepage or measurable water levels prior to rock coring.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	16-1,758	336-36,918	7,492-14,941	83.5-98.3
Sandstone with varying amounts of interbedding	30-100	10-516	210-10,836	2,173-7,923	3.3-76.5
Shale	0-100	12-376	252-7,896	252-7,896	0-58.4
Siltstone	58-94	133-549	2,793-11,529	3,758	41.5-93.5

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.4 Rock Cut #4 (Station 177+75 to Station 207+25)

The subsurface conditions generally consisted of less than 0.5 foot of topsoil overlying the soil. Silt and Clay (A-6a), Sandy Silt (A-4a) and Silt (A-4b) were the most prominent soil types identified in the soil overburden. Soil thicknesses varied and generally ranged from 3 to 12 feet. However, soil thicknesses were up to 37.5 feet in some areas. Severely weathered sandstone was encountered in SPT samples collected in the bedrock. These severely weathered samples were similar to the underlying competent rock and were thin, typically less than 4 feet thick.

The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. Below the highly weathered layer, the sandstone was mostly medium hard to hard. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone are summarized in the table below.

Most of the borings did not encounter any seepage prior to rock coring. However, seepage was encountered in Boring R-102 at depths of 8.5 and 35 feet, Boring R-103 at a depth of 2.5 feet and at depths of between 11.0 and 21.0, and Boring R-104 at depths of between 16.0 and 30.0 feet. Wet soils were noted in Boring R-140 between the depths of 18 and 20 feet. However, no measurable water levels were present in any of the borings drilled for this rock cut prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	127-2,225	2,667 – 46,725	3,201 – 12,131	97.5- 98.2

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.5 Rock Cut #5 (Station 212+25 to Station 228+00)

The subsurface conditions generally consisted of less than 4 inches of topsoil underlain by soils including Silty Clay (A-6b), Silt and Clay (A-6a) and Silt (A-4b). Overburden was generally less than 3.5 feet to as much as 8.5 feet thick.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

Severely weathered sandstone and shale were mostly encountered in the upper 2 to 5 feet of the bedrock strata. The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. However, shale, claystone, siltstone and coal were encountered between elevations 796 and 837. All borings were completed at least 10 feet into bedrock. Generally, the sandstone bedrock was mostly medium hard to hard. Shale, claystone, siltstone and coal bedrock were typically weaker and less durable than the sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	30-100	25-553	525-11,613	1,918-11,696	4.9-97.6
Varying amounts of Shale, Siltstone, Sandstone and Coal interbeded	37-100	116-285	2,436-5,985	NM	NM
Shale	88-100	37-118	777-2,478	2,101	1.7-10.2
Siltstone	88-100	43-433	903-9,093	987-4,920	19.4-49

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

NM = not measured.

6.6 Rock Cut #6 (Station 257+75 to Station 268+25)

Topsoil was not encountered in any of the borings drilled for this rock cut area. The overburden was typically 3 to 13 feet thick. Silt and Clay (A-6a) and Sandy Silt (A-4a) were the majority of the soil types encountered although smaller amounts of Silty Clay (A-6b) and Clay (A-7-6) were also encountered.

A layer of severely weathered rock was encountered below the soils. This layer of severely weathered rock was only a few feet thick and rapidly gave way to the more competent rock below. The primary bedrock in the area was medium hard to hard sandstone. However, shale and mixes of shale, sandstone siltstone and coal were located between elevation 830 and 886. Very fine to fine grained sandstone was generally encountered at approximate elevation 830. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	21-778	411-16,338	2,324-11,150	67-93.6
Varying amounts of Shale, Siltstone, Sandstone and Coal interbeded	53-87	59-490	1,239-10,290	NM	3.1
Shale	22-94	25-296	525-6,216	703	11.4-45.2

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.7 Rock Cut #7 (Station 269+75 to Station 290+25)

Generally less than one foot of topsoil was encountered in this cut section area. Below the topsoil, the soils were between less than one foot and 24.5 feet thick. Soils were typically Silt and Clay (A-6a), Clay (A-7-6) and Sandy Silt (A-4a). Smaller amounts of Silty Clay (A-6b) were also encountered. Generally, finer grained clay soils were more prevalent where soils were thicker and silts were more prevalent where the overburden was thinner. Up to 9 feet of severely weathered bedrock was encountered below the soil layer.

With few exceptions, all borings encountered bedrock consisting of medium hard to hard sandstone below elevation 809. Soft shale, coal and siltstone were encountered in several borings above elevation 809. Interbedded sandstone and siltstone were also encountered sporadically across the stratagraphic column. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was encountered in Borings R-150 and R-154 at depths of 5 feet and 9 feet, respectively. However, no appreciable amount of water was encountered in any of these borings prior to coring. The other borings reviewed for this cut did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	16-100	18-1,636	378-34,356	2,974-11,269	80.9-81.1
Varying amounts of Shale, Siltstone, Sandstone and Coal interbeded	67-100	26-395	756-8,295	2,270-9,960	1.4-18.7
Shale	27-100	28-369	588-7,749	699-5,348	14.6-64.2

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.8 Rock Cut #8 (Station 305+75 to Station 317+25)

Typical topsoil thicknesses were between 1 to 4 inches. Below the topsoil, borings encountered 5 to 21 feet of native soil. Sandy Silt (A-4a) was the most common soil encountered. Clay (A-7-6), Silt and Clay (A-6a) and Silt (A-4b) were also encountered but were about half common as Sandy Silt. (A-4b). Single occurrences of Silty Clay (A-6b) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were encountered in the borings drilled for this rock cut. All of these soils appeared to be derived from the bedrock. Soil thicknesses varied widely across the rock cut area and ranged from 0 to 14.5 feet.

The severely weathered bedrock located beneath the soil was similar to the underlying rock. The severely weathered rock was typically less than 9 feet thick. Generally the principal bedrock type encountered in the area was sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was not encountered in any of the borings. However, wet soil conditions were reported in two borings, R-177 and R-178, at depths of at 5 feet and 2.5 feet, respectively. No measurable water levels were present in any of the borings prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	51-100	189-2,071	3,969-43,491	5,323-8,478	NM

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.9 Rock Cut #9 (Station 322+75 to Station 328+25)

Borings located between stations 322+75 and 328+25 report a little to no topsoil. The thicknesses of the soils were found to be a maximum of 15 feet. Silt and Clay (A-6a), Clay (A-7-6), and Silt (A-4b) are the primary soil types encountered in the borings. Below the soil was a layer of severely weathered rock. The thicknesses of the severely weathered rock ranged from approximately 0 to 5 feet.

The bedrock was typically medium hard to hard, very fine to fine grained sandstone with occasional zones containing varying amounts of argillaceous laminations. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	14-100	19-1,633	399-34,293	4,621-8,880	89.2-97.6

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.10 Rock Cut #10 (Station 329+25 to Station 343+75)

Generally, less than 5 inches of topsoil was encountered in this rock cut area. Soil encountered by the boreholes mainly included Sandy Silt (A-4a) Silt and Clay (A-6a) and Clay (A-7-6). However, lesser amounts of Silty Clay (A-6b) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were also encountered. The soil thicknesses were typically less than 6 feet. However, Boring R-199 encountered approximately 26 feet of soil. Severely weathered bedrock, approximately 0 to 15 feet thick, was encountered beneath the soils. The severely weathered bedrock consisted mostly of sandstone but siltstone and shale were also noted.

Bedrock generally consisted of medium hard to hard, very fine to fine sandstone or sandstone with varying amounts of shale interbedding or argillatious laminations. Interbedded bedrock and shale typically appeared to be most prominent above elevation 760. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	215-2,016	4,515-42,336	1,701-12,224	63.5-98.1
Sandstone and Shale interbedded	0-100	76-507	1,596-10,647	NM	18.6

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

6.11 Rock Cut #11(Station 347+25 to Station 351+50)

Rock Cut 11 is one of the shortest and shallowest cuts along the proposed Phase 3 alignment. It will be about 425 feet in length with a typical cut depth of less than 20 feet. Two borings drilled for this rock cut indicate that the area was covered with approximately 11.5 to 23 feet of soil. No topsoil was encountered in either boring. The soil types identified included Sandy Silt (A-4a), Clay (A-7-6) and Silt and Clay (A-6a). One sample of Silt (A-4b) was encountered in Boring R-206 between elevation 658.9 and

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

661.4. Below these soils, 8 to 10 feet of severely weathered sandstone and shale were encountered in these borings.

The two borings were cored ten feet into rock. The recovered samples consisted of moderately to highly weathered sandstone. Testing was not performed on the rock cores collected from these borings for point load strengths, uniaxial compressive strengths, and slake durability indices (SDI). Rock Quality Designation (RQD) values of the sandstone cores are summarized in the table below.

Wet soil conditions were reported at a depth of 21 feet in Boring R-206; however, this boring did not encounter any water seepage. Prior to coring, seepage and measurable water levels were not present in any of the borings drilled in this rock cut area.

Rock Types	RQD, %	Point Load Strengths, psi	Equivalent Compressive Strengths, psi	Uniaxial Compressive Strengths, psi	SDI, %
Sandstone	78-91	NM	NM	NM	NM

NM = not measured.

6.12 Rock Cut SR 140 Ramp A (Station 77+00 to Station 105+50)

In general, the topsoil thicknesses found in the borehole locations were less than 6 inches. Silt (A-4b) and Sandy Silt (A-4a) were the most common soil types found overlying the bedrock. A small amount of Silt and Clay (A-6a) was also encountered. Soil thicknesses found in the borings were generally between 4 and 15 feet. However, boring B-1408 encountered a soil thickness of approximately 1.5 feet. Generally severely weathered bedrock underlying the soils was less than 3 feet thick. However, boring R-30 encountered a decomposed rock thickness of 8.5 feet.

The dominant rock type in this rock cut was sandstone. However, Boring R-30 encountered a layer of shale just below the severely weathered zone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	61-100	228-454	4,788-9,534	7,841-13,025	93.2-97.8
Shale	21	38	798	NM	NM

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

NM = not measured.

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.13 Rock Cut SR 140 Ramp B (Station 60+92 to Station 77+95)

The borings encountered less than 6 inches of topsoil in this cut area. The overburden soils were generally thin, less than 15 feet thick. These soils were mostly Silt (A-4b) although smaller amounts of Silt and Clay (A-6a) and Sandy Silt (A-4a) were also encountered. Severely weathered sandstone was located below the soil layer. The severely weathered bedrock was generally less than 5 feet in thick.

With the exception of Boring R-30, which contained a layer of shale below the severely weathered zone, the competent bedrock encountered below the severely weathered zone was mostly fine to very fine grained sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	44-100	106-601	2,226-12,621	8,887	91.5
Shale	21	38	798	NM	NM

^{*}Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

NM = not measured.

7.0 ROCK EXCAVATION AND CUT SLOPE RECOMMENDATIONS

7.1 Rock Excavation Recommendations

The rippability of the bedrock is estimated to be fair to good for the upper 10 to 15 feet due to its weathered condition. Below the upper 10 to 15 feet of weathered material the rippability is estimated to be poor to fair and rock blasting will be required to achieve the roadway template. Blasting efforts should conform to Item 208 of the current CMS. All blasting operations should also be performed in accordance with applicable federal, state, and local laws and regulations.

7.2 Cut Slope Recommendations

Cut slope recommendations were based upon visual observations of the rock cores obtained, the presence and angles of joints and/or fractures within the cores, depths to bedrock, point load strengths, uniaxial compressive strengths, laboratory SDI, regional and local lithology, results of the field reconnaissance, and DLZ's past experiences. In general, DLZ reviewed the profile and cross-section views of the cuts to determine the likely positions/elevations for bench locations. Benches were typically placed at lithology breaks where a more durable rock overlies a weaker rock unit. Upon identifying the bench positions, the lift height between benches was evaluated and

^{**}Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

additional benching used, if considered to be appropriate. The details of the cut slope design procedure are presented in Section 5.0 of this report.

In general, sandstone slope angles are recommended to be cut on 0.5H:1V slopes. Severely weathered sandstone should be cut on 1.5H:1V or flatter slopes. Shales, siltstones, clayshales, claystones, and siltshales were typically soft, severely to highly weathered and prone to rapid weathering once exposed and were typically recommended to be cut on 2H:1V slopes.

Specific recommended cut slope configurations are included in Appendix D of this report.

7.3 Groundwater Considerations

Generally, groundwater was not encountered in the unconsolidated materials or severely weathered bedrock along the project alignment except in a few locations. Seepage was generally encountered in thin zones less than 2 to 3 feet thick at the time of the investigation. As a result, significant yields of groundwater would not be anticipated in the overburden. The amount seepage in the bedrock could not be readily determined because water was added to core the bedrock. Final water levels reported in the borings reflect water added for coring and are not indicative of the actual groundwater levels. It should be noted that groundwater conditions can change with time, seasonal changes and precipitation. The reported findings represent only the conditions encountered at the time of drilling and may not be indicative of the long-term groundwater conditions. The contractor should be prepared to perform dewatering to maintain reasonably dry excavations and prepared to deal with unexpected seepage and precipitation entering any excavations. A summary of the groundwater findings is presented below.

Rock Cut US Route 52 Ramps A and B (Station 40+50 to Station 54+00) and Rock Cut #1 (Station 54+00 to Station 61+25)

Seepage was encountered in Boring R-23 at a depth of 20.7 feet (approximate elevation 751 at Station 58+17.3, 191.2' RT). At the completion of drilling, five feet of water was present in the borehole. Note that no water was added to the boring. Although the boring was located outside the rock cut and on a flank of a hillside away from the rock cut, there is a possibility that similar groundwater bearing strata could be encountered within the proposed rock cut. Seepage was not encountered in the soil strata in Boring R-2014 (Station 46+43.1, 25.4' LT) but 9.4 feet of water was present in the borehole prior to coring. This boring was located in the area that will have significant excavation. Any seepage zones within the soil will likely be completely removed prior to rock excavation. Depending on the field conditions during construction, special sloping and benching may be necessary to control and direct runoff during and after construction.

Rock Cut #2 (Station 77+00 to Station 106+25)

Seepage was noted at a depth of 1.0 foot in Boring R-34. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #3 (Station 103+75 to Station 173+25)

Seepage was noted at a depth of 1.0 foot in Borings R-81 and R-87 and at a depth of 6 feet in Boring R-85. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #4 (Station 177+75 to Station 207+25)

Wet conditions were encountered in a Clay (A-7-6), between the depths of 18.0 and 20.0 feet (elevation 589.8 and 892.3), in Boring R-104. Additionally, groundwater seepage was noted in Boring R-102 between depths of 8.5 and 35.0 feet and in Boring R-103 at a depth of 2.5 feet and between the depths of 11.0 and 21.0 feet. However, none of these borings had appreciable amount of water present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #5 (Station 212+25 to Station 228+00)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #6 (Station 257+75 to Station 268+25)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #7 (Station 269+75 to Station 290+25)

Seepage was encountered in Boring R-150 at a depth of 5 feet but no measurable water was present in the boring prior to coring. Seepage was also encountered in Boring R-2154 at a depth of 8 feet (286+03.1, 117.5°. LT at elevation 778.9). This seepage zone was within the sandstone that will be cut. Seepage through joints or seams in this type of rock formation is not uncommon. Depending on the field conditions during construction, special sloping and benching may be necessary to control and direct runoff during and after construction.

Rock Cut #8 (Station 305+75 to Station 3170+25)

Seepage was noted at a depth of 2.5 feet in Boring R-178 and at a depth of 5 feet in Boring R-177. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #9 (Station 322+75 to Station 328+25)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #10 (Station 329+25 to Station 343+75)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #11(Station 347+25 to Station 351+50)

Seepage was encountered in Boring R-206 at a depth of 21.0 feet. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, this low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut SR 140 Ramp A (Station 77+00 to Station 105+50)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut SR 140 Ramp B (Station 60+92 to Station 77+95)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

8.0 COLORADO ROCKFALL SIMULATION PROGRAM (CRSP) ANALYSES

The CRSP requires the input of a number of coefficients concerning the slope geometry, slope material properties, rock material properties and the assumption of rock geometry. In general, the ODOT Geotechnical Bulletin GB-3 "Rock Cut Slope & Catchment Design" was used as a guide for input data and catchment ditch configuration. Input data was also based on field observations and measurements of the existing rock cuts described in Section 3.5 of this report. The number of rocks simulated for the analyses was 500 and the shape of rock was assumed to be discoidal. Note that rounded rocks generally result in greater amounts of rock reaching the roadway since rounded rocks rolling gather a great deal more energy than angular blocks sliding. Based on the observations of the rock cores obtained, it is our opinion that the discoidal rocks can better describe the types of rocks encountered in the borings. The average rock size used in the analyses was a 1-foot tall and 1-foot diameter discoidal rock, while the maximum size used in the analyses was a 1.5-foot tall and 1.5-foot diameter discoidal rock. A summary of the input data for the CRSP analyses is presented in the following table.

Input Data for End of Construction Conditions

Rock Type	Rock Thickness	Rock Diameter	Surface Roughness (S.R.)	Tangential Coefficient (Rt)	Normal Coefficient (Rn)	Rock Density
Hard Sandstone and Siltstone	1.5	1.5	0.15	0.85	0.2	155
Shale	1.5	1.5	0.3	0.75	0.18	140
Sandstone with Shale interbeds	1.5	1.5	0.25	0.75	0.18	145
Hard Sandstone and Siltstone	1	1	0.12	0.85	0.2	155
Shale	1	1	0.15	0.75	0.18	140
Sandstone with Shale interbeds	1	1	0.14	0.75	0.18	145

Input Data for Long-term Conditions

Rock Type	Rock Thickness	Rock Diameter	Surface Roughness (S.R.)	Tangential Coefficient (Rt)	Normal Coefficient (Rn)	Rock Density
Hard Sandstone and Siltstone	1.5	1.5	0.3	0.8	0.18	155
Shale	1.5	1.5	0.5	0.68	0.15	140
Sandstone with Shale interbeds	1.5	1.5	0.6	0.6	0.15	145
Hard Sandstone and Siltstone	1	1	0.21	0.8	0.18	155
Shale	1	1	0.3	0.68	0.15	140
Sandstone with Shale interbeds	1	1	0.28	0.6	0.15	145

Given the existing site conditions and the results of the preliminary CSRP analyses, it appears that a minimum slope height of 80 feet is necessary for any falling rock to reach beyond the catchment ditch. Consequently, the CSRP analysis was performed only for the cut slope of 80 feet or higher along the proposed alignment. A summary of the CRSP analysis results is presented in the following table. The output of the CRSP analyses is included in Appendix B.

Rock Cut #	Stations	Left Slope	Right Slope
US 52 Ramps A&B	40+50 - 54+00 &	Failed**	Passed*
1	54+00 - 61+25		
2	77+00 – 106+25	Passed	Not Run, < 80'
3	138+75 – 173+25	Passed	Passed
4	177+75 – 207+25	Not Run, < 80'	Passed
5	212+25 - 228+00	Not Run, < 80'	Not Run, < 80'
6	257+75 – 268+25	Not Run, < 80'	Not Run, < 80'
7	269+75 – 290+25	Not Run, < 80'	Not Run, < 80'
8	305+75 - 317+25	Not Run, < 80'	Not Run, < 80'
9	322+75 – 328+25	Not Run, < 80'	Not Run, < 80'
10	329+25 - 343+75	Passed	Not Run, < 80'
11	347+25 - 351+50	Not Run, < 80'	Not Run, < 80'
SR 140 Ramp A	77+00 – 105+50	Not Run, < 80'	Not Run, < 80'
SR 140 Ramp B	60+92 - 77+95	Not Run, < 80'	Not Run, < 80'

^{*}Passed = Greater than or equal to 95% rockfall catchment achieved at analysis point 2.

Based on the results of the CRSP analyses, a Type D barrier placed at the edge of the catchment ditch is recommended as a rockfall mitigation measure for the failure area in rock cut #1. The proposed location of the barrier is the left side of the cut between stations 52+50 and 54+50. The CRSP analyses did not identify other areas requiring rockfall mitigation measures.

9.0 ODOT GENERAL EARTHWORK DESIGN CHECKLIST

The ODOT General Earthwork Design Checklist – Centerline Cuts Checklist is included in Appendix C of this report.

^{**}Failed = Less than 95% rockfall catchment achieved at analysis point 2.

10.0 CLOSING REMARKS

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning this report.

Respectfully submitted,

DLZ OHIO, INC.

Eric W. Tse, P.E. Senior Geotechnical Engineer

Andrew Jalbrzikowski Geologist



Brian E. Mott Senior Geologist, P.G.

BEM/aj/ewt

 $M:\proj\old 21\all 3070.03\c Cut\ Slope\ Designs\Submittals\Submittal\ Rock\ Cut\ Report\ Phase\ 3-Stage\ 1\all SCI\ 823.00-Rock\ Cut\ Rpt-Phase\ 3-Stage\ 1. ScI\ 823.00-Rock\ Rpt-Phase\ 1. ScI\ 823.00-Rock\$

APPENDIX A

Project Location Map Project Alignment and Boring Plan

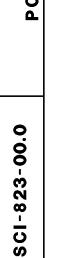


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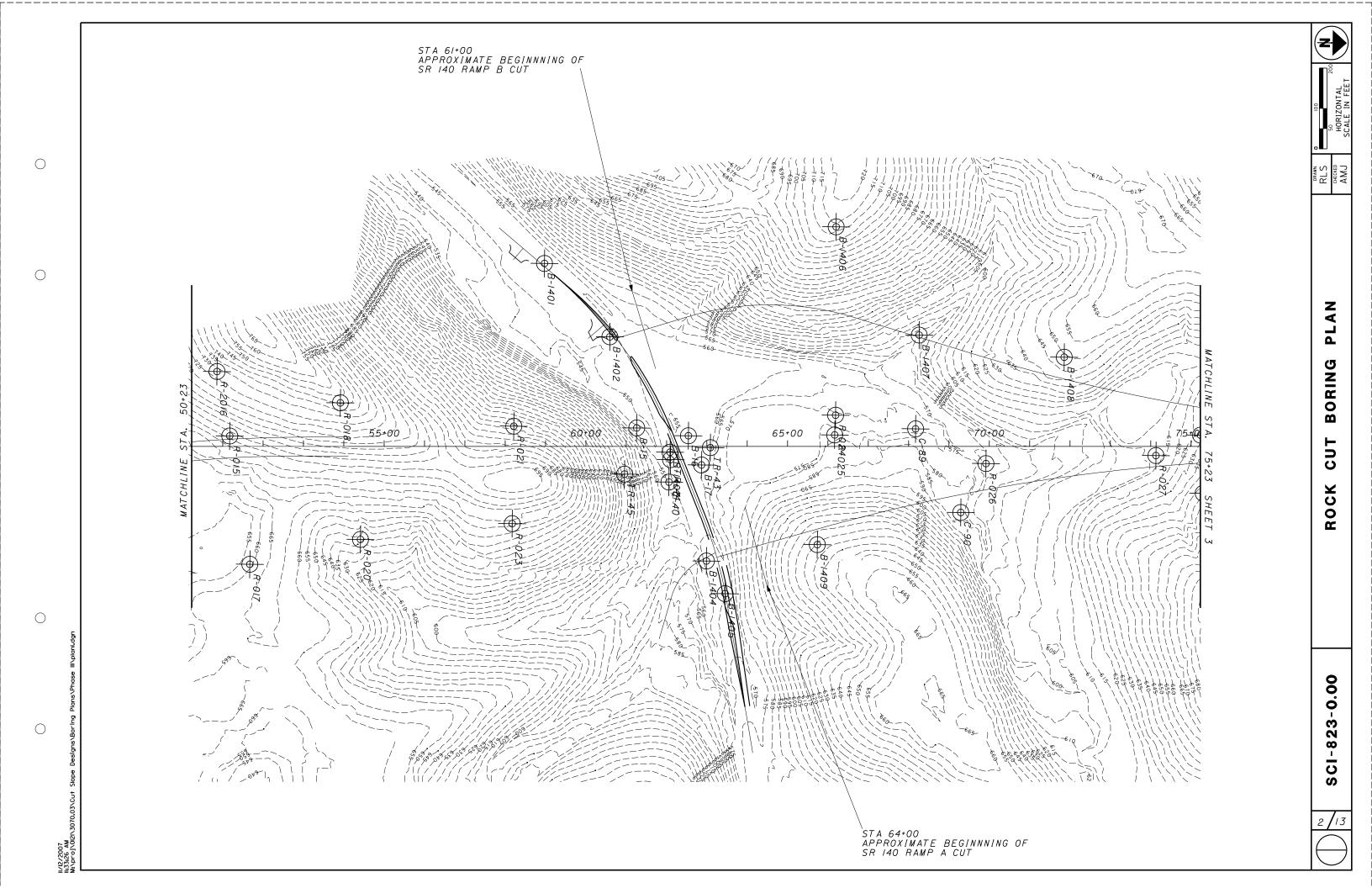


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 \bigcirc

ROCK

SCI-823-0.00





RLS CHECKED AMJ

 \bigcirc \bigcirc STA 138+75 APPROXIMATE BEGINNING OF CUT 3 \bigcirc

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PRAWN RLS CHECKED AMJ

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PRAWN RLS CHECKED AMJ

SCI-823-0.00

PLAN

PLAN

BORING

CUT

ROCK

SCI-823-0.00

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245+00 230-00 240+00 R-/33 STA 228+00 APPROXIMATE END OF ROCK CUT 5

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SCI-823-0.00

PRAWN RLS CHECKED AMJ





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PRAWN RLS CHECKED AMJ



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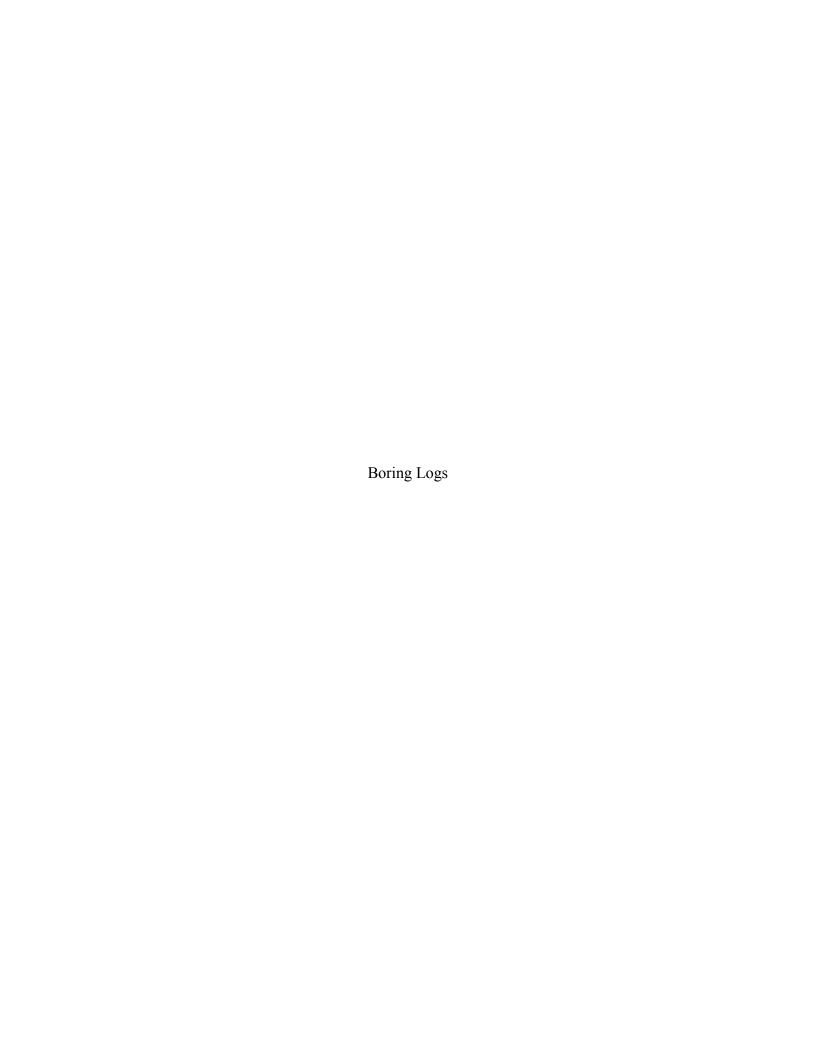
PRAWN RLS CHECKED AMJ



SCI-823-0.00

APPENDIX B

Boring Logs
Results of Slake Durability Index and Uniaxial Compressive Tests
Cut Slope Cross Sections
Colorado Rock Fall Simulation Analysis



Client: 7					_		Project: SCI-823-0.00								Job No	. 0121	-307	0.03
LOG C	F: Bo	ring	B-15		_	ocation: Sta	a. 61+26.0, 45.9 ft. LT of SR 823 CL Date Drilled: 9/	20/0										
Depth (ft)	Elev. (ft) 551.8	Blows per 6"	Recovery (in)	Samp No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate		% M. Sand	and	<i>t</i>	% Clay	Natu Pi	NDARD ral Moist L ⊢—— Blows p 0 2	ure Cor er foot	ntent, %	6 - •
_	-551.6- -548.8-	4 9 15	10	1 2		-	Topsoil - 2" Medium dense brown SILT (A-4b), little clay, trace to little fine sand, trace to little coarse sand, little gravel; dry to damp. Severely weathered brown SILTSTONE, arenaceous.	12	9		9	55	15					140
4.5 5 -	- 547.3-	Core 30"	Rec 29"	RQD 87%	R-1		Medium hard to hard gray SANDSTONE, fine to medium grained, moderately to slightly weathered, medium to thickly bedded, slightly fractured. @ 4.5'-4.7', brown.	-										
- 10 10 7	-541.1 -	Core 60"	Rec 60"	RQD 97%	R-2		 4.9', 5.1', 5.2', 8.1', argillaceous, low angle fractures. 5.7'-6.1', qu=12,960 psi, Er=2,626,964 psi. 8.6'-8.8', high angle fracture, brown. 											
- - -	-537.3-	Core 30"	Rec 30"	RQD 80%	R-3		Medium hard to hard gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, moderately weathered, medium bedded, highly to moderately fractured. @ 11.4', 11.9', 13.3', 13.6', argillaceous, low angle fractures. @ 12.1'-12.3', high angle fracture. \[@ 14.1'-14.5', qu=13,299 psi. \]											
- - -							Bottom of Boring - 14.5'											
20 —																1 1 1 1	1111	1 1
25 — 																		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
- -																		1 1 1 1 1 1 1 1 1 1 1 1

Client: T	ΓranSy	stems	, Inc.				Project: SCI-823-0.00							Job No. 0121-307	0.03
LOG O	F: Bo	ring	R-15	_		ocation: Sta	a. 51+17.4, 25.9 ft. LT of SR 823 CL Date Drilled: 4/	13/0				to		4/14/05	
Depth (ft)	Elev. (ft) 692.2	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	and	t.	% Clay	STANDARD PENETRATION Natural Moisture Content, Some PL I I I I I I I I I I I I I I I I I I	
0 0.7- <u></u> -	-691.5-	3 4 7	18	1		3.0	Topsoil - 8" Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.							R	
5 		5 8 10	18	2		4.5+		5	5		7	51	32		
 8.0	-684.2-	5 10 14	18	3		4.5+	Hard brown SILT (A-4b), some clay, little fine to coarse sand;							\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
10 —		6 16 49	18	4		4.5+	contains sandstone fragments; damp.								6
-		12 16 25	18	5		4.5+		0	5		8	56	31		
15 —		8 12 19	18	6		4.0									
- -		11 13 14	18	7		4.5+									
19.0 20 	-673.2-	9 25 32 18 38	18	8			Severely weathered brown SANDSTONE, argillaceous.								5
-22.0 - - - 25 -	- 670.2-		15 Rec			*007	Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured to broken, with typical low angle iron stained fractures.								1 1 1
-28.7 	-663.5-	120"	120"	RQD 74%	H-1	*297	Soft to medium hard brownish gray SANDSTONE.								1 1 1

	TranSy				_		Project: SCI-823-0.00								lob No. 01	21-30	70.03
LOG (DF: Bo	ring	R-15		_	ocation: Sta	L. 51+17.4, 25.9 ft. LT of SR 823 CL Date Drilled: 4/	13/0			A T /	to		4/14/05			
Depth (ft)	Elev. (ft) 662.2	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura. PL	DARD PEI Moisture 	Content	
30 —	658.8	Core 120"	Rec 120"	RQD 93%	R-2	*394	Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. Medium hard to hard gray SANDSTONE; very fine to fine grained, micaceous, argillaceous, thinly bedded to thickly bedded, highly to moderately fractured, with typical low angle clay filled fractures; contains few to moderate argillaceous laminations in lenses. @ 36.0'-36.2', IRON STONE.										
45 — 50 —		Core 120"	Rec 120"	RQD 88%	R-3	*382	 @ 44.6'-44.7', decomposed argillaceous lens. @ 45.5'-46.5', SDI = 98.1%. @ 46.6'-47.0', qu = 1,911 psi. @ 50.8'-50.9', 55.5'-55.6', argillaceous zones. 										1 1 1 1
- 55 	- - - - -	Core 120"	Rec 120"	RQD 88%	R-4	*434	@ 56.3'-57.2', contains moderate to abundant argillaceous laminations.										

Client:					_		Project: SCI-823-0.00								Job No.	0121	-3070).03
LOG C	F: Bo	ring	R-15		_	ocation: Sta	L. 51+17.4, 25.9 ft. LT of SR 823 CL Date Drilled: 4/	13/0				to		4/14/05				
Depth (ft)	Elev. (ft) 632.2	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	Sand	Sand	% F. Sand	% Silt	% Clay	Natura PL	IDARD F al Moistu Blows pe	re Con	tent, % ──	5 - (
60 — - - -63.8—	628.4						Medium hard to hard gray SANDSTONE; very fine to fine grained, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures. Hard gray SILTSTONE interbedded with SANDSTONE;											
65 —		Core 120"	Rec 120"	RQE 91%	R-5	*361	slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately fractured, with typical low angle clay filled fractures, friable. @ 66.3'-66.7', qu = 4,352 psi. @ 68.0'-68.7', SDI = 89.8%.											
72.9 — 75 — 75 — - - 80 —	619.3-	Core 120"	Rec 120"	RQE 100%	R-6	*473	@ 72.7', 78.1', low angle clay filled fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
85 — - - - -		Core 120"	Rec 120"	RQE 100%	R-7	*501	@ 86.5' pyritic inclusions											1.1

Client:	TranSy	stems	. Inc				Project: SCI-823-0.00	00-0	040						Joh No	012	1-3070	.03
	F: Bo				L	ocation: Sta	a. 51+17.4, 25.9 ft. LT of SR 823 CL Date Drilled: 4/	13/0)5			to	4,	 14/0!		. 0.12	. 00.0	.00
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _i No	ole	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	% Aggregate	GI	% M. Sand	F. Sand	Silt	% Clay	STA Natu Pi	NDARD ral Mois - ⊢—— Blows µ	ture Co		- • .L
90 —	602.2	Core 120"	Rec 120"	RQD 100%		*511	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured, pyritic.	8	8	8	85	82				20 .	30 4	10
105 —		Core 120"	Rec 120"	RQD 100%	R-9	*537												
115 —	572.2	Core 96"	Rec 96"	RQD 100%	R10	*649	Bottom of Boring - 120.0'											

	TranSy				_		Project: SCI-823-0.00									o. 012	21-307	70.03
_OG (DF: Bo	ring	R-17		_	ocation: Sta	i. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4/	14/0				to	4/	5/0	5			
Depth (ft)	Elev. (ft) 659.2	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moi L ⊢			% - LL
-0.4 - - -	658.8 -	1 3 5	18	1		1.0	Topsoil - 5" Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp to moist.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
5 —		5 12 18		2		4.5+		12	5		20	39	24					
- 	651.2	19 28 11 17		3		4.0	Dense orangeish brown FINE SAND (A-3), little silt, trace clay dry to damp.											
_	649.2- -647.2-	30 50/3	18	5			Severely weathered orangeish brown SANDSTONE.						1					
14.5— 15 — 15 — - - 20 —	644.7-	Core 120"	Rec 120"	RQD 76%	R-1	*402	Hard gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, micaceous, thinly bedded to thinly bedded. ② 12.9'-13.1', 14.0'-14.3', high angle iron stained fractures. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains few argillaceous laminations. ② 15.0', 17.4', 18.5', low angle clay filled fractures. ② 17.5', 17.6', 17.7', low angle iron stained fractures. ② 18.6', 18.7', 20.9', low angle clay filled fractures. ② 19.0'-19.3', broken zone.											
- 25 - - -		Core 120"	Rec 120"	RQD 98%	R-2	*425	@ 22.6', 23.2', 23.3', low angle clay filled fractures.@ 26.2', 29.9', 30.3', low angle clay filled fractures.											

Client:					_		Project: SCI-823-0.00								ob No. 01	21-307	70.03
LOG C	F: Bo	ring	R-17	0	_	ocation: Sta	. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4/	14/0			A T10	to		4/15/05			
Depth (ft)	Elev. (ft) 629.2	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural PL	DARD PEN Moisture (Hows per fo	Content,	% - • LL
35 — -	-627.2- -620.8-	Core 120"	Rec 120"	RQD 63%		*476	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured; contains few argillaceous laminations. Soft to medium hard gray SANDSTONE interbedded with SILTSTONE; highly weathered to decomposed, argillaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures. Hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured. @ 38.6', 39.8', 40.0', low angle fractures. @ 40.7', 41.3', 42.5', low angle fractures.					6					40 1 1 1 1 1 1 1 1 1
45 —		Core 120"	Rec 120"	RQD 100%	R-4	*319	@ 44.8', 45.5', 50.7', low angle fractures.										
- - 55 — - - -		Core 120"	Rec 120"	RQD 100%	R-5	*559	@ 52.1', 52.9', low angle fractures. 58.2', IRON STONE band.										

	TranSy				_		Project: SCI-823-0.00									lo. 012	1-307	70.03
LOG (DF: Bo	ring	R-17	Com		ocation: Sta	L. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4/	14/0		240	ATIO	to	4	15/0	5			
Depth (ft)	Elev. (ft) 599.2	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Moı PL ⊢	D PENE	ontent,	% - (LL
60 —		Core 120"	Rec 120"	non	R-6	*607	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 60.8', 61.8', low angle fractures. @ 62.0'-63.0', SDI = 98.4%. @ 65.0'-65.4', qu = 9,419 psi.						-					1
75 — 80 —		Core 120"	Rec 120"	RQD 100%	R-7	*599												
 85 		Core 120"	Rec 120"	RQD 100%	R-8	*457												

	TranSy				_		Project: SCI-823-0.00							•	lo. 012	1-3070	.03
_OG C	F: Bo	ring	R-17	0	_	ocation: Sta	i. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4	/14/		A T.	to	4/	15/0	5			
Depth (ft)	Elev. (ft) 569.2	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu F	ıral Moi PL ⊢	sture Co		- (
90 — - - - - 95.0—	-564.2-	Core 36"	Rec 36"	RQD 100%	R-9	*518	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. Bottom of Boring - 95.0'										
- - - 100 —							Bottom of Borning Co.C										
- - - - 05 -																	
- - - 10 																	
- - - 15 																1 1 1 1	
- - - 20																	

Client:					_		Project: SCI-823-0.00									lo. 012	21-30	70.03
LOG (DF: Bo	ring	R-18	0	_	ocation: Sta	. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/	13/		045) A T (to	4	/14/0	5			
Depth (ft)	Elev. (ft) 741.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Moi °L ⊢	Sture C	ontent,	% - LL
0 -0.5 - -	740.7-	3 5 5	8	1		2.5	Very stiff to hard brown SANDY SILT (A-4a), little clay, trace gravel; damp to moist.											
-3.5 5	- 737.7-	10 18 22		2			Severely weathered brown SANDSTONE.											
-7.0 - - 10	-734.2- -	25 50/5 Core 36"	11 Rec 30"	3 RQD 33%	R-1	*241	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures.	_										5
	-	Core 120"	Rec 120"	RQD 29%	R-2	*179	 @ 7.0'-7.6', broken zone. @ 7.9'-8.4', high angle iron stained fracture. @ 10.8'-11.0', 12.7'-12.8', 12.9'-13.0', high angle iron stained fractures. @ 13.9'-15.7', 16.3'-16.8', 19.1'-20.0', high angle iron stained fractures. 											
20 —	-						@ 21.4'-28.6' few to moderate argillaceous laminations.											
- - - 25 — - -		Core 120"	Rec 120"	RQD 48%	R-3	*336	 @ 20.6'-20.7', 21.1'-21.2', 21.8'-22.2', high angle iron stained fractures. @ 22.5'-22.8', 23.0'-23.2', 23.3'-23.4', high angle iron stained fractures. @ 24.0'-24.1', 24.2'-24.3', 26.1'-26.3', high angle iron stained fractures. @ 26.5'-27.5', SDI = 17.6%. @ 27.3'-28.0', high angle iron stained fracture. @ 29.0'-29.5', qu = 3,484 psi. 											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No.	0121-	3070.	03
LOG (F: Bo	ring	R-18		_	ocation: Sta	a. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/	13/0				to	4	/14/05	,			
Depth (ft)	Elev. (ft) 711.2	Blows per 6"	Recovery (in)	Sam No Puive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD : al Moistu Humble Blows pe	re Cont er foot -	ent, % → Ll	- • L
30 —	711.2	Core 120"	Rec 119"	RQD 98%	R-4	*191	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations in lenses or inclusions.											
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*352	@ 42.8'-43.7', SDI = 99.8%. @ 44.0'-45.0', SDI = 84.5%. @ 47.5'-48.0', qu = 10,993 psi.											
55—		Core 120"	Rec 120"	RQE 100%	R-6	*552												

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No.	0121	-3070	.03
LOG (DF: Bo	ring	R-18		_	ocation: Sta	. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/	13/0				to		4/14/05	1			
Depth (ft)	Elev. (ft) 681.2	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD al Moiste .	ure Cor er foot	ntent, % —— L	-
60 — - - - 65 — - -	-	Core 120"	Rec 120"	RQD 100%		*436	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations in lenses or inclusions. © 68.0'-68.2', argillaceous lenses.											
70 — 75 — 80 —		Core 120"	Rec 120"	RQD 100%		*369	 @ 70.0'-70.2', IRON STONE band. @ 70.2'-70.5', very fine grade zone. @ 72.5'-72.6', 72.8'-72.9', 73.4'-73.7', argillaceous, very fine grained SANDSTONE lenses. @ 75.4'-76.3', turbidity zone with few argillaceous laminations. 											
85 — - - 85 — - -		Core 120"	Rec 120"	RQD 100%	R-9	*610											1 1 1 1	

Client:					_		Project: SCI-823-0.00								Vo. 012	21-30	70.03
LOG (DF: Bo	ring	R-18	0	_	ocation: Sta	i. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/	13/0	240	A T/	to	4	/14/0	5			
Depth (ft)	Elev. (ft) 651.2	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Mo. PL ⊢	RD PEN. isture C	ontent,	LL
90 —		Core 120"	Rec 120"	RQD 100%	R10	*488	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, turbidity bedded.										
- - - 105 — - -		Core 120"	Rec 120"	RQD 100%	R11	*332											
110 —		Core 120"	Rec 120"	RQD 100%	R12	*542	 @ 110.5'-110.9', qu = 10,588 psi. @ 111.3'-118.8', contains moderate to abundant argillaceous laminations, friable zones. @ 116.6', low angle clay filled fracture. @ 117.8'-118.8', SDI = 92.4%. @ 119.0'-119.4', qu = 3,044 psi. 										

Client:					_		Project: SCI-823-0.00									lo. 01	21-30	70.03
LOG (F: Bo	ring	R-18		_	ocation: Sta	i. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/	13/0				to	4/	14/05	5			
Depth (ft)	Elev. (ft) 621.2	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pl	ral Moi L ⊢			% - (LL
120 —	-	Core 120"	Rec 120"	RQD 100%	R13	*483	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded (contains turbidity bedding). @ 126.1'-126.6', calcareous zone.											
130 —		Core 120"	Rec 116"	RQD 95%	R14	*571							i					
140 —		Core 120"	Rec 120"	RQD 100%	R15	*531	@ 140.0', pyritic.											

Client:					_		Project: SCI-823-0.00								Job No.	0121-	3070.00	3
LOG C	F: Bo	ring	R-18	Sam	_	ocation: Sta	. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4	/13/		745	ATIO	to	4	1/14/05				
Depth (ft)	Elev. (ft) 591.2	Blows per 6"	Recovery (in)	No No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moistu ⊢—— Blows pe	re Conte	_	
150 — — — — — — — — — — — — — — — — — — —		Core 120"	Rec 117"	RQD 98%	R16	*476	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to thickly bedded (contains turbidity bedding), slightly fractured tunfractured. @ 150.0'-151.0', SDI = 97.5%. @ 151.1'-151.5', qu = 10,810 psi.	0								1 1 1		
- - - 165 — - -		Core 120"	Rec 120"	RQD 100%	R17	*435												
170 — - - -		Core 60"	Rec 60"	RQD 100%	R18	*462												
175.0 180	-566.2 - -						Bottom of Boring - 175.0'							1 1 1 1				

Client:					_		Project: SCI-823-0.00								Job No.	0121	-3070	.03
LOG C	F: Bo	ring	R-20	Sam	_	ocation: Sta	n. 54+41.5, 230.4 ft. RT of SR 823 CL	13/0			ATI	ON						
Depth (ft)	Elev. (ft) 642.4	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water) DESCRIPTION	% Aggregate		Sand	% F. Sand	% Silt	% Clay	Natura PL	Blows pe	er foot	tent, % — L	-
-0.3	642.1-	4 10 12	18	1			Topsoil - 4" Very stiff brown SILT (A-4b), little fine to coarse sand, trace gravel; contains sandstone fragments; dry to damp.	1	6		12	66	15		•	 		
-	639.4	18 36 50/4	16	2			Severely weathered brown SANDSTONE argillaceous.											
5.0 - - - - 10 -	637.4-	Core 84"	Rec 84"	RQD 49%	R-1		Soft to medium hard yellowish brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, micaceous, argillaceous, laminated to thinly bedded, broken to highly fractured. @ 5.2'-5.5', decomposed zone. @ 5.9', decomposed shale, fractured. @ 7.8', low angle filled fracture. @ 8.5'-9.2' 10.5'- 10.7',11.4'-11.8', high angle rust stained fractures.											504
	628.1-	Core 120"	Rec 120"	RQD 73%	R-2		 @ 12.9'-13.6', high angle fracture. Soft to medium hard gray SANDSTONE interbedded with SHALE; highly weathered to decomposed, laminated to thinly bedded, moderately fractured, friable and poorly cemented. @ 21.8', grades to SANDSTONE with moderate to abundant argillaceous laminations. 											
22.9 - 25 - - - - 30	619.5-	Core 120"	Rec 120"	RQD 84%	R-3	*304	Hard gray SANDSTONE; fine grained, moderately to highly weathered, argillaceous, micaceous, laminated to medium bedded. @ 27.0'-27.5', 29.1'-31.3', few to moderate argillaceous laminations. @ 27.7'-27.9',28.7',28.9'-29.1', calcareous zones. @ 29.3'-33.8', turbidity bedding. @ 29.1',30.0',31.6', shale laminations.											

Client:	TranSy	stems	, Inc.		_	_	Project: SCI-823-0.00							Job No.	0121-	3070.	03
LOG (F: Bo	ring	R-20	0	_	ocation: Sta	. 54+41.5, 230.4 ft. RT of SR 823 CL Date Drilled: 4/	13/0	<u> </u>	\ A T'	<u> </u>						
Depth (ft)	Elev. (ft) 612.4	Blows per 6"	Recovery (in)	Samp No		Penetro- meter (tsf) / * Point-Load	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	IDARD I al Moistu I I I I I I I I I I I I I I I I I I I	re Cont r foot -	ent, % ·	- • <u>-</u>
30 —	012.7	Core 120"	Rec 120"	DOD.	R-4	*424	Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, contains pyritic inclusions, moderately to slightly fractured. @ 33.8',34.8', low angle fractures with argillaceous laminations. @ 35.1',35.2',35.5', 35.9', low angle fractures with shale laminae. @ 36.0' slightly to unfractured.										
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*510	@ 40.5'-40.7', calcareous layer. @ 40.7'-41.1', 41.5'-41.7', turbidity bedding.										
55 — - - - -		Core 120"	Rec 120"	RQD 98%	R-6	*479	@ 57.1',57.2', calcareous laminae.@ 57.7',57.8', low angle fractures with argillaceous laminations.										

	TranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
LOG (DF: Bo	ring	R-20	0	_	ocation: Sta	i. 54+41.5, 230.4 ft. RT of SR 823 CL Date Drilled: 4/	13/0		740	A T16	24/						
Depth (ft)	Elev. (ft) 582.4	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		ture Co per foot	ntent, %	6 -
60 —	572.4-	Core 96"	Rec 96"	RQD 100%	R-7	*482	@ 57.8'-58.4',59.9'-60.5', siltstone inclusions. Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, contains pyritic inclusions, slightly fractured to unfractured. @ 67.8'-68.1', calcareous zone. Bottom of Boring - 70.0'											

	TranSy				_		Project: SCI-823-0.00							Job No	. 012	1-307	0.03
LOG C	DF: Bo	ring	R-21	0		ocation: Sta	a. 58+21.4, 50.3 ft. LT of SR 823 CL Date Drilled: 4/	12/0	D 4.5	\ A T'	011						
Depth (ft)	Elev. (ft) 656.3	Blows per 6"	Recovery (in)	Sam No enive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natu Pi	NDARD ral Mois -	ture Co	ntent, '	% - • LL
-0.2 	 656.1 -	2 36 15 10 49 50/1		1			Topsoil - 2" Severely weathered brown SANDSTONE.	-									
-5.0 - - - - 10 —	651.3-	50/1 Core 84"	Rec 84"	RQE 73%	R-1	*191	Soft to medium hard brown SANDSTONE; very fine to fine grained, decomposed to highly weathered, argillaceous, highly fractured to broken; contains moderate argillaceous laminations. @ 5.2',11.5',12.0',16.4',19.0', high angle fractures. @ 10.5'-11.0',11.7'-11.9',12.2'- 12.6', broken zones.	,									50
- 15 — - - - 20 —		Core 120"	Rec 120"	RQE 51%	R-2	*76	 @ 12.6', moderately to highly weathered. @ 17.0'-17.5', gray. @ 18.5', hard. @ 19.2'-20.8', broken zone rust staining. @ 21.0', high angle fracture, gray. 										
22.6—_ - 25 — - - -	633.7-	Core 120"	Rec 120"	RQE 66%	R-3		Medium hard gray SANDSTONE very fine to fine grained, interbedded with SHALE, highly weathered, micaceous, highly fractured, poorly laminated. @ 22.6'-23.6', brown, broken zone, shale interbeds. @ 23.6'-25.3', gray, broken zone, shale interbeds. @ 25.6', clay filled fracture, highly weathered. @ 26.2', high angle fracture, rust stained fractures, silt interbeds, argillaceous.	- -									1 1 1

Client:					_		Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG C	F: Bo	ring	R-21	0	_	ocation: Sta	. 58+21.4, 50.3 ft. LT of SR 823 CL Date Drilled: 4/	12/0		A	<u> </u>						
Depth (ft)	Elev. (ft) 626.3	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt %	% Clay	Natur PL	NDARD al Moiste H Blows pe	ure Con er foot	tent, %	- (
_30.0 _ _ _	-626.3-						Soft to medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, highly fractured.										
33.5 — 35 — — — — — 40 —	- 622.8-	Core 120"	Rec 120"	RQD 70%	R-4	*550	Medium hard gray SANDSTONE; fine grained, moderately to highly weathered, micaceous, argillaceous, moderately fractured; contains turbidity bedding, few to moderate argillaceous laminations. @ 40.4', high angle fracture.										
45 — 47.7— 50 —	- 608.6-	Core 120"	Rec 120"	RQD 84%	R-5	*297	 @ 44.8', pyritic. @ 47.4', high angle fracture, rust stained. Hard gray and brown SANDSTONE, very fine to fine grained, moderate to highly weathered, micaceous, argillaceous, pyritic, unfractured to moderately fractured. @ 47.7'-48.7',48.9'-49.8', light brown, highly weathered. @ 48.1'-48.2', clay filled fracture. @ 49.8'-51.1', highly fractured. 							1 1 1 1			
55 —		Core 120"	Rec 120"	RQD 80%	R-6	*289	 @ 49.8'-51.1', highly fractured. @ 52.5', high angle fracture, rust staining. @ 55.5',58.9', clay filled fractures. @ 59.0', slightly to moderately weathered. 										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	_							Job No.	0121	-3070.03
LOG C					_	ocation: Sta	. 58+21.4, 50.3 ft. LT of SR 823 CL Date Drilled: 4/	12/0)5					<u>'</u>			
				Sam _l No		Hand	WATER OBSERVATIONS: Water seepage at: None		GI	RAD	ATI	ON					
Depth (ft)	Elev. (ft) 596.3	Blows per 6"	Recovery (in)	Drive	Press / Core	Penetro- meter (tsf) / * Point-Load Strength (psi)	Water seepage at. Notice Water level at completion: None (prior to coring) 9.8' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL		ure Con er foot	_
60 —	-	Core 120"	Rec 120"	RQD 95%	R-7	*305	Hard gray and brown SANDSTONE, very fine to fine grained, moderate to highly weathered, micaceous, argillaceous, pyritic, unfractured to moderately fractured. @ 65.8', high angle fracture. @ 69.6'-70.4', contains few argillaceous laminations. @ 70.6', slightly weathered, moderately fractured.								1111		
- 75.0	- - -581.3-	Core 36"	Rec 36"	RQD 100%	R-8	*456	Bottom of Boring - 75.0'	-									
80 — - - - 85 — - - - -	- - - - - - - - -																

lient: TranSy				Project: SCI-823-0.00								Job No	. 012	1-3070	0.03
OG OF: Bo	ring R-23	0		a. 58+17.3, 191.2 ft. RT of SR 823 CL Date Drilled: 4/	12/0		745	A T.	to	4/	/13/05	1			
Depth Elev. (ft) (ft) 671.8	Blows per 6" Recovery (in)	Sample No.	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water) DESCRIPTION	% Aggregate	Sand	Z.	and	Silt	% Clay	Natur PL	NDARD al Moist I Blows p	ure Co er foot	ntent, % 	6 - (
-0.3 671.5-	WOH 1 14	1	1.25	Topsoil - 4" Stiff brown SILT (A-4b), little fine to coarse sand, little clay; damp to moist.	0	3		10	68	19					
5 —	2 4 9 16	2	4.5+	@ 3.5'-12.5', very stiff to hard.											
- - -	6 8 9 15	3	4.0												
10 —	14 12 12 18	4	3.75		0	6		20	54				1		
12.5 <u>6</u> 59.3-	10 17	5	3.5	Severly weathered SANDSTONE.											
15.0 656.8- 		RQD 52%	-1 *273	Medium hard brown SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. @ 16.6'-16.9', high angle fracture.											50
20 —	Core Rec 120" 120"	RQD 90%	-2 *149	 @ 21.9', high angle fracture. @ 22.2'-24.6', gray and brown mixed with silt interbeds. @ 24.6', brown. @ 26.1'-26.5', qu = 1,621 psi. @ 26.9'-27.9', SDI = 98.2%. @ 27.9', clay filled fracture. @ 28.8'-29.7', mottled gray and brown. @ 29.7', brown with rust staining. 											

ev. ft) 1.8	ing F "9 sed smol8 Core 120"	Rec 120"	Samp No.	_	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	MATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water) DESCRIPTION Medium hard brown SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. @ 30.4', 30.9'-31.5', high angle fracture, rust staining. @ 30.5'-31.5', SDI = 4.1%. @ 31.5'-31.9', broken zone. @ 31.9'-33.0', clay filled fracture. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous,	N Aggregate 7		RAD % W. Sand	and	to ON tile %	% Clay	Natui PL	NDARD ral Moiste Blows po 0 20	ure Cor er foot	ntent, % 	-
1.8 8.6	Blows per	Secovery Recovery	No.	Press / Core	Penetro- meter (tsf) / * Point-Load Strength (psi)	Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water) DESCRIPTION Medium hard brown SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. @ 30.4', 30.9'-31.5', high angle fracture, rust staining. @ 30.5'-31.5', SDI = 4.1%. @ 31.5'-31.9', broken zone. @ 31.9'-33.0', clay filled fracture. Medium hard to hard gray SANDSTONE; very fine to fine	% Aggregate	C. Sand	M. Sand	F. Sand	Silt	% Clay	Natui PL	ral Moistu	ure Cor er foot 0 3	ntent, % 	- • LL
8.6-			RQD 92%	R-3	*171	moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. ② 30.4', 30.9'-31.5', high angle fracture, rust staining. ② 30.5'-31.5', SDI = 4.1%. ② 31.5'-31.9', broken zone. ② 31.9'-33.0', clay filled fracture. Medium hard to hard gray SANDSTONE; very fine to fine											
						moderately to slightly fractured; contains few to moderate argillaceous laminations.											
	Core 120"	Rec 120"	RQD 73%	R-4	*294	 @ 33.2'-52.7', siltstone interbeds, thinly laminated. @ 41.1'-42.5', brown. @ 43.5'-48.9', moderate to abundant argillaceous laminations, poorly to moderately cemented. @ 43.9'-44.1', high angle fracture. 											
		Rec 120"	RQD 93%	R-5	*389	 @ 48.5'-49.0', broken zone. Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 57.8', moderately to highly fractured. 											
0.8		Core 120"	Core Rec	Core Rec RQD	Core Rec RQD R 5	Core Rec RQD R 5 *200	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations.	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 *389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 *389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations.	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 *389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 57.8', moderately to highly fractured.	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 57.8', moderately to highly fractured.	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 *389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389 #389	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 *389 #389	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 57.8', moderately to highly fractured.	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. *389 Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations.

Client:					_		Project: SCI-823-0.00							Job N	o. 01 2	21-307	0.03
LOG (F: Bo	ring	R-23		_	ocation: Sta	a. 58+17.3, 191.2 ft. RT of SR 823 CL Date Drilled: 4/	12/0			to	4	1/13/0	5			
Depth (ft)	Elev. (ft) 611.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pl	al Mois . ⊢— Blows i	ture Co	ontent, '	ON (N) % - • LL) 40
60 —		Core 120"	Rec 116"	RQD 94%	R-6	*467	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 63.8'-64.3', calcareous zone.										
70 —		Core 120"	Rec 120"	RQD 100%	R-7	*512	@ 69.3, pyritic.@ 70.2', silt filled fracture.@ 76.6', slightly to moderately fractured.										
80 — - - - 85 —		Core 120"	Rec 120"	RQD 100%	R-8	*437											
- 90	-						@ 89.0', high angle fracture.										1 1 1

Client:	TranSy	stems	s, Inc.				DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)8 Project: SCI-823-0.00		2.0						Job No. 01	21-3070	.03
LOG (DF: Bo	ring	R-23	ı	_	ocation: Sta	a. 58+17.3, 191.2 ft. RT of SR 823 CL Date Drilled: 4/	12/0				to		4/13/05			
Depth (ft)	Elev. (ft) 581.8	Blows per 6"	Recovery (in)	Sam No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	IDARD PEN Il Moisture C Il Moisture S Il Moistur	Content, % 	-
90 — - - - 95 — - -	-	Core 120"	Rec 120"	RQE 100%	, n-9		Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 93.1', high angle fracture.										
-100.0—	571.8	Core 12"	Rec 12" ,	RQE 100%	R10	*333	Bottom of Boring - 100.0'										1.1
- - 115 — - - -	-																

	ΓranSy				_		Project: SCI-823-0.00								Job No.	0121-30	70.03
_OG C	F: Bo	ring	R-201		_	Location: Sta	. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL Date Drilled: 1/	12/0		D 4 5	\ A T (to		1/16/06			
Depth (ft)	Elev. (ft) 662.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand		% F. Sand	% Silt	% Clay	Natur PL	NDARD P al Moistur I Hows per D 20	e Conten	
-0.3 - - -	661.9	8 8 10	13	1		4.5+	Topsoil - 3" Hard gray SANDY SILT (A-4a), little clay, trace to little gravel; contains sandstone fragments; dry to damp. @ 1.0'-2.5' contains organics.	_									
5 -5.5 	4	10 6 8	11	2		4.5+											
- - -	- 656.7 -	6 8 14	13	3		4.5+	Very stiff to hard brown SILT (A-4b), some fine to coarse sand, little clay; trace gravel; dry to damp.	9	16		9	51	15				
- 10 		12 12 13	15	4		4.5+											
-		7 8 10	15	5		4.0											
- 15 	<u>.</u>	8 9 11	15	6		3.5	@ 13.5', trace fine to coarse sand.										
- - 7.5 	644.7	13 33 50/2	17	7		4.5+	@ 16.0' contains sandstone fragments.	1	2		8	73	16		•		
		Core 78"	Rec 59"	RQI 18%		*151	Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, massive, highly fractured to broken. @ 18.1'-18.3', 19.0'-19.5', 20.3'-21.3', broken. @ 22.7'-24.0', broken and decomposed.										
25 -		Core	Rec 71"	RQI 45%		*299	@ 26.1'-26.2', high angle fracture. @ 26.3'-29.6', 31.0'-31.5', lost recovery likely due to decomposed/poor rock quality.										

	TranSy				_		Project: SCI-823-0.00							Job I	Vo. 01	21-3	070.0	03
OG C	DF: Bo	ring	R-201		_	ocation: Sta	1. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL Date Drilled: 1/	12/0			to	1	/16/0	6				_
Depth (ft)	Elev. (ft) 632.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Mo °L ⊢	RD PEN isture C s per for 20	Conter		-
30 —	-						Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, massive, highly fractured to broken. @ 31.5'-32.7', SDI = 37.6%. @ 32.8'-33.0', broken zone.									1 1		
35.5— - - - 40 — -	-626.7-	Core 120"	Rec 120"	RQE 66%	R3	*728	Soft to medium hard gray SANDSTONE interbedded with SHALE; very fine to fine grained, moderately to highly weathered, argillaceous, laminated to thinly bedded, moderately to highly fractured. @ 36.5'-36.7', broken zone. @ 36.8'-36.9', high angle fracture.											
3.3— - 45 — - - - 50 —	618.9	Core 120"	Rec 120"	RQE 98%	R4	*1404	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured. @ 44.3', 44.9', 45.3', low angle fractures. @ 45.4'-45.6', broken zone, decomposed to highly weathered. @ 45.5'-46.3', iron stained. @ 46.0'-46.5', 49.2'-50.1', 50.8'-51.1', calcareous.	-										
- - 55 — - - -		Core 120"	Rec 120"	RQE 100%), R5	*1691	@ 54.5'-55.9', qu = 7,447 psi SDI = 96.1%.											

Client: -					_		Project: SCI-823-0.00								Job No	. 012 ⁻	-307	0.03
LOG C	DF: Bo	ring	R-201		_	Location: Sta	a. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL Date Drilled: 1/	12/0				to	1	1/16/06	1			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD al Moist .	ure Col er foot	ntent, % 	6 - (LL
60 —	602.2	Core 120"	Rec 120"	RQD 100%	R6		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured. @ 64.3'-65.7', qu = 13,985 psi SDI = 98.7%.		8	8		84						
83 — - - - -	-	Core	Rec 120"	RQD 100%	R8	*2060												

	TranSy				_		Project: SCI-823-0.00							_		. 012	1-307	0.03
_OG (DF: Bo	ring	R-201		_	ocation: Sta	i. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL Date Drilled: 1/	12/0				to	1/1	6/06				
Depth (ft)	Elev. (ft) 572.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt		Natura PL	al Mois Blows μ	ture Co per foot		% - LL
90 —	-562.2-	Core 72"	Rec 72"	RQD 100%	R9	*1497	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured. Bottom of Boring - 100.0'											

Client: 1	ΓranSy	stems	, Inc.		_		Project: SCI-823-0.00								Job No	. 012	1-30	70.03
LOG O	F: Bo	ring	R-201		_	Location: Sta	. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL Date Drilled: 1/	16/0		-		to	-	1/17/06				
Depth (ft)	Elev. (ft) 669.6	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water) DESCRIPTION	% Aggregate		RAD % W. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Mois Blows _l	ture Co	ntent	TION (N :, % - + LL
-0.2 - -	-669.4-	8 19 8	10	1			\Topsoil - 2" Loose to medium dense gray SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.											
-3.0 - 5 —	- 666.6-	4 4 5	7	2			Loose to medium dense gray GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.	40	19		7	28	6					Non-Pla
- -8.0	-661.6-	7 4 8	8	3													1 1	
10 —		5 4 4	9	4			Medium stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; ; damp.		11		7	42	20				-	
3.0—	-656.6-	3 3 4	8	5			Hard raddish brown CILT AND CLAY (A.Ca), same fine to											
- 15 		7 12 15	18	6		4.25	Hard reddish brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	7	12		9	47	25				<u> </u>	
	-652.6- -651.6-	9 22 50/5	18	7a 7b	_	4.5	Severely weathered light brown and gray SANDSTONE, \argillaceous.											5
20 		Core 78"	Rec 77"	RQD 52%	R1	*145	Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, medium bedded, highly fractured to broken.										111	
25 — - - -							@ 27.0'-27.5', 26.1'-26.6', gray.										1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
_ 30		Core	Rec	RQD	R2	*632	@ 29.8'-29.9', 30.2'-30.3', clayey.										1.1	

	TranSy				_		Project: SCI-823-0.00							b No.()121-3(70.03
LOG (F: Bo	ring	R-201		_	Location: Sta	. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL Date Drilled: 1/	16/0	7.7.5		to	1/1	7/06			
Depth (ft)	Elev. (ft) 639.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natural I PL +			
30 —	637.3	120"	Rec 115"	85% RQD 88%	R3	*609	Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, medium bedded, highly fractured to broken. @ 30.7'-40.0', broken zone, high angle fracture. Medium hard to hard dark gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, laminated to medium bedded, highly fractured to moderately fractured, contains few argillaceous laminations.									
45 — 48.6— 50 —	621.0-	Core 120"	Rec 120"	RQD 100%	R4	*638	 @ 41.1'-41.4', 42.0'-42.9', rust stained broken zones. @ 41.7'-42.0', argillaceous zone. @ 42.9'-43.2', clay filled fracture, broken zone. @ 43.8'-43.9', high angle fracture. @ 44.6'-48.6', contains moderate to abundant argillaceous laminations. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, calcareous, massive, slightly fractured to unfractured, slightly pyritic. 					i				
55 		Core	Rec	RQD	R5	*1358	@ 56.8'-56.9', 57.0'-57.3', 57.9'-58.4', 64.0', 64.4', calcareous zones.									

Client:	TranSy	stems	, Inc.			_	Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG (DF: Bo	ring	R-201		_	ocation: Sta	a. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL Date Drilled: 1/	16/0			to	1	1/17/06				
Depth (ft)	Elev. (ft) 609.6	Blows per 6"	Recovery (in)	Sam _i No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt NO	% Clay	Natur PL	NDARD : al Moistu H Blows pe	ire Con er foot	tent, % ── L	-
65 —	- 009.6 - 609.6 	Core 120"	Rec 120"	RQD 100%		*2062	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly pyritic, slightly fractured to unfractured. @ 70.1'-70.3', calcareous.										
75 —	- - - - - -	Core 120"	Rec 119"	RQD 99%	R7	*1471											
- - - 90		Core	Rec	RQD	R8	*3678	@ 89.2'-89.5', 91.6'-92.0', 92.0'-93.2', 94.3'-94.5, calcareous.										

	TranSy				_		Project: SCI-823-0.00								No. 01	21-30	70.03
.OG (F: Bo	ring	R-201		_	ocation: Sta	1. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL Date Drilled: 1/	16/0			to	1/	17/0	6			
Depth (ft) 90 —	Elev. (ft) 579.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu F	ıral Mo L ⊢			
95 —	569.6	Core 66"	Rec 66"	95% RQD 100%		*1735	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly pyritic, slightly fractured to unfractured. @ 94.5'-95.3', high angle fracture. @ 94.5'-95.3', calcareous. Bottom of Boring - 100.0'										

	ranSy				_		Project: SCI-823-0.00								lob No	. 012	1-3070.0
.0G 0	F: Bo	ring	R-201		_	ocation: Sta	. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/	18/0				to		1/19/06			
		_	(in)	Sam _l No		Hand Penetro- meter	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring)	0	Gi	RAD	ATI	ON		STAN	DARD	PENE	TRATION
Depth (ft)	Elev. (ft) 727.6	Blows per 6"	Recovery (Drive	Press / Core	(tsf) / * Point-Load Strength (psi)	7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate	% C. Sand	Z.	% F. Sand	% Silt	% Clay	Natura PL B	l Moist ⊢—— lows p		ontent, % - —— LL
0.3	- 727.3 -	1 2 2	3	1			Topsoil - 4" Loose to medium dense light brown SILT (A-4b), some clay, trace fine to coarse sand; contains sandstone fragments; dry to damp.										
5 —		12 12 14	15	2			@ 0.3'-3.0', little fine to coarse sand, trace clay, little gravel.	0	0		2	75	23	B			4
-		26 49 50/1	16	3			@ 6.0', very dense, contains sandstone boulders.										
10 0.5 <u>-</u> -	-717.1-	26 20 22	18	4			Hard brown and gray SILT AND CLAY (A-6a), trace gravel,	5	6		4	59	26		• · · · • • • • • • • • • • • • • • • •		
		9 13 15	17	5		4.5+	little fine to coarse sand; damp.	7	11		6	49	27		• ; ; ;		
15 —	- 711.6-	10 13 18	14	6		4.5+											
_		11 50/2	15	7			Severely weathered brown SANDSTONE, argillaceous.										
20 —	- 710.1 - -706.0-	Core	Rec	RQD	R1	*1186	Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 17.7', 18.6',19.0', 20.5', 21.0', 21.5', 21.6', low angle fractures.										
25 —	700.0	91	91"	89%			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.										
- - -							@ 26.6'-28.1', qu = 8,879 psi SDI = 98.3%. @ 27.1', 27.2', low angle fractures.										

	TranSy				_		Project: SCI-823-0.00							J	ob No.	012	1-307	0.03
LOG (F: Bo	ring	R-201		_	ocation: Sta	i. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/	18/0				to	1/19	9/06				
Depth (ft) 30 —	Elev. (ft) 697.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt		Natural PL	Moisti ⊢——	ure Co er foot	ntent, s	ON (N) % - (LL) 40
35 —	-	Core 120"	Rec 120"	RQD 99%	R2	*1540	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
40 —		Core 120"	Rec 120"	RQD 100%	, R3	*1413	@ 38.2'-40.0', qu = 9,626 psi SDI = 98.4%.						1.1					
 50 — 		Core 120"	Rec 120"	RQD 100%	R4	*1549							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		 			
55	-				-		@ 55.4'-57.0', qu = 12,576 psi SDI = 96.6%. @ 58.0', low angle fracture.								1 1 1 1 1 1 1 1 1 1 1 1			

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070.	.03
LOG C	F: Bo	ring	R-201		_	Location: Sta	. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/	18/	745		to	1	/19/06	i			
Depth (ft) 60 —	Elev. (ft) 667.6	Blows per 6"	Recovery (in)	Sam No	Press / Core		WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay	Natur PL	al Moist ⊢—— Blows p	ure Con er foot	TRATION tent, % — Li - () 0 4	- • L
65 —		Core 120"	Rec 120"	RQD 98%		*487	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 60.0'-60.1', broken zone. @ 61.2', 62.8', 62.9', low angle fracture. @ 63.4', 64.0', low angle fracture in highly weathered to decomposed argillaceous zones.										
70 — - - 70 — - - - 75 —		Core 120"	Rec 120"	RQD 100%	R6	*1523											
80 — 80 — 85 —		Core 120"	Rec 120"	RQD 100%		*1482											

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00							Job N	o. 012	21-307	0.03
LOG C	F: Bo	ring	R-201			ocation: Sta	. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1	18/			to	1	/19/0	3			
Depth (ft)	Elev. (ft) 637.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		sture Co	ontent,	% - LL
90 — - - - - 95 —	-	Core 120"	Rec 120"	RQD 100%		*1706	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.										
- - -	627.9-	Core 120"	Rec 120"	RQD 100%	R9	*1092	Medium hard to hard gray SANDSTONE; very fine grained, slightly weathered, micaceous, argillaceous, laminated to thinly bedded, unfractured to slightly fractured. @ 100.0'-100.2', calcareous.										
- - 109.0— 110 — - -	618.6-	Core 120"	Rec 119"	RQD 99%	R10	*1375	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured. @ 113.6'-113.9', calcareous.										
- 115 — - - -							 @ 113.6-113.9 , calcareous. @ 114.9'-115.3', vertical fracture. @ 115.1'-115.3', calcareous. @ 118.0'-118.2', high angle fracture. 										1 1 1

Client:	TranSv	stems	, Inc.			L	Project: SCI-823-0.00	00-0	040						Job N	o. 012	1-307	0.03
LOG C				6	L	ocation: Sta	a. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/	18/0	06			to	1/	19/06				
Depth (ft)	Elev. (ft) 607.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	Silt	% Clay	Natu Pl	ral Mois - ⊢— Blows	sture Co		6 - •
120 — - - - 125 —	-	Core 120"	Rec 120"	RQD 98%	R11	*2306	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured. @ 121.1', 121.2', low angle fractures. @ 121.3'-121.8', calcareous.											
130 — - - - - - - - 135 —		Core 120"	Rec 119"	RQD 99%	R12	*2097	@ 131.2', low angle fracture.											
 140 - - - - 145		Core 120"	Rec 120"	RQD 100%	R- 13	*1996												
145 — - - - - - 150	-																	

	ΓranSy				_		Project: SCI-823-0.00							Job N	o. 012	1-3070	.03
_OG C	F: Bo	ring	R-201		_	ocation: Sta	a. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/	18/0			to	1/1	9/06	<u> </u>			
Depth (ft)	Elev. (ft) 577.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	ral Mois - ⊢— Blows	sture Co per foot		-
- - - - 155 —		Core 120"	Rec 120"	RQD 100%	R- 14	*1584	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured.					1					
- - - 60 0	- 567.6-	Core 59"	Rec 59"	RQD 100%	R15	*1761											
- - - -	307.0						Bottom of Boring - 160.0'										1 1 1 1 1 1 1 1 1
65 -																	
- 70 													1.1.1			1 1 1 1	- 1
 75 																	
- - 80												1 1 1 1					1 1 1 1 1 1

	ΓranSy				_		Project: SCI-823-0.00								o. 01 2	21-3070	0.03
.OG C	F: Bo	ring	B-140		_	ocation: Sta	i. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL Date Drilled: 1/WATER	17/0	240	ATIC	to	1/	19/06	<u>;</u>			
epth (ft)	Elev. (ft) 708.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	F. Sand	Silt	% Clay	Natur PL	ral Mois - ⊢— Blows ¡	ture Co		; - (
0 - - -		50/2	_ 2	1			No topsoil/6.0' soil removed before drilling Severely weathered brown SANDSTONE.					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
.0— 5 — - - - 0 —	 704.6-	Core 78"	Rec 76"	RQD 72%	R-1		Medium hard to hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, highly to moderately fractured. @ 4.0'-4.3', 4.8'-5.3', 5.6' -5.9' 6.2'-6.5', broken zones. @ 8.0', 8.4', 9.2', 10.5', 10.6, 12.0', 13.3', 14.8', 15.5', low angle fractures.										
5 — - - - - -		Core 120"	Rec 120"	RQD 93%	R-2	*344	 @ 12.0'-13.9', qu = 7,841 psi SDI = 96.8%. @ 14.4'-14.6', 15.1'-15.4', gray. @ 15.9', 17.3', 22.7', 22.8', 23.2', 24.0', low angle rust stained fractures. @ 20.2'-22.0', high angle rust stained fracture. 										
).5— — — — 25 — — —	-688.1-	Core 120"	Rec 120"	RQD 83%	R-3		Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 22.4'-22.7' high angle rust stained fracture.	-									

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-3	070.03
LOG (DF: Bo	ring	B-140		_	ocation: Sta	. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL Date Drilled: 1	/17/0			to		1/19/06			
Depth (ft)	Elev. (ft) 678.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura	al Moistur ⊢—— Blows per	e Conte	ATION (N) nt, % - ●
30 — - - 35 — - - - 40 —		Core 120"	Rec 120"	RQD 98%	R-4	*228	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, highly fractured, contains few argillaceous laminations in bands. @ 30.5'-31.5', SDI = 93.2%. @ 32.1'-32.6', qu = 10,114 psi.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
45 — - - - - - - - - -		Core 120"	Rec 120"	RQD 100%	R-5		@ 40.0'-40.3' vuggy zone, contains fossils. @ 40.5'-43.6', rust stained.									
55 — - - - - - -		Core 120"	Rec 120"	RQD 100%	R-6											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-3	3070.03
LOG (DF: Bo	ring	B-140		_	Location: Sta	. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL Date Drilled: 1	/17/			to	1	1/19/06			
Depth (ft)	Elev. (ft) 648.6	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay	Natura PL	al Moistu ⊢—— Blows pe	re Conte r foot -	ATION (N) ent, % - ■ LL □ 40
60.5	648.1	Core 120"	Rec 120"	RQD 100%	, R-7	*284	Very hard gray SANDSTONE; fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured to unfractured, burrows. @ 60.7'-63.3' iron stained. @ 61.9'-63.0', high angle fracture. @ 64.5'-66.2', qu = 9,236 psi, SDI = 97.8%.									
 75 —- 80 —		Core 120"	Rec 120"	RQD 100%	R-8		@ 73.7'-74.3',76.0'-76.3', calcareous. @ 75.0'-80.5' few to moderate argillaceous laminations.									
- - 85 — - - - - 90		Core 120"	Rec 120"	RQD 100%	R-9											

	TranSy				_		Project: SCI-823-0.00						_		. 012	1-3070	0.03
LOG (DF: Bo	ring	B-140		_	ocation: Sta	1. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL Date Drilled: 1	17/0	245	A T/	to	1/1	9/06				
Depth (ft)	Elev. (ft) 618.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt		Natura PL	al Mois ⊢—— Blows µ	ture Co per foot	_	ó -
90 — 90.5— - - 95 — - - -	618.1-	Core 120"	Rec 120"	RQD 100%			@ 90.4'-90.5', calcareous zone. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, slightly fractured to unfractured. @ 90.8'-91.1',95.3'-95.5', calcareous.					1					
- - 05 — - - -		Core 120"	Rec 116"	RQD 97%	R- 11		@ 101.5'-102.0', calcareous. @ 108.3', pyritic										
	-598.1- - - - - - -						Bottom of Boring - 110.5'										

	TranSy				_		Project: SCI-823-0.00							,	lob No.	0121-	3070	.03
.OG C	F: Bo	ring	B-140		_	ocation: Sta	i. 67+98.8, 5.4 ft. LT of SR 140 Ramp B BL Date Drilled: 0	1/16			4 T16	211						
Depth (ft)	Elev. (ft) 582.6	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None (Prior to coring) Water level at completion: 17.0' (Includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	DARD F I Moistu Hows pe	re Conte	ent, % ── L	-
-0.4 	582.2	3				4.0	Topsoil - 5" Very stiff brown and gray SANDY SILT (A-4a), some gravel, trace to little clay; damp.				0	10			111			
5 	-	8 18 21	16 20	2		4.0 3.5		23	13		8	42	14		P : : F 1			
- -	570.0	7 12 18		3		2.0	@ 7.5', contains sandstone fragments.	32	15		10	34	9					
0.0— - - 15 — - -	-572.6- -	50/3 Core 120"	Rec 118"	4 RQD 86%	R-1		Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, massive, moderately fractured. @ 11.5', 15.7', 16.9', 18.4', low angle fractures. @ 13.6'-14.6', highly fractured to broken. @ 14.4'-14.6', brown, decomposed to highly weathered.											<u> </u>
0.0— - - 25 — - -	-562.6-						Bottom of Boring - 20.0'											

	TranSy				_		Project: SCI-823-0.00						J	ob No.	012	1-3070.0
LOG C	F: Bo	oring	B-140		_	Location: Sta	a. 71+61.3, 52.4 ft. LT of SR 140 Ramp B BL Date Drilled: 1/	16/0		 A T /	<u> </u>					
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% F. Sand	% Silt	% Clay	Natura PL	Moistu	ire Coi er foot	TRATION ntent, %
-0.3 —	648.6	6 10 12 7 13 17 5 12 24	13	1 2 3	1		Topsoil - 4" Medium dense to dense brown SANDY SILT (A-4a), some gravel, little clay; contains sandstone fragments; dry to damp.	_	21		28					30 40
- -14.5 15 	636.6	5 11 21		5 6			Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains sandstone fragments; damp. Severely weathered brownish gray SANDSTONE, argillaceous.	2	6	 7	56	29		• •		
-16.0— - - 20 — - 21.6—	632.6	Core 120"	Rec 118"	RQD 73%	R-1		Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to massive, highly fractured. @ 16.0'-16.8', decomposed. @ 16.5'-16.6', broken zone. @ 19.5'-19.6', iron staining. Medium hard to hard brown and gray SANDSTONE; slightly weathered, argillaceous, micaceous, pyritic, massive, slightly	-						1.1.1		
					-		to moderately fractured. @ 26.6'-27.5', iron staining, calcareous. @ 26.6', 26.8', low angle fractures. @ 26.8'-27.5', 26.6'-27.0', 30.2'-30.4', high angle fractures.									

	TranSy						Project: SCI-823-0.00							Job N	o. 012	1-30	70.03
OG C	F: Bo	ring	B-140		_	ocation: Sta	71+61.3, 52.4 ft. LT of SR 140 Ramp B BL Date Drilled: 1/	16/0			<u> </u>						
Depth (ft)	Elev. (ft) 618.6	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi			ontent,	% - LL
30 — - - - 35 —		Core 120"	Rec 119"	RQE 88%	R-2	*277	Medium hard to hard brown and gray SANDSTONE; slightly weathered, argillaceous, micaceous, pyritic, massive, slightly to moderately fractured. @ 31.8'-33.5', qu = 11,233 psi, SDI = 96.9%. @ 34.6'-34.8', brown, highly weathered to decomposed.									1.1	
- - 40 — - - - 45 —		Core 120"	Rec 120"	RQE 91%	R-3		@ 39.3'-40.7', calcareous. @ 40.1'-40.2', 41.6'-42.0', high angle fractures. @ 40.6'-40.7', 41.1'-41.6', iron staining. @ 40.6'-40.7', 41.1'-41.6', broken.										
- -	-						@ 46.8'-48.1', qu = 13,025 psi, SDI = 97.8%.										
50 — - - - - 55 —		Core 120"	Rec 119"	RQE 88%	R-4	*264	@ 50.0'-50.1',54.2'-54.3', argillaceous, decomposed.										
- - - -		Core 63"	Rec 63"	RQE 75%	R-5		© 56.6'-56.9', argillaceous, decomposed, broken.© 59.5'-59.8'; decomposed.									1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

Client:	TranS	ystems	s, Inc.				Project: SCI-823-0.00								Job N	o. 012	21-30	70.03
LOG (OF: B	oring	B-140	_	_	ocation: Sta	a. 71+61.3, 52.4 ft. LT of SR 140 Ramp B BL Date Drilled: 1/	16/										
Depth (ft)	Elev. (ft) 588.6	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		sture C	ontent,	% - (LL
60 — 61.3— 61.3— 65 — 70 — 65 — 65 — 65 — 65 — 65 — 65 — 65 — 6	-587.3·						Medium hard to hard brown and gray SANDSTONE; slightly weathered, argillaceous, micaceous, pyritic, massive, slightly to moderately fractured. Bottom of Boring - 61.3'											

	TranSy				_		Project: SCI-823-0.00								Job No	. 012 ⁻	1-307	0.03
LOG C	F: Bo	ring l	B-140		_	ocation: Sta	a. 65+47.3, 37.2 ft. RT of SR 140 Ramp A BL Date Drilled: 1/	25/0										
Depth (ft)	Elev. (ft) 636.2	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	. Sand	% F. Sand		% Clay	Natu Pi	ral Mois -	er foot	ntent, 9	% - LL
-0.3 - - - -4.5 -	635.9	4 7 19	19	1		2.5	Topsoil - 4" Very stiff to hard brown SILT (A-4b), trace to little clay, trace fine to coarse sand; dry to damp. Hard brown SILT AND CLAY (A-6a), trace fine to coarse											
- - -	-	14 13 15 5 10 14	19	3		4.5+ 4.5+	sand, trace gravel; dry to damp.	5	1		3	47	44					
10.0 11.0 	626.2 625.2	13 50/5	12	4			Severely weathered brown SANDSTONE argillaceous, micaceous.										/	5
15 —		Core 120"	Rec 113"	RQD 52%	R1		Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, thinly bedded to massive, highly fractured. @ 14.7'-14.9', 15.2'-15.5', 19.5'-20.0', 20.3'-20.4', high angle fractures. @ 16.2'-16.5', core loss, decomposed rock and fracture suspected. @ 17.9'-18.1', 18.3'-18.5', 18.5'-19.1', 20.0'-20.3', 20.6'-20.7', broken zones, iron stains throughout.											
21.0— - - 25 — - -	-6 15.2 -	Core 120"	Rec 120"	RQD 93%	R2	*305	Hard gray SANDSTONE; very fine grained, slightly to highly weathered, argillaceous, micaceous, pyritic, massive, slightly fractured. @ 21.2'-21.3', 23.9'-24.2', multiple high angle fractures. @ 26.0'-29.1', qu = 8,887 psi, SDI = 97.8%. @ 26.0'-26.2', broken zone.											

_	TranSy				_		Project: SCI-823-0.00						Job N	o. 012	1-3070.03	
LOG	OF: Bo	ring	B-140		_	ocation: Sta	. 65+47.3, 37.2 ft. RT of SR 140 Ramp A BL Date Drilled: 1	/25/0								
Depth (ft)	Elev. (ft) 606.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	Π.	% Clay	Natural Mois PL ⊢ Blows	sture Co	TRATION (Nontent, % - 0	′
30 — —31.0— 35 —	605.2-	Core 120"	Rec 119"	RQD 79%	R3		Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, pyritic, massive, moderately fractured. @ 31.2'-31.9', weathered and iron stained. @ 31.3'-32.9', 39.8'-39.9', high angle fractures.									
45 —		Core 120"	Rec 120"	RQD 100%	R4	*192	@ 41.1', 48.3', 49.2', low angle fractures.@ 46.7'-48.2', qu = 10,867 psi, SDI = 91.5%.									-1
55 — - - - - - -		Core 120"	Rec 120"	RQD 100%	R5		@ 52.5'-52.6', 54.3'-54.6', 56.3'-56.8', calcareous. @ 59.2', low angle fracture.									

Sample No. Hand Penetron meter (1st) / Point-Load Strength (psi) DESCRIPTION Point-Load Strength (psi) Point-Load Strength (psi) DESCRIPTION Point-Load Strength (psi) Point-Load Streng	Sample No. Hand Penetro Water seepage at: None GRADATION		TranSy				_		Project: SCI-823-0.00								Job No	. 012	1-307	0.03
No. Hand Penetrometer Water seepage at: None Water seepage at	No. Hand Periter meter No. Periter meter No. Periter meter No. Periter No. Periter meter No. Periter No. Periter	LOG (OF: Bo	ring	B-140		_	ocation: Sta		1/25/										
Bottom of Boring - 61.0'	50 - 575.2- Bottom of Boring - 61.0'	Depth (ft)	(ft)	3lows per 6"		No). 	Penetro- meter (tsf) / * Point-Load Strength	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water)	% Aggregate	C. Sand	M. Sand	F. Sand		% Clay	Natu Pl	ral Mois - ⊢— Blows μ	ture Co	ntent, % 	6 - (LL
55 — 70 — 70 — 70 — 70 — 70 — 70 — 70 —	55 —	60 61.0 			, H	7	4		Bottom of Boring - 61.0'	0\	6	6	6	6	0	1 1 1 1			30	
	75—																			

	ΓranSy				_		Project: SCI-823-0.00								Job N	o. 01 2	1-30	70.03
.og o	F: Bo	ring	R-26	Same	_	ocation: Sta	i. 66+91.6, 42.4 ft. RT of SR 823 CL Date Drilled: 05	/18 I		240	ATIC	<u> ۱۸۷</u>						
Depth (ft)	Elev. (ft) 577.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: 6.0' Water level at completion: None (prior to coring) 3.5' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	F. Sand	% Silt	% Clay	Natui PL	al Mois . ⊢— Blows		ontent,	FION (N, % - () LL) 40
-0.3 - -	- 576.8 -	1 2 2	7	1			Topsoil - 3" Loose to medium dense brown SANDY SILT (A-4a), little clay, trace to little gravel; damp to moist.	10	22		11	46	11	<u> </u>	•			√dn-Pla
5 —		2 11 6	10	2														
- 3.0	- 569.1-	WOH 1 6	13	3		•	Now, stiff over and bysour CHT (A 4b) some along little fine to								/			
- 10 		6 9 9	16	4		3.25	Very stiff gray and brown SILT (A-4b), some clay, little fine to coarse sand; damp to moist.	0	1		14	63	22					
_ _ _		3 4 7	15	5		3.5	@ 11.0', contains sandstone fragments.								<u> </u>	111		
3.5 <u> </u>	- 563.6-	12 24 16	18	6			Severely weathered gray SANDSTONE, argillaceous, micaceous.											
_ 7 0—	-560.1-	50/5	4	7										1 1 1 1		1 1 1		
_ _ 20 _		Core 60"	Rec 58"	RQD 77%	R-1		Medium hard to hard gray SANDSTONE; very fine grained, highly to moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 17.5'-17.9', clay filled fractures.											
2.0— - - 25 —	- 555.1-						Bottom of Boring - 22.0'											
- - - 30																		

	ranSy				_		Project: SCI-823-0.00								Job No.	0121	3070	.03
og o	F: Bo	ring	R-27	0	_	ocation: Sta	. 74+12.9, 22.6 ft. RT of SR 823 CL Date Drilled: 04	/11			A T.(24/						
epth (ft)	Elev. (ft) 609.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	pu	% Silt	% Clay	Natu P	NDARD I ral Moistu L ⊢—— Blows pe	re Cont er foot -	ent, % ── L	- (
0 — — — —		25 48 50/3 15 50/4	15	1 2			No Topsoil Severely weathered brown SANDSTONE, argillaceous.											50
0 —	-604.8-	Core 84"	Rec 84"	RQD 88%	R-1	*106	Soft to medium hard brownish gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. @ 7.0'-7.2', broken zone.											
5—	- 598.4 -	Core 120"	Rec 120"	RQD 92%	R-2	*434	Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. @ 11.4'-17.4', contains few to moderate argillaceous laminations. @ 12.6'-12.9', iron stained broken zone. @ 17.4'-22.0', slightly fractured.											
2.0— - 25 — - -	- 587.8-						Bottom of Boring - 22.0'											

	ΓranSy				_		Project: SCI-823-0.00							Job No. 0121-3070.03
og o	F: Bo	ring	R-28		_	ocation: Sta	1. 75+23.5, 28.0 ft. LT of SR 823 CL Date Drilled: 4/	11/0			A T /	211		т
lonth	Elev.	er 6"	ry (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.8' (including drilling water)	gate	Sand	Sand	Sand	JN_		STANDARD PENETRATION (N Natural Moisture Content, % -
epth (ft)	(ft) 628.6	Blows per 6"	Recovery	Drive	Press /	Strength (psi)	DESCRIPTION	% Aggregate	% C. Sa		% F. Sa	% Silt	% Clay	PL
).4 - -	628.2	3 3 10	18	1		1.25	Topsoil - 5" Stiff brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; contains sandstone fragments; moist.	1	9		10	57	23	
.5 5 -	- 625.1-	15 25 14	18	2		4.5	Very stiff to hard brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist.	8	8		18	48	18	
_		7 7 10	18	3		3.75								
o — –		8 10 11	18	4		3.5								
_		7 11 8		5		4.5								
5.0—	-613.6-	12 50/5	17	6		4.5+								
	- 612.5-		Rec 120"	RQD 93%	R-1		Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, slightly fractured. @ 15.0'-15.1', broken zone. @ 15.2', low angle clay filled fracture. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to thickly bedded, slightly fractured. @ 16.4', 18.5', 22.2', low angle clay filled fractures.	_						
_ 5.0—	603.6						@ 23.3', 24.3', low angle clay filled fractures.							
-							Bottom of Boring - 25.0'							

Client: T					_		Project: SCI-823-0.00								Job No.	0121	-3070	0.03
OG O	F: Bo	ring	R-29	0	_	ocation: Sta	. 75+30.1, 115.9 ft. RT of SR 823 CL Date Drilled: 04	1/11			A T/	<u> </u>						
Depth (ft)	Elev. (ft) 649.8	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.0' (Prior to coring) 2.5' (Includes drilling water) DESCRIPTION	% Aggregate		M. Sand	% F. Sand	% Silt	% Clay	Natu P	ANDARD Iral Moist L I Blows p 10 2	ure Cor er foot	ntent, %	, -
-0.3 - - -	-649.5-	1 1 1 1	13	1 2		1.25 3.5	Topsoil - 4" Stiff to very stiff brown SILT (A-4b), little fine to coarse sand, trace to little gravel; damp to moist.	10	11		7	52	20		•			
5.0	- 643.8 -	12	16	3		5.5	Severely weathered brown SANDSTONE, fine grained, argillaceous.	_										
_ _ _ _	-639.8- -634.4-	Core	Rec 112"	RQD 44%	R-1	*166	Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to medium bedded, highly fractured. @ 10.1'-10.2',12.7'-12.9', high angle fractures. @ 12.2'-13.2',14.3'-15.4', broken, decomposed zone contains moderate argillaceous zone. Medium hard gray SANDSTONE interbedded with SHALE, very fine to fine grained, highly weathered, thinly bedded, moderately fractured. @ 15.6'-15.9', high angle fracture.											
0.0	-6 29.8 -						Bottom of Boring - 20.0'											

Client: 1					_		Project: SCI-823-0.00									o. 012	1-3070	0.03
LOG O	F: Bo	ring	R-30	Cam	_	<i>Location:</i> Sta	76+18.6, 34.4 ft. LT of SR 823 CL Date Drilled: 4/	8/05 T		240		to	4	/11/0	5			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 9.8' (prior to coring) 5.5' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ral Moi - ⊢	sture Co	_	6 -
_	643.2	2 3 3	9	1		0.5	Topsoil - 4" Soft grayish brown SILT (A-4b), little fine to coarse sand, little clay, trace gravel; organic, contains roots and sandstone fragments; moist.	8	10		8	56	18	Non-PI	astic			
-3.5— 5 —	640.0	5 6 6	18	2		2.0	Very stiff brown SANDY SILT (A-4a), little clay, little gravel; contains sandstone fragments; damp.	12	15		12	44	17					
- 8.5 	635 0	9 11 22	18	3		2.0										, , , , , , , , , , , , , , , , , , ,		
	635.0 633.5	30 36 50/4 Core	16 Rec	4 RQD	R-1	*38	Severely weathered brown SANDSTONE, fine grained, argillaceous. Soft brown SHALE, decomposed to highly weathered,											5
- 13.2— 15 — - - - - 20 —	- 630.3-	24" Core 120"	24" Rec 120"	21% RQD 80%			medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, argillaceous, highly to moderately fractured, contains few argillaceous laminations. @ 13.8', gray with siltstone interbeds. @ 13.8'-14.0' argillaceous zone @ 19.3'-19.4',19.6'-19.7', calcareous.											
- - - 5.0	- 618.5 -	Core 36"	Rec 36"	RQD 61%	R-3	*454	 @ 20.1', moderately fractured. @ 20.1'-20.9',22.5'-22.8', calcareous. @ 22.8'-25.0', SANDSTONE interbedded with SILTSTONE, highly fractured. Bottom of Boring - 25.0' 											
- 30																		

	TranSy				_		Project: SCI-823-0.00								Vo. 012	1-3070.03
LOG C	F: Bo	ring	R-31		_	ocation: Sta	i. 76+08.3, 123.6 ft. RT of SR 823 CL Date Drilled: 4.	/11/0				to	4	4/12/05		
			(in)	Sam No		Hand Penetro- meter	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring)			RAD	ATIO	ON		STANDAR	ON PENE	TRATION (I
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (i	Drive	Press / Core	(tsf) / * Point-Load Strength (psi)	19.5' (includes drilling water) DESCRIPTION	Aggregate		≥.	% F. Sand	Silt	Clay	Natural Mo PL ⊢ Blows		ntent, % -
-0.3 	671.8 671.5	_	1 12	D	Р			%	%	%	%	%	%	10	<u>20 ;</u>	<u>30 40 </u>
- -	071.0	2 4 4	15	1			Topsoil - 4' Loose brown SILT (A-4b), little to some clay, trace fine to coarse sand, trace gravel; contains sandstone fragments; damp.									
	668.3	14 46 50/1	13	2		•	Severely weathered brown SANDSTONE, fine grained, argillaceous.								+	11111
- - -	000.0	Core 48"	Rec 48"	RQD 46%	R-1	*187	Medium hard to hard brown SANDSTONE; fine grained, highly weathered, micaceous, highly to moderately fractured. @ 5.0'-6.2', broken. @ 6.2',8.4', high angle fractures. @ 8.0', rust stained fracture.									
10 —																
15 —		Core 120"	Rec 120"	RQD 80%	R-2	*131	@ 13.4'-18.0', brownish gray.@ 16.0', high angle fracture.									
_	653.8					•	Hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, moderately fractured.									
20 - -							@ 19.3', rust stained fracture.									
25 		Core 120"	Rec 120"	RQD 88%	R-3	*396										
- -							@ 26.8'-27.0', argillaceous zone.									
- 30							@ 29.2'-29.8', thinly laminated siltstone/sandstone layers.								1 1 1 1	

	TranSy				_		Project: SCI-823-0.00									Vo. 01	21-30	70.03
LOG (F: Bo	ring	R-31		_	ocation: Sta	i. 76+08.3, 123.6 ft. RT of SR 823 CL Date Drilled: 4/	11/0			4 = 1	to	4	/12/0	5			
Depth (ft)	Elev. (ft) 641.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 19.5' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Mo L ⊢	isture (Content,	FION (N, % - (LL) 40
30 —		Core 120"	Rec 115"	RQD 74%	R-4		Hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, moderately fractured; contains few argillaceous laminations. @ 35.9'-36.1', argillaceous zone. @ 37.7'-41.8', moderate to abundant argillaceous laminations, highly weathered.											
45 — - - - - 50.0— -	-621.8-	120"	119" Rec 12"	76% RQD 100%	n-3		Bottom of Boring - 50.0'								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1		
- 55 — - - -																		

Client:					_		Project: SCI-823-0.00							Jo	b No. ()121-307	70.03
LOG C	F: Bo	ring	R-32		_	ocation: Sta	a. 80+19.3, 34.5 ft. LT of SR 823 CL Date Drilled: 4/	7/05			4 = 1						
				Sam No		Hand Penetro-	WATER OBSERVATIONS: Water seepage at: None		GI	RAD.	ATIC	ON					
		per 6"	(in)		Core	meter (tsf) /	Water level at completion: None (prior to coring) 10.9' (includes drilling water)	yate	Q	ρι	ρ					ENETRATI Content,	
Depth (ft)	Elev. (ft)	vs pe	Recovery	g,	Press / C	* Point-Load Strength		Aggregate	. Sand	1. Sand	. Sand	Silt	Clay	PL			LL
n —	698.0	Blows ,	Rec	Drive	Pre	(psi)	DESCRIPTION	% A	% C.	% M.	% F.	8 %	% C	10	ows per	foot - ()
0.4	697.6	3					Topsoil - 5" / 6" soil removed before drilling Loose brown SILT (A-4b), little fine to coarse sand, trace	-								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1
-		4 4	12	1			gravel; contains sandstone fragments; damp.	9	4		12	59	16	Non-Plast			
3.0	695.0	4					Hard brown SANDY SILT (A-4a), little clay, trace gravel;										
5 —	-	11 28	18	2		4.5+	contains sandstone fragments; damp.										
6.0	692.0	50/4	_4	3			Severely weathered brown SANDSTONE, fine grained,	1									50+
7.5 	690.5						argillaceous. Soft brown SANDSTONE; fine grained, highly weathered,	-									
-	-	Coro	Doo	BOD			micaceous, highly fractured.										
10 —	1	Core 54"	Rec 54"	RQD 65%	R-1	*53	@ 8.5', medium hard. @ 9.7', high angle fracture.										
_							@ 11.0', carbonaceous seam.										
-							@ 12.8'-13.4', clay filled fractures.										
							@ 14.1', high angle fracture, rust staining.										
15 15.7- <u>-</u> -	682.3						@ 14.7', decomposed SHALE interbeds.										
_	_	Core	Rec 120"	RQD 57%	R-2	*208	Medium hard gray SANDSTONE; fine grained, moderately weathered, micaceous, highly fractured, contains clay filled										
-	-	120"	120	5/%			fractures. @ 17.4'-22.0', abundant argillaceous, interbedded with										
-							SHALE.										
20 —																	
_	-						@ 22.0', gray.										
_	1																
25 	1						@ 23.8', fossilferous.@ 24.5', moderately weathered, moderately fractured.										
_	-						© 21.0, moderatory weathered, moderatory fractared.										
25 —	1	Core 120"	Rec 120"	RQD 88%	R-3	*382											
_	†																
30																	

	TranSy				_		Project: SCI-823-0.00							Job N	o. 012	1-307	0.03
_OG C	F: Bo	ring	R-32	C	_	<i>₋ocation:</i> Sta	L. 80+19.3, 34.5 ft. LT of SR 823 CL Date Drilled: 4/	7/0: T) A T'	<u> </u>						
Depth (ft)	Elev. (ft) 668.0	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.9' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, 9	6 -
30 —		Core 120"	Rec 120"	POD	R-4	*381	Medium hard gray SANDSTONE; fine grained, moderately weathered, micaceous, highly fractured, contains clay filled fractures. @ 37.6', high angle fracture. @ 38.9',41.8',46.0', clay filled seams.										
45 — - - - - 0.0—	648.0-	Core 96"	Rec 96"	RQD 100%	R-5	*438	@ 44.4', clay filled fracture.										
- - 55 — - - -							Bottom of Boring - 50.0'										

	TranSy				_		Project: SCI-823-0.00								Job No	. 012	21-307	70.03
LOG C	F: Bo	ring	R-34	0	_	ocation: Sta	1. 80+35.5, 180.0 ft. RT of SR 823 CL Date Drilled: 4/	7/0			\ A = 1	21/		1				
Depth (ft)	Elev. (ft) 748.1	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	Solt Silt	% Clay	Natur PL	al Mois	ture Co	ETRATI	% - LL
-0.4 	-747.7- -	1 1 2	14	1		3.0	Topsoil - 5" Very stiff brown SANDY SILT (A-4a), little fine to coarse sand, little gravel; contains sandstone fragments; damp.	18	7		8	45	22					
3.5— 5 —	744.6-	12 20	18	2			Severely weathered brown and gray SANDSTONE, argillaceous.									; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;		//
7.0— - 10 — - -	- 741.1-	50/5 Core 96"	Rec 89"	RQD 71%	R-1	*157	Soft to medium hard brown SANDSTONE interbedded with SILTSTONE; fine grained, highly weathered, argillaceous, medium bedded, highly fractured, with typical low angle iron stained fractures. @ 7.1'-7.3',9.7'-9.9',13.5'- 13.6', high angle rust stained fractures. @ 7.4'-8.0', broken zone.											
		Core 120"	Rec 120"	RQD 88%	R-2	*172	@ 14.5'-15.0', core loss. @ 15.0'-15.1', 16.8'-17.0',22.8'-23.0', high angle rust stained fractures.											
25.3— - - -	-722.8- -	Core	Rec 120"	RQD 57%) R-3		Soft to medium hard grayish brown SHALE interbedded with SANDSTONE; highly weathered to decomposed, argillaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures. @ 29.7'-30.0', broken zone.	_										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00		, , ,						Job No.	0121	-3070.	.03
LOG C					_	ocation: Sta	. 80+35.5, 180.0 ft. RT of SR 823 CL Date Drilled: 4/	7/0	5									
Depth (ft)	Elev.	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water) DESCRIPTION	% Aggregate			% F. Sand	% Silt	% Clay	Natura	NDARD I al Moistu HBlows pe	re Cont r foot -	tent, % ── LI	- • L
30.0 	718.1 -718.1-	 	ł	7	4	*401	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured.		0	0	6	6	0,	10		30) 4	
40 — - 40 — - - 45 —		Core 120"	Rec 120"	RQD 100%	R-4	*529	@ 38.0'-38.1', argillaceous zone with low angle fractures.@ 40.1', low angle fracture.											
50 —		Core 120"	Rec 120"	RQD 100%		*473												
55 — - - - - 60		Core 120"	Rec 120"	RQD 100%	R-6		@ 57.4'-57.9', few to moderate argillaceous laminations.											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG C	OF: Bo	ring	R-34		_	ocation: Sta	. 80+35.5, 180.0 ft. RT of SR 823 CL Date Drilled: 4/	7/0			<u> </u>						
Depth (ft)	Elev. (ft) 688.1	Blows per 6"	Recovery (in)	Sam _l No			WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi	NDARD ral Moistu -	ure Con	tent, % —	-
60	-					*436	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured.	l									
65 —		Core 120"	Rec 120"	RQD 100%	R-7	*462	@ 68.0'-68.2', contains few to moderate argillaceous laminations.										
75 — — — 80 —		Core 120"	Rec 120"	RQD 100%		*462	@ 75.3'-77.2', very fine grained SANDSTONE with moderate argillaceous laminations.							1111	1 1 1 1		
- 85 — - - - -		Core 120"	Rec 120"	RQD 100%	R-9		@ 82.0', argillaceous zone with low angle fractures.										1 1 1

	TranSy				_		Project: SCI-823-0.00							Job N	o. 012	1-307	0.03
LOG	DF: Bo	ring	R-34		_	ocation: Sta	a. 80+35.5, 180.0 ft. RT of SR 823 CL Date Drilled: 4/	7/0									
Depth (ft) 90 —	Elev. (ft) 658.1	Blows per 6"	Recovery (in)	Sam _l No			WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natui PL	ral Mois - ⊢— Blows	D PENE sture Co per foot 20	ntent, 9	% - (LL
95 —						*523	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations, turbidity bedded. @ 92.5', contains few argillaceous laminations, turbidity.	k									
100 —		Core 120"	Rec 120"	RQD 100%	R10	*402											
05.0— 1110 —	-643.1-						Bottom of Boring - 105.0'										

	ΓranSy				_		Project: SCI-823-0.00								Job No	. 012	1-307	70.03
_OG C	F: Bo	ring	R-35	Sam	_	Location: Sta	i. 84+27.1, 49.2 ft. LT of SR 823 CL Date Drilled: 4/	7/0! T		RAD	ΔΤΙΛ	OM.						
Depth (ft)	Elev. (ft) 720.2	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	M. Sand	and	% Silt	% Clay	Natu Pl	NDARE ral Mois -	ture Co per foot	ntent,	% - LL
- - -	- 719.9 -	4 4 4	18	1		2.25	Topsoil - 3" Very stiff brown SILT (A-4b), some fine to coarse sand, some clay, trace gravel; damp. @ 1.0'-2.5', contains roots.	5	6		15	52	22			H		
	716.1		8	2a 2b		2.5	Severely weathered brown fine grained SANDSTONE,	1								1 1 1 1	171	1 5
10 —	- 715.2-	Core 84"	Rec 84"	RQE 64%	R-1	*338	\argillaceous. Medium hard brown SANDSTONE; fine grained, highly weathered, highly fractured. @ 5.0'-5.9', broken, clay interbeds, thinly laminated. @ 6.7', rust stained fracture. @ 7.1'- 7.5', broken. @ 7.5'-8.0', rust staining. @ 8.0'-10.8', grayish brown, rust staining. Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured.	-										
- 15 — - - - 20 —		Core 120"	Rec 120"	RQE 93%	R-2	*368	@ 12.0'-16.3', rust stained fractures. @ 12.3', high angle fracture.											
25 — 		Core 120"	Rec 120"	RQE 100%	R-3	*443	@ 22.0', moderately fractured.@ 23.3', clay filled fracture.											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-3	3070.03
LOG C	F: Bo	ring	R-35		_	ocation: Sta	ı. 84+27.1, 49.2 ft. LT of SR 823 CL Date Drilled: 4	/7/0								
Depth (ft)	Elev. (ft) 690.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	Silt %	% Clay	Natur PL	al Moistu ⊢—— Blows pe	re Conte r foot -	ATION (N, ent, % - (LL 0 40
30 —		Core 120"	Rec 120"	RQD 92%	R-4	*494	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, slightly to moderately fractured. @ 41.2'-41.5', broken sandstone. @ 41.5'-42.0', possible core loss.									
45 — 		Core 120"	Rec 120"	RQD 99%	R-5	*400	@ 44.2', clay filled fracture.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-6	*527										

	TranSy				_		Project: SCI-823-0.00								Job No	o. 012	1-307	0.03
.og c	F: Bo	ring	R-35			ocation: Sta	. 84+27.1, 49.2 ft. LT of SR 823 CL Date Drilled: 4/	7/05										
Depth (ft)	Elev. (ft) 660.2	Blows per 6"	Recovery (in)	Sami No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt #18%	% Clay	Natu P	NDARE ral Mois L ⊢— Blows p 0 2	ture Coi per foot	ntent, %	6 -
60 — - - - 65.0— - -	-655.2-	Core 36"	Rec 36"	RQD 100%	R-7	*152	Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, slightly fractured; contains few argillaceous laminations. Bottom of Boring - 65.0'											
70 — - - - 75 —	-																	
- - 80 — - -	- - - - -																	
 85 - - -	- - - - -																	

Client:					_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
LOG C	F: Bo	ring	R-37		_	ocation: Sta	i. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 4	6/0										
Depth (ft)	Elev. (ft) 761.1	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 2.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ontent, s	% - • LL
-0.3 - - - -3.5	760.8- - - 757.6-	2 2 1 8 50/4	18	1 2		0.5	Topsoil - 3" Soft to medium stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; contains roots; moist. Very dense brown SANDY SILT (A-4a), some gravel, little	27	15		12	33	13					
-	755.1- 			3			clay; contains sandstone fragments; damp. Severely weathered brown fine grained SANDSTONE, argillaceous.											50-
-9.0 10 - - -	- 752.1-	Core 60"	Rec 56"	RQD 67%	R-1		Medium hard brown SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, highly fractured, with low angle iron stained fractures @ 9.0'-9.2', 11.5'-11,8', 13.4'-13.7', broken zone. @ 9.5-9.6', 9.9'-10.0', high angle iron stained fractures.											50
15 — - - -	-	Core 60"	Rec 60"	RQD 100%	R-2	*157												
20 —		Core 120"	Rec 120"	RQD 64%	R-3	*141	@ 19.2'-19.3', 26.6'-26.8', broken zones. @ 19.5'-19.7, 21.8'-21.9', 24. 6'-25.0', 26.0'-26.5', high angle iron stained fractures.											
–27.0— – –	- 734.1-						Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered to decomposed, micaceous, thinly laminated to thinly bedded, moderately fractured.											

Client:					_		Project: SCI-823-0.00						Job No.	0121-3070.0	03
LOG (F: Bo	ring	R-37	Com	_	<i>_ocation:</i> Sta	84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 4/	6/0! T	240	A T1/	20/				
Depth (ft)	Elev. (ft) 731.1	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 2.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	and	t	% Clay			- • L
30 — - - - 35 — - -36.7 —	724.4-	Core 120"	Rec 117"	RQD 97%	R-4	*500	Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered to decomposed, micaceous, thinly laminated to thinly bedded, moderately fractured, with low angle clay filled fractures. @ 30.6', low angle iron stained fracture. @ 36.3'-36.7', clay filled zone. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.								
40		Core 120"	Rec 120"	RQD 100%	R-5	*477									
50 — - - - - 55 — -		Core 120"	Rec 119"	RQD 99%	R-6	*366									

Client:	TranS	ystems	, Inc.			•	Project: SCI-823-0.00								Job No.	0121-30	070.03
LOG (OF: B	oring	R-37		_	ocation: Sta	a. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 4/	6/0									
Depth (ft)	Elev. (ft) 701.1	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	G. Sand	% M. Sand DAS	% F. Sand	Sit NO	% Clay	Natur PL	NDARD F al Moistur . I————————————————————————————————————	re Conten	
60.0 - - - - 65 — - -	7-701.1- - - - - - -	Core 120"	Rec 120"	RQD 100%	R-7	*285	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.										
70 — - - - 75 — -	-	Core 120"	Rec 120"	RQD 100%	R-8	*420											
80 — 80.5 — - - -	680.6·	Core 18"	Rec 18"	RQD 100%	R-9	*420	Bottom of Boring - 80.5'	_						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
85 — - - -	-																

Client:					_		Project: SCI-823-0.00								b No. 012	1-3070.03
LOG C	F: Bo	ring	R-38	_	_	ocation: Sta	a. 88+08.9, 35.1 ft. LT of SR 823 CL Date Drilled: 4/9	5/05				to		4/6/05		
Depth (ft)	Elev. (ft) 750.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water) DESCRIPTION	% Aggregate		Sand	% F. Sand		% Clay	Natural I PL +	Moisture Co	TRATION (Nontent, % - LL -
0.3 _ _ _	- 750.3 -	3 4 5	18	1		2.75	Topsoil - 4" Very stiff brown SANDY SILT (A-4a), some clay, trace gravel; moist.	0	2		26	46	26	 	•	
_ 5 5.5 	745.1	5 8 14	18	2		2.0	@ 3.5', damp.									
_	J	21 25 19	18	3			Severely weathered brown SANDSTONE, fine grained, argillaceous.									
_ _ 10.0 	740.6	50/4	_ 2	4			O (II OANDOTONE) A LA LA LA MARIE (II									5
- - - 15 		Core 24"	Rec 24"	RQD 63%	R-1		Soft brown SANDSTONE interbedded with SHALE; very fine grained to fine grained, highly weathered to decomposed, argillaceous, micaceous, highly fractured. @ 11.9',12.9',14.1', high angle fractures. @ 12.3'-12.5',13.5-13.8', broken zones.									
20 —		Core 120"	Rec 97"	RQD 46%	R-2	*40	@ 16.6', broken zone.@ 17.6'-19.5', possible core loss.@ 20.2', high angle fracture.									
_	-728.6- - -725.9-	Core 120"	Rec 120"	RQD 93%	R-3	*415	© 21.8'-22.0', broken zone. Soft to medium hard gray SHALE; arenaceous, highly weathered, highly fractured. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous, moderately fractured. @ 27.6', low angle fracture.	-								

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No	. 0121	-3070.0)3
LOG C	F: Bo	ring	R-38		_	ocation: Sta	1. 88+08.9, 35.1 ft. LT of SR 823 CL Date Drilled: 4	1/5/0				to	4	/6/05				
Depth (ft)	Elev. (ft) 720.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	M. Sand	% F. Sand		% Clay	Natui Pl	ral Moist L ⊢—— Blows p	ture Cor per foot	TRATION tent, % - -	•
30 -	-						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, micaceous, moderately to slightly fractured. @ 30.7', clay filled fracture. @ 33.1'-33.3',35.2', clay filled fractures.											
35 — - - - 40 — -		Core 120"	Rec 120"	RQD 98%	R-4	*570	@ 36.5', low angle fracture.											
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*488	@ 43.6', high angle fracture.@ 46.8', clay filled fracture.							I - I - I - I	1 1 1 1			$\Box \Box \Box$
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-6	*486												

	TranSy				_		Project: SCI-823-0.00								Vo. 012	21-30	70.03
.OG (DF: Bo	ring	R-38	C	_	ocation: Sta	88+08.9, 35.1 ft. LT of SR 823 CL Date Drilled: 4/	5/05	745	A T !	to	4	/6/05				
Depth (ft)	Elev. (ft) 690.6	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Mo L ⊢	RD PEN. isture C	ontent,	% - LL
60 —		Core 120"	Rec 120"	POD	R-7	*485	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, fractured; contains few argillaceous laminations. @ 62.4', contains few argillaceous laminations. @ 65.2'-65.8', very fine grained with few to moderate argillaceous laminations. @ 69.1'- 70.2', 70.9'-72.0', very fine grained, moderate to abundant argillaceous laminations. @ 74.3'-74.6', few to moderate argillaceous laminations.										
- 75 — - - - 0.0—		Core 96"	Rec 96"	RQD 100%	R-8	*428	@ 73.1'-74.5', low angle fractures.										
85 — - - - 85 —	070.0						Bottom of Boring - 80.0'										

Client: T					_		Project: SCI-823-0.00					_			<i>No.</i> 012	1-3070.03
OG O	F: Bo	ring	R-40	0	_	ocation: Sta	n. 88+41.6, 204.8 ft. RT of SR 823 CL Date Drilled: 4/4	4/05 1		740	A T/	to	4	4/5/05		
Depth (ft)	Elev. (ft) 807.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural M PL ⊢	oisture Co	TRATION (I ntent, % -
0.3 - - -	-806.7-	3 4 8	13	1		4.25	Topsoil - 7" Hard brown and reddish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; dry to damp.									
5 —		4 6 7	13	2		4.5+	@ 3.5'-5.0', gray.	5	3		2	38	52			1 1 1 1 1 1
6.0	- 801.0-	12 14	12	3			Severely weathered brown and dark gray SHALE.									
10 —		12 30 49	18	4												
2.5	- 794.5-	25 49 50/2	14	5			@ 11.0'-12.5', arenaceous. Soft brown SHALE; highly weathered to decomposed,									
15 —							argillaceous, micaceous, highly fractured.									
_ _ _ _ 20 _		Core 120"	Rec 82"	RQD 57%	R-1		@ 15.7'-18.7', core loss due to poor rock.									
:1.1 - -	- 785.9 -						Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, micaceous, carbonaceous, highly fractured; contains moderate arenaceous laminations.									
25 -		Core	Rec	RQD 81%	B-2		@ 23.6'-25.0', possible core loss.									
30		120"	104"	81%												

	TranSy				_		Project: SCI-823-0.00							Job N	o. 0 12	21-3070	0.03
LOG (F: Bo	ring	R-40		_	ocation: Sta	. 88+41.6, 204.8 ft. RT of SR 823 CL Date Drilled: 4	4/05	745	A = 1 -	to	4/	5/05				
Depth (ft)	Elev. (ft) 777.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	ral Mois L ⊢— Blows	sture Co	_	- (
30 —	-774.5-	Core 120"	Rec 120"	RQD 89%			Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, micaceous, carbonaceous, highly fractured; contains moderate arenaceous laminations. Soft to medium hard gray SANDSTONE interbedded with SHALE; highly weathered, arenaceous, micaceous, argillaceous, highly fractured.	5									
45 —		Core 120"	Rec 120"	RQD 81%	R-4		@ 44.6', gray. @ 46.6'-46.9', broken zone.					i i					
_	751.3- 748.9-	Core	Rec 120"	RQD 79%	R-5	*257	@ 54.4'-55.3', broken. Medium hard black SHALE; highly weathered, micaceous, carbonaceous, highly fractured to broken; contains COAL blossom. Medium hard to hard light gray SANDSTONE.										

	ΓranSy				_		Project: SCI-823-0.00							•	lo. 012	21-307	70.03
_OG O	F: Bo	ring	R-40		_	ocation: Sta	a. 88+41.6, 204.8 ft. RT of SR 823 CL Date Drilled: 4/	4/0			to	4	1/5/05	<u> </u>			
Depth (ft)	Elev. (ft) 747.0	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	П.	% Silt	% Clay	Natı F	ANDAR ural Moi PL ⊢— Blows 10	sture C	ontent,	% - (
60 —							Medium hard to hard light gray SANDSTONE; fine grained, highly weathered, moderately to highly fractured.										
62.3— — 65 — — — 70 — —	- 744.7-	Core 120"	Rec 120"	RQD 92%	R-6	*61	Soft to medium hard gray SHALE, highly weathered, arenaceous, moderately fractured. @ 62.3'-71.9', siltstone interbeds. @ 71.7'-71.9', very fine grained SANDSTONE layers. @ 72.7'-72.8', 73.0', 73.2'-73. 4', 73.7'-74.6', 76.0'-76.1', SANDSTONE layers.										
75 — - - - 80 —	7040	Core 120"	Rec 120"	RQD 83%	R-7	*473	@ 78.4', medium hard.									1 1 1 1	
82.2— — 85 — — —	- 724.8-	Core 120"	Rec 120"	RQD 100%	R-8	*488	Hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured. @ 84.2'-84.9', argillaceous zone. @ 87.8', fine to medium grained. @ 87.8', high angle fracture.										

	ΓranSy				_		Project: SCI-823-0.00									lo. 012	21-3070	0.03
og o	F: Bo	ring	R-40		_	ocation: Sta	a. 88+41.6, 204.8 ft. RT of SR 823 CL Date Drilled: 4/	4/0				to	4	/5/05				
Pepth (ft)	Elev. (ft) 717.0	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ral Moi L ⊢	sture Co		, -
0.00 <u> </u>	_717.0 <u>_</u>						Medium hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured. @ 93.0', high angle fracture.											
95 — — — —		Core 120"	Rec 120"	RQD 100%	R-9	*503												
00 																		
		Core 120"	Rec 120"	RQD 100%	R10	*569												
- 10 - -																		1.1
- 15 - -		Core 120"	Rec 120"	RQD 100%	R11	*580	@ 115.3'-115.4', brown, fine to medium grained.											

		stems			_		Project: SCI-823-0.00						Job No. 0121-3070.03
<u> </u>	F: Bo	ring	R-40	0		ocation: Sta	a. 88+41.6, 204.8 ft. RT of SR 823 CL Date Drilled: 4/	4/0	D 4 5	A	to	4	4/5/05
epth (ft)	Elev. (ft) 687.0	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water) DESCRIPTION	% Aggregate	Z.	and		% Clay	STANDARD PENETRATION (I Natural Moisture Content, % - PL
20							Medium hard gray SANDSTONE; fine grained, slightly weathered, micaceous, moderately fractured. @ 123.2', 124.8', argillaceous laminations, low angle fractures.						
30 —		Core 120"	Rec 120"	RQD 100%	R12	*361	@ 128.5', 128.6', argillaceous laminations.						
- - - -	-672.0	Core 30"	Rec 30"	RQD 100%	R13	*484	@ 133.6, high angle fracture.						
-	072.0						Bottom of Boring - 135.0'						
.0 —													
-													
- 5 -													
_													

Client: Tra					_		Project: SCI-823-0.00								Job No	. 012	1-307	0.03
LOG OF	: Bo	ring	R-41			ocation: Sta	. 92+20.4, 115.9 ft. LT of SR 823 CL Date Drilled: 4.	5/05					-					
(ft)	Elev. (ft) 777.7	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	NDARL ral Mois -	ture Co	ntent,	% - (LL
-0.2 		WOH 2 2 5 11 31	11	1 2		1.5 4.5+	Topsoil - 2" Stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, some gravel; contains roots; damp. @ 3.5'-5.0', hard, contains sandstone fragments.	24	7		13	33	1					
-6.0 - 7 - - -		50/5	5	3			Severely weathered brown fine grained SANDSTONE, argillaceous.											50
15 —	767.7 -	Core 108"	Rec 108"	RQD 63%	R-1	*197	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. @ 10.0'-10.3', 10.5'-10.7', 13.8'-13.9', 17.8'-17.9', 19.1'-19.4', broken zones. @ 10.7'-11.2', 14.5'-14.6', high angle iron stained fractures.											
20 —	754.7—	Core 120"	Rec 120"	RQD 68%	R-2	*314	 @ 19.0'-19.5', 19.7'-19.9', high angle iron stained fractures. @ 21.0'-21.2',22.0'-22.7', high angle iron stained fractures. @ 21.3'-21.5', 21.6'-21.8', broken zones. Medium hard to hard brownish gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, contains few argillaceous laminations. @ 25.2'-25.3', broken zone. @ 27.5', 28.6', low angle fractures. 											

Client:					_		Project: SCI-823-0.00						Job No.	0121-3070.0	03
LOG (DF: Bo	ring	R-41	Cana	_	ocation: Sta	. 92+20.4, 115.9 ft. LT of SR 823 CL Date Drilled: 4/	5/0: T) A T !	<u> </u>				
Depth (ft)	Elev. (ft) 747.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water) DESCRIPTION	% Aggregate			t t	% Clay	STANDARD I Natural Moistu PL ⊢ Blows pe 10 20	er foot -	- • L
30 — - - - 35 — - -		Core 120"	Rec 102"	RQD 80%	R-3	*206	Medium hard to hard brownish gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 30.1'-30.5', high angle iron stained fracture. @ 31.0'-32.0', 34.3, low angle fractures. @ 31.5', 32.1', 33.1'-33.4', 33.6'-34.4', 35.0'-35.1', 35.3'-36.0', contains moderate to abundant argillaceous laminations. @ 35.2', 35.8', 39.3', low angle fractures.								
45 — - -	728.9	Core 120"	Rec 120"	RQD 91%	R-4	*259	 @ 39.7'-41.5', contains moderate to abundant argillaceous laminations. @ 41.5'-41.9', high angle iron stained fracture. Medium hard to hard gray SHALE interbedded with very fine grained SANDSTONE; highly weathered, micaceous, thinly laminated to thinly bedded. @ 46.5'-47.2', very fine SANDSTONE. @ 47.9', 48.1', 48.6', low angle fractures. 								
50 — 50 — - - 55 — -	, 20.0	Core 120"	Rec 120"	RQD 100%	R-5	*515	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured. @ 55.4', argillaceous laminations.								

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No.	0121-30	70.03
LOG (DF: Bo	ring	R-41		_	ocation: Sta	. 92+20.4, 115.9 ft. LT of SR 823 CL Date Drilled: 4.	/5/0	5								
Depth	Elev.	s per 6"	very (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water)	% Aggregate		Sand	Sand		J,	Natur		ENETRAT e Content,	, ,
(ft) 60 —	(ft) 717.7	Blows I	Recovery	Drive	Press.	Strength (psi)	DESCRIPTION		% C.	% M.	% F.	% Silt	% Clay		Blows per		
65 —	-	Core 120"	Rec 120"	RQE 100%	R-6	*554	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured.										
70 —		Core 120"	Rec 120"	RQD 100%	R-7	*483											
80 — - - - 85 — -	-	Core 120"	Rec 120"	RQD 100%	R-8	*452											

	TranSy					-	Project: SCI-823-0.00								Job N	lo. 012	21-307	0.03
LOG (F: Bo	ring	R-41		_	ocation: Sta	i. 92+20.4, 115.9 ft. LT of SR 823 CL Date Drilled: 4/5	5/05										
Depth (ft)	Elev. (ft) 687.7	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ıral Mois L ⊢— Blows			% - LL
95 —		Core 120"	Rec 120"	RQD 100%	R-9	*139	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly to massive, slightly fractured to unfractured.										1 1 1 1	
		Core 12"	Rec 12"	RQD 100%	R10	*139	Bottom of Boring - 100.0'											
110 —	-																	

Client: Ti					_		Project: SCI-823-0.00							Job No. 0121	-3070.03
OG O	F: Bo	ring	R-43		_	ocation: Sta	. 92+21.9, 189.4 ft. RT of SR 823 CL Date Drilled: 0	3/31				to	(04/01/05	
(ft)	Elev. (ft) 806.0	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water) DESCRIPTION	% Aggregate		M. Sand		Sit Sit	% Clay	STANDARD PENET Natural Moisture Con PL Blows per foot 10 20 3	tent, % -
	805.6	4 4 7	18	1		3.5	Topsoil - 5" Very stiff to hard light reddish brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp.							9	
5 —		7 9 10	18	2		4.5		9	10		15	28	38		
		7 12 14	18	3		4.5+	@ 6.0', brown.								<u> </u>
0.0	- 796.0–	8 25 32	18	4		4.5+	Severely weathered brownish gray SHALE, contains								
	700.0	18 27 50/5	17	5			interbedded sand seams.								
13.0————————————————————————————————————	-793.0-	Core 120"	Rec 112"	RQD 58%	R-1	*17	Soft to medium hard grayish brown SHALE; decomposed, arenaceous, thinly bedded, highly fractured. @ 13.6'-14.3', lost recovery. @ 14.3'-14.6', 14.9-15.1', 22. 5'-23.0', 23.0'-23.4', broken zones. @ 16.6'-17.6', 24.5'-24.7', high angle iron stained fractures. @ 18.4'-18.6', coal seam.								
20 —							€ 10.7 10.0, total 30am.								
- - 24.7 - - - -	-781.3-	Core 120"	Rec 120"	RQD 73%	R-2		@ 23.0'-23.3', highly weathered. Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures; contains moderate to abundant argillaceous laminations. @ 28.6'-30.3', qu = 10,909 psi SDI = 39.4%.								

	TranSy				_		Project: SCI-823-0.00							Job No. 0121-3070.03
OG C	F: Bo	ring	R-43		_	Location: Sta	i. 92+21.9, 189.4 ft. RT of SR 823 CL Date Drilled: 03	/31				to	(04/01/05
Depth (ft)	Elev. (ft) 776.0	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water) DESCRIPTION	% Aggregate	© Sand	Sand	% F. Sand	Silt	% Clay	STANDARD PENETRATION (I Natural Moisture Content, % - PL
30 — - - 35 — - 40 — 40.5 —	765.5	Core 120"	Rec 120"	RQD 60%	R-3	*396	Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, micaceous, thinly bedded to thickly bedded, moderately weathered, contains few to moderate argillaceous laminations.							
-45 — 50 — 		Core 120"	Rec 120"	RQD 78%	R-4	*405	 @ 45.8'-47.1', SHALE bed. @ 48.0'-49.5', qu = 11,468 psi SDI = 96.0%. @ 50.2'-52.1', argillaceous broken zone. 							
-55 — - - - -59.4—	- - - -746.6-	Core 120"	Rec 120"	RQD 92%	R-5	*468								

	TranSy				٦.	anation. Cto	Project: SCI-823-0.00	0/04	/O.E	:		to.			NO. UIZ	1-3070.03
<u>_0G (</u>	F: Bo	ring	ห-43	Sam	_	ocation: Sta	. 92+21.9, 189.4 ft. RT of SR 823 CL Date Drilled: 03	5/31 T			DATI	to ON		04/01/05 T		
Depth (ft)	Elev. (ft) 746.0	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water) DESCRIPTION	% Aggregate		M. Sand	Sand	% Silt	% Clay	Natural I PL + Blo	Noisture Co	TRATION (Nontent, % - LL -
65 —	740.0	Core 120"	Rec 120"	RQD 62%		*84	Soft to medium hard gray SHALE interbedded with SANDSTONE; highly, arenaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures. @ 64.0'-67.2', 68.0'-68.9', highly weathered to decomposed. @ 69.5'-70.8', qu = 12,415 psi SDI = 74.2%. @ 70.8'-77.6', dark gray.									
75 — -77.6 — - 80 —	- 728.4-	Core 120"	Rec 120"	RQD 83%	R-7	*435	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded; contains few argillaceous laminations.	_							11 111	
85 —		Core 120"	Rec 120"	RQD 100%	R-8	*474	@ 83.8'-85.4', qu = 11,340 psi SDI = 98.2%.									

Client: 1	ΓranSy	stems	s, Inc.				Project: SCI-823-0.00							Job No.	0121-3070.03
LOG O	F: Bo	ring	R-43		_	ocation: Sta	a. 92+21.9, 189.4 ft. RT of SR 823 CL Date Drilled: 0	3/31				to	(04/01/05	
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength		% Aggregate			: Sand		% Clay	Natural Moistu PL ⊢——	PENETRATION (Note: 1881) PENETRATION (Note: 1881) PENETRATION (Note: 1881)
90 —	716.0	Blo	Rec	Drive	Press	(psi)	DESCRIPTION	4 %	0 %	٧ %	% F.	% Silt	0 %	Blows pe 10 20	
95 —					-		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured.								
100 —		Core 120"	Rec 120"	RQD 98%	R-9	*792	@ 96.2', 96.6', 96.7', 100.0', 100.1', low angle fractures.								
105 — -		Core	Rec	RQD 100%	P10	*612									
- 110 		120"	120"	100%	n I U	012									
- 115 															
-117.8 - 	688.2	Core 120"	Rec 120"	RQD 100%	R11	*448	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous.								

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00								Job No	. 012	1-307	0.03
LOG (DF: Bo	ring	R-43		_	ocation: Sta	a. 92+21.9, 189.4 ft. RT of SR 823 CL Date Drilled: 03	3/31				to	C	04/01/)5			
Depth (ft)	Elev. (ft) 686.0	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARE ral Mois L ⊢— Blows µ 0 2	ture Co	ntent, 9	% - • LL
120 —	676.0-	Core 84"	Rec 84"	RQD 100%	R12	*443	Medium hard to hard gray SANDSTONE; very fine to fine grained, lightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded; contains few to moderate argillaceous laminations. Bottom of Boring - 130.0'											

	√ranSy						Project: SCI-823-0.00							Job No	012	1-3070	0.03
OG O	F: Bo	ring	R-44		_	ocation: Sta	. 96+33.4, 121.5 ft. LT of SR 823 CL Date Drilled: 3/3	31/0				to	4	4/4/05			
epth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Samp No.	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	Aggregate	Sand	Sand	Sand		ау	STANDARD Natural Moist PL ⊢			-
	8127		Весс	Drive	Press	(psi)	DESCRIPTION	% Ag	% C.	% M.	% F.	% Silt	% Clay	Blows p 10 2		_	40
_	- 812.5-	2 2	18	1		1.75	Topsoil - 2" Stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.	5	5		8	36	46				
.5 <u> </u>	-809.2-	6 13 20	18	2		4.5+	Hard grayish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; possible decomposed shale; dry to damp.										
		9 19 22		3		4.5+											
0 —	-802.2-	8 15 18	18	4		4.5+	Severely weathered brownish gray SHALE, contains rust										
		11 31	18	5			stains and sulphur precipitate. @ 11.0'-12.0',16.0'-17.5', black, carbonaceous.										\(\)
5 —		17 24		6													
-	- 794.2-	18 23 19	14	7													
	- 792.7-	30/3	3				Severely weathered brownish gray fine grained SANDSTONE fragments, argillaceous. Medium hard to hard gray SANDSTONE; very fine to fine										
							grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 20.3', 20.5', 21.9', low angle fractures.										1 1 1 1 1 1 1 1
25 - - -		Core 120"	Rec 120"	RQD 96%	R-1	*271	@ 24.2', 25.1', 26.5', low angle fractures.										
_																	

Client:	TranSy	stems	, Inc.			_	Project: SCI-823-0.00								Job I	Vo. 01	21-30	70.03
LOG (F: Bo	ring	R-44		_	ocation: Sta	a. 96+33.4, 121.5 ft. LT of SR 823 CL Date Drilled: 3/3	31/0				to	4/-	4/05				
Depth (ft)	Elev. (ft) 782.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ıral Mo L ⊢		Content,	ION (N) % - • • LL) 40
30 — 40 —		Core 120"	Rec 120"	RQD 96%	R-2	*410	Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.						1					
45 —		Core 120"	Rec 120"	RQD 100%	R-3	*479							l i					
-50.0— - - - - - 55 — - -	762.7-	Core 120"	Rec 120"	RQD 100%	R-4	*444	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, argillaceous, micaceous, massively bedded, slightly fractured; contains few argillaceous laminations.											

Client:					_		Project: SCI-823-0.00								Job No	. 0121	-307	0.03
LOG C	F: Bo	ring	R-44		_	ocation: Sta	n. 96+33.4, 121.5 ft. LT of SR 823 CL Date Drilled: 3/	31/0				to		4/4/05				
Depth (ft)	Elev. (ft) 752.7	Blows per 6"	Recovery (in)	San Nive	Core /	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	Silt %	% Clay	Natu Pl	NDARD ral Moisi - ⊢—— Blows p 0 2	er foot	ntent, %	6 -
_	-744.7-	Core 120"	Rec 120"	RQI 1009	R-5	*427	Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, argillaceous, micaceous, massively bedded, slightly fractured; contains few argillaceous laminations. @ 67.2'-67.5' very fine grained. Medium hard very fine grained SANDSTONE; argillaceous, micaceous, thinly bedded to massive, slightly fractured; contains few argillaceous laminations.											
70 — — — — — — — — — — — — — — — — — — —		Core 120"	Rec 120"	RQI 100%	R-6	*124	contains few argillaceous laminations.											
80 — -81.3 — - - - - - - - - - - - - -	-731.4-	Core 120"	Rec 120"	RQI 1009	R-7	*482	@ 80.0', becomes SILTSHALE like. Hard gray very fine to fine grained SANDSTONE; moderately weathered to slightly weathered, argillaceous, micaceous, massive, slightly to unfractured.											

	TranSy				_		Project: SCI-823-0.00								Job N	lo. 012	21-307	0.03
LOG	F: Bo	ring	R-44		_	ocation: Sta	a. 96+33.4, 121.5 ft. LT of SR 823 CL Date Drilled: 3/	31/0				to	4/	4/05				
Depth (ft)	Elev. (ft) 722.7	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ral Mo L ⊢			% - (LL
90.0	7-722.7- - - - - - -	Core 120"	Rec 120"	RQD 100%	R-8	*471	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thinly bedded to thickly bedded.						1 1 1 1 1				1 1 1 1	
100 - - - 105 - - - - 110 -		Core 120"	Rec 120"	RQD 100%	R-9	*440												
		Core 120"	Rec 120"	RQD 100%	R10	*455												

	TranSy					_	Project: SCI-823-0.00								Job I	Vo. 01	21-30	70.03
LOG (DF: Bo	ring	R-44	-	_	ocation: Sta	i. 96+33.4, 121.5 ft. LT of SR 823 CL Date Drilled: 3/3	31/0		245	4.71	to	4/	4/05				
Depth (ft)	Elev. (ft) 692.7	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	Silt 8	% Clay	Natu P	ıral Mo. L ⊢		Conten	TION (N ;, % - + LL
120 —		Core 120"	Rec 120"	RQD 100%	R11	*629	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thinly bedded to thickly bedded. @ 122.8'-123.1', iron stained zone.											
- - -		Core 60"	Rec 60"	RQD 100%	R12	*507												
-135.0—	677.7-						Bottom of Boring - 135.0'											

Client:							Project: SCI-823-0.00						Job N	o. 0121	-3070.03
LOG C	F: Bo	ring	R-46		_	ocation: Sta	i. 96+23.1, 84.5 ft. RT of SR 823 CL Date Drilled: 03	/30							
Depth (ft)	Elev. (ft) 793.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natural Moi PL ⊢—	sture Cor per foot	— <i>LL</i>
	793.1-	4 4 5 5	18	1 2		3.75 1.25	Topsoil - 8" Stiff to very stiff light brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp to moist.								
5 — 6.0 — 	- 787.8-	9	18	3		1.20	Severely weathered gray SANDSTONE, argillaceous, rust stained.								51
-10.0 - - -	- 783.8-	Core 36"	Rec 30"	RQD 28%	R-1		Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, broken to highly fractured. @ 10.0'-10.4', 12.3'-12.5', 12.8'-13.0', broken zones. @ 10.4'-10.9', lost recovery.								
15 — 15 — —18.1— 20 —		Core 120"	Rec 120"	RQD 91%	R-2	*401	 @ 11.7', 11.9', low angle clay filled fractures. @ 12.1'-12.3', 15.9'-16.0', 16.8'-17.0', high angle iron stained fractures. Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 23.4'-25.0',25.5'-26,0, contains poorly cemented								
25 — - - - - - -		Core 120"	Rec 120"	RQD 84%	R-3	*351	@ 23.4-25.0,25.5-26,0, contains poony cemented argillaceous zones.								

	ΓranSy				_		Project: SCI-823-0.00							Job N	lo. 012	21-3070	.03
.OG C	F: Bo	ring	R-46	Cam		Location: Sta	1. 96+23.1, 84.5 ft. RT of SR 823 CL Date Drilled: 03	3/30 T		<u> </u>	24/	_					
Depth (ft)	Elev. (ft) 763.8	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Mois L ⊢— Blows	sture C	_	-
30 —		Core 120"	Rec 120"	RQD 85%	R-4	*203	Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 31.9'-33.1' contains poorly cemented argillaceous zones. @ 35.5'-42.4' few to moderate argillaceous laminations.										
	-743.3	Core 120"	Rec 120"	RQD 90%	R-5	*314	@ 45.0'-45.2', 48.5'-48.7', argillaceous broken zones. Soft to medium hard gray SANDSTONE interbedded with SHALE; fine to very fine grain, decomposed to highly weathered, thinly laminated to thinly bedded, highly fractured.										
- 5.7 - - -	- -738.1-	Core 120"	Rec 120"	RQD 85%	R-6	*109	Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, thinly laminated to thinly bedded, highly to moderately fractured.										

	TranSy				_		Project: SCI-823-0.00								Job No	0121	-3070	0.03
.og c	F: Bo	ring	R-46	0	_	ocation: Sta	a. 96+23.1, 84.5 ft. RT of SR 823 CL Date Drilled: 03	3/30			4 T/	<u> </u>						
epth (ft)	Elev. (ft) 733.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARD ral Moist L ⊢—— Blows p 0 2	ure Cor er foot	ntent, % —— I	-
60 — - - 63.5 — - - - 70 — -	730.3	Core 120"	Rec 120"	RQD 91%	R-7	*464	Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, thinly laminated to thinly bedded, highly to moderately fractured. @ 62.2'-63.5' gravel to SILTSTONE/ SILT to SHALE, highly fractured to broken. Hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 64.1', low angle clay filled fractures. @ 65.9', 66.1', 66.2', 66.4', low angle clay filled fractures.											
75 — - - - 30 — -		Core 120"	Rec 120"	RQD 100%	R-8	*547								1 1 1 1	1 1 1 1	1 1 1 1		1 1 1 1 1
- 35 — - - -		Core 120"	Rec 120"	RQD 100%	R-9	*779									1111			

	TranSy				_		Project: SCI-823-0.00								Job No	. 012	-3070	.03
LOG (F: Bo	ring	R-46		_	ocation: Sta	. 96+23.1, 84.5 ft. RT of SR 823 CL Date Drilled: 0	3/30										
Depth (ft)	Elev. (ft) 703.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois - ⊢— Blows p	ture Coi per foot		- (
90 —	-	Core 84"	Rec 84"	RQD 100%	R- 10	*470	Hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 96.3',97.4',98.5', low angle clay filled fractures.											
00.0—	693.8						Bottom of Boring - 100.0'											

Client:					_		Project: SCI-823-0.00								o. 012	1-307	0.03
LOG C	F: Bo	ring	R-47	-	_	ocation: Sta	. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24		A T (to	(3/30/	05			
Depth (ft)	Elev. (ft) 838.6	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows i	D PENE ture Col per foot	ntent, 9	% - (
-0.3 - - - -	-838.3- - -	WOH 2 6	16	1		3.0	Topsoil - 4" Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.	_									
	834.6	30 50/0	12	2			Severely weathered brown SANDSTONE, rust stained.	1							1111	1	
-5.0 - - - -	- 833.6-	Core 60"	Rec 35"	RQD 8%	R-1		Medium hard reddish brown SANDSTONE; very fine to fine grained, highly weathered, broken; contains breccia. @ 5.0'-5.1', 5.8'-10.0', relithified sediments.										
-10.0 - - - - 15 - - - - -	828.6	Core 120"	Rec 120"	RQD 58%	R-2	*43	Hard brown SANDSTONE; fine to medium grained, moderately weathered, medium bedded to thickly bedded with cross bedding, highly fractured with high angle fractures.										
- - - 25 — - -		Core 120"	Rec 90"	RQD 34%	R-3	*64	 @ 24.5'-25.9', qu = 2,629 psi. @ 26.0'-26.6', contains gray decomposed, argillaceous laminations. @ 26.0'-27.0', SDI = 80.1%. 										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								lob No. 01	21-30	70.03
LOG C	F: Bo	ring	R-47		_	ocation: Sta	. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24				to	(03/30/0	5		
Depth (ft)	Elev. (ft) 808.6	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate	G. Sand	Sand	% F. Sand	% Silt	% Clay	Natura PL	DARD PEN I Moisture (Hows per for	Content,	% - LL
30 —		Core 120"	Rec 120"	RQD 86%	R-4	*162	Hard brown SANDSTONE; fine to medium grained, highly weathered, medium bedded to thickly bedded with cross bedding, moderately fractured, contains rust staining. @ 30.0'-32.5', contains high angle fractures with sandy silt infilling. @ 41.6'-42.7', decomposed SILTSTONE.										
40 — - -42.7— - 45 — - - - 50 —	795.9-	Core 120"	Rec 120"	RQD 58%	R-5	*187	Medium hard dark gray SHALE; carbonaceous, highly to moderately weathered, thinly bedded, arenaceous, moderately fractured. @ 45.5'-46.9', qu = 2,332 psi, SDI = 11.7%. @ 48.5', coal stringer.	-									
_	-785.2-	Core 120"	Rec 120"	RQD 91%	R-6	*362	Hard light gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, thinly bedded to medium bedded. @ 53.4'-55.3', red and gray gradational zone with shale and siltstone clasts. @ 58.5'-59.3', contains moderate argillaceous laminations.	7									

Client:					_		Project: SCI-823-0.00								o. 012	1-307	0.03
LOG C	F: Bo	ring	R-47		_	ocation: Sta	. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24		4.71	to	(03/30/	05			
Depth (ft)	Elev. (ft) 778.6	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, 9	% - (LL
65 —		Core 120"	Rec 120"	RQD 100%	R-7	*350	Hard light gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, medium to massively bedded, slightly fractured to unfractured, contains occassional siltstone or shale clast. @ 60.8'-61.8', SDI = 84.5%. @ 62.0'-62.4', qu = 5,340 psi. @ 62.7', 67.7', 68.2', argillaceous laminations. @ 62.7', 67.2', low angle fractures.								1111		
75 —		Core 120"	Rec 120"	RQD 100%	R-8	*454											
80 — — —82.5 — — 85 — —	- 756.1 -	Core 120"	Rec 120"	RQD 100%	R-9	*799	Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to medium bedded.										i ii

	TranSy				_		Project: SCI-823-0.00								Job N	lo. 01	21-30	70.03
LOG	F: Bo	ring	R-47		_	ocation: Sta	i. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24				to	03	/30/0)5			
Depth (ft)	Elev. (ft) 748.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	al Moi		Content,	ION (N) % - • LL) 40
90.0— - - 95— - - - 100—	748.6-	Core 120"	Rec 120"	RQD 100%	R10	*353	Hard to very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured. @ 98.6'-99.3', 99.8'-107.3', very fine SANDSTONE with few argillaceous laminations.											
100 —		Core 120"	Rec 120"	RQD 100%	R11	*613	@ 107.3'-107.8', contains moderate to abundant argillaceous laminations.											
		Core 120"	Rec 120"	RQD 100%	R12	*553												

	TranSy				_		Project: SCI-823-0.00									lo. 012	21-307	0.03
LOG (F: Bo	ring	R-47		_	ocation: Sta	n. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24				to	0	3/30/	05			
Depth (ft)	Elev. (ft) 718.6	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand		% Clay	Natu F	ıral Moi °L ⊢			% - (LL
120 —		Core 120"	Rec 120"	RQD 99%	R13	*421	Hard to very hard gray SANDSTONE; very fine to fine grained slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured.	,									1 1 1 1	
135 — - 135 — - - -		Core 120"	Rec 120"	RQD 100%	R14	*405	@ 134.0'-135.0', SDI = 98.7%. @ 135.2'-135.6', qu = 12,216 psi.											
145 — - - 145 — - -		Core 120"	Rec 120"	RQD 100%	R15	*406												

Client:	TranSv	stems	. Inc.				Project: SCI-823-0.00	00 0	040					Job No.	0121-3	070.03
LOG					1	ocation: Sta	n. 100+19.8, 176.4 ft. LT of SR 823 CL Date Drilled: 03	3/24	/05		to	()3/30/0		0	2.0.00
Depth (ft)	Elev. (ft) 688.6	Blows per 6"	Recovery (in)	Sam No	ple	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natu Pi	NDARD P ral Moistur - \to Slows per 0 20	e Contei	ATION (N) nt, % - ● → LL → 40
150 —		Core 120"	Rec 120"	RQD 100%	R16	*303	Hard to very hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured, contains few argillaceous laminations.									
165 — - - 165 — - - - 170 —		Core 120"	Rec 120"	RQD 98%	R17	*411										
- - - 175 — - - -	658.6	Core 120"	Rec 120"	RQD 100%	R18	*543	Bottom of Boring - 180.0'									

Client: 7	ΓranSy	stems	, Inc.			-	Project: SCI-823-0.00	30 0	0 10					Job No. 0121-	3070.03
LOG O	F: Bo	ring	R-49		_	ocation: Sta	100+31.5, 65.8 ft. RT of SR 823 CL Date Drilled: 03	/22				to	03/24	I/05	
Depth (ft)	Elev. (ft) 792.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand OITA	Silt	Na	TANDARD PENETF tural Moisture Conto PL ├──── Blows per foot - 10 20 30	ent, % - • LL
0.3 _ _ _	-791.9-	WOH 1 2		1		2.75	Topsoil - 3" Very stiff brown SANDY SILT (A-4a), little to some clay, little gravel; contains sandstone fragments; damp.						111	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
5 6.0	- 786.2-	3 10 11	18	2		2.0	Coverally weathered brown CANDOTONE for a service of								
<u> </u>		33 50/3		3			Severely weathered brown SANDSTONE fine grained, argillaceous. @ 8.5'-10.0', contains vertical seam of gray siltstone.								50+
10 —		39 50/4		4			C 0.0 10.0, comains roman country officials.								50+
_		10 34 33 8	17	5											67-
15 —		50/5 50/4	4	7											50+
20 — 25 — —	- 776.7-	Core 114"	Rec 111"	RQD 67%	R-1	*211	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 15.5'-18.0', broken, highly weathered with core loss. @ 18.3'-18.6', high angle fracture. @ 21.7'-22.2', high angle fracture.								50+
- - - 30		Core 120"	Rec 120"	RQD 96%	R-2										

	TranSys				_		Project: SCI-823-0.00							Job No.	0121-	3070.	.03
LOG (DF: Bo	ring	R-49	Sam	_	ocation: Sta	. 100+31.5, 65.8 ft. RT of SR 823 CL Date Drilled: 03	3/22 T		ATIO	to	<u> </u>	03/24/0	<u> </u>			
Depth (ft)	Elev. (ft) 762.2	Blows per 6"	Recovery (in)	Drive No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	and	% Silt	% Clay	Natura PL	IDARD P Il Moistur Ilows per 20	e Cont	ent, % —⊢ Li	- (
30 —	-					*405	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 33.1'-34.1', moderate argillaceous laminations.						1 1 1 1				
35 —		Core 120"	Rec 120"	RQD 100%	R-3	*347											
50 —	-	Core 120"	Rec 120"	RQD 98%		*501	 @ 47.2'-47.4', moderate to abundant argillaceous laminations moderately to highly weathered. @ 52.7'-55.0', contains moderate argillaceous laminations, 										
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-5		moderately to highly weathered. @ 53.3'-53.9', high angle fracture. @ 55.0'-57.7', 58.5'-60.0', 62.0'-62.1', contains few argillaceous laminations. @ 58.5'-65.0', very fine grained.										

	TranSy				_		Project: SCI-823-0.00									0121-3	070.03	_
LOG C	F: Bo	ring	R-49	0	_	ocation: Sta	i. 100+31.5, 65.8 ft. RT of SR 823 CL Date Drilled: 03	3/22				to	- 0	03/24/0	5			_
Depth (ft)	Elev. (ft) 732.2	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	al Moistur ⊢—— Blows per	e Conter	ATION (N nt, % - 1	
60 —	732.2	Core 120"	Rec 120"	RQD 100%		*651	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured.											
80 —		Core 120"	Rec 120"	RQD 100%	R-7	*523												
- - 90		Core	Rec 120"	RQD 98%	R-8		@ 87.4'-88.4', SDI = 99.4%.											

	TranSy				_		Project: SCI-823-0.00									o. 01 2	1-307	0.03
LOG C	F: Bo	ring	R-49		_	ocation: Sta	n. 100+31.5, 65.8 ft. RT of SR 823 CL Date Drilled: 03	/22				to	03	/24/0)5			
Depth (ft)	Elev. (ft) 702.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	al Mois . ⊢— Blows i			6 -
90 —						*578	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				1.1.1	
95 —		Core 120"	Rec 120"	RQD 96%	R-9	*480												
10		Core 120"	Rec 120"	RQD 100%	R10	*527												
- 115 - - -		Core 60"	Rec 60"	RQD 100%	R11	*375	@ 115.0'-115.2', fossiliferous zone.											

Client:	TranSy	stems	s, Inc.				Project: SCI-823-0.00								Job No	. 012	1-307	0.03
LOG (OF: Bo	ring	R-49		_	ocation: Sta	a. 100+31.5, 65.8 ft. RT of SR 823 CL Date Drilled: 03	3/22				to	C	3/24/0)5			
Depth (ft)	Elev. (ft) 672.2	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pl	NDARL ral Mois -	ture Co	ntent, s	% - (LL
120 —	662.2-	Core 120"	Rec 120"	RQD 100%	R12	*426	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured. Bottom of Boring - 130.0'											

	TranSy				_		Project: SCI-823-0.00							o. 0121	-3070	.03
LOG C	F: Bo	ring	R-50	Sam	_	ocation: Sta	. 104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24 T		ATIC	to	03/2	8/05			
Depth (ft)	Elev. (ft) 812.1	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	and	Silt			sture Cor per foot	tent, %	-
0 -0.5 -	811.6-	3 5 5	18	1		3.5	Topsoil - 6" Very stiff light reddish brown SILT AND CLAY (A-6a), little fine sand; damp.	9				11				
-3.5 - -	808.6	14 16 17	18	2			Severely weathered gray SANDSTONE, fine grained, argillaceous.					11				
- -		12 50/5	11	3												
- 10.0 -	802.1-	25 50/4 Core 12"	16 Rec 12"	4 RQD ,83%	R-1		Hard gray and light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded, highly									
15 — 15.6— - - 20 —	796.5-	Core 120"	Rec 120"	RQD 69%	R-2	*255	fractured with low to high angle fractures with clay infilling, contains decomposed zones, argillaceous. Medium hard to hard light gray and light brown SANDSTONE very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to medium bedded, moderately fractured with low to high angle fractures with clay infilling.	;								
25 — 26.6— -	- -785.5-	Core 120"	Rec 120"	RQD 78%	R-3	*256	Soft to hard gray SANDSTONE; very fine to medium grained, interbedded with SHALE, micaceous, decomposed to moderately weathered, shale zones typically highly weathered to decomposed.	 - -								

Client:					_		Project: SCI-823-0.00							Job No.	0121	-3070.	.03
LOG (DF: Bo	ring	R-50	Sam	_	ocation: Sta	. 104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24 T		ATIO	to	(03/28/0)5			
Depth (ft)	Elev. (ft) 782.1	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	and	% Silt	% Clay	Natur PL	NDARD al Moiste .	ure Con er foot	tent, % —	-
30 —		Core	Rec	RQD			Soft to hard gray SANDSTONE, very fine to medium grained, interbedded with SHALE, micaceous, decomposed to moderately weathered, shale zones typically highly weathered to decomposed.										
-36.0 - - - - 40	- 776.1- - - -	120"	120"	88%	R-4	*221	Hard light gray SANDSTONE; very fine grained to fine grained, highly weathered to moderately weathered, moderately fractured to unfractured, contains few argillacious laminations. @ 43.9', 44.5', 52.1', low angle fractures.										
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*237	@ 38.6'-38.7', 48.2'-49.1', argillaceous zones. @ 55.6'-55.7', argillaceous zone fracture.										
- - 55 — - - - -		Core 120"	Rec 120"	RQD 89%	R-6	*237	@ 56.8', 57.0', 57.7', 58.0', argillaceous laminations with low angle fractures.										

	TranSy				_		Project: SCI-823-0.00								Job No.	0121	-307	0.03
LOG C	F: Bo	ring	R-50		_	ocation: Sta	104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24				to	(03/28/0	5			
Depth (ft)	Elev. (ft) 752.1	Blows per 6"	Recovery (in)	San No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD F al Moistu Hows pe 0 20	re Con	tent, %	6 -
65 —		Core 120"	Rec 120"	RQI 1009	R-7	*672	Hard light gray SANDSTONE; very fine to fine grained, highly to moderately weathered, pyritic, moderately fractured to unfractured, contains argillaceous laminations. @ 60.4', 60.7', 60.8', argillaceous laminations with low angle fractures. @ 63.0', 63.1', argillaceous laminations with fractures. @ 64.6'-70.9', contains moderate to abundant argillaceous laminations.											
75 —	-741.2- - - - -731.7-	Core 120"	Rec 120"	RQE 90%	R-8		Soft to medium hard SHALE, highly weathered, arenaceous, thinly laminated to thinly bedded, moderately fractured. @ 71.8'-71.9', 72.9'-73.3', 80.1'-80.3', SANDSTONE layers.											
85 — - - - -		Core 120"	Rec 120"	RQI 1009	R-9	*362	Hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured.											

	TranSy				_		Project: SCI-823-0.00									o. 012	1-3070	0.03
LOG ()F: Bo	ring	R-50		_	ocation: Sta	104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24				to	0	3/28/	05			
Depth (ft)	Elev. (ft) 722.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Moi: PL ⊢— Blows	per foot		•
90 —		Core 120"	Rec 120"	RQD 100%	R10	*546	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured.										1 1 1 1	
105 —		Core 120"	Rec 120"	RQD 100%	R11	*417											1111	
- - 115 - - -		Core 120"	Rec 120"	RQD 100%	R12	*316												

	TranSy				_		Project: SCI-823-0.00								•	Vo. 01	21-307	70.03
LOG (DF: Bo	ring	R-50	Sam	_	ocation: Sta	104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24 T		240	ATIC	to	0	3/28/	05			
Depth (ft)	Elev. (ft) 692.1	Blows per 6"	Recovery (in)	No No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	F. Sand		% Clay	Nati F	ural Mo PL ⊢			% - (LL
120 —	-	Core 120"	Rec 120"	RQD 100%	R13	*410	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured. @ 124.4'-125.1', very fine grained SANDSTONE with moderate argillaceous laminations. @ 128.5'-129.2', few to moderate argillaceous laminations. @ 130.3', argillaceous laminations.										1 1 1 1	
135 — - - - - 140 —		Core 120"	Rec 120"	RQD 100%	R14	*317											1 1 1 1	
- - 145 - - -		Core 120"	Rec 120"	RQD 100%	R15	*422	@ 145.7'-147.9', contains few argillaceous laminations.											

	TranSy				_		Project: SCI-823-0.00							Job No	o. 012	1-307	0.03
LOG (DF: Bo	ring	R-50		_	ocation: Sta	a 104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03	3/24			to	C	03/28/0)5			
Depth (ft) 150 —	Elev. (ft) 662.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pl	NDARD ral Mois L ⊢— Blows p 0 2	ture Co	ontent, s	% - (LL
155 — - - - - -	651.1-	Core 120"	Rec 120"	RQD 100%	R16	*426	Hard gray SANDSTONE; very fine to fine grained, slighly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured. @ 159.9'- 161.0', argillaceous lamination. Bottom of Boring - 161.0'										

	ranSy				_		Project: SCI-823-0.00							Job No. 0121-3070.03
_OG O	F: Bo	ring	R-52		_	ocation: Sta	a 104+28.8, 67.4 ft. RT of SR 823 CL Date Drilled: 03	3/29				<u> </u>		Т
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength		Aggregate	C. Sand		F. Sand	1,	Clay	STANDARD PENETRATION (I Natural Moisture Content, % - PL LL
•	711.6	Blo	Rec	Drive	Press	(psi)	DESCRIPTION	1 %	%	٧ ٧	% F	8	0 %	Blows per foot - () 10 20 30 40
0 -0.5 - -	- 711.1-	4 8 10	18	1			Topsoil - 6" Very stiff brown SANDY SILT (A-4a), "and" gravel, little clay; contains sandstone fragments; damp.							
5 		8 14 17	18	2				41	13		8	26	12	•
		9 10 12	18	3										jan
8.5 10 	- 703.1-	3 5 6	1	4			Severely weathered brown SANDSTONE, argillaceous.							
_		50/1	_1_	5										
13.0— - 15 — -	- 698.6-						Medium hard brown SANDSTONE; fine grained, moderately to highly weathered, micaceous, highly fractured. @ 13.0'-13.4', broken. @ 15.8'-18.0', possible core loss.							
20 —		Core 120"	Rec 95"	RQD 51%	R-1	*425	@ 18.7',19.2',20.0', clay filled fractures. @ 18.8', high angle fracture. @ 19.2'-19.8', gray. @ 20.5'-24.9', argillaceous, with rust staining, highly weathered.							
24.9 	- 686.7-	Core 120"	Rec 114"	RQD 79%	R-2	*173	Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, highly fractured. @ 23.6'-23.9', broken zone, possible core loss. @ 25.8',27.1', clay filled fractures. @ 28.5'-28.7', moderate argillaceous laminations.							

Client:	TranSys	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070.	03_
LOG C	F: Bo	ring	R-52		_	ocation: Sta	. 104+28.8, 67.4 ft. RT of SR 823 CL Date Drilled: 03	/29							_		
Depth (ft)	Elev. (ft) 681.6	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.1' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	N Silt	% Clay	Natur PL	NDARD : al Moistu Humble Blows pe	re Con er foot	tent, % - ── LL	•
30 —	-	Core 120"	Rec 120"	RQD 100%	R-3	*453	Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured. @ 30.5', clay filled fracture. @ 31.1'-32.7', moderate interbedded clay/shale layers. @ 32.4'-32.7', broken zone. @ 33.5', fine to medium grained, moderately fractured, slightly to moderately weathered.										
45 —		Core 120"	Rec 120"	RQD 100%	R-4	*451							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1111	
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-5	*483											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	000-0						Job No	0121	-3070.	03
LOG C	F: Bo	ring	R-52		_	ocation: Sta	104+28.8, 67.4 ft. RT of SR 823 CL Date Drilled: C	3/29				-					
Depth (ft)	Elev. (ft) 651.6	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.1' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natui PL		ure Con er foot	TRATION itent, % - LL - 0 40	- • <u>-</u>
60 — - - - -65.0—	-646.6-	Core 24"	Rec 24"	RQD 100%	R-6	*374	Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured. @ 62.3', contains argillaceous laminations, moderately to highly weathered. Bottom of Boring - 65.0'										
- - 70 —																	
 75 																	
80 —																	
85 — - - - - 90																	

Client:					_		Project: SCI-823-0.00								0121-30	70.03
LOG C	F: Bo	ring	R-53	0	_	ocation: Sta	. 106+21.7, 95.2 ft. LT of SR 823 CL Date Drilled: 0	3/22		A T !	to	0	3/23/0	5		
Depth (ft)	Elev. (ft) 680.5	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.1' (3/23/05 am) 8.6' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	l Moistur ⊢—— lows per		
-0.4 	680.1						Topsoil - 5"								111111	1 1 1 1
_		4 7 7	18	1			Medium dense brown SANDY SILT (A-4a), "and" gravel, little clay; contains sandstone fragments; damp.						1 1 1 1			
-3.5 - 5	677.0	39 27 9	1	2			Severely weathered brown SANDSTONE, argillaceous.	_								
-		6 8 17	18	3												
- - -10.0 	670.5	25 28 50/3 Core	15 Rec	4 RQD			M. F. J.									
- - - 15 - -		12" Core 120"	12" Rec 120"	, <u>33%</u> RQD 31%	n-1	*256	Medium hard to hard gray and brown SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, broken with low to high angle fractures with clay infilling; contains argillaceous decomposed zones, few to moderate argillaceous laminations. @ 13.0'-14.0', argillaceous zone. @ 15.3'-15.7',16.9'-17.7', high angle rust stained fractures. @ 17.7'-19.0', argillaceous zone.	,								
-19.0— 20 — - - -	-661.5-						Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to medium bedded, broken to highly fractured, contains low angle fractures with clay infilling; contains few to moderate argillaceous laminations. @ 22.5'-23.5', broken zone.									
25 — — — — —		Core 120"	Rec 120"	RQD 78%	R-3	*306	@ 27.0', 27.2'-27.8', 28.1'-28.2', 29.3'-30.1' moderate to abundant argillaceous laminations.									

	TranSy				_		Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG	OF: Bo	ring	R-53	0	_	ocation: Sta	a. 106+21.7, 95.2 ft. LT of SR 823 CL Date Drilled: 03	3/22			to)3/23/0	05			
Depth (ft)	Elev. (ft) 650.5	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.1' (3/23/05 am) 8.6' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu Pi	NDARD ral Moisti L ⊢—— Blows p 0 20	ure Con er foot	tent, % —	-
35 —	-647.3- -640.2- -635.5-	Core 120"	Rec 120"	RQD 48% RQD 92%	Π-4		Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to medium bedded, highly fractured to broken, with low angle fractures, contains clay infilling; contains moderate argillaceous laminations. Soft to medium hard SANDSTONE interbedded with SHALE; fine grained to very fine grained, decomposed to highly weathered, thinly laminated to thinly bedded. @ 33.2'-34.9', broken, decomposed zone. Hard gray SANDSTONE; very fine to fine grained, highly weathered to moderately weathered, argillaceous, highly fractured to moderately fractured.										
50 —							Bottom of Boring - 45.0'										

Client: Tra					_		Project: SCI-823-0.00								Job No	. 012	1-3070	0.03
OG OF:	: Bo	ring l	R-55	_	_	ocation: Sta	. 106+05.7, 188.4 ft. RT of SR 823 CL Date Drilled: 5/	11/										
(ft) (Elev. (ft) 91.7	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	M. Sand	% F. Sand	Silt	% Clay	Natu P	ANDARD Iral Mois IL IIII Blows II	ture Co	ontent, %	5 -
5 —		15 27 50/3 36 50/3	7	1 2			No Topsoil / 2"-4" soil removed before drilling Severely weathered brown SANDSTONE, argillaceous.										1111	50
6.0 58 - - 10 - 11.0 58	85.7	Core 60"	Rec 60"	RQD 63%	R-1		Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, medium bedded, moderately fractured, discolored infilling. @ 9.1'-9.3', high angle fracture.	-										
15 —							Bottom of Boring - 11.0'											

	TranSy				_		Project: SCI-823-0.00							Job No	. 0121	-307	0.03
LOG	OF: Bo	ring	R-203		_	ocation: Sta	1. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 1/	19/0			<u> </u>						
Depth (ft)	Elev. (ft) 761.1	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natui PL	al Mois . ⊢— Blows μ	er foot	ntent, %	6 -
- - -	-761.0- -	8 17 27 13 35 43		1 2			Topsoil - 1" Dense to very dense gray and brown COARSE AND FINE SAND (A-3a), some gravel; contains sandstone fragments; dry to damp.										
5 — —5.5— - -	755.6-	50/5	4	3			Severely weathered brown SANDSTONE, argillaceous.										50
 10.0 	751.1-	37 50/1 Core 30"	6 Rec 27"	4 RQD 60%	R-1	*145	Medium hard pinkish brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, moderately fractured to broken.										50
15 — 13.6—		Core 120"	Rec 120"	RQD 78%	R-2	*299	@ 13.0'-13.6', broken. Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 14.5',15.9',17.0',17.3',20.0' 21.3',21.5', low angle rust stained fractures. @ 17.4'-17.5', decomposed zone. @ 18.5'-18.7', high angle fracture. @ 19.4'-21.3', qu = 2,969 psi SDI = 88.4%.										
25 — - - - -		Core 120"	Rec 120"	RQD 78%		*513	 @ 25.2', decomposed zone. @ 25.3'-26.8', very fine to medium grained sandstone. @ 26.8'-30.2', contains moderate argillaceous laminations. 										

	ranSy				_		Project: SCI-823-0.00								Job N	lo. 01	21-30	70.03
.OG O	F: Bo	ring	R-203		_	ocation: Sta	a. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 1/	19/0										
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sami No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt NO	% Clay	Natu F	ıral Moı L ⊢	sture C	ontent,	FION (N. % - 1 LL) 40
	731.1 -728.7- -726.0-	Core 120"	Rec 120"	RQD 78%		*116	Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 30.2'-30.4', ferric band. @ 31.7'-32.1', near vertical fracture with iron staining. Soft to hard gray and brown SHALE interbedded with SANDSTONE; moderately to highly weathered, micaceous, argillaceous, arenaceous, laminated to medium bedded, moderately to highly fractured. Soft to medium hard gray to dark gray SHALE; moderately weathered, thinly laminated, slightly fractured. @ 41.0'-42.5', qu = 5,662 psi SDI = 93.2%. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.	-	0.	5	0,	5	0.					40
		Core 120"	Rec 120"	RQD 100%	R-5	*867	slightly fractured.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
55 - - -		Core 120"	Rec 120"	RQD 100%	R-6	*2042	@ 56.5'-57.9', qu = 13,945 psi SDI = 99.0%.											

	TranSy				_		Project: SCI-823-0.00							Job No.	0121-3	3070.03
LOG C	DF: Bo	ring	R-203	7 Sam		Location: Sta	n. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 1/	19/0	240	ATIO	201					
Depth (ft)	Elev. (ft) 701.1	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura	al Moistui I	re Conte	ATION (N, nt, % - 0
60 —	701.1	Core 120"	Rec 120"	RQD 100%		*1630	Very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.			5						
75 — 80 —		Core 120"	Rec 120"	RQD 100%	R-8	*1764	@ 77.5'-79.1', qu = 10,425 psi SDI = 97.8%.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
-85 — - - - -		Core 120"	Rec 120"	RQD 100%	R-9	*1555	@ 88.6', argillaceous band with low angle fracture.						1 1 1 1			

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	30 0	3-10					Job No.	0121	-3070	0.03
LOG (F: Bo	ring	R-203		_	ocation: Sta	a. 84+54.5, 169.3 ft. RT of SR 823 CL Date Drilled: 1/	19/									
Depth (ft) 90 —	Elev. (ft) 671.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water) DESCRIPTION	% Aggregate		M. Sand	% F. Sand	% Clay	Natur PL	NDARD F al Moistui Hows pei	re Con	tent, %	5 - T
95 —		Core 120"	Rec 120"	RQD 100%	R10	*1810	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 92.0'-92.1', calcareous.										
-112.5—	-648.6-	Core 120"	Rec 120"	RQD 100%	R- 5 11	*1065	@ 111.0'-112.0', low angle fracture. Bottom of Boring - 112.5'										
115 —	-						Dollom of Boning - 112.0										

Client:					_		Project: SCI-823-0.00							Job No	. 012	1-307	0.03
LOG C	F: Bo	ring	PB-31		_	ocation: Sta	a. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/			to	7	/24/0	3			
Depth (ft)	Elev. (ft) 881.9	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	M. Sand	F.	Silt	% Clay	Natu P	ANDARD ral Mois L ⊢— Blows p	ture Co	ontent, s	% - (LL
0.4 	-881.5- -877.8-	50/4	4	1 2			Topsoil - 5" Very dense brown and light brown SANDY SILT (A-4a); damp (decomposed sandstone) Soft to medium hard light brown, brown and light gray										50
- -		Core 66"	Rec 66"	RQD 74%	R-1		SANDSTONE; fine to coarse grained, thinly to medium bedded, poorly cemented, micaceous, moderately weathered, broken.										
10 — — — — — — — — — — — — — — — — — — —		Core 120"	Rec 114"	RQD 20%	R-2		@ 9.6'-19.9', very broken.										
20 —		Core 120"	Rec 110"	RQD 88%	R-3		@ 22.6'-23.5', very broken.										
_							@ 29.6', argillaceous.										1 1 1

Client:	<u> </u>	stems	s, Inc.				Project: SCI-823-0.00		U- 1 U						Job No	. 0121	-3070	.03
LOG C	F: Bo	ring	PB-31		L	ocation: Sta	ı. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/0				to	7	7/24/0	3			
Depth (ft)	Elev. (ft) 851.9	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	© Sand	% M. Sand	% F. Sand	SN %	% Clay	Natu P	NDARD ral Moist L ⊢—— Blows p	ure Con	tent, % ——	-
30 —		Core	Rec 103"	RQD 63%	R-4		Soft to medium hard light brown, brown and light gray SANDSTONE; fine to coarse grained, thinly to medium bedded, poorly cemented, micaceous, moderately weathered, broken.											
-35.2 - - - -	- 846.7-	120	103				Medium hard gray SHALE; thinly bedded to laminated, micaceous, slightly to moderately weathered, contains thin sandstone laminations.											
40 — — — — — — — — — — — — — — — — — — —		Core 120"	Rec 120"	RQD 100%	R-5		@ 45.0', interbedded shale and sandstone.											
—50.0 — — —						,	Medium hard gray interbedded SHALE and SANDSTONE; thinly bedded to laminated, micaceous, moderately weathered.											
55 — —	-827.6- -824.5-	Core 120"	Rec 109"	RQD 50%	R-6		Soft dark gray to black SHALE; very thinly bedded to laminated, carbonaceous, broken, moderately to severely weathered, contains smooth polished fractures.											
_	-824.5- -823.4-						Medium hard to hard gray and brown SANDSTONE; fine grained, micaceous, moderately weathered. Soft gray to black SHALE.	-										

	TranSy:				_		Project: SCI-823-0.00								Vo. 01	21-3	070.	03
_OG C	F: Bo	ring	PB-31		_	ocation: Sta	. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/0	740	A T1/	to	7.	24/0	3				
Depth (ft)	Elev. (ft) 821.9	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mo L ⊢	RD PEN isture (s per for 20	Conter		-
60 —		Core 60"	Rec 32"	RQD 20%	R-7		Soft dark gray to black SHALE, very thinly bedded to laminated, carbonaceous, broken, moderately to severely weathered, contains smooth polished fractures.											
_	- 812.9-	Core 60"	Rec 30"	RQD 0%	R-8		Medium hard light gray LIMESTONE; thinly to thickly bedded,											
_	809.4-	Core 60"	Rec 57"	RQD 62%	R-9		slightly leached, mechanically broken. @ 69.6'-70.4', high angle clean fracture. @ 71.0'-71.3', black shale layer. Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains argillaceous layers.								1 1 1 1	1 1		
75 - - -		Core 60"	Rec 60"	RQD 100%	R10		@ 76.1', 77.0', low angle clean fractures.											
80 —		Core 120"	Rec 116"	RQD 97%	R11		 @ 78.9', clean, well cemented. @ 81.8', contains small brown grains and occasional small iron and pyrite inclusions. @ 85.1'-88.1', slightly argillaceous. 											

	TranSy				_		Project: SCI-823-0.00									lo. 012	1-307	0.03
LOG C	PF: Bo	ring	PB-31		_	ocation: Sta	. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/0			A T10	to	7.	24/0	3			
Depth (ft)	Elev. (ft) 791.9	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Moi. L ⊢—	D PENE sture Co per foot 20	ntent, 9	% - (LL
90 —		Core 120"	Rec 120"	RQD 100%	R- 12		Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains argillaceous layers. @ 89.3'-94.4', slightly argillaceous.									1 1 1 1		
100 —		Core 120"	Rec 116"	RQD 97%	R13		 @ 101.0', contains small iron pyrite inclusions. @ 105.8'-106.1', high angle fracture. @ 106.1', near horizontal clay filled fracture. 											
110 —		Core 120"	Rec 118"	RQD 88%	R14		@ 111.9'-113.1', high angle fracture with small pyrite crystals.											

Client:					_		Project: SCI-823-0.00							Job No. 01	21-3070.03
LOG C	F: Bo	ring	PB-31		_	ocation: Sta	. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7	17/0				to	7/24/0	3	
Depth (ft)	Elev. (ft) 761.9	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Solt %	Nat		IETRATION (N Content, % -
120 —		Core 120"	Rec 120"	RQD 100%	R15		Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains small iron pyrite inclusions.								1 1111 11
135 —	-752.2- - -745.7-	Core 120"	Rec 120"	RQD 100%	R16		Medium hard to hard interbedded SHALE, SILTSTONE and SANDSTONE, very thin to thinly bedded, slightly to moderately weathered. @ 135.8'-136.0', contains limestone clasts. @ 136.0'-136.2', leached limestone layer. Hard gray SANDSTONE, fine grained, thinly to thickly bedded unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.	-							1 1111 11
140 —		Core 120"	Rec 120"	RQD 100%	R17										

	TranSy				_		Project: SCI-823-0.00									o. 012	1-307	'0.03
LOG C	F: Bo	ring	PB-31			ocation: Sta	L. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/0		745	A	to	7/2	4/00	3			
Depth (ft)	Elev. (ft) 731.9	Blows per 6"	Recovery (in)	Sam No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pl	ral Moi L ⊢	D PENE sture Co per foot 20	ntent,	% - LL
150 —		Core 120"	Rec 120"	RQD 100%	R18		Hard gray SANDSTONE, fine grained, thinly to thickly bedded unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.	,								1 1 1 1	111	1 1
160 —		Core 120"	Rec 120"	RQD 100%	R19													
170 —		Core 120"	Rec 120"	RQD 100%	R20		@ 173.1'-173.4', ironstone.											

Client:	ΓranSy	stems	s, Inc.			-	Project: SCI-823-0.00		2.0						Job No. 0	121-3	070.03
LOG C	F: Bo	ring	PB-31		_	ocation: Sta	ı. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/	17/0				to		7/24/03			
Depth (ft)	Elev. (ft) 701.9	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt N	% Clay	Natura PL	IDARD PE al Moisture Blows per i	Conte	
180 — — — — — — — — — — — — — — — — — — —		Core 120"	Rec 120"	RQD 100%	nz I		Hard gray SANDSTONE, fine grained, thinly to thickly bedded unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.	,									
190 — -191.2= - - - - 195 —	-6 90.7-	Core 19"	Rec 19"	RQD 100%	R22		Bottom of Boring - 191.2'	-						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
200 —														1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
205 —																	1 1 1 1 1 1

Client:	TranSy	stems	, Inc.				DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)8 Project: SCI-823-0.00						·	lob No.	0121	-3070	.03
LOG C	OF: Bo	ring	R-70		_	ocation: Sta	a. 143+03.0, 247.2 ft. LT of SR 823 CL Date Drilled: 3.	/4/0			to	3	3/7/05				
Depth (ft)	Elev. (ft) 767.5	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water) DESCRIPTION	% Aggregate	. Sand	% F. Sand	ON % Silt	% Clay	Natura PL E	DARD F I Moistur Hows pe	re Con	tent, % —	- •
0 0.6 <u>-</u>	766.9	5 8 11	18	1		4.5+	Topsoil - 7" Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.										
5 —		6 6 9	18	2		4.5+											
- -		15 21 28	18	3		4.5+							1 1 1 1			, , , , , , , , , , , , , , , , , , ,	
—9.0— 10 —	- 758.5-	21 50/4	10	4		4.5+	Severely weathered SANDSTONE.										50
—11.5— - - - 15 —	-756.0-	Core 30"	Rec 30"	RQD 72%	R-1	*16	Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, highly fractured, moderate to abundant argillaceous laminations.						1 1 1 1				
20 —	-	Core 120"	Rec 120"	RQD 92%	R-2	*561	 @ 17.7', interbedded with SILTSTONE and CLAYSTONE. @ 21.9'-22.2', decomposed CLAYSTONE. @ 22.0', high angle fracture. @ 22.2'-22.5', broken zone. 										
 23.6 25 - -	743.9- 						@ 23.0'-23.6', rust staining. Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured low angle fractures, contains few argillaceous laminations.										
- 30	_	Core 120"	Rec 120"	RQD 85%	R-3	*317	@ 26.9'-27.3', low angle fracture.										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job N	o. 012	1-3070	0.03
LOG	F: Bo	ring	R-70	C	_	ocation: Sta	. 143+03.0, 247.2 ft. LT of SR 823 CL Date Drilled: 3/	4/0	D 4 C	ATI	to	3,	/7/05				
Depth (ft)	Elev. (ft) 737.5	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pl	ral Mois L ⊢— Blows	sture Co per foot		- •
30 —		Core 120"	Rec 120"	RQD 100%	R-4	*458	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, slightly fractured to unfractured, contains few argillaceous laminations.										
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*354	@ 43.0'-45.5', slightly fractured with fractures low angle.@ 46.7', silty seam.@ 48.1'-48.4', IRONSTONE									1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1
55 — - - - -		Core 120"	Rec 120"	RQD 100%	R-6	*308											

	TranSy				_		Project: SCI-823-0.00							Job N	lo. 012	21-307	70.03
_OG (F: Bo	ring	R-70	0		ocation: Sta	i. 143+03.0, 247.2 ft. LT of SR 823 CL Date Drilled: 3/	4/0	240	A T/	to	3	7/05				
Depth (ft)	Elev. (ft) 707.5	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moi L ⊢	D PENI sture Co per foo 20	ontent,	% - LL
60 —		Core 120"	Rec 120"	RQD 100%		*503	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, slightly fractured to unfractured, contains few argillaceous laminations.										
75 — - - - 80 — -		Core 120"	Rec 120"	RQD 100%	R-8	*443	@ 78.2'-78.6', qu = 9,029 psi. @ 82.4', low angle silt filled fracture. @ 82.6'-83.0', possible core loss.										
- 85 — - - -		Core 120"	Rec 120"	RQD 100%	R-9	*535											

Elev. (ft) 677.5	Blows per 6"	Recovery (in)	Sample No.	Har Pene met (tsf,	WATER OBSERV r r oad	03.0, 247.2 ft. LT of SR 823 CL PARTIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water)			GRA	DATI	to ON	3	/7/05 07/			TDATIO	
(ft)	Blows per 6"		No.	Har Pene met (tsf,	d OBSER\ ro- r / .oad	VATIONS: Water seepage at: None							OT.	ND 4 C	> DCA/C	TDATIO	
			1	ii (ps		DESCRIPTION	Č	Ag o	% C. Sand % M. Sand	17.	% Silt	% Clay	Natu P	ıral Mois L ⊢— Blows į	sture Co per foot	_	-
						um hard to hard gray SANDSTONE; fine grained, slight hered, micaceous, slightly fractured. I.3', silt and clay filled low angle fracture.	tly										
	Core	Rec	RQDR	10 *47		5.9'-96.2', thinly laminated SHALE interbeds.											
	120"	120"	RQD _R		(W 90	3.0'-98.4', contains abundant argillaceous laminations.											
						02.6', high angle fracture. 06.0'-106.3', high angle fracture. 06.3'-111.6, contains moderate to abundant argillaceous											
	Core 120"	Rec 120"	RQD 98%	11 *21	lamin	06.3'-111.6, contains moderate to abundant argillaceous nations turbidity bedded. 09.5'-111.0', qu = 7,588 psi, SDI = 89.0%.	5										
	Core	Rec 120"	RQD 100%R	12 *35		14.4 - 1 15.0 , comains moderate arginaceous raminations). 										
		Core 120"		Core Rec RQD R-120" 120" 100%				@ 114.4'-115.8', contains moderate argillaceous laminations. Core Rec 120" RQD 100% R12 *351						@ 114.4'-115.8', contains moderate argillaceous laminations.			

Client:	TranSy	stems	s, Inc.				DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)								o. 01 2	21-307	70.03
LOG (OF: Bo	ring	R-70		_	ocation: Sta	a. 143+03.0, 247.2 ft. LT of SR 823 CL Date Drilled: 3	/4/0			to	3	3/7/05				
Depth (ft)	Elev. (ft) 647.5	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water) DESCRIPTION	% Aggregate	Sand	П.	N Silt	% Clay	Natu P	NNDARI ral Mois L ⊢— Blows p	ture Co	ontent,	% - (LL
120 —		Core 120"	Rec 120"	RQD 100%		*645	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, slightly fractured to unfractured, contains few argillaceous laminations. @ 130.5'-131.1', qu = 9,892 psi.										
135 — - - - 140 —		Core 120"	Rec 120"	RQD 100%	R14	*504									1 1 1		1 1 1
145 — - - - - - 150.0	617.5	Core 84"	Rec 84"	RQD 100%	R15	*615	Bottom of Boring - 150.0'										

Client:	TranSy	stems	, Inc.			_	Project: SCI-823-0.00		J 10						Job No	. 012	1-3070	0.03
LOG C	F: Bo	ring	R-72		_	ocation: Sta	. 143+31.6, 71.5 ft. RT of SR 823 CL Date Drilled: 3/	10/0				to	_	3/10/0	5			
Depth (ft)	Elev. (ft) 664.3	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	Sand	% F. Sand	Silt %	% Clay	Natu P	ral Mois ∟ ⊢— Blows I	ture Co		· •
- -	664.0	4 4 3	13	1		4.5	Topsoil - 4" Hard brown SANDY SILT (A-4a), little clay, little gravel; damp.											
—3.0 - 5 —	661.3	3 4 5	18	2		4.5+	Very stiff to hard brown SILTY CLAY (A-6b), some fine to coarse sand, little gravel; contains rock fragments; damp. @ 3.5'-5.0', reddish brown.								 			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
- - -	-	3 5 8	18	3		2.25									\.			
10.0 	654.3		18	4		4.5+	Very stiff to hard brown and gray SANDY SILT (A-4a), some	-										
- -	-	9 11 16	18	5		4.5+	clay, trace gravel; contains sandstone fragments; damp.	1	14		38	25	22					
15 		7 7 8	18	6		2.75												
- -		10 10	18	7		2.25												
20 —		6 6 8	18	8		2.5												
- -	-	9 11 7	18	9		4.5												
—25.0 — — — —	639.3	8 4 Core 96"	18 Rec 29"	10 RQD 16%	R-1	4.5+	Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, broken, contains clay filled fractures. @ 26.0'-31.6', lost recovery.	_										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No. 0121-3070.03
LOG C	F: Bo	ring	R-72			ocation: Sta	. 143+31.6, 71.5 ft. RT of SR 823 CL Date Drilled: 3/	10/0				to	(3/10/05
Depth (ft)	Elev. (ft) 634.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.5' (includes drilling water) DESCRIPTION	% Aggregate	© Sand	% M. Sand	% F. Sand	t t	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - PL
30 —							Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, broken, contains clay filled fractures. @ 33.6'-37.1', lost recovery.							
_	627.2-	Core 120"	Rec 79"	RQD 27%	R-2	*492	Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, highly fractured, with low angle clay filled fractures. @ 37.5'-37.9', broken zones. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 43.0'-43.2', broken zones.							
45 —		Core 120"	Rec 120"	RQD 98%	R-3	*409								
	609.3 -	Core 24"	Rec 24"	RQD 100%	R-4	*617	Bottom of Boring - 55.0'							
-	-													

Client:					_		Project: SCI-823-0.00							Job No. 012	21-3070.	03
LOG C	F: Bo	ring	R-73	0	_	ocation: Sta	n. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/	2/0	D45	\ A = '	to	- (3/3/05			
Depth (ft)	Elev. (ft) 837.5	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand		% Clay	Natura PL	IDARD PEN al Moisture C 	ontent, % ──── LL	- •
5 —	-837.2- -834.0-	5 8 15	18	1 2			Topsoil - 3" Medium dense to dense reddish brown and gray SANDY SILT (A-4a), little gravel; contains sandstone fragments; relic rock structure; damp. Severely weathered SANDSTONE.							Q		± 50
5.5	832.0-	Core 90"	Rec 90"	RQD 41%	R-1	*222	Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, broken to highly fractured with typical low angle fracture. @ 5.5'-6.1', broken zone. @ 7.2'-7.4', high angle fracture. @ 8.6'-8.8', high angle fracture with clay fill. @ 10.1'-10.2', high angle fracture with clay fill.									
15		Core 120"	Rec 120"	RQD 38%	R-2	*167	 @ 14.0'-14.2', broken zone. @ 16.4'-16.5', high angle fracture, iron staining. @ 17.0'-17.6', broken zone. @ 22.2'-22.4', high angle fracture, iron staining. 									
	-814.3- -813.4-		Rec 120"	RQD 100%	R-3	*57	Soft brownish gray SILTSTONE; decomposed. Soft dark gray to black SHALE; highly weathered to decomposed, arenaceous, carbonaceous, highly fractured. @ 28.3'-28.7', qu = 1,402 psi.								i i i i i i	

Client:	TranSy	stems	, Inc.		_		Project: SCI-823-0.00								Job No	o. 012 1	-3070	0.03
LOG (F: Bo	ring	R-73		_	Location: Sta	a. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/	2/0				to	3	3/3/05				
Depth (ft)	Elev. (ft) 807.5	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate		Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows p	per foot	ntent, %	5 -
-41.1		Core 120"	Rec 120"	DOD.	R-4		Soft dark gray to black SHALE; highly weathered to decomposed, arenaceous, carbonaceous, highly fractured. @ 30.5'-31.5', SDI = 4.1%. @ 33.0', gray. @ 34.0', gray, decomposed. @ 35.1', black, carbonaceous. Soft light gray SHALE; highly weathered to decomposed, arenaceous, highly fractured. @ 36.4', carbonaceous layer. @ 37.0'-38.0', occasional iron staining. @ 39.9'-40.8', coal blossom. Medium hard gray SILTSTONE; highly weathered, arenaceous, highly fractured.	6	60	000	0%	0%	8		0 2	20 3		40
-43.0— - 45 — - - 50 — - -	794.5- - - - - - - - -	Core 120"	Rec 120"	RQD 92%	R-5	*167	Soft light gray SHALE; highly weathered to decomposed, arenaceous, highly fractured. Medium hard light gray SANDSTONE; medium to fine grained, highly weathered, moderately to highly fractured. @ 45.3', argillaceous, grayish brown. @ 48.8', gray, medium hard to hard. @ 50.1', light gray sandstone with IRON STONE inclusion, occasional carbonaceous interbeds. @ 52.5', light gray with carbonaceous interbeds.											
55 — -56.1— - - -		Core 120"	Rec 120"	RQD 100%	R-6	*284	Soft dark gray SHALE; decomposed to highly weathered, carbonaceous, highly fractured. @ 58.2'-59.0', SDI = 0.0%.	_										

	TranSy				_		Project: SCI-823-0.00						Job N	lo. 0121-3070.03
LOG	F: Bo	ring	R-73	0	_	ocation: Sta	. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3	/2/0			to	-3	3/3/05	
Depth (ft)	Elev. (ft) 777.5	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natural Mo PL ⊢	D PENETRATION (Noture Content, % - LL per foot - 20 30 40
60 — —60.8—— —64.3—— 65 — ————————————————————————————————	-776.7- -773.2-	Core 120"	Rec 120"	RQD 100%	R-7	*376	Soft grayish brown SILTSTONE; highly weathered, argillaceous, contains moderate to abundant argillaceous laminations. @ 64.3', low angle fracture. Hard gray SANDSTONE; argillaceous, moderately to highly weathered, contains turbidity bedding, slightly fractured, contains few argillaceous interbedded.							
75 — 75 — - 80 —		Core 120"	Rec 120"	RQD 100%	R-8	*460	 @ 75.7', 80.5'-85.5' moderate to few argillaceous laminations. @ 85.5'-92.7' moderate to abundant argillaceous. @ 78.5', clay seam low angle fracture. 							
85 — - - - - -	-	Core 120"	Rec 120"	RQD 95%	R-9	*561	 @ 84.5'-85.5', SDI = 83.5%. @ 86.5', 86.7', 86.9', 87.0', clay filled fracture. @ 89.0'-89.2', iron stained. 							

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job N	o. 0 12	1-307	0.03
LOG (F: Bo	ring	R-73		_	ocation: Sta	a. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/	2/05				to	3	3/3/05				
Depth (ft)	Elev. (ft) 747.5	Blows per 6"	Recovery (in)	Sam No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		sture Co	ontent, 9	% - •
— 92.1— - - -	747.5 -747.5- - -745.4-				_		Medium hard to hard gray SILTSTONE interbedded with very fine grain SANDSTONE; highly weathered, highly fractured. @ 91.5'-91.9', qu = 9,309 psi. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, contains few argillaceous laminations, slightly											
95 —		Core 120"	Rec 120"	RQD 100%	R10	*623	fractured to unfractured.											
105 —		Core 120"	Rec 120"	RQD 100%	R11	*501											1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
- 115 — - - - - -		Core 120"	Rec 120"	RQD 100%	R12	*483												

Client: -					_		Project: SCI-823-0.00							_	b No. 0	121-307	70.03
LOG C	F: Bo	ring	R-73		_	Location: Sta	n. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/	2/0				to	3/3/	05			
Depth (ft)	Elev. (ft) 717.5	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand			latural N PL ⊢	Moisture		% - (LL
120 —	717.3	Core 120"	Rec 120"	RQD 100%		*460	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations. @ 125.0'-125.4', qu = 8,085 psi. @ 130.5', turbidity bedded, moderate to few argillaceous laminations.										
135 — - - - 140 — - -		Core 120"	Rec 120"	RQD 100%	R14	*592	@ 143.5'-144.1', argillaceous very fine grained zone.										
145 — - - - 150		Core 120"	Rec 120"	RQD 100%	R15	s *423											

Client: 7	TranSy	stems	s, Inc.				Project: SCI-823-0.00							J	lob No. 🕻	121-3070.0
LOG C	F: Bo	ring	R-73		_	ocation: Sta	a. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/	2/0				to	3	3/3/05		
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	% Aggregate		Sand	Sand		lay	Natura PL	Moisture ⊢	ENETRATION • Content, % -
	687.5	Blov	Rec	Drive	Press,	(psi)	DESCRIPTION	% A	% C.	% M.	% F.	% Silt	% Clay	В 10	lows per 20	foot - () 30 40
150 — — — — — 155 —	-						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, slightly fractured, contains few argillaceous laminations.									
- - - 160 —		Core 120"	Rec 120"	RQD 100%	R16	*539										
- 165 - -		Core	Rec	RQD 100%	R17	*490										
- 170 - -		120"	120"	100%		100										
_ 175 																
-177.3 	660.2	Core 120"	Rec 120"	RQD 100%	R18	*345	Hard gray SANDSTONE; argillaceous, micaceous, slightly fractured, contains turbuidity bedding, moderate argillaceous interbedding.									

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No	o. 012	-3070	.03
LOG (F: Bo	ring	R-73	_		ocation: Sta	. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3	/2/0			to	3	/3/05				
Depth (ft)	Elev. (ft) 657.5	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	Sit Sit	% Clay	Natu Pl	ral Mois L ⊢— Blows ¡	eture Cor per foot	_	-
180 	-						Hard gray SANDSTONE; slightly fractured, argillaceous, micaceous, contains turbidity bedding and moderate argillaceous interbedding.										
185.0	652.5	Core 120"	Rec 120"	RQD 100%	R19	*263	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.										
- - - - -195.0	- - - - -642.5-	Core 24"	Rec 24"	RQD 100%	R20	*558	Bottom of Boring - 195.0'										
200 —	-												$1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$	1 1 1 1	1 1 1 1		1.1.1
205 — - - - -	-																

% M. Sand WE Sand % F. Sand % S.i.t	Silt	Nat	TANDARD PENETRATION atural Moisture Content, % - PL
M. Sand F. Sand	Silt	Nat I	atural Moisture Content, % - PL
		1 1 1 1	

	TranSy				_		Project: SCI-823-0.00						Jo	b No. 012	21-3070	0.03
LOG C	DF: Bo	ring	R-74	C- :	_	ocation: Sta	1. 148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 03	3/01		A T ! .	24.	-				
Depth (ft)	Elev. (ft) 832.3	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay	Natural I PL +	ARD PENE Moisture Co ws per foo 20	ontent, % 	5 -
30	-	Core 120"	Rec 120"	RQD 53%	R4	*124	Soft to medium hard brown and gray SANDSTONE interbedded with SHALE; very fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typically low angle clay filled fractures. @ 32.6'-34.3' brown fine grained SANDSTONE bed. @ 33.1'-34.3', high angle rust stained fracture.									
-40.0— - - - - - - - - - - - - - - - - - - -	822.3-	Core 120"	Rec 120"	RQD 80%	R5	*48	Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous. @ 40.0'-41.0', broken zone. @ 42.5'-42.8', high angle rust stained fracture. Medium hard gray SHALE; moderately to highly weathered, micaceous, carbonaceous, thinly laminated to thinly bedded.	_								
50 — - 52.7 — - 55 — -	809.6-	Core 120"	Rec 106"	RQD 76%	R6	*258	 @ 46.7'-47.1', qu = 1,911 psi. @ 48.3'-48.7', high angle rust stained fracture. @ 49.0'-50.0', SDI = 5.6%. @ 50.3'-52.7', contains abundant arenaceous laminations. Medium hard dark gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, contains abundant argillaceous laminations. @ 52.5'-53.2',56.2'-56.4', high angle rust stained fractures. @ 58.8'-59.4' carbonaceous SHALE bed.	-								

Client: Tran					_		Project: SCI-823-0.00								Job N	o. 0 12	1-307	0.03
OG OF:	Boı	ring l	R-74	0	_	ocation: Sta	148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 03	/01		345	A T.(24/	- 1					
(ft) (f	lev. (ft) 02.3	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, %	% - LL
60		Core	Rec 120"	RQD 53% RQD 59%	R7		Soft to medium hard gray SILTSTONE; highly weathered to decomposed, argillaceous. Medium hard gray SANDSTONE; fine grained, moderately weathered, argillaceous, thinly bedded to thickly bedded, occassional COAL stringers. @ 59.4'-60.0',60.0'-60.2',61.0'- 63.0',70.0'-70.8', broken zones. @ 60.7'-60.8',65.6'-66.0',67.0', high angle fractures.											
80 — 80.7—78·	31.6 -	120" Core 120"	Rec 111"	POD	R9		 @ 72.5'-72.8', high angle fracture. @ 70.0'-70.9', decomposed zone. @ 75.9'-76.2', broken zone. @ 78.9'-80.7', argillaceous zone, broken. Soft gray SHALE and SILTSTONE; decomposed, argillaceous, carbonaceous. @ 81.4'-81.9', broken zones. @ 83.4'-83.6', coal blossoms. Hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous, argillaceous, thinly to											

	TranSy				_	Project: SCI-823-0.00							Jo	ob No.	0121-	3070.	.03
LOG (OF: Bo	ring	R-74	0	_	. 148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 03	3/01			A 711							
Depth (ft)	Elev. (ft) 772.3	Blows per 6"	Recovery (in)	Samp No.	Press / Core	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	© Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural PL	Moistu	PENETR ire Conte er foot - 30	ent, % → L	- •
90 —		Core 120"	Rec 120"	RQD 88%	R10	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly to thickly bedded. @ 95.6', low angle clay filled fracture.											
- - - 105 — - - -		Core 120"	Rec 120"	RQD 100%	₹11									1 1 1			
- - - - 115 — -	-751.8- - - - - - - - - - - - - - - - - - -	Core 120"	Rec 120"	RQD 85%	R12	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, argillaceous, thinly laminated to thinly bedded, moderately fractured, with typically low angle clay filled fractures, contains moderate argillaceous laminations. @ 116.1'-118.0', fine to coarse grained. Hard gray SANDSTONE, very fine to fine grained. @ 119.5',119.7', low angle clay filled fractures.	, ,										

	TranSy				_		Project: SCI-823-0.00							Job No	. 012	1-307	70.03
LOG C	DF: Bo	ring	R-74	-	_	ocation: Sta	a. 148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 0.	3/01		A T10	21/						
Depth (ft)	Elev. (ft) 742.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natui PL	NDARE al Mois	ture Co	ntent,	% - (LL
120 — 130 —	-	Core 120"	Rec 120"	RQD 94%	R13		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, massive to thickly bedded, slightly fractured to unfractured.										
- - - - 135 —	-	Core 60"	Rec 60"	RQD 100%	R14												
40 —		Core 84"	Rec 84"	RQD 100%	R15	*475										1.1.1	
- 145 - - -		Core 120"	Rec 120"	RQD 98%	R16	*525	@ 143.3', contains few argillaceous laminations.@ 143.7',143.8',143.9', low angle fractures.										

	TranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
LOG (DF: Bo	ring	R-74		_	ocation: Sta	a. 148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 03	3/01			4 = 1							
Depth (ft)	Elev. (ft) 712.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ıral Mois L ⊢— Blows	D PENE sture Co per foo	ontent, s	% - LL
150 —		Core 120"	Rec 120"	RQD 100%	-	*546	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded.											
- 165 — - - - 170 —	- - - - - -	Core 120"	Rec 120"	RQD 100%	R18	*630												
- 175 - - -	- - - -	Core 120"	Rec 120"	RQD 100%	R19	*497												

	TranSy						Project: SCI-823-0.00							Job No.	0121-	3070.0)3
LOG (DF: Bo	ring	R-74	Sam	_	<i>ocation:</i> Sta	i. 148+91.8, 66.8 ft. RT of SR 823 CL Date Drilled: 03 WATER	3/01 T		ATIO	<u> </u>		1				_
Depth (ft)	Elev. (ft) 682.3	Blows per 6"	Recovery (in)	Drive No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur	NDARD P al Moistur I Hows per Diggi 20	re Conte	ent, % - ── LL	
180 —	-	Core 120"	Rec 120"	RQD 100%		*236	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded.										
195 —		Core 120"	Rec 120"	RQD 100%	R21	*486	@ 192.8'-194.0', 194.7'-195.8', 199.9'-205.0', contains moderate argillaceous laminations.									11111	
- - -205.0 - -	657.3	Core 36"	Rec 36"	RQD 100%	R22		Bottom of Boring - 205.0'						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
- - 210	-												1 1 1 1				

		stems			_		Project: SCI-823-0.00							Job No. 0121-3070	<u>).03</u>
OG O	F: Bo	ring	R-78	_	_	ocation: Sta	i. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 1	1/17				to		11/22/04	
			(in)	Sam _i No) <u>.</u>	Hand Penetro- meter	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)			RAD	ATIO	ON		STANDARD PENETRATIC	ON (I
Depth (ft)	Elev. (ft) 877.1	Blows per 6"	Recovery (Drive	Press / Core	(tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand		% F. Sand	% Silt	% Clay	Natural Moisture Content, % PL I I I I I I I I I	6 -
-0.2 - -	- 876.9-	1 1 2	18	1		1.0	\Topsoil - 2" Medium stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; contains roots; moist.								
3.0 5 	- 874.1-	7 12 18	18	2			Severely weathered SANDSTONE.								
_		9 50/5	6	3											,
_		50/2	0	4											1 1
10.0— — — — — ——————————————————————————	- 867.1-	Core 120"	Rec 100"	RQD 78%	R-1	*118	Medium hard brown SANDSTONE; fine to coarse grained, highly weathered, poorly cemented, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle rust stained fractures. @ 10.0'-10.2',20.0'-20.3', broken zones. @ 11.4'-11.5',21.8'-21.9', high angle fractures.								
20 	-855.2-														i i
_ _ 25 _ _		Core 120"	Rec 120"	RQD 85%	R-2		Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered, mostly weathered SHALE turbidity interbedded, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures.								
_							@ 27.0'-27.5', qu = 533 psi. @ 28.2'-29.2', SDI = 58.4%.								1

Client:					_		Project: SCI-823-0.00						Job No. 0121-3070.	.03
LOG C	F: Bo	ring	R-78		_	ocation: Sta	1. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 1	1/17			to		11/22/04	
Depth (ft)	Elev. (ft) 847.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	1	% Clay	, ,	-
30 — — — — 35 — — —		Core 120"	Rec 120"	RQD 59%	R-3	*98	Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered, mostly weathered SHALE turbidity interbedded, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures.							
45 — - - - -	836.8-	Core 120"	Rec 120"	RQD 95%	R-4	*276	Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures. @ 42.8', turbidity interbeds diminish (light grey fine grained SANDSTONE). @ 40.3'-42.7', abundant argillaceous laminations. @ 45.2'-45.6', qu = 7,568 psi. @ 42.7', moderate to few argillaeous laminations.							
50.3	827.6- -826.8- -826.3- -822.3-	Core 120"	Rec 120"	RQD 74%	R-5	*55	COAL Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous, highly fractured, with typically low angle clay filled fractures. @ 51.1'-51.5', broken zone. Medium hard gray SANDSTONE interbedded with SILTSTONE; very fine to medium grained, moderately to highly weathered, argillaceous, thinly bedded, moderately							
_ 59.5 	817.6-						\fractured, with typically low angle fractures. Medium hard gray to reddish gray SANDSTONE; fine grained highly weathered, argillaceous, thickly bedded.	,						

Client: -	TranSy	stems	, Inc.		_		Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG C	F: Bo	ring	R-78	0	_	ocation: Sta	. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 1	1/17		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	to	-	11/22/0	4			
Depth (ft)	Elev. (ft) 817.1	Blows per 6"	Recovery (in)	Sam No enive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	Π.	% Silt	% Clay	Natura	IDARD I al Moistu Ilows pe	re Con er foot	tent, % — L	-
60 — - -63.1— - 65 — -	814.0-	Core 120"	Rec 109"	RQD 58%	R-6	*385	Medium hard to hard dark gray to black SHALE; very fine to fine grained, moderately weathered, argillaceous, carbonaceous, thinly laminated. Soft to medium hard gray and red SILTSTONE; moderately to highly weathered, argillaceous, contains slickensides in high angle fractures. @ 63.2'-64.2', SDI = 93.5%.)									
	-803.1-	Core	Rec	RQD		*000	 @ 66.1'-66.8', broken zone. @ 69.1'-70.0', lost recovery. @ 70.0'-74.0', medium bedded, slightly fractured. Medium hard red and grey SILTSTONE interbedded with										
75 — — — 80 —		120"	120"	91%	R-7	*369	CLAYSTONE; moderately to highly weathered, very arenaceous, turbid, with slicken sides on high angle fractures @ 75.0'-75.5', qu = 7,932 psi. @ 75.6'-75.8',76.7'-76.9', high angle fractures. @ 77.0'-77.5', qu = 6,413 psi. @ 77.5'-77.8',79.0'-79.3', broken zones. @ 70.0'-73.0' light brown very fine grained SANDSTONE, SILTSTONE lenses										
85 — - -		Core 120"	Rec 120"	RQD 94%	R-8	*516	@ 80.0'-90.0', SDI = 53.0%. @ 80.7'-80.8',82.3'-82.7',85.3' high angle fractures.										

	TranSy				_		Project: SCI-823-0.00								o. 012	1-307	0.03
LOG (DF: Bo	ring	R-78	0	_	ocation: Sta	. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 11	/17		\ A T !	to		1/22/	04			
Depth (ft)	Elev. (ft) 787.1	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Moi: L ⊢— Blows	D PENE sture Co per foot 20	ntent, %	6 -
- 95 -96.4 -	-785.3- -780.7- -778.2-	Core 120"	Rec 120"	RQD 94%	R-9	*280	Medium hard red and grey SILTSTONE interbedded with CLAYSTONE; turbid, arenaceous. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. Medium hard red SILTSTONE; highly weathered, arenaceous slickensides. @ 96.4'-96.6',97.3'-97.6', high angle fractures. Medium hard gray SANDSTONE; fine to medium grained,										
105 —	773.4	Core 120"	Rec 120"	RQD 87%	R10	*631	highly weathered, highly argillaceous, calcareous, thinly bedded to massive, highly fractured, poorly cemented, with typical low angle fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.										
110 —	-	Core 120"	Rec 120"	RQD 100%	R11	*467											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-	3070.03
LOG C	F: Bo	ring	R-78		_	ocation: Sta	. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 11	/17			to	•	11/22/0	4		
Depth (ft)	Elev. (ft) 757.1	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur	al Moistu ⊢—— Blows pe	er foot	
120 —		Core 120"	Rec 120"	RQD 100%	R12	*351	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 120.0'-129.3' very fine grained, argillaceous. @ 129.3'-130.5' SHALE like lamination									
130 — —130.5 — ———————————————————————————————————	- 746.6-	Core 120"	Rec 120"	RQD 100%	R13	*600	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.									
- - 145 — - - - 150		Core 120"	Rec 120"	RQD 100%	R14	*646										

	TranSy				_		Project: SCI-823-0.00							Job No.	0121-	3070.	03
LOG C	F: Bo	ring	R-78		_	ocation: Sta	a. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 11	1/17			to	1	11/22/0	1			
Depth (ft)	Elev. (ft) 727.1	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natura PL	DARD F I Moistui I	re Conte		-
150 —		Core 120"	Rec 120"	RQD 100%	R15	*513	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massively to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.										
- - 165 — - - - 170 —		Core 120"	Rec 120"	RQD 100%	R16	*641	@ 169.0'-169.6', qu = 10,461 psi.										
- - - 175 — - -		Core 120"	Rec 120"	RQD 100%	R17	*430										1.1.1	

	TranSy				_		Project: SCI-823-0.00									o. 012	1-3070	0.03
LOG (F: Bo	ring	R-78		_	ocation: Sta	a. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 11	/17				to	1	1/22/	04			
Depth (ft)	Elev. (ft) 697.1	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	NDARL ral Mois L ⊢— Blows µ	ture Co per foot	ntent, %	5 - (
180 — 190 —		Core 120"	Rec 120"	RQD 100%	R18	*467	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations. @ 180.9'-181.1', 181.4' argillaceous zone.											
190 —		Core 120"	Rec 120"	RQD 100%	R19	*451												
205 — - - 205 — - -		Core 120"	Rec 120"	RQD 100%	R20	*467												

Client: T					_		Project: SCI-823-0.00							Job No	o. 012	-3070	0.03
LOG O	F: Bo	ring	R-78	0	_	ocation: Sta	a. 152+94.6, 60.7 ft. LT of SR 823 CL Date Drilled: 1	1/17) A T I	to		1/22/	04			
Depth (ft) _210.0	Elev. (ft) 667.1	Blows per 6"	Recovery (in)	Sam _l No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows i	D PENE ture Col per foot	ntent, % 	6 - (
- - - -		Core 60"	Rec 60"	RQD 100%	R21	*561	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.										
220 —	-662.1-						Bottom of Boring - 215.0'										
230 —																	

Client:					_		Project: SCI-823-0.00							Jok	No. 012	21-307	0.03
LOG C	F: Bo	ring	R-80		_	ocation: Sta	. 156+98.7, 222.0 ft. LT of SR 823 CL Date Drilled: 11	/11				to	1	11/15/04			
Depth (ft)	Elev. (ft) 804.4	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	. Sand	% F. Sand	Silt	% Clay	Natural M PL ⊢	RD PENE loisture Co vs per foo 20	ontent, 9	% - (LL
- -	- 804.1-	2 4 6	18	1		2.5	Topsoil - 4" Very stiff light brown SANDY SILT (A-4a), some gravel, trace clay; contains sandstone fragments; damp.										
5 —	800.4	37 31 12 50/2	18 6	3			Severely weathered SANDSTONE.										68
-6.5 - - 10	- 797.9-	Core 48"	Rec 48"	RQD 69%	R1	*19	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle rust stained fractures. @ 7.0'-9.0',11.0'-11.5', argillaceous zone (decomposed										
- -	790.8	Core 120"	Rec 120"	RQD 87%	R2	*394	Shale). @ 10.9'-11.2',12.0'-12.1', high angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 16.6',17.7',17.8', argillaceous zones with low angle rust stained fractures.								i i i i i		
- - - 25 — - -		Core 120"	Rec 120"	RQD 100%	R3	*445	 @ 18.2',19.6',24.9', argillaceous zones with low angle clay filled fractures. @ 23.4'-24.2', broken zone containing abundant argillaceous laminations. 										

Client:	ΓranSy	stems	, Inc.				Project: SCI-823-0.00		J .J						Job No. (121-30	70.03
LOG C	F: Bo	ring	R-80		_	ocation: Sta	. 156+98.7, 222.0 ft. LT of SR 823 CL Date Drilled: 11	/11				to	1	11/15/0	4		
Depth (ft)	Elev. (ft) 774.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water) DESCRIPTION	% Aggregate	© Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	Blows per	Content	
30.0 - - - 35 — - - - 40 —	1-774.4-	Core 120"	Rec 120"	RQD 100%	R4	*576	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 45.5'-47.0', contains very fine grained zone with moderate argillaceous laminations. @ 49.7'-50.0', contains very fined grain zone with moderate argillaceous laminations.										
45 — - - - - - - - 50.0—	-754.4-	Core 120"	Rec 120"	RQD 100%	R5	*631											
- - - 55 —	-747.5-	Core 120"	Rec 120"	RQD 100%	R6	*445	Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, slightly fractured, contains abundant to moderate argillaceous (SILTSTONE) laminations. @ 53.8'-54.2', qu = 7,492 psi. @ 56.5', low angle clay filled fracture. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured. @ 59.5'-60.5', SDI = 1.7%.										ii iiiii

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00						Ι,	lob No. C	121-307	0.03
LOG (_	ocation: Sta	. 156+98.7, 222.0 ft. LT of SR 823 CL Date Drilled: 11	/11			to		11/15/04	ļ		
Depth (ft)	Elev. (ft) 744.4	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay	Natura	l Moisture ⊢—— lows per	ENETRATION Content, 9 foot -	6 - •
60 — - - - 65 — - - - 70 —		Core 120"	Rec 120"	RQD 100%	, R7	*400	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured.									
75 — - - - - - 80 —		Core 120"	Rec 120"	RQD 100%	R8	*505										
- - 85 — - - - - 90		Core 120"	Rec 120"	RQD 100%	R9	*470										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00-0	040					Π,	Job No.	0121	-3070	.03
LOG (F: Bo	ring	R-80		1	ocation: Sta	a. 156+98.7, 222.0 ft. LT of SR 823 CL Date Drilled: 11	/11	/04			to	11	/15/0	4			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	M. Sand	Π.	Silt	Clay	Natura PL		ıre Con		- • L
90 —	714.4	Core 120"	Rec 120"	RQD 97%			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured. @ 98.2'-98.6', qu = 10,939 psi.	%	%	%	%	%		10	1 1 1 1) 3	0 4	10
105 —		Core 120"	Rec 120"	RQD 100%	R11	*443												
- - 115 — - - - 120.0	684.4	Core 114"	Rec 114"	RQD 100%	R12	*435	Bottom of Boring - 120.0'											

	ΓranSy				_		Project: SCI-823-0.00								0121-3	070.03
OG O	F: Bo	ring	R-81		_	ocation: Sta	. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11	/16			to		11/17/04	<u> </u>		
Depth (ft)	Elev. (ft) 862.3	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natura PL	l Moistu ⊢—— llows pe		-
_	-862.0-	1 3 3	18	1		2.5	Topsoil - 3" Very stiff brown SILT AND CLAY (A-6a); moist.									
3.0— - 5 —	- 859.3 -	1 5 6	18	2			Medium dense brown COARSE AND FINE SAND (A-3a), trace clay; possible weathered sandstone; damp.									
-		5 7 11	18	3												
- 10 		12 13 10	18	4												
1.5 -	-850.8-	50/5	16	5			Severely weathered SANDSTONE.									<u></u>
- 15 		28 40 50/5	14	6												
_	- 845.3-	30 50/1 Core 36"	6 Rec 36"	7 RQD 42%	R1		Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures, turbidity interbedded	-								
20 — - - - 25 —		Core 120"	Rec 120"	RQD 57%	R2	*338	with silt and clay size grains, poorly cemented orange/grey. @ 20.0'-30.0', SDI = 76.5%.									
26.5— — — — 30	- 835.8-						Hard gray SANDSTONE; fine to medium grained, highly weathered, argillaceous, medium bedded, highly fractured to broken, turbidity bedding.									

Client:	ΓranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-	3070.	.03
LOG C	F: Bo	ring	R-81		_	ocation: Sta	a. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11	/16			to		11/17/0)4			
Depth (ft)	Elev. (ft) 832.3	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand		% Silt	% Clay	Natur PL	NDARD I ral Moistu .	re Conte	ent, % → L	-
30.0 	832.3-	Core 120"	Rec 120"	RQD 54%	R3	*96	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typically low angle clay filled fractures, turbidity interbedded with argillaceous laminations, poorly cemented SILT. @ 34.6'-35.7', silt seam. @ 35.7'-36.6', light gray, moderately weathered, thickly bedded. @ 36.6'-37.6', CLAYSTONE seam. @ 37.6'-43.7', fine to medium grained, massive. @ 38.9'-39.3', broken zone.										
	-818.6- -818.1- -	Core 120"	Rec 120"	RQD 30%	R4	*46	Medium hard black COAL; highly weathered, thinly bedded. Soft to medium hard gray and red SILTSTONE; highly weathered to decomposed, argillaceous, shaley zones laminated to thinly bedded. @ 48.0'-48.3', broken zone.										
55.3 	- 812.0-	Core 120"	Rec 120"	RQD 93%	R5	*658	Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 50.3'-60.0', SDI = 87.6%. @ 50.5',50.6',51.2', low angle clay filled fractures. @ 50.7'-50.9', CLAYSTONE interbeded, contains poorly cemented, medium grained interbeds.										

Client:	TranSy	stems	, Inc.		_		Project: SCI-823-0.00								Job No.	0121	-3070.	03
LOG C	F: Bo	ring	R-81	0	_	ocation: Sta	. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11	/16			\ <u> </u>	to		11/17/0	4			
Depth (ft)	Elev. (ft) 802.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD : al Moistu .	re Con er foot	tent, % ── LL	-
60 — - - - 65 — - -	-	Core 120"	Rec 120"	RQD 97%	R6	*571	Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured. @ 65.6'-67.7', abundant argillaceous laminations. @ 66.8',74.0', low angle clay filled fractures. @ 69.8'-70.8', abundant to moderate argillaceous laminations.								1111			
70 — - - - 74.0— 75 — - - - 80 —	- 788.3-	Core 120"	Rec 120"	RQD 100%	R7	*595	 @ 73.5', argillaceous laminations. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 78.7'-79.1', abundant argillaceous laminations. @ 80.1'-80.9', 85.5'-85.8', very fine grained. 											
- - 85 — - - - - 90		Core 120"	Rec 120"	RQD 100%	R8	*515	G co co.c co.c, vo., mio gramou.											

Client:	TranSy	stems	s, Inc.				Project: SCI-823-0.00								Job N	<i>lo.</i> 01	21-30	70.03
LOG C	F: Bo	ring	R-81		L	ocation: Sta	a. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11	/16				to	1	1/17/	04			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water) DESCRIPTION	% Aggregate		W. Sand	Ä.	% Silt	% Clay	Natu F	ıral Moi PL ⊢ Blows	s per fo	ot - (, % - H LL
90 —	772.3	Core 120"	Rec 120"	RQD 100%		*546	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 93.0'-93.4', qu = 10,067 psi.	0,	0/	0,	0	6	8		10	20		40
- - - 05 — - -	7500	Core 120"	Rec 120"	RQD 100%	R10	*285												
- - - 15 —	-752.6- - - -745.7-	Core 120"	Rec 120"	RQD 100%	R11	*419	Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, slightly fractured. @ 116.3',116.5', low angle clay filled fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured, contains few argillaceous laminations.											

	TranSy				<u> </u>		Project: SCI-823-0.00									o. 012	1-307	0.03
LOG (DF: Bo	ring	R-81	Com	_	ocation: Sta	i. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11 WATER	/16 T			ATIO	to	1	1/17/	04			
Depth (ft)	Elev. (ft) 742.3	Blows per 6"	Recovery (in)	Sam	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ral Mois L ⊢— Blows	D PENE sture Co per foot	ntent, %	6 -
120 —	-	Core 120"	Rec 120"	RQD 53%	R12	*560	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to unfractured, contains few argillaceous laminations.											
130 —		Core 120"	Rec 120"	RQD 100%	R13	*694												
140	-	Core 120"	Rec 120"	RQD 100%	R14	*564												

Client:	TranSy	stems	. Inc.				Project: SCI-823-0.00								Job No	0121-	3070.03	3
	OF: Bo				1	ocation: Sta	a. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11	/16	/04			to	1	1/17/0				\neg
		J		Sam No	ple	Hand	WATER				ATIC							
Depth (ft)	Elev. (ft) 712.3	Blows per 6"	Recovery (in)	Drive	Press / Core	Penetro- meter (tsf) / * Point-Load Strength (psi)	Water level at completion: 6.4' (includes drilling water)	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natui Pl		re Conte	RATION (N ent, % - → LL ○ 40	
150 —		Core 120"	Rec 120"	RQD 100%	R15	*709	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured, contains few argillaceous laminations.											
165 — 165 — 170 —		Core 120"	Rec 120"	RQD 100%	R16	*708										1.1.1		
- - - 175 — - - -		Core 120"	Rec 120"	RQD 100%	R17	*554	Bottom of Boring - 180.0'											

Client:					_		Project: SCI-823-0.00							Job No	. 0121-3070.0)3
LOG C	F: Bo	ring	R-84		_	ocation: Sta	i. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 1	1/09				to	_	11/10/04		
Depth (ft)	Elev. (ft) 868.3	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	Silt %	% Clay	Natural Moist PL ⊢— Blows p	PENETRATION ure Content, % -	•
	- 868.1-	2 6 12 9 22 34		1 2			Topsoil - 2" Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace clay; possible decomposed sandstone; damp.									56
- - -	-	17 50/5 30 50/4	8	3			@ 6.0', contains weathered micaceous sandstone fragments.									50
- - - 15 — - -	858.3		Rec 73"	RQE 40%	R-1	*10	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle rust stained fractures.									150
20 — - - - - - - 23 — -	843.7-	Core 102"	Rec 77"	RQE 46%	R-2	*26	 @ 18.0'-18.6',19.3'- 21.4',22.5'-23.0', broken zones. @ 23.9'-24.7', argillaceous zone. Medium hard gray SHALE; highly to moderately weathered, arenaceous, micaceous, thinly to thickly bedded, moderately fractured, contains abundant arenaceous laminations. 									
_		Core 18"	Rec 18"	RQE 100%	 R-3	*150										

Client: Ti	ranSy	stems	, Inc.				Project: SCI-823-0.00		1040					,	Job No.()121-307	70.03
LOG O	F: Bo	ring	R-84		_	ocation: Sta	. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11	/09				to		11/10/0	4		
Depth (ft)	Elev. (ft) 838.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate		Sand	% F. Sand		% Clay	Natura PL	l Moistur ⊢—— Blows per		. ,
35.8	-838.3-	Core 120"	Rec 120"	RQD 90%	R-4	*151	Medium hard gray SANDSTONE interbedded with SHALE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle fractures. @ 30.5'-35.0', qu = 2,801 psi, SDI = 3.3%. @ 35.0'-35.8', sandstone bed. Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous, carbonaceous, bedding weathered out. @ 35.8'-39.7', qu = 2,173 psi, SDI = 56.7%. @ 38.0',38.2', low angle clay filled fractures.										
45 —	-828.0- -822.3- -821.5-	Core 120"	Rec 120"	RQD 86%	R-5	*328	Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains coal stringers. @ 42.2'-43.0',45.0'-45.6', high angle fractures. Medium hard black COAL; slightly weathered, thinly bedded. Soft to medium hard gray and red SILTSTONE interbedded with SHALE; highly weathered, argillaceous, thinly bedded,										
50 —	-810.0-	Core 120"	Rec 120"	RQD 85%	R-6	*133	moderately fractured, with typically high angle slickensided fractures. @ 47.7'-47.9', arenaceous zone. @ 50.0'-58.3', SDI = 41.5%. @ 52.0', red interbeds. @ 54.1'-54.5', qu = 3,758 psi.										

	TranSy				_		Project: SCI-823-0.00								o. 012	1-307	0.03
OG C	F: Bo	ring	R-84	0	_	ocation: Sta	ı. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11	1/09		A T (to		1/10/	04			
Depth (ft)	Elev. (ft) 808.3	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, %	6 -
60.0 - - - 65 — - - - 70 —	808.3-	Core 120"	Rec 120"	RQE 100%	R-7	*417	Medium hard light gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations and medium grained iron stained sandstone.								1111		
75 — - - - - -		Core 120"	Rec 120"	RQE 98%	R-8	*355	@ 77.3'-78.4', contains interbedded shale.										
80 — - - 85 — - -		Core 120"	Rec 120"	RQE 100%	R-9	*154	@ 87.5'-88.4', high angle rust stained fracture.										

Client: Tr	ranSy	stems	, Inc.			_	Project: SCI-823-0.00	55 0	3 10						Job No.	0121	-3070	.03
LOG OF	: Bo	ring	R-84		_	ocation: Sta	. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11	/09				to	_	11/10/0	4			
(ft)	Elev. (ft) 778.3	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD I al Moistu I Blows pe	er foot	tent, % ── L	-
90 — — — 94.2 — 95 — — — — —		Core 120"	Rec 120"	RQE 100%	R10	*398	Medium hard light gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations and medium grained iron stained sandstone. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.											
105 —		Core 120"	Rec 120"	RQE 100%	R11	*474												
115 —	751.3-	Core 120"	Rec 120"	RQE 100%) R12	*647	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, unfractured to slightly fractured.											

	TranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
LOG (DF: Bo	ring	R-84	C	_	ocation: Sta	. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11	/09			ATIO	to		1/10/	04			
Depth (ft)	Elev. (ft) 748.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows i	D PENE ture Col per foot	ntent, 9	% - (LL
120 —		Core 120"	Rec 120"	RQD 100%	R13	*397	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, unfractured to slightly fractured. @ 120.0'-124.1', becomes fissile under dessication.											
135 — - - 135 — - - -		Core 120"	Rec 120"	RQD 100%	R14	*419												
- - - 145 — - -	-	Core 120"	Rec 120"	RQD 100%	R15	*393												

	TranSy				_		Project: SCI-823-0.00							Job No	. 012 ⁻	-3070	.03
_OG C	F: Bo	ring	R-84		_	ocation: Sta	. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11	/09			to	11	/10/0	4			
Depth (ft)	Elev. (ft) 718.3	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	al Moisi ⊢—— Blows p	ture Coi per foot		- (
150 —	718.3	Core 120"	Rec 120"	RQD 100%		*490	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, unfractured to slightly fractured. Bottom of Boring - 160.0'										

Client:					_		Project: SCI-823-0.00									o. 012	1-307	'0.03
LOG C	F: Bo	ring	R-85		_	ocation: Sta	i. 164+83.3, 62.1 ft. LT of SR 823 CL Date Drilled: 1	1/4/(to	1	11/4/0	<u> </u>			
Depth (ft)	Elev. (ft) 783.3	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ontent, '	% - (
0.3 	- 783.0-	2 2 2 3 4 6	18	1 2		1.5	Topsoil - 4"/2" soil removed before drilling Stiff reddish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp. @ 3.5'-7.5', hard.	5	2		5	52	36					
5 — - 	-775.3-	7 9 11	18	3		4.5+	Medium dense brown and gray SANDY SILT (A-4a), trace fine sand, trace clay possible decomposed sandstone; dry to damp.	;										
- - -		38 50/4 50/3	8	5			@ 11.0'-13.8', very dense.	38	12		14	3	6				, , , , , , , , , , , , , , , , , , ,	on-Pla
-14.5 15 - - -	- 768.8-	Core 60"	Rec 60"	RQD 90%	R-1	*229	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured, with typical low angle fractures. @ 15.5'-15.7', 17.1'-17.8', 19.0'-19.2', 21.4'-21.7', rust stained high angle fractures.											
20 — 	- 761.6-	Core 120"	Rec 120"	RQD 79%	R-2	*38	Medium hard brown SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures. @ 24.2'-27.9', contains few argillaceous laminations. @ 27.9'-29.6', abundant to moderate argillaceous laminations											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00		1040						Job No.	0121	-3070.03
LOG C	F: Bo	ring	R-85		_	ocation: Sta	. 164+83.3, 62.1 ft. LT of SR 823 CL Date Drilled: 1	1/4/				to	1	1/4/04	ļ		
Depth (ft)	Elev. (ft) 753.3	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water) DESCRIPTION	% Aggregate		Sand	% F. Sand	% Silt	% Clay	Natui Pl		ure Cont er foot -	_
30 — - - - 35 — - -		Core 120"	Rec 120"	RQD 73%	R-3		Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedde to thickly bedded, moderately fractured, with typical low angle fractures. @ 32.6'-34.0', high angle clay filled fracture. @ 34.5'-34.8', 37.0'-37.3',38.6'-39.1', argillaceous zones.										
-39.5 40	-743.8- - - - -	Core 120"	Rec 117"	RQD 96%	R-4	*750	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.										
50 — - - - 55 — - -		Core 120"	Rec 120"	RQD 100%	R-5	*707											

	TranSy						Project: SCI-823-0.00								Vo. 012	1-307	0.03
LOG (DF: Bo	ring	R-85	0	_	ocation: Sta	a. 164+83.3, 62.1 ft. LT of SR 823 CL Date Drilled: 11	1/4/(240	A T /	to	1	1/4/0	4			
Depth (ft)	Elev. (ft) 723.3	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ral Mo L ⊢	RD PENE isture Co s per foo 20	ontent, s	% - LL
60 —	-	Core 72"	Rec 72"	RQD 100%	R-6	*790	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.										
65.5— - - 70 — - - 75 — - -	-717.8- - - - - - - - - - - - -						Bottom of Boring - 65.5'										
80 — - - 85 — - -																	

	ΓranSy				_		Project: SCI-823-0.00							lob No.()121-(3070.0)3
OG C	F: Bo	ring l	R-87		_	ocation: Sta	. 164+75.9, 106.3 ft. RT of SR 823 CL Date Drilled: 1	1/5/			to	_	11/9/04				
Depth (ft)	Elev. (ft) 792.8	Blows per 6"	Recovery (in)	Sam No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natura PL	DARD PI I Moisture I I I I I I I I I I I I I I I I I I I	e Conte		
-0.2 - - -	- 792.6-	2 1 2	3	1		2.25	Topsoil - 2"/1.5' soil removed before drilling Very stiff to hard reddish brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						0				
5 5.5	-787.3-	7 12 13 39 48	18	2		4.5+	Severely weathered CLAYSTONE.	_									
-8.0 -8.5 10	-784.8- -784.3-	50/5	5	4			Severely weathered SANDSTONE. Soft to medium hard brown SANDSTONE; very fine to fine	-									8
15 —		Core 90"	Rec 90"	RQD 21%	R-1	*162	grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typically high angle rust stained fractures. @ 10.6'-11.2',12.3'-13.3',14.7', decomposed zones.						1 1 1 1				
- - 9.9 - -	-772.9-	Core 120"	Rec 120"	RQD 81%	R-2	*313	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured.	_									
25 							@ 25.3',25.7',26.4', low angle clay filled fractures.										

Client: 7					_		Project: SCI-823-0.00								Job N	o. 01 2	21-30 ⁻	70.03
LOG O	F: Bo	ring	R-87		_	Location: Sta	a. 164+75.9, 106.3 ft. RT of SR 823 CL Date Drilled: 11	/5/0				to	1	1/9/04				
Depth (ft)	Elev. (ft) 762.8	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	al Mois . ⊢— Blows i	ture C	ontent,	FION (N. % - 1 LL) 40
30 —		Core 120"	Rec 120"	RQD 98%	R-3	*269	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured. @ 37.0',39.2', low angle clay filled fractures.											
40 — 41.2— 41.5— 45 —	- - -751.6-	Core 120"	Rec 120"	RQD 95%	R-4	*363	Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, contains abundant to moderate argillaceous laminations. @ 44.1',49.1', low angle clay filled fractures.											
9.2— 50 — — — — 55 —	-743.6- - -	Core 120"	Rec 120"	RQD 100%	R-5	*374	@ 48.2'-49.0', highly weathered. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured.											
- - -															1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

	TranSy				_		Project: SCI-823-0.00								lo. 012	1-307	0.03
LOG (DF: Bo	ring	R-87	0		ocation: Sta	1. 164+75.9, 106.3 ft. RT of SR 823 CL Date Drilled: 1	1/5/0	040	A T1/	to	1	1/9/0	4			
Depth (ft)	Elev. (ft) 732.8	Blows per 6"	Recovery (in)	San Nive	o. Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moi L ⊢— Blows	D PENE sture Co per foot 20	ntent, s	% - (LL
60 —		Core 120"	Rec 120"	RQI 98%			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.								1 1 1 1		
80 — 85 — -86.0—	706.8-	Core 120"	Rec 120"	RQI 1009	P-8	*558	Bottom of Boring - 86.0'										

Client:					_		Project: SCI-823-0.00							Job No.	0121	-3070	0.03
LOG C	F: Bo	ring	R-88		_	ocation: Sta	a. 166+92.7, 51.3 ft. LT of SR 823 CL Date Drilled: 11	/2/			 						
Depth (ft)	Elev. (ft) 699.7	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.6' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	M. Sand		% Clay	Natu P	NDARD F ral Moistui L ⊢——— Blows pei 0 20	re Con	tent, %	•
-0.3	699.4						Topsoil - 3"									1 1 1 1	
2.0 5 5 10	697.7-	50/2 Core 120"	Rec 57"	RQD 0%	R-1		Severely weathered brown SANDSTONE, argillaceous. Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, broken, contains large filled fractures.										
	686.0-	Core 120"	Rec 120"	RQD 78%	R-2	*578	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle fractures, contains few argillaceous laminations.	-							1.1.1		
- - 25.0	674.7	Core 36"	Rec 36"	RQD 100%	R-3	*667									 		
	-						Bottom of Boring - 25.0'										

Client:					_		Project: SCI-823-0.00							ob No. 012	21-3070.03
LOG C	F: Bo	ring	R-90		_	ocation: Sta	. 168+20.2, 110.2 ft. LT of SR 823 CL Date Drilled: 1	0/28			to	-	10/29/04		
Depth (ft)	Elev. (ft) 764.1	Blows per 6"	Recovery (in)	Sam, No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	% Silt	% Clay	Natural PL Bl	Moisture C	<i>LL</i>
0 0.5 - -	763.6	5 6 12	18	1		4.5+	Topsoil - 6" Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.								
-4.0 5	760.1-	16 26 40	18	2			Severely weathered SANDSTONE.							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
-5.5	-758.6-	Core 90"	Rec 90"	RQD 69%	R-1		Soft gray and brown SILTSTONE; highly weathered, argillaceous, highly fractured, with typical low angle fractures.								
15 — - -17.5 — - 20 — -		Core 120"	Rec 120"	RQD 91%	R-2	*549	Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thickly bedded to massive, moderately to highly fractured with typical low angle clay filled fractures.	ė							
-24.6 -25 - 	-739.5-	Core 120"	Rec 120"	RQD 100%	R-3	*595	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured.	<u> </u>							

	TranSy				_		Project: SCI-823-0.00							Job No	o. 012	-3070	0.03
OG C	DF: Bo	ring	R-90	0	_	ocation: Sta	. 168+20.2, 110.2 ft. LT of SR 823 CL Date Drilled: 10)/28		A T/	to	1	0/29/	04			
Depth (ft)	Elev. (ft) 734.1	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows i	D PENE ture Col per foot	ntent, % 	
30 —		Core	Rec	RQD	R-4	*622	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.										
35.0 	 -729.1-	24"	24"	100%	11-4	022	D.H (D. iv. of Ol									1 1 1 1	
40 —							Bottom of Boring - 35.0'										i
55 — - - - -																	

Client:					_		Project: SCI-823-0.00								o. 012	1-307	0.03	}
LOG (DF: Bo	ring	R-91	C .	_	ocation: Sta	a. 168+47.7, on CL SR 823	1/1/	D 4.5		to	11	1/1/0	4				_
Depth (ft)	Elev. (ft) 728.9	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.6 (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	π.	Silt	% Clay	Natu F	ANDARI ural Mois PL Hows Blows	ture Co	ontent,	% - LL	
0.3	728.6						Topsoil - 4"											1 1
 2.0	 -726.9-	50/4	3	1			Severely weathered SANDSTONE.						1 1 1	1111		1 1 1	1 1 1	1 I 1 I 1 I
5 —	720.3	Core 120"	Rec 120"	RQD 70%	R-1	*1023	Hard to very hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinl bedded to thickly bedded, highly fractured with typically low angle clay filled fractures. @ 2.0'-2.4',2.6'-2.8',3.0'-3.4', 8.7'-9.0', broken zones. @ 6.5'-6.6',7.3'-7.4', high angle fractures.	y										
-13.3	715.6-	Core 120"	Rec 120"	RQD 92%	R-2	*583	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 12.0'-12.1',13.5'-13.9', high angle rust stained fractures.											
-	700 0	Core 36"	Rec 36"	RQD 100%	R-3	*617	@ 24.0'-24.3', argillaceous zone.					1						
—25.0— - - -	- 703.9-						Bottom of Boring - 25.0'					1						

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	040						Job No. 012	1-3070	.03
LOG (OF: Bo	ring	R-92		_	ocation: Sta	a. 168+46.5, 79.3 ft. RT of SR 823 CL Date Drilled: 11	/2/				to	1	1/2/0	4		
Depth (ft)	Elev. (ft) 697.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	M. Sand	% F. Sand	% Silt	% Clay	Natu F	ANDARD PENE ural Moisture Co PL Home Blows per foot 10 20	ntent, % ──── L - ○	-
0.4	696.8	27 50/1	7	1			Topsoil - 5"/2.5' soil removed before drilling Severely weathered brown SANDSTONE, argillaceous.										5
2.0	695.2-	Core 120"	Rec 120"	RQD 96%	R1	*311	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded.										
15 — 20 —		Core 120"	Rec 120"	RQD 100%	R2	*519	 @ 11.2', low angle rust stained fracture. @ 20.0'-20.1', 20.9'-21.0', arenaceous zones. @ 24.0', 24.7', 25.3', low angle fractures. @ 24.0'-25.3', contains moderate to few argillaceous 										
25 — 30.0	667.2	Core 96"	Rec 96"	RQD 100%	R3	*96	laminations. Bottom of Boring - 30.0'										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00		,					Job	No. 0121	-3070.03
LOG C	F: Bo	ring	R-94		_	Location: Sta	ı. 169+98.5, 139.6 ft. LT of SR 823 CL Date Drilled: 10)/29				to	_	11/2/04		
Depth (ft)	Elev. (ft) 803.1	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water) DESCRIPTION	% Aggregate	© % C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural M PL ⊢	loisture Con	_
-	-802.8- -801.1-	40 50/1	6	1 2		4.5+	Topsoil - 3" Hard brown SANDY SILT (A-4a); dry to damp. Severely weathered SANDSTONE.									50
7.0— - - 10 —	-796.1- -	50/2 Core 42"	Rec 42"	3 RQE 52%	R-1	*291	Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle rust stained fractures.									50
15 —		Core 120"	Rec 120"	RQE 72%	R-2	*149	 @ 7.0'-7.3', 7.9'-8.1', 9.6'- 10.8', decomposed, broken. @ 9.8'-10.1',19.9'-21.0', high angle rust stained fractures. @ 11.4'-12.1', contains moderate argillaceous laminations. @ 18.1'-18.6',25.1'-25.5', contains abundant to moderate argillaceous laminations. @ 24.0'-24.6',29.8'-30.0', high angle rust stained fractures. 									
25 — - - - - - - 30		Core 120"	Rec 120"	RQE 85%) R-3	*216	@ 25.5'-25.9', broken zone.									

Client:	ΓranSy	stems	, Inc.				Project: SCI-823-0.00						J	ob No. 012	21-3070	0.03
.og c	F: Bo	ring	R-94		_	ocation: Sta	. 169+98.5, 139.6 ft. LT of SR 823 CL Date Drilled: 10	0/29			to	1	11/2/04			
Depth (ft)	Elev. (ft) 773.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand		% Clay	Natural PL	DARD PENE Moisture Co House per foo 20	ontent, % t -	- (
30 — - - 35 — - -		Core 120"	Rec 120"	RQD 95%	R-4	*325	Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle rust stained fractures. @ 41.8'-42.0', 42.4'-42.6', 42.0'-43.8', moderate argillaceous laminations. @ 48.4'-48.9', contains moderate argillaceous laminations.									
40 — - - 45 — -		Core 120"	Rec 120"	RQD 82%	R-5	*248	@ 42.4',42.5',42.6', low angle rust stained fractures. @ 46.5',46.6',46.7', low angle clay filled fractures.									
50 — - - - 55 —	- 754.4−	Core 120"	Rec 120"	RQD 96%	R-6	*329	Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, contains abundant argillaceous laminations. @ 49.2',52.3', low angle clay filled fractures.									
7.1 - -	7 70.0						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.									

	ΓranSy				_		Project: SCI-823-0.00								No. 0	121-3	070.0)3
OG C	F: Bo	ring	R-94		_	ocation: Sta	a. 169+98.5, 139.6 ft. LT of SR 823 CL Date Drilled: 10)/29			to		1/2/0	4				
Depth (ft)	Elev. (ft) 743.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ıral Mo PL ⊢				(
60 — - - 65 — - - 70 —		Core 120"	Rec 120"	RQD 100%	R-7	*454	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.											
- - 75 — - - -	700.0	Core 120"	Rec 120"	RQD 100%	R-8	*448												
85 — - - - 85 — - -	- 722.6 -						Bottom of Boring - 80.5'											

	TranSy				_		Project: SCI-823-0.00							Job No.	0121-307	0.03
.OG C	F: Bo	ring	R-96	0	_	ocation: Sta	. 169.79.4, 61.3 ft. RT of SR 823 CL Date Drilled: 1	/2/0	D 4 5	A						
Depth (ft)	Elev. (ft) 763.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moistur ⊢—— Blows per		% - (LL
-0.2 	-762.9- -	3 3 5	18	1			Topsoil - 2" Loose to medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.									
-5.0 	758.1-	5 9 12	18	2												
_	755.9-	Core 120"	Rec 84"	RQD 20%	R-1	*33	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, broken. Soft to medium hard brown and gray SILTSTONE; highly weathered to decomposed, argillaceous.	-								
- 15 — - - 8.5—		Core 60"	Rec 60"	RQD 90%	R-2	*277	@ 7.2'-9.7',18.2'-18.5', decomposed, broken zones.@ 10.8',10.9',11.1', low angle clay filled fractures.									
20 							Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.									
- 25 - -		Core 120"	Rec 120"	RQD 100%	R-3	*450	@ 19.2',28.4', low angle clay filled fractures.									

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070.0	3_
LOG C	F: Bo	ring	R-96		_	ocation: Sta	ı. 169.79.4, 61.3 ft. RT of SR 823 CL Date Drilled: 1	1/2/0									
Depth (ft)	Elev. (ft) 733.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	N Silt	% Clay	Natur PL	al Moistu . ⊢—— Blows pe	er foot	_	
30 — - - - 35 — - -		Core 120"	Rec 120"	RQD 96%	R-4	*386	Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.										
40 —		Core 120"	Rec 120"	RQD 98%	R-5	*430	@ 31.3'-32.9',46.0'-47.2', high angle rust stained fractures.										
50.0 	- -713.1-						Bottom of Boring - 50.0'										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No	. 012 ⁻	I-3070	0.03
LOG C	F: Bo	ring	R-97		_	ocation: Sta	. 172+81.7, 5.1 ft. LT of SR 823 CL Date Drilled: 10)/28									
Depth (ft)	Elev. (ft) 755.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.5' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	ON Silt	% Clay	Natu Pl	NDARD ral Moist -	ure Col er foot	ntent, %	-
	754.7- - -	5 6 9	18	1		1.5	Topsoil - 3"/6" soil removed before drilling Stiff to very stiff brown SANDY SILT (A-4a), trace gravel, trace clay; contains sandstone fragments; dry to damp.	<u>,</u>									
5 — 5.5 — 	749.5-	12 16	18	3		4.0	Hard gray SILT AND CLAY (A-6a), trace fine to coarse sand; dry to damp.	-									
10.0—	745.0-	35 50/4	10	4		4.5+	@ 8.5', brown. Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly	_									50+
- - 15 — - - 16.4 — - -	738.6-	Core 120"	Rec 120"	RQD 85%	R-1	*455	bedded, highly fractured, with typical low angle clay filled fractures. @ 10.0'-10.5', rust stained broken zone. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded weathered.										
20.0	-735.0- - - - - - - - - -						Bottom of Boring - 20.0'										

	TranSy				_		Project: SCI-823-0.00								Job No	. 012	I-307	0.03
LOG (DF: Bo	ring	R-98			ocation: Sta	. 172+78.6, 43.4 ft. RT of SR 823 CL Date Drilled: 10)/28										
Depth (ft)	Elev. (ft) 752.3	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.9' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Mois ⊢—— Blows p	er foot	ntent, 9	% - (LL
5 		4 6 9 16 27 40 22 29 50/2	18	2			Topsoil - 4" Medium dense brown SILT AND CLAY (A-6a), trace fine to coarse sand; contains sandstone fragments; damp to moist. Severely weathered SANDSTONE.	-							0			67
-7.5 - 10 - -	- 744.8-	Core 66"	Rec 66"	RQD 75%	R-1	*356	Medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured, with typical low angle clay filled fractures.	•										50
-	- -737.5- - -	Core 84"	Rec 84"	RQD 100%	R-2	*496	@ 7.7'-7.8',8.9'-9.0',10.9'-11.0 ', broken zones. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded, moderately fractured.	-										
-20.0— - - - 25 — - - -	+732.3- - - - - - - -						Bottom of Boring - 20.0'											

	ΓranSy				_		Project: SCI-823-0.00								Job No.	0121	-307	0.03
.OG C	F: Bo	ring	R-209		_	ocation: Sta	i. 170+05.3, 135.6 ft. LT of SR 823 CL Date Drilled: 1/	16/0			4 = 1	to	1	1/17/06				
Depth (ft)	Elev. (ft) 803.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natura PL	IDARD I al Moistu IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	re Con	ntent, 9	% - (LL
_	-802.8 -800.0-	3 3 23	8	1		4.5+	Topsoil - 2" Hard reddish brown CLAY (A-7-6), some silt, trace fine to coarse sand, trace gravel; moist.	6	3		3	29	59					
5 		21 50/4 27 50/3	10	2			Severely weathered brown SANDSTONE, argillaceous.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			50
10 —		35 50/2	8	4														50
-	-791.5-	50/4	3	5														
- - 15 — - -		Core 120"	Rec 113"	RQD 59%	R1	*905	Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, laminated to medium bedded, highly fractured to broken. @ 12.3'-12.9', lost recovery, possible void. @ 11.5'-12.3',15.1'-15.2', 19.0', broken zones. @ 17.2'-18.2', high angle fracture.							1 1 1 1				1 50
9.2 20 -	1- 783.8-						Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, calcareous, laminated to thickly bedded, moderately fractured, contains few argillaceous laminations.									1		
25 — — — —		Core 120"	Rec 120"	RQD 100%	R2	*891	@ 25.5'-27.3', iron stained.@ 26.1', 26.2', 26.3', decomposed argillaceous zone.@ 27.3'-27.4', broken zone.											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	0+0						Job No	. 0121	-3070	.03
LOG (F: Bo	ring	R-209		_	ocation: Sta	. 170+05.3, 135.6 ft. LT of SR 823 CL Date Drilled: 1/	16/0				to	1	1/17/0	3			
Depth (ft)	Elev. (ft) 773.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water) DESCRIPTION	% Aggregate	© Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARD ral Moist L ⊢—— Blows p 0 2	ure Cor er foot	tent, % ——	-
	773.0-	Core 120"	Rec 120"	RQD 93%	R3	*1186	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, calcareous, massive, slightly fractured. @ 30.1', 30.7', 32.0', low angle fractures. @ 30.9'-31.5', calcareous. @ 31.0'-32.0', 35.8'-36.5', calcareous. @ 36.1'-36.5', vertical fracture. @ 36.5'-36.8', weathered, high angle fracture.											
42.6	760.4-	Core 120"	Rec 120"	RQD 98%	R4	*200	Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, slightly fractured, contains few to abundant argillaceous laminations occurring in bands. @ 44.5'-44.6', ferric band, broken. @ 46.4', low angle fracture.											
-58.2 -60	- - - - - - - - - - - - - - - - - - -	Core 120"	Rec 120"	RQD 100%	R5	*1012	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly fractured.											

	TranSy				_		Project: SCI-823-0.00								lo. 012	1-307	70.03
.OG (F: Bo	ring	R-209		_	Location: Sta	ı. 170+05.3, 135.6 ft. LT of SR 823 CL Date Drilled: 1/	16/0			to	1	/17/0	6			
Depth (ft)	Elev. (ft) 743.0	Blows per 6"	Recovery (in)	Sam _l No			WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Moi. PL ⊢—	D PENE sture Co per foot	ontent,	% - LL
60 —	743.0	Core 120"	Rec 120"	RQD 100%	DC		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly fractured. Very hard gray SANDSTONE; fine grained, unweathered, argillaceous, thinly laminated to massive, slightly fractured, burrows, turbidity. @ 62.0', 63.4', 66.2', 67.0', 67.9', 68.2', low angle fractures.	-								1 1 1	
 75 — 		Core 120"	Rec 120"	RQD 100%	R7	*1610	@ 75.6', 76.3', 76.9', 78.0', low angle fractures.										
- - 85 - - - -		Core 120"	Rec 120"	RQD 100%	R8	*1720	@ 87.1', 88.3', 89.6', 91.1', low angle fractures.										

	TranSy				_		Project: SCI-823-0.00								•	Vo. 012	21-307	0.03
LOG (OF: Bo	oring	R-209		_	ocation: Sta	t. 170+05.3, 135.6 ft. LT of SR 823 CL Date Drilled: 1/	/16/0		545	\ A = 1	to	1/	17/0	6			
Depth (ft)	Elev. (ft) 713.0	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water) DESCRIPTION	% Aggregate		M. Sand	Α.	% Silt	% Clay	Nati F	ural Mo. PL ⊢			% - LL
90 —	713.0	Core 102"	ਦੇ Rec 102"	RQD 100%			Very hard gray SANDSTONE; fine grained, unweathered, argillaceous, thinly laminated to massive, slightly fractured, burrows, turbidity. @ 91.7', 91.8', 93.4', 97.0', low angle fractures. Bottom of Boring - 100.0'	<u>*</u>	%	%	%	%	%		10	20	30	40
- - 115 — - - -																		

	ΓranSy				_		Project: SCI-823-0.00								lob No. ()121	-3070	.03
.OG C	F: Bo	ring I	R-209		_	ocation: Sta	. 172+79.1, 81.4 ft. LT of SR 823 CL Date Drilled: 1/WATER	18/0		745	<u> </u>	201	<u> </u>					
Depth (ft)	Elev. (ft) 756.2	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.8' (inside hollowstem augers) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natura PL	DARD P.I Moisture Iows per	e Cont	rent, % —	-
_	- 755.6-	6 6	5	1			Topsoil - 7"/6" soil removed before drilling Medium dense brown SANDY SILT (A-4a), trace gravel, little clay; moist.	10	14		14	48				 		
-3.0 	- 753.2 -	6 9 11	12	2			Very stiff to hard grayish brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; contains sandstone fragments; damp.	3	15		7	47	28		 			
_		12 13 15	14	3														
10 	-745.7-	10 25 20	15	4			Coverable weed by a constant of the constant o											
- - - - 3 5	-742.7-	50/5	_ 5	5			Severely weathered brown SANDSTONE, argillaceous.									1 1	1 1 1 1 1 1 1 1 1 1	-5
15 —	- 740.4−	Core 78"	Rec 78"	RQD 100%	R1		Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to massive, moderately fractured. @ 14.5'-14.7', broken. @ 14.7'-15.1', gray. Very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, unfractured to slightly fractured.	7										
25 — —		Core 120"	Rec 120"	RQD 100%	R2													

Client:	TranSv	stems	, Inc.				Project: SCI-823-0.00	00 0	0.10						Job No. (121-30	70.03
LOG C				7	1	ocation: Sta	n. 172+79.1, 81.4 ft. LT of SR 823 CL Date Drilled: 1/2	18/0)6								
Depth (ft)	Elev. (ft)	ws per 6"	Recovery (in)	Sam No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength		% Aggregate	Sand	Sand	: Sand		ilay	Natur PL	NDARD PI	Content	, % - ● H <i>LL</i>
00	726.2	Blows ,	Rec	Drive	Press	(psi)	DESCRIPTION	% A	% C.	% M.	% F.	% Silt	% Clay	1	Blows per D 20	foot - (<u>30</u>) 40
30 — - - 35 — - - - 40 —		Core 120"	Rec 120"	RQD 100%	R3	*1242	Very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, unfractured to slightly fractured.										
 45 — 50 —		Core 120"	Rec 120"	RQD 100%	, R4	*1343											
55 — - - 55 — - -	696.2	Core 120"	Rec 116"	RQD 97%	R5	*1421	@ 58.8',59.6', low angle fractures. Bottom of Boring - 60.0'										

Client:	TranSy	stems	s, Inc.				Project: SCI-823-0.00								Job No.	012	1-3070	0.03
LOG C	F: Bo	ring	R-209		_	ocation: Sta	a. 172+57.4, 85.5 ft. RT of SR 823 CL Date Drilled: 1/	18/0										
Depth (ft)	Elev. (ft) 754.6	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	<i>t</i>	% Clay	Natur PL	NDARD al Moiste Blows per	ure Co er foot	ntent, %	5 - •
0.3 	754.3-	3 5 9 6 9 13 4 10 12		1 2 3		4.5+ 4.5+ 4.5+	Topsoil - 4" Hard brown and gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; contains sandstone fragments; damp.	3	6		4		33					
10.5 _ - -	-744.6- -744.1- -739.7-		Rec 120"	4 RQD 82%	R-1	*1508	Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones.											504
25 — - - - - -		Core 120"	Rec 120"	RQD 96%	R-2	*1511	@ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No. \	0121-30	070.03
LOG C	F: Bo	ring	R-209		_	ocation: Sta	. 172+57.4, 85.5 ft. RT of SR 823 CL Date Drilled: 1/	18/0									
Depth (ft)	Elev. (ft) 724.6	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura	al Moistur ⊢—— Blows per	e Conten	TION (N) t, % - ● ⊢ LL ○ 40
30 — - - - 35 — - - - 40 —		Core 120"	Rec 120"	RQD 99%	R-3	*1143	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, burrows, turbidity. @ 33.8', thin argillaceous band with fracture.										
45 —		Core 120"	Rec 120"	RQD 100%	R-4	*1108	@ 49.1'-49.2', shale bed.										
55 — - - - - - -		Core 120"	Rec 118"	RQD 93%	R-5	*1079	@ 56.5'-56.7', 57.8'-58.0', clay filled fractures.										

	TranSy				_		Project: SCI-823-0.00							Job No	. 0121	-3070.0	3
LOG (DF: Bo	oring	R-209			ocation: Sta	a. 172+57.4, 85.5 ft. RT of SR 823 CL Date Drilled:	1/18/		:	<u> </u>						_
Depth (ft) 60 —	Elev. (ft) 694.6	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	t	% Clay	Natu P	ral Mois L ⊢— Blows p	ture Cor per foot	FRATION (tent, % -	
60.5—60.5—60.5—60.5—60.5—60.5—60.5—60.5—	694.1-						Bottom of Boring - 60.5'										

	TranSy				_		Project: SCI-823-0.00						Jo	b No. 01	21-307	0.03
LOG C	F: Bo	ring	TR-29		_	ocation: Sta	a. 140+26.7, 84.5 ft. LT of SR 823 CL Date Drilled: 3/	8/0	745	A T ! !	24.					
Depth (ft)	Elev. (ft) 667.6	Blows per 6"	Recovery (in)	Samp No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natural I PL +	Moisture (
-0.4	667.2	Core 120"	Rec 30"	RQD 0%	R-1		Topsoil - 5" / 3.0' soil removed before drilling Soft gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, very broken. @ 1.9'-9.5', lost recovery due to decomposed rock.									
9.5— 10 — –	658.1	Core 36"	Rec 36"	RQD 64%	R-2		Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typically low angle clay filled fractures.									
15 — 15.5 — - - 20 —	652.1	Core 120"	Rec 120"	RQD 92%	R-3		 @ 15.4' to 15.5', high angle rust stained fracture. Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately fractured, contains few to moderate argillaceous laminations. @ 21.0',22.0',22.3', low angle clay filled fractures. 									
25 — 26.5 — - 26.3 —	641.1-	Core 120"	Rec 120"	RQD 92%	R-4		 @ 27.5'-28.1', high angle rust stained fracture. @ 28.2', low angle rust stained fracture. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured. 									

	ΓranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
LOG C	F: Bo	ring	TR-29		_	ocation: Sta	a. 140+26.7, 84.5 ft. LT of SR 823 CL Date Drilled: 3/	8/05		245	A = '	24.						
Depth (ft)	Elev. (ft) 637.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.) DESCRIPTION	% Aggregate	Sand	M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Moi. PL ⊢	D PENE sture Co per foo	ontent, 9	% - LL
30	557.0	Core 120"	Rec 120"	RQD 100%			Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 34.0'-52.0', pyritic. @ 31.1',34.6',35.3', low angle clay filled fractures.											
45 —		Core 120"	Rec 120"	RQD 100%	R-6		@ 53.9'-54.4',58.2'-59.5', high angle rust stained fractures.								1 1 1 1			
55 — - - - -	-6 08.0-	Core 120"	Rec 120"	RQD 82%	R-7		@ 56.2',56.9', low angle rust stained fractures.											1 1 1

	TranSy				_		Project: SCI-823-0.00								Job No.	0121	-3070	0.03
LOG	F: Bo	ring	TR-29		_	ocation: Sta	. 140+26.7, 84.5 ft. LT of SR 823 CL Date Drilled: 3/	8/05										
Depth (ft)	Elev. (ft) 607.6	Blows per 6"	Recovery (in)	Samp No.		Penetro- meter (tsf) / * Point-Load	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD al Moiste I Blows p	ure Cor er foot	ntent, % —	5 - (
60 —	-596.2-	Core 120"	Rec 120"	RQD 100%	R-8		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 61.8'-62.4', qu = 13,956 psi. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive slightly fractured, contains few argillaceous laminations.											
75 —		Core	Rec 120"	RQD 100% RQD 100%			@ 80.9', contains few to moderate argillaceous laminations.											1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-85.0 - - -	-582.6- -	24"	24"	100%			Bottom of Boring - 85.0'											

Client:					_		Project: SCI-823-0.00							Job No	. 0121	-3070	.03
LOG C	F: Bo	ring	TR-30	Samp	_	ocation: Sta	. 139+35.0, 52.3 ft. LT of SR 823 CL Date Drilled: 3/	8/0 <u></u>		ATIO	<u> </u>	ı					
Depth (ft)	Elev. (ft) 637.1	Blows per 6"	Recovery (in)	No.	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 12.2' (Includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moisi . ⊢—— Blows p	ure Cor er foot	TRATION Intent, % Intent L Intent C	-
-0.4	636.7	Core 120"	Rec 120"	RQD 62%	R-1		Topsoil - 5" / 3.2' soil removed before drilling Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, moderatly fractured. @ 1.0'-1.3',5.0'-5.1', broken zones. @ 3.6'-3.9', clay filled zone. @ 5.8'-6.4', qu = 5,441 psi. @ 3.9'-4.7', high angle clay filled fracture. Medium hard gray very fine grained SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.										
- - - 15 — - -	047.4	Core 120"	Rec 120"	RQD 100%	R-2		@ 11.9',15.9',16.8',18.8' low angle clay filled fractures.										
-20.0	617.1-						Bottom of Boring - 20.0'										

	TranSy						Project: SCI-823-0.00						U	lob No. 0°	121-307	70.03
_OG C	F: Bo	ring	TR-31	Samp	_	<i>Location:</i> Sta	i. 138+68.7, 106.5 ft. LT of SR 823 CL Date Drilled: 3/9 WATER	3/0! T	RAD	ATI	<u> </u>					
Depth (ft)	Elev. (ft) 621.4	Blows per 6"	Recovery (in)	No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 5.3' (Includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	<i>t</i>	% Clay	Natura PL	DARD PEI Moisture lows per fo	Content,	% - LL
0 — -0.5 — - - 5 — - -7.9 — -	620.9	Core 120"	Rec 110"	RQD 50%	R-1		Topsoil - 6" / 4.0' soil removed before drilling Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typically low angle clay filled fractures. @ 0.0'-0.9', lost recovery. @ 0.9'-2.0', broken zones. @ 5.1'-5.4',6.8'-7.0',7.7'-7.9' high angle clay filled fractures. @ 6.3'-6.7', qu = 1,254 psi. @ 7.9'-9.8', iron staining. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous,								11 111	
- - 15 — - -		Core 120"	Rec 116"	RQD 96%	R-2		micaceous, thinly to thickly bedded, unfractured to slightly fractured. @ 10.4'-10.5', broken zone. @ 11.0'-11.4',11.9'- 12.1',15.2', rust stained zones. @ 11.2', low angle rust stained fracture. @ 19.6'-20.0', lost recovery.									
20.0— - - - 25 — - -	601.4-						Bottom of Boring - 20.0'									

	ΓranSy				_		Project: SCI-823-0.00							Job No. 0121-3070.03
LOG C	F: Bo	oring	R-101		_	ocation: Sta	. 180+90.9, 23.6 ft. LT of SR 823 CL Date Drilled: 10	/27						
				Sam _l No		Hand Penetro-	WATER OBSERVATIONS: Water seepage at: None		Gi	RAD	ATIO	ON		
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Drive	Press / Core	meter (tsf) / * Point-Load Strength (psi)	Water level at completion: None (prior to coring) 7.3' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	Ź.	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (I Natural Moisture Content, % - PL
-0.2 	695.6 695.4						`\Topsoil - 2"	Ť						10 20 30 40
_		2 3 4	18	1			Loose brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.							
3.0— - 5 —	692.6	9 13 21	18	2			Severely weathered brown SANDSTONE.							
- -		7 8 10		3										
_		50/4	4	4										
10 —		9 11 16		5										
- 15 		27 37 48	18	6			@ 13.5'-17.5', argillaceous.							
_		27 9 22	18	7										
_ 20.0 	675.6-	50/2	2	8										
25.0 - - - - 25 —		Core 120"	Rec 120"	RQD 33%	R-1	*499	Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical high angle rust stained fractures. @ 20.7'-21.5', 22.8'-23.9', 24.1'-25.2', high angle rust stained fractures. @ 25.3'-26.4', high angle fractures.							
- - 30.0	665.6						@ 28.8'-29.3', contains carbonaceous laminations with turbidity beds. Bottom of Boring - 30.0'							

Client:					_		Project: SCI-823-0.00								Job No	. 012	1-307	70.03
LOG C	F: Bo	ring	R-102		_	ocation: Sta	a. 181+02.4, 182.6 ft. RT of SR 823 CL Date Drilled: 10)/27				<u> </u>						
Depth (ft)	Elev. (ft) 612.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 8.5'-35.0' Water level at completion: 8.0' (includes drilling water) DESCRIPTION	% Aggregate		Ź.	Sand		% Clay	Natura PL	ıl Mois ⊢—— Blows µ			% - LL
0.2 -	612.6	2 2 3	18	1			\Topsoil - 2" Loose to medium dense brown SANDY SILT (A-4a), little gravel, trace clay; contains sandstone fragments; damp.											
5 —		13 16 13	18	3														
10 —	604.8-	3 5 4	18	4		1.25	Stiff gray and brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp to moist. @ 9.0', torvane = 0.7 tsf											
_	1	W O H	18	5	P-1	1.0	Medium stiff to stiff gray SILT (A-4b), trace fine sand, some clay; moist to wet. @ 11.0', torvane = 0.2 tsf	0	0		5	70	25					
15 —		WOH 2 2	18	6			Loose gray and brown SILT (A-4b), some fine to coarse sand, trace gravel; contains sandstone fragments; moist.											
_	- - -	WOH 2 3	18	7				5	6		21	56	12	Non-Plas	stic :			
20 20.5 	592.3	10	18	8			Medium dense gray and light brown FINE SAND (A-3), little											
23.0 	589.8	4	18	9			silt; contains sandstone fragments; damp. Medium dense gray SANDY SILT (A-4a), trace clay; contains	-										
25 -	- -	3 5 6		10			sandstone fragments; damp to moist.											
_	-	8 8 11	18	12														1 1 1

<i>lient:</i> Tr					_		Project: SCI-823-0.00								Job No	. 0121	-3070	0.03
OG OF	: Bo	ring	R-102		_	ocation: Sta	a. 181+02.4, 182.6 ft. RT of SR 823 CL Date Drilled: 10	/27										
(ft)	Elev. (ft) 582.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 8.5'-35.0' Water level at completion: 8.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois ∟ ⊢— Blows μ	er foot	tent, %	ó - (
35 —		6 10 13	18	13			Medium dense gray SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp to moist.											
0.0		50/3	_ 3	14			Severely weathered gray SANDSTONE.										\(\)	5
.0 —		Core 120"	Rec 120"	RQD 100%	R-1	*678	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thickly bedded, slightly fractured.											
50 — 5 	563.8						Bottom of Boring - 49.0'											

	ΓranSy				_		Project: SCI-823-0.00							Job No. 012	21-3070.03
LOG O	F: Bo	ring	R-103		_	ocation: Sta	. 185+41.0, 317.0 ft. LT of SR 823 CL Date Drilled: 10	/26				to		10/27/04	
Depth (ft)	Elev. (ft) 633.3	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 2.5', 11.0'-21.0' Water level at completion: 6.1' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	Silt NS%	% Clay	STANDARD PENI Natural Moisture C PL H Blows per foo	ontent, % -
-0.3 - - -	633.0	5 6 6	18	1		2.5	Topsoil - 4" Very stiff brown SILT (A-4b), some clay, trace fine to coarse sand, trace gravel; contains sandstone fragments; damp to moist.							Q':::	
5 		3 5 8	13	2		3.0									
_ 		10 11 7	18	3		2.25		1	2		7	65	25		
- 10 10.5 	-622.8-	4 4 6	18	4		3.5									1
- - -	022.0	2 3 4	18	5			Very loose to loose brown and gray SILT (A-4b), some fine to coarse sand, little clay, trace gravel; contains sandstone fragments; damp.	1	13		12	58	16		Non-PI
- 15 		3 4 4	18	6											
_		1 2	18	7			O 10 51 maint								
20 —	610.0	⁴ 2 3	18	8			@ 18.5', moist.								
21.5	-612.3- -611.8- -610.4-	Core 120"	Rec 120"	9 RQD 88%	R-1	*274	Severely weathered grayish brown SANDSTONE. Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical low angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly to thickly bedded, moderately fractured, with typical low angle clay filled fractures.								

lient: TranSystems, Inc.		Project: SCI-823-0.00						Job No. 012	1-3070.03
OG OF: Boring R-103		tion: Sta. 185+41.0, 317.0 ft. LT of SR 823 CL Date Drilled:	10/2		D 4 T:	to	10/27/	04	
Depth Elev. (ft) (ft) (603.3 Blows ber 6.1 (19)	Per m (t. 2) * Poii (s. 2) * Stroi	WATER OBSERVATIONS: Water seepage at: 2.5', 11.0'-21.0' Water level at completion: 6.1' (includes drilling water) water level at completion: 6.1' (includes drilling water) WATER OBSERVATIONS: Water seepage at: 2.5', 11.0'-21.0' Water seepage at: 2.5', 11.0'-21.0'	% Aggregate	M. Sand	% F. Sand	t	Natu F	ANDARD PENE ural Moisture Co PL Hous per foot 10 20	ntent, % - ─── LL
30		Hard gray SANDSTONE; very fine to fine grained. Bottom of Boring - 31.5'							

	<u>FranSy</u>				_		Project: SCI-823-0.00							Job No	. 0121	-3070.03
_OG O	F: Bo	ring	R-104	Sam	_	ocation: Sta	a. 184+80.6, 37.3 ft. RT of SR 823 CL Date Drilled: 10)/26 T			ATI	ON.		1		
Depth (ft)	Elev. (ft) 627.5	Blows per 6"	Recovery (in)	Drive No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: 5.0', 16.0'-30.0' Water level at completion: 4.8' (includes drilling water)	% Aggregate		Sand		% Silt	% Clay			tent, % - ────────────────────────────────────
-0.3 - - -	-627.2-	2 3 6	18	1		4.0	Topsoil - 3" Very stiff to hard brown and gray SILT AND CLAY (A-6a), little to some gravel, little fine to coarse sand; damp to moist.	!								
5 		2 3 4	18	2		3.5										
-		2 5 10	18	3		3.0										
- 10 		11 12 13	18	4		3.25										
-		4 9 8	18	5		4.0										
_ 15 —		3 3 4	18	6		3.5		20	5		11	44	20			
8.0 	-609.5-	4 6 8	18	7		2.5										
_ 20 — 0.5 —	-607.0-	3 3 3	18	8	P1	<0.25	Very soft gray CLAY (A-7-6), trace to little fine to coarse sand; contains sandstone fragments; moist to wet.	0	2		9	31	58			
-		5 6 6	18	9			Loose to medium dense gray SANDY SILT (A-4a); contains sandstone fragments; dry to damp.									
_ 25 —		2 4 6	18	10												
-		3 4 4	18	11												
30		3 4 7	18	12											1 1 1 1	

	ΓranSy				_		Project: SCI-823-0.00							Job No	o. 012	1-307	0.03
OG C	F: Bo	ring	R-104		_	ocation: Sta	L. 184+80.6, 37.3 ft. RT of SR 823 CL Date Drilled: 10)/26) A T'	011						
Depth (ft)	Elev. (ft) 597.5 -597.5-	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0', 16.0'-30.0' Water level at completion: 4.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		ture Co per foot	ntent, 9	6 -
- - -	-597.5- -593.5-		5	_13			Severely weathered gray SANDSTONE, very fine to fine grained, argillaceous. Hard gray SANDSTONE: very fine to fine grained, slightly										50
35 — 40 — -		Core 120"	Rec 120"	RQD 79%	R-1	*572	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured.										
- 4.0 	-583.5-						@ 41.5'-43.0', argillaceous zone. Bottom of Boring - 44.0'										
45 — - - - 50 —																	
- - - - 55 —																	
- - - -														1 1 1 1			

	TranSy				_		Project: SCI-823-0.00								Job No.	012	1-307	0.03
LOG C	F: Bo	ring	R-105		_	Location: Sta	. 185+04.3, 215.9 ft. RT of SR 823 CL Date Drilled: 10)/27 T			A T1	20.1						
Depth (ft)	Elev. (ft) 684.5	Blows per 6"	Recovery (in)	Sam		. o = oaa	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 6.7' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	IDARD Il Moistu Il M	ire Coi er foot	ntent,	
-0.3 - - - -3.5 -	-684.2- -681.0-	5 9 12 50/2	18	1 2			Topsoil - 3" Medium dense brown SILT (A-4b), some fine to coarse sand, little clay, trace gravel; contains sandstone fragments and roots; damp to moist. Severely weathered SANDSTONE.	9	16		10	54	11				X	on-Plas
-5.0 - - - - 10 — -	679.5	Core 96"	Rec 96"	RQD 40%	R-1	*428	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical low angle fractures. @ 9.0'-10.8',12.5'-12.8', rust stained high angle fractures.											
- 15 - -	671.7-	Core 84"	Rec 84"	RQD 100%), R-2	*441	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured to unfractured.											
25 — - - 25 — - -							Bottom of Boring - 20.0'											

	TranSy				_		Project: SCI-823-0.00								Job No	o. 01 2	21-30	70.03
LOG C	F: Bo	ring	R-106		_	ocation: Sta	i. 188+85.1, 50.5 ft. RT of SR 823 CL Date Drilled: 10	/26										
Depth (ft)	Elev. (ft) 647.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.9' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois - ⊢— Blows ∣	ture C	ontent,	ION (N) % - (LL) 40
0.3 	647.1-	4 4 6	18	1 2			Topsoil - 3" Medium dense brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist.											
5 -5.5 - - -	641.9	9 4 6 7	18	3		0.25	Soft to stiff mottled brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; contains sandstone fragments; damp to moist.	9	4		8	55	24					
 10.5 	636.9	12 16 17 12 22 29	18	5		2.0 4.0	Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp to moist.	0	4		9	64	23			7-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	1 1 1	
- - 15.0 	-	12 15 19		6		4.5+	Severely weathered brown SANDSTONE, argillaceous.											5
	630.4	12 50/3 Core 72"	9 Rec 72"	7 RQD 22%	R-1	*609	Soft gray and brown SANDSTONE; very fine to fine grained, decomposed to highly weathered, argillaceous, thinly to thickly bedded, highly fractured to broken, with typical low angle fractures.											50
21.2— - - 25 — - -	626.2-	Core 84"	Rec 84"	RQD 100%	R-2	*615	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thickly bedded, moderately to highly fractured. @ 23.0', slightly fractured. Bottom of Boring - 30.0'											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00		<i>J</i> 10					,	Job No.	0121-	3070.03	3
)F: Bo				_	ocation: Sta	i. 191+91.1, 71.3 ft. RT of SR 823 CL Date Drilled: 10)/26										
Depth (ft)	Elev. (ft) 665.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 13.4' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	I Moistu ⊢—— Blows pe	re Conte		
0.3 - - - -	665.5	3 4 5	18	1			Topsoil - 4" Medium dense brown SANDY SILT (A-4a), little gravel, trace clay; contains sandstone fragments; damp.											
5 	_	12 17 16 22 29	18	3													55	
	-657.8- - -	Core 60"	Rec 32"	RQD 0%	R-1		Very soft to soft brown SANDSTONE; very fine to fine grained, decomposed, argillaceous, broken; contains gravel and other residual soil like materials. @ 9.1'-11.7', no recovery.							1 1 1 1				
	652.8	Core 120"	Rec 120"	RQD 84%	R-2	*480	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured, with typical low angle fractures. @ 13.0'-13.8', brown highly weathered.											
25 — - - - - 30.0	635.8	Core 84"	Rec 84"	RQD 100%	R-3	*503	Bottom of Boring - 30.0'											

	ΓranSy				_		Project: SCI-823-0.00						Job	No. 012	1-307	0.03
LOG C	F: Bo	ring	R-107		_	ocation: Sta	a. 194+85.7, 32.6 ft. RT of SR 823 CL Date Drilled: 10	/26								
Depth (ft)	Elev. (ft) 685.7	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 11.1' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Clay	Natural M PL ⊢	RD PENE loisture Co vs per foot 20	ntent, s	% - LL
-0.3 	- 685.4			1		0.25	Topsoil - 3"/1.1' soil removed before drilling Soft brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; contains sandstone fragments; damp to moist.	4	5		16					70
5 —		6 8 12	18	2		1.0										
_		11 15 18	18	3		3.5	@ 6.0', very stiff to hard.									
0 —		10 11 13	18	4		2.5										
- 3.0 	-672.7-	10 12 14	18	5		4.5+	Severely weathered brown and gray SANDSTONE.									
_		19 50/2	8	6			Severely weathered brown and gray SANDSTONE.									-5
5.0— - - - - - - - - -	-6 70.7-	Core 96"	Rec 96"	RQD 76%	R-1	*477	Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to thickly bedded, slightly to highly fractured, with typically low angle fractures; contains few argillaceous laminations.									
- 25 - - -		Core 84"	Rec 84"	RQD 80%	R-2	*127	 @ 20.6'-22.5', broken with clay filled fractures. @ 22.5'-26.7', moderate to abundant argillaceous laminations, fissile. 									
_ 0.0	655.7						Bottom of Boring - 30.0'									

		, Inc.		_		Project: SCI-823-0.00		10							<u> </u>	-3070.03
F: Bo	ring	R-108	_	_	ocation: Sta)/25 			ATI	ON.					
Elev. (ft) 737.6	Blows per 6"	Recovery (in)			Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.8' (includes drilling water) DESCRIPTION	% Aggregate	Sand	Sand		% Silt	% Clay	Natura PL B	Moistu ⊢—— Iows pe	re Con	tent, % -
736.8	4 6 9	18	1			Topsoil - 9" Medium dense reddish brown SANDY SILT (A-4a), little gravel, little clay; contains sandstone fragments; damp to moist.	18	7		16	38	21				
	12 50/1	7	2			@ 3.5'-4.1', very dense.										
-/32.6- -731.3-	Core 96"	Rec 96"	RQD 85%	R-1	*494	Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly to thickly bedded, highly fractured, with typical low angle rust stained fractures. @ 5.0'-5.3', high angle rust stained fracture. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured, contains few argillaceous laminations.										
	Core	Rec	RQD	R-2	*531	@ 20.8', low angle fractures.										
	120	120														
	Core 84"	Rec 84"	RQD 100%	R-3	*592											
	Elev. (ft) 737.6 -736.8-	Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. 10 10 10 10 10 10 10 1	Sample Hand penetron meter (tst) Point-Load Strength (pst)	Sample No. Hand penetron meler (Ist) Point-Load (Ist) Point-	Sample Hand Penetrometer (ist) / Point-Load Strength Penetro	Sample Hand Penetro-meter (tst) / Point-Load Strength (ps)	Sample Hand Pose Pose	Sample Hand Penetro meter (igh) Pene	Sample Hand Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Penetro-meter Mater level at completion: None (prior to coring) 4.8' (includes drilling water) Penetro-meter Penetro-meter	Sample No. Hand Penetro Post Pos	Sample No. Hand Penetro No. Hand Penetro No. Water seepage at: None Water level at completion. None (prior to coring) Water level at completion. None (prior to coring) Water level at completion. None (prior to coring) A.S. (includes drilling water) A.S. (includes drilling water) Point-Load Sriengilling Point-Load Sriengilling	Sample No. Hand Persistrations: Water seepage at: None Water level at completion: None (prior to coring) A.5 (includes drilling water) Point-Loar Strength (ge) Point-Loar Point-Loar

	ranSy				<u> </u>		Project: SCI-823-0.00									o. 012 1	1-307	0.03
<u>.OG O</u>	F: Bo	ring	R-109		_	<i>Location:</i> Sta	. 198+85.5, 3.9 ft. RT of SR 823 CL Date Drilled: 10)/25 T			DATIO	to	1	10/26/0)4			
Depth (ft)	Elev. (ft) 755.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.7' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi	ral Mois L ⊢— Blows ¡	O PENET ture Cor per foot 20 3	ntent, %	ó -
-0.5 - - -	-754.5 -	4 5 8	18	1		3.5	Topsoil - 6" Very stiff to hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; dry to damp.											
5 —		9 12 26	18	2		4.5+										/		
6.0	- 749.0 -	18 25 33	18	3			Severely weathered dark brown SANDSTONE.											5
9.0	- 746.0-	26 50/3	9	4														
10 —	-743.3 -	Core 45"	Rec 45"	RQD 79%	R-1	*226	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle rust stained fractures, contains moderate argillaceous laminations.											
15 — - -		Core 84"	Rec 84"	RQD 88%	R-2	*514	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured, with typical high angle rust stained fractures, contains few argillaceous laminations. @ 14.5'-15.0', rust stained zone.											
0.0 	- 735.0 -						Bottom of Boring - 20.0'	-									1 1 1 1	
_ _ 25 																		
- -																		

	TranSy				_		Project: SCI-823-0.00							J	ob No.	0121	-307	0.03
.OG C	F: Bo	ring	R-110		_	ocation: Sta	. 199+04.6, 141.4 ft. RT of SR 823 CL Date Drilled: 10)/25				to	1	10/26/04	-			
Depth (ft)	Elev. (ft) 796.7	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 15.9' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	Sand	% F. Sand	% Silt	% Clay	Natura PL	DARD I Moistu Hows pe	er foot	ntent, %	6 -
_	-796.4- -792.7-	2 4 13		1			Topsoil - 3" Very stiff brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; damp.											
-4.0 -5.5 	-792.7- -791.2-	29 50/2	12	2			Severely weathered brown SANDSTONE. Soft gray and brown SHALE; fine grained, decomposed,											50
-6.6 -	790.1-	Core 54"	Rec 54"	RQD 31%	R-1	*392	arenaceous, thinly laminated, highly fractured with typical low angle clay filled fractures, contains few arenaceous laminations. Medium very hard to hard gray and brown SANDSTONE; fine	-										
10 — - - 15 — - -		Core 120"	Rec 120"	RQD 70%	R-2	*284	grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately to highly fractured, contains low angle clay filled fractures. @ 7.3',8.4', low angle rust stained fractures. @ 12.8'-13.0', clay filled fractures. @ 13.0'-13.9', broken zone. @ 18.2'-20.1', abundant to moderate argillaceous laminations.							iiiiiii	1.1.1			
20.2 - - - 25 — - -	-776.5-	Core 120"	Rec 120"	RQD 98%	R-3	*470	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, few argillaceous laminations. @ 20.6', 28.7', low angle fractures.	-										

	TranSy				_		Project: SCI-823-0.00								Job N	lo. 012	21-307	0.03
LOG (DF: Bo	ring	R-110		_	ocation: Sta	. 199+04.6, 141.4 ft. RT of SR 823 CL Date Drilled: 10)/25				to	1	0/26/	04			
Depth (ft)	Elev. (ft) 766.7	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 15.9' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt %	% Clay	Natu F	ıral Moi L ⊢		ETRATION TENTE TO THE TRATE TO	% -
30 —	-756.7-	Core 120"	Rec 120"	RQD 100%	R-4	*414	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded. @ 36.4'-36.5', 38.6', 39.4', thin argillaceous bands. Bottom of Boring - 40.0'											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No	. 0121-3070.03
LOG (F: Bo	ring l	₹-111		_	Location: Sta	. 204+01.7, 5.7 ft. RT of SR 823 CL Date Drilled: 1	0/21				to	1	10/22/04	
Depth (ft)	Elev. (ft) 817.4	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drillling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natural Mois PL ⊢ Blows p	PENETRATION (N) ure Content, % - ●
0.3 	-817.1- - - - - - - - 814.4-	2 2 4 13 31	18	1 2		2.0	Topsoil - 4" Stiff to very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist. Hard light brown CLAY (A-7-6), trace fine to coarse sand, trace gravel; dry to damp.	5	6		13	47	29		
5 — - - - -9.0—	-808.4	5 8 13	18	3		4.5+	@ 6.0', brown and gray.	1	3		3	23	70		5551
10 — - - 12.5	804.9	24 50/2 16 50/6	8	5			Severely weathered brown SANDSTONE. Hard brown SANDSTONE; very fine to fine grained, highly								50+ 50+
-13.8 - 15 - 15 - 15 - 10 - 10 - 10 - 10 - 10	803.6	Core 96"	Rec 96"	RQD 98%		*345	weathered, argillaceous, thinly bedded to thickly bedded. @ 13.4', low angle rust stained fracture. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 17.7'-18.7', SDI = 57.8%. @ 18.0'-20.6', contains abundant to moderate argillaceous laminations. @ 18.0',18.3',19.2', low angle clay filled fractures.								
25 — 27.1 — 27.1 —	- - - - - - - - - - - - - - - - - - -	Core 120"	Rec 120"	RQD 91%	R-2	*297	 @ 19.4',26.9',27.0', low angle clay filled fractures. @ 20.1'-20.5', qu = 12,399 psi. @ 21.5'-23.0', contains moderate argillaceous laminations. @ 26.4'-27.2', contains abundant to moderate argillaceous laminations. @ 26.9'-27.2', broken. Hard gray SANDSTONE; very fine to fine grained, slightly								
30							weathered, argillaceous, micaceous, thinly to thickly bedded.								

	TranSy				_		Project: SCI-823-0.00								lo. 012	1-307	70.03
LOG (F: Bo	ring	R-111		_	ocation: Sta	204+01.7, 5.7 ft. RT of SR 823 CL Date Drilled: 10)/21 T		ATIO	to	-	0/22/	04			
Depth (ft)	Elev. (ft) 787.4	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drillling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Moi L ⊢	D PENE sture Co per foot 20	ontent,	% - LL
30 —		Core 120"	Rec 120"	RQE 100%	R-3	*434	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured. @ 30.6'-30.8', 31.9'-32.3', 37.0'-39.0', contains moderate to abundant argillaceous laminations. @ 37.0'-38.0', SDI = 98.2%. @ 39.0'-39.7', qu = 11,352 psi. @ 40.0'-40.4', qu = 10,493 psi.								1111		
45 —		Core 120"	Rec 120"	RQE 100%	R-4	*409	@ 40.7'-41.1', qu = 3,201 psi.										
55 — - -		Core 120"	Rec 120"	RQE 100%	R-5	*508	@ 53.0'-53.4', qu = 12,131 psi. @ 53.6'-54.6', SDI = 97.5%. @ 57.8'-58.1', 58.4'-58.6', 58.9'-59.0', 60.1'-60.5', contains moderate argillaceous laminations.										

	TranSy				_		Project: SCI-823-0.00									o. 012	1-3070	0.03
LOG (DF: Bo	ring	R-111		_	ocation: Sta	i. 204+01.7, 5.7 ft. RT of SR 823 CL Date Drilled: 1	0/21				to	10)/22/(<u>)4</u>			
Depth (ft)	Elev. (ft) 757.4	Blows per 6"	Recovery (in)	Samp No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drillling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pi	ral Mois L ⊢— Blows	per foot		6 - •
60.5 — 60.5 — 60.5 — 65 — 65 — 65 — 65 — 65 — 65 — 65 —	-756.9-						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded. Bottom of Boring - 60.5'											

	ΓranSy				_		Project: SCI-823-0.00							Job No	. 0121	-3070.	.03
_OG C	F: Bo	ring	R-112		_	ocation: Sta	1. 205+84.3, 118.9 ft. LT of SR 823 CL Date Drilled: 10)/22		• == :							
Depth (ft)	Elev. (ft) 799.4	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.6' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	F. Sand	Silt	% Clay	Natui PL	NDARD ral Moist -	ure Con er foot	tent, % — Li	- L
-0.3 - - -3.5 -	-799.1- -795.9-	5 6 6	18	1 2		2.0	Topsoil - 4" Stiff to very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp. Severely weathered brown SANDSTONE.	-									
5.0— — — — 10 —	794.4- 	Core 96"	Rec 85"	RQD 36%	R-1	*264	Medium hard to very hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately to highly fractured, with typical high angle rust stained fractures, contains few to moderate argillaceous laminations. @ 7.1'-8.0', lost recovery.										15
- 5 — - - - -	—779.4—	Core 84"	Rec 84"	RQD 90%	R-2	*159	 @ 9.2'-9.6', broken zone. @ 12.2'-12.6', high angle clay filled fracture. @ 19.5'-19.9', broken, poorly cemented. 										
- - 25 — - - - - 30							Bottom of Boring - 20.0'							1 1 1 1			

Elev. (ft) 789.5 -789.2-	Plows ber 6"	7 Recovery (in)	Samp No.	ole	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	A. 205+82.1, 62.6 ft. RT of SR 823 CL WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 11.5' (includes drilling water) DESCRIPTION Topsoil - 3"	% Aggregate [5]	Sand Sand		% F. Sand	Silt	Clay	Natu	NDARD ral Moist L ⊢——	ture Co	ntent,	% - • LL
(ft) 789.5 -789.2	Blows per	Tecovery Recovery	No.	/ Core	Penetro- meter (tsf) / * Point-Load Strength	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 11.5' (includes drilling water) DESCRIPTION Topsoil - 3"	% Aggregate	C. Sand	M. Sand	F. Sand	Silt	Clay	Natu	ral Moist L ⊢—	ture Co	ntent,	% - • LL
	2		1							0/	%	%				30	40
-783.5 -		18	2			Very loose dark brown SILT (A-4b), some clay, little fine to coarse sand; contains roots; moist.	8	8		7	54	23					
	9 20 50/5	16	3		•	Severely weathered brown SANDSTONE.											, , , , , , , , , , , , , , , , , , ,
-782.0 -777.0 -	Core 90"	Rec 90"	RQD 73%	R-1	*255	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle fractures. @ 9.7'-10.5', high angle rust stained fracture. @ 10.6'-11.0',12.3'-12.5', broken zones. Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures.											
	Core 120"	Rec 115"	RQD 92%	R-2	*495	@ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained.											
-764.5 -						Bottom of Boring - 25.0'											
-7	764.5 -	120"	120" 115"	120" 115" 92%	120" 115" 92% ^{N-2}	120" 115" 92% N-2 495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" RQD 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" RQD 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" RQD 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" RQD 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" Rec 115" RQD 92% R-2 *495	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core 120" 115" 92% R-2 *495 Bottom of Boring - 25.0'	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core Rec 120" R-2 *495 Bottom of Boring - 25.0'	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core Rec 120" R-2 *495 Bottom of Boring - 25.0'	highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained. Core Rec 120" R-2 *495 Bottom of Boring - 25.0'

Client: T					_		Project: SCI-823-0.00						Job I	<i>lo.</i> 0121-3	3070.03
LOG O	F: Bo	ring	R-211		_	ocation: Sta	. 198+94.2, 150.5 ft. RT of SR 823 CL Date Drilled: 01	/24		A T /	211				
Depth (ft)	Elev. (ft) 795.9	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water) DESCRIPTION	% Aggregate	M. Sand	% F. Sand	% Silt	% Clay	Natural Mo PL ⊢	D PENETR, sture Conte per foot - 20 30	
-0.3 - - -	- 795.6-	8 9 15		1		4.5+	Topsoil - 3" Hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; contains sandstone fragments; damp.							0,1	
-5.0 -5.5	-790.9- -790.4-	24 50/2	12	√ 2			Severely weathered brown SANDSTONE, argillaceous.								7
10 —		Core 120"	Rec 109"	RQD 43%	R-1	*870	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, laminated to massive, moderately to highly fractured, iron stained fractures. @ 5.5'-6.6', broken zone. @ 6.6'-7.6', lost recovery.								
15 —							@ 14.3'-15.0', decomposed broken zone.								
20 —	-779.9-	Core 120"	Rec 119"	RQD 87%	R-2	*1120	Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded. @ 16.3'-16.9', 21.0'-21.3', iron stained zones. @ 16.5'-16.8', 21.0'-21.3', argillaceous, decomposed, broken.								
25 —	-//4.2- 						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 22.2'-22.3', medium grained with low angle fracture.								
- - 30							@ 26.6', low angle fracture.								

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070.0)3
LOG C	F: Bo	ring	R-211		_	ocation: Sta	a. 198+94.2, 150.5 ft. RT of SR 823 CL Date Drilled: 01	/24									
Depth (ft)	Elev. (ft) 765.9	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	NDARD F al Moistu .	re Cont er foot -	tent, % -	•
30 — - - - 35 — -		Core 120"	Rec 120"	100%	R-3	*1224	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 30.1', low angle clay filled fracture.										
40 —		Core 120"	Rec 120"	RQD 100%		*1198	@ 43.9',47.6',51.0', low angle clay filled fractures. @ 43.9'-53.4', thinly laminated to thinly bedded										
50 —		Core 120"	Rec 120"	RQD 100%		*1096											
55 — - - - - 60	-				_												

Client:	TranSy	/stems	, Inc.			•	Project: SCI-823-0.00	200	2.0						Job No	o. 012	1-3070	0.03
LOG (DF: Bo	ring	R-211		_	ocation: Sta	a. 198+94.2, 150.5 ft. RT of SR 823 CL Date Drilled: 01	/24										
Depth (ft)	Elev. (ft) 735.9	Blows per 6"	Recovery (in)	Sam No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu P	ral Mois L ⊢— Blows i	D PENE ture Co per foot	ntent, % 	6 -
- - - - 65 —	- - - -	Core 120"	Rec 120"	RQD 100%	R-6	*1535	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.											
70 —	-	Core 120"	Rec 119"	RQD 99%	R-7	*1300												
80 —	-	Core 120"	Rec 120"	RQD 100%	R-8	*1279												
- - -																		

Client: Tra	anSys	stems	, Inc.				Project: SCI-823-0.00								Job N	o. 012	1-307	70.03
LOG OF:	: Boı	ring l	R-211		_	ocation: Sta	. 198+94.2, 150.5 ft. RT of SR 823 CL Date Drilled: 01	/24										
(ft)	Elev. (ft) '05.9	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt NO	% Clay	Natu P	NDARL ral Mois L ⊢ Blows	ture Co	ntent,	% - (LL
95 —		Core 120" Core 60"	Rec 120" Rec 60"	RQD 100% RQD 100%	R-	*1677 *1746	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.											
00.5 - 69	95.4						Bottom of Boring - 100.5'											

Client:					_		Project: SCI-823-0.00								Job No	. 012	1-307	70.03
LOG C	F: Bo	ring	R-211		_	ocation: Sta	. 203+89.1, 3.8 ft. RT of SR 823 CL Date Drilled: 1/	23/0		7.5		<u> </u>						
Depth (ft)	Elev. (ft) 817.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported DESCRIPTION	% Aggregate	Sand	Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moisi ⊢—— Blows p	ure Co	ontent,	ION (N) % - • LL) 40
	817.6	8 10 12 6 7 9		1 2		4.5+ 4.5+	Topsoil - 2" Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist. @ 5.0', contains rock fragments.	1	5		22	40	32		•	——————————————————————————————————————		
-7.5 - - 10 	810.3	4 13 21		3		4.5+	Hard brown CLAY (A-7-6), some silt, little fine to coarse sand, trace gravel; damp. @ 10.0', contains sandstone fragments.	3	8		7	30	52		•	<u> </u>		
	-806.2- -804.0- -797.2-	24 50/2 Core 108"	Rec 105"	4 RQD 62%	R-1	4.5+ *638	Severely weathered brown SANDSTONE, argillaceous. @ 13.0'-13.4', coarse grained (conglomerate). Medium hard to hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, laminated to medium bedded, broken.											50
25 — - - 25 — - -		Core 120"	Rec 118"	RQD 98%	R-2	*470	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, laminated to massive, moderately fractured, contains few to moderate argillaceous laminations.									1 1 1 1		

	TranSy				_		Project: SCI-823-0.00							Job No	. 012	1-307	0.03
LOG C	F: Bo	ring	R-211		_	ocation: Sta	a. 203+89.1, 3.8 ft. RT of SR 823 CL Date Drilled: 1	/23/0									
Depth (ft)	Elev. (ft) 787.8 787.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt Silt	% Clay	Natui Pl	NDARD al Mois	ture Co per foot	ntent, 9	% - (
30.0	787.8	Core 120"	Rec 117"	RQD 98%	R-3	*1099	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured. @ 31.6'-31.9', argillaceous bands.										
45 —		Core 120"	Rec 120"	RQD 100%	R-4	*1598											
- - - 55 — - -		Core 120"	Rec 120"	RQD 100%	R-5	*1247							1 1 1 1				1 1 1

	ΓranSy				_		Project: SCI-823-0.00							Job N	o. 012	1-307	0.03
LOG C	F: Bo	ring	R-211		_	ocation: Sta	L. 203+89.1, 3.8 ft. RT of SR 823 CL Date Drilled: 1/	23/0									
Depth (ft)	Elev. (ft) 757.8 757.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		ture Co per foot	ntent, 9	% - (
65 —	748.1-	Core 120"	Rec 120"	RQD 100%	R-6	*1038	Hard dark gray SANDSTONE; very fine grained, slightly weathered, argillaceous, massive, slightly fractured, with few argillaceous laminations, turbidity burrows.										
75 —		Core 120"	Rec 119"	RQD 99%	R-7	*2225	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, turbidity.										
85 — - -		Core 120"	Rec 120"	RQD 100%	R-8	*2013											

Client: T					_		Project: SCI-823-0.00							Job N	o. 012	21-30 ⁻	70.03
LOG O	F: Bo	ring	R-211		_	ocation: Sta	a. 203+89.1, 3.8 ft. RT of SR 823 CL Date Drilled: 1/	23/0									
Depth (ft)	Elev. (ft) 727.8	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	sture Co	ontent,	(ION (N) % - (LL) 40
90.0	- 727.8-	Core 120"	Rec 120"	RQD100%	R-9	*1665	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, turbidity. @ 99.1'-99.2', calcareous. Bottom of Boring - 100.6'										

	ranSy				_		Project: SCI-823-0.00							Job N	lo. 01	21-30	70.03
.0G C	F: Bo	ring	R-211		_	ocation: Sta	. 205+94.6, 125.6 ft. LT of SR 823 CL Date Drilled: 1/	20/0	740	ATIO	24/						
epth (ft)	Elev. (ft) 795.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu F		sture C		% - LL
0.3—— 4.0—— 5.5——— ————————————————————————————	-795.1- -791.4- -789.9-	9 7 8 50/6	10	1 2 RQD 67%	R-1	*293	Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp. Severely weathered brown SANDSTONE. Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, laminated to massive, broken to moderately fractured, iron stains. @ 5.5'-9.0', broken to highly fractured. @ 7.3'-7.8', high angle fracture. @ 9.9'-10.5', core loss due to washout.										,
	- 779.1−	Core 120"	Rec 120"	RQD 87%	R-2	*882	 @ 14.8'-16.3', broken to highly fractured, contains argillaceous laminations. Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, massive, moderately fractured. @ 18.5'-18.6' shale bed. @ 18.7',19.1',20.8',22.0', 25.2', low angle fractures. @ 20.2'-23.0', iron stained. @ 20.8'-21.6', calcareous zone, abundant burrows throughout @ 20.1'-20.2', high angle fracture. @ 25.3'-26.0', iron stained vertical fracture	-									
_							@ 27.5'-27.7', rust stained high angle fracture.@ 26.7',27.3',30.0', low angle fractures, rust stained.										

Client: Tr	anSy	stems	, Inc.				Project: SCI-823-0.00						Job No.	. 0121-3070.03
LOG OF	: Bo	ring	R-211		_	ocation: Sta	. 205+94.6, 125.6 ft. LT of SR 823 CL Date Drilled: 1/	20/0						
(ft)	Elev. (ft) 765.4	Blows per 6"	Recovery (in)	Sam _i No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	ON Nilt	% Clay	Natural Moist PL ⊢——	er foot -
35 —		Core 120"	Rec 118"	RQD 84%	R-3	*958	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, massive, moderately fractured.							
-37.7 -7 	757.7-	Core 120"	Rec 120"	RQD 100%			Medium hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, laminated to thinly bedded, slightly fractured, increasing argillaceous laminations. @ 39.9', 41.7', 44.7', 44.9' low angle fractures.							
-47.7	747.7-	Core 120"	Rec 120"	RQD 100%		*1024	 @ 46.6', low angle fracture. @ 47.6'-47.7', confined gravel. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured to unfractured. 							
60														

	TranSy					•	Project: SCI-823-0.00							Job N	o. 012	21-307	70.03
LOG C	F: Bo	ring	R-211		_	ocation: Sta	a. 205+94.6, 125.6 ft. LT of SR 823 CL Date Drilled: 1/	/20/0									
Depth (ft)	Elev. (ft) 735.4	Blows per 6"	Recovery (in)	Sam _i No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois - ⊢— Blows	sture C	ontent,	ION (N) % - (LL) 40
65 —		Core 120"	Rec 120"	RQD 100%	R-6	*1195	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured to unfractured.										
70 —		Core 120"	Rec 120"	RQD 100%	R-7	*1246											
- - -		Core 54"	Rec 54"	RQD 100%	R-8												
80.0— — — — 85 — — — —	+715.4-						Bottom of Boring - 80.0'										

	TranSy				_		Project: SCI-823-0.00							Job No	o. 012	-3070	0.03
LOG (OF: Bo	ring	R-120		_	ocation: Sta	. 212+84.2, 38.7 ft. RT of SR 823 CL Date Drilled: 10)/22		\ A T'	011						
Depth (ft)	Elev. (ft) 770.8	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.6' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natu Pl	NDARE ral Mois L ⊢ H Blows µ 0 2	ture Col per foot	ntent, % 	· -
-0.3		13 27 39 50/4	18	1 2			Topsoil - 4" Severely weathered brown SANDSTONE.	-									50
5 — 5.5 —	-765.3- - - - - - - - - -	Core 114"	Rec 108"	RQD 58%	R-1	*40	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typical low angle clay filled fractures. @ 5.5'-5.8',6.9'-7.1', broken zones. @ 14.5'-15.0', lost recovery.										
-15.0—	755.8- 						Bottom of Boring - 15.0'										

Client:							Project: SCI-823-0.00		0					Job No.	0121	-3070	.03
LOG C	F: Bo	ring l	R-121		_	ocation: Sta	. 216+91.4, 28.0 ft. RT of SR 823 CL Date Drilled: 10)/21									
Depth (ft)	Elev. (ft) 811.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.9' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natui Pl	NDARD ral Moistu -	ure Con er foot	tent, % —	-
-	810.9 - - - 808.1	5 10 20 27 50/4	18	1 2		4.5+	Topsoil - 2" Hard brown and gray SILTY CLAY (A-6b); dry to damp. Severely weathered gray and light brown SANDSTONE, argillaceous.										
5 — 5.5 — — — — — — ————————————————————	-805.6-	Core 90"	Rec 90"	RQD 84%	R-1	*67	Soft to medium hard gray and red SILTSTONE interbedded with SANDSTONE; highly weathered to decomposed, argillaceous, highly fractured.	-									50+
15 —		Core 120"	Rec 120"	RQD 44%	R-2	*25	@ 20.6'-21.0',23.6'-23.8', interbedded coal seams.							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
25 — 26.5 — 	- 784.6-	Core 120"	Rec 120"	RQD 84%	R-3	*211	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly to thickly bedded, moderately fractured. @ 26.9'-27.6', SDI = 5.6%.	-									1.1.1

	ΓranSy				_		Project: SCI-823-0.00							Job N	lo. 012	21-3070	0.03
.og c	F: Bo	ring	R-121		_	ocation: Sta	i. 216+91.4, 28.0 ft. RT of SR 823 CL Date Drilled: 10)/21									
epth (ft)	Elev. (ft) 781.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.9' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu F	ıral Moi: PL ⊢—	sture C		
30 — - 32.5— - 35 — - 40 — - 45 —	- 778.6-	Core 120"	Rec 120"	RQD 88%	R-4	*496	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly to thickly bedded, moderately fractured. @ 31.5'-32.2', interbedded with decomposed SHALE, highly fractured. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 33.2',33.5',33.9', low angle clay filled fractures.	1									
- -	- 761.1-	Core 84"	Rec 78"	RQD 89%	R-5	*553	@ 49.3', interbedded to abundant SHALE laminations.@ 49.5'-50.0', lost recovery.										
55 — - - - - -							Bottom of Boring - 50.0'										

	TranSy				_		Project: SCI-823-0.00								o. 012	21-3070	0.03
LOG C	F: Bo	ring	R-121		_	Location: Sta	. 219+91.4, 61.4 ft. LT of SR 823 CL Date Drilled: 10)/20			to	_	10/21/	04			
Depth (ft)	Elev. (ft) 850.3	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay	Natu P	ıral Mois L ⊢— Blows	sture C		6 -
-0.3 - -3.0	850.0- - - 847.3-	50/4	4	1		3.0	Topsoil - 3" Very stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; contains sandstone fragments; damp. Soft to medium hard brown SANDSTONE; fine grained,										
5 — 10 —		Core 120"	Rec 120"	RQD 30%	R-1	*192	broken to highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, contains clay filled fractures. @ 3.0'-3.2',4.4'-5.5', broken zones.										
	837.3-	Core 120"	Rec 97"	RQD 37%	R-2	2 *285	Soft to medium hard dark gray CLAYSTONE; highly weathered to decomposed, argillaceous, carbonaceous, thinly bedded, moderately fractured, with typically low angle fractures. ② 14.8'-15.4', coal seam. Medium hard to hard brown and gray SANDSTONE interbedded with SHALE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. ② 15.3'-15.5',17.2'-17.7',18.8'- 19.2', broken zones. ② 20.0'-21.9', lost recovery.	-									
25 — - -	827.3	Core 120"	Rec 120"	RQD 73%	R-3	*116	Soft to medium hard dark gray SHALE; highly weathered to decomposed, argillaceous, carbonaceous,thinly laminated to thinly bedded, moderately fractured. @ 26.9'-27.8', coal blossom. Soft to medium hard gray SANDSTONE.										

Client: 1	ΓranSy	stems	s, Inc.				Project: SCI-823-0.00						Job	vo. 0121-	-3070.03
LOG O	F: Bo	ring	R-121		_	ocation: Sta	a. 219+91.4, 61.4 ft. LT of SR 823 CL Date Drilled: 10)/20			to	1	10/21/04		
Depth (ft)	Elev. (ft) 820.3	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.5' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand		% Clay	Natural Mo PL ⊢		
30 — - -33.0— - 35 —	-817.3-				-		Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded, moderately fractured. @ 31.7'-32.2', contains carbonaceous inclusions. @ 31.9', coal blossom Soft to medium hard gray SHALE; decomposed.								
40 	- - -808.9	Core 120"	Rec 120"	RQD 90%			@ 38.9'-39.6', SDI = 10.2%. @ 41.0'-41.4', SANDSTONE lens. Medium hard gray SILTSTONE; highly weathered to decomposed, arenaceous, moderately fractured.								
45 — - - -		Core 120"	Rec 120"	RQD 100%	R-5	*67	@ 41.4'-41.9', qu = 987 psi. @ 47.4'-47.9', SDI = 19.4%.								
50 							@ 52.5'-53.0', qu = 1,749 psi.								
55 		Core	Rec	RQD 93%	De	*433									
- - 60		120"	120"	93%	n-0	433									

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00-0	040					П	Job N	o. 0 12	1-3070	0.03
LOG (F: Bo	ring	R-121	Α	L	ocation: Sta	a. 219+91.4, 61.4 ft. LT of SR 823 CL Date Drilled: 10)/20				to	10)/21/()4			
Depth (ft)	Elev. (ft) 790.3	Blows per 6"	Recovery (in)	Sam No enive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.5' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	Silt	% Clay	Natui Pl	ral Mois L ⊢— Blows	sture Co		6 - •
60 — 61.9— -	788.4-						Medium hard to hard gray and brown SILTSTONE; decomposed to highly weathered, arenaceous, moderately fractured. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured contains moderate argillaceous.	-										
65 — - - - 70 — - -	-	Core 120"	Rec 120"	RQD 100%	R-7	*367	bedded, moderately fractured contains moderate argillaceous laminations. @ 65.3'-71.2', few to moderate argillaceous laminations. @ 71.2', few argillaceous laminations. @ 79.3'-80.3', moderate argillaceous laminations, highly fractured.											
75 — - - - 80 — -		Core 120"	Rec 120"	RQD 96%	R-8	*260							1					
85 — - - - - - 90.0	760.3	Core 84"	Rec 84"	RQD 100%	R-9	*485	@ 84.3', argillaceous zone. Bottom of Boring - 90.0'											1111

Client:					_		Project: SCI-823-0.00							Job No. 012	1-3070.03
LOG C	F: Bo	ring	R-122		_	Location: Sta	. 222+99.5, 9.0 ft. RT of SR 823 CL Date Drilled: 10	/19			to		10/20/04	4	
Depth (ft)	Elev. (ft) 869.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	π.		% Clay	Natura PL	IDARD PENE Il Moisture Co Il Blows per foot 20	ntent, % - ——⊢ LL
0.2 - - -	- 868.8-	7 10 12	18	1		4.5+	Topsoil - 2" Hard brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.	-							
-3.5 - 5	- 865.5 -	1 / 21	18	2			Severely weathered brown SANDSTONE.								
		35 50/2	8	3											
10 —	- 861.5-	Core 66"	Rec 66"	RQD 41%	R-1	*26	Soft to medium hard brown and gray SANDSTONE; fine to medium grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures.								
13.0 15 - - -	- 856.0-	Core	Rec 120"	RQD 61%	R-2	*28	Soft to medium hard dark gray SHALE; decomposed to highly weathered, arenaceous, carbonaceous, thinly laminated, highly fractured, with typical high angle clay filled fractures. @ 22.3'-23.5', SANDSTONE lens.								
20 —		120	120				 @ 18.3'-19.4', qu = 1,918 psi, SDI = 4.9%. @ 23.2',23.4', low angle clay filled fractures. @ 22.3'-22.6', broken zone. 						1		
25 							@ 26.1'-26.5', 27.1'-27.2', SANDSTONE lenses.								
27.9 	- 841.1-	Core 120"	Rec 120"	RQD 60%	R-3	*166	@ 27.6', low angle clay filled fractures. Medium hard brown SANDSTONE interbedded with SHALE.								

Client: -	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No. 0121-3070.	03
LOG C	F: Bo	ring	R-122		_	ocation: Sta	a. 222+99.5, 9.0 ft. RT of SR 823 CL Date Drilled: 1	0/19				to		10/20/04	
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam No	/ Core	Hand Penetro- meter (tsf) / * Point-Load Strength	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water)	Aggregate		Sand	Sai	t	Clay	STANDARD PENETRATION Natural Moisture Content, % PL ⊢ L	-
	839.0	Blow	Rec	Drive	Press	(psi)	DESCRIPTION	% A	% C.		% F.	% Silt	% C	Blows per foot - 0 10 20 30 4	<u>o</u>
- - -	-835.0-	Core 120"	Rec 120"	RQD 88%	R-4	*37	Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded, highly fractured. @ 30.8'-31.2', qu = 6,049 psi. @ 32.6'-33.4', broken zone. Soft to medium hard dark gray SHALE; highly weathered to decomposed, arenaceous, carbonaceous, moderately fractured. @ 33.9'-35.5', qu = 2,101 psi, SDI = 1.7%.								
45 — - - -		Core 120"	Rec 120"	RQD 97%	R-5	*91									
50 —					_		@ 49.9'-51.3', COAL blossom. @ 51.3, gray.								
55 — - - -58.7—	- - 810.3-	Core 120"	Rec 120"	RQD 100%	R-6	*118	Medium hard gray and red SILTSTONE.								

Client:					_		Project: SCI-823-0.00						Job N	o. 0121-3	070.03
LOG C	F: Bo	ring	R-122		_	ocation: Sta	a. 222+99.5, 9.0 ft. RT of SR 823 CL Date Drilled: 10	/19			to		10/20/04		
Depth (ft)	Elev. (ft) 809.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand		% Clay		ture Conter	
60 —		Core 120"	Rec 120"	RQD 88%	R-7	*376	Medium hard gray and red SILTSTONE; moderately to highly weathered, arenaceous, moderately fractured, contains few SANDSTONE interbeds. @ 66.8'-67.9', SDI = 49.0%.								
75 — - - - 80 — -81.2— -	- 787.8−		Rec 120"	RQD 95%	R-8	*43	@ 74.3'-75.6', red fine grained SANDSTONE. @ 77.2'-77.9', qu = 4,920 psi. Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded,								
85 — - - - - -		Core 120"	Rec 120"	RQD 98%	R-9	*73	\tag{contains abundant to moderate argillaceous laminations.} \text{Medium hard to very hard SANDSTONE; fine grained, moderately weathered, argillaceous, massive, slightly fractured.} \text{@ 84.8'-85.5', qu = 4,983 psi.}								

Client: T	ranSy	stems	s, Inc.		_		Project: SCI-823-0.00						J	ob No. 01	21-3070	0.03
LOG O	F: Bo	ring	R-122		_	ocation: Sta	1. 222+99.5, 9.0 ft. RT of SR 823 CL Date Drilled: 10	/19			to		10/20/04			
Depth (ft)	Elev. (ft) 779.0	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natural PL	Moisture	NETRATIC Content, % oot - () 30	ó - (
90 —	773.0	Core 120"	Rec 120"	RQD 100%		*336	Medium hard to very hard SANDSTONE; fine grained moderately weathered, argillaceous, massive bedded, slightly fractured. @ 95.1'-96.1', SDI = 97.6%. @ 98.2'-99.3', moderate argillaceous and carbonaceous laminations. @ 96.2'-96.6', qu = 11,696 psi. @ 99.0', coal stringers.									#U
110 —	-756.2 - -	Core 120"	Rec 120"	RQD 96%	R11	*480	 @ 103.7', coal stringers. @ 103.5'-104.5' moderate argillaceous and carbonaceous laminations. @ 109.7'-110.7', fine to medium grained BRECCIA, poorly cemented. 									
_ 115 _ _ _	749.0	Core 84"	Rec 84"	RQD 100%	R12	*135	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to laminated, contains moderate argillaceous laminations. Bottom of Boring - 120.0'									

	TranSy				_		Project: SCI-823-0.00							Job N	lo. 0121	1-3070	0.03
LOG (DF: Bo	ring	R-123		_	ocation: Sta	1. 226+93.5, 68.4 ft. LT of SR 823 CL Date Drilled: 10	/14			ATI	24/					
Depth (ft)	Elev. (ft) 800.0	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate	% C. Sand	Sand	% F. Sand	% Silt	% Clay	STANDAR Natural Moi PL ⊢ Blows 10	sture Cor per foot	ntent, % 	- (
0.3 3.0 5	-799.7- - -797.0-	2 3 5	14	1 2		3.0	Topsoil - 4" Very stiff brown SILT (A-4b), trace fine to coarse sand; slightly organic; contains wood fragments; moist. Hard brown SILTY CLAY (A-6b), little fine to coarse sand, little gravel; damp.							00			
- - -	-	8 16 18	14	3		4.0 4.5+		14	3		13	42	28	•			
10 — -10.5 — - - - - 15 —		33 37 27 33 38 40 50/5		5 6		4.0+	Severely weathered brown and gray SHALE.										7
-16.0—	-784.0- -776.6- -774.0-	Core 120"	Rec 120"	RQD 59%	R-1	*537	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to medium bedded, broken to moderately fractured. @ 16.0'-16.4', dark gray. @ 16.1',16.4', interbedded coal seams. @ 21.0'-21.5', moderate argillaceous laminations, broken to highly fractured zone. @ 21.8'-22.3',22.6'-22.9',23.1', high angle rust stained fractures. Hard gray and brown SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured. Bottom of Boring - 26.0'										

Client: T	ranSy	stems	, Inc.				Project: SCI-823-0.00							Job No. 0121-3070.0)3
LOG O	F: Bo	ring	R-125			ocation: Sta	. 226+94.5, 105.0 ft. RT of SR 823 CL Date Drilled: 10)/13				to		10/14/04	
				Samp No.		Hand Penetro-	WATER OBSERVATIONS: Water seepage at: None		G	RAD	ATIO	ON			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Drive	Press / Core	meter (tsf) / * Point-Load Strength (psi)	Water level at completion: None (prior to coring) 5.8' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand		F. Sand	% Silt	Clay	STANDARD PENETRATION Natural Moisture Content, % - PL	•
2	824.4	Bk	Re	Du	Pre	(μοι)		%	%		%	%	%	10 20 30 40	
-0.3̂	-824.1-	3 7 5	18	1		4.5+	Topsoil - 3" Hard brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.							Q	
5 —		5 9 12	18	2		4.5+	@ 1.0'-2.5', contains roots.								
_	010.1	10 16 24	18	3		4.5+									
10 —	- 816.4-	11 22 50/5	13	4		•	Severely weathered brown SANDSTONE, argillaceous.								5
-		10 24 40	16	5			@ 11.0'-12.5', gray.								6
15 —		18 33 50/4	16	6											5
		33 50/3	7	7											5
	005.4		5	_ 8			Medium hard brown and gray SANDSTONE; very fine to fine	4							5
20 	-804.8- -803.2-		Rec 67"	RQD 55%	R-1	*149	grained, highly weathered, argillaceous, micaceous, thinly bedded, broken, with typical high angle rust stained fractures. Medium hard brown and red SILTSTONE; highly weathered to decomposed, micaceous, highly fractured, with typical high angle fractures. Medium hard gray SANDSTONE; very fine to fine grained,	_) _							
25 —							moderately weathered, argillaceous, thinly bedded, moderately fractured, with typical low angle fractures, contains abundant to moderate argillaceous laminations.								
30		Core 120"	Rec 120"	RQD 90%	R-2		@ 25.5'-37.4', contains coal stringers.								

Client:					_		Project: SCI-823-0.00								Job No. C	121-30	070.03
LOG C	F: Bo	ring	R-125		_	Location: Sta	a. 226+94.5, 105.0 ft. RT of SR 823 CL Date Drilled: 10	/13				to	-	10/14/0	4		
Depth (ft)	Elev. (ft) 794.4	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.8' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	NON Silt	% Clay	Natura PL	IDARD PE al Moisture Ilows per 20	Conten	
30 — - - -33.7— 35 —	790.7-					*244	Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly bedded, moderately fractured, contains abundant to moderate argillaceous laminations. @ 32.5'-33.7', contains BRECCIA. Medium hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous,										
40 —		Core 120"	Rec 120"	RQD 98%	R-3	*373	thinly bedded to thickly bedded. @ 33.7'-34.8', high angle rust stained fracture. @ 39.2',39.6', low angle clay filled fractures. @ 45.6', 45.9, 49.0', argillaceous laminations.										
50 —		Core 120"	Rec 120"	RQD 100%	R-4	*282	@ 40.0'-42.3', contains moderate to few argillaceous laminations.										
55.0— - - -	-769.4- - -						Bottom of Boring - 55.0'										

Client:					_		Project: SCI-823-0.00						Jo	b No. 0121-3070	0.03
LOG C	F: Bo	ring	R-144		_	ocation: Sta	. 259+85.0, 148.2 ft. LT of SR 823 CL Date Drilled: 10)/6/	D 4 5	\ A = '	<u> </u>				
Depth (ft)	Elev. (ft) 860.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	π.		% Clay	Natural I PL +	ows per foot -	5 - (
0 	-	3 20 7	13	1		4.0	No topsoil/4" soil removed before drilling Very stiff brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3.0 5	 857.0 -	19 24 21 15	16	2			Severely weathered brown and gray SANDSTONE, fine grained, argillaceous.								
7.0 	853.0 -	37 50/1 Core 36"	13 Rec 18"	RQD 0%	R-1	*208	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, broken to highly fractured, with								5
10 — - - - 15 — - - -18.8 —	-841.2	Core 120"	Rec 40"	RQD 1%	R-2		typical low angle clay filled fractures, contains moderate argillaceous laminations.								
20 — — — —23.6 —	-836.4- -834.8-	Core	Rec 93"	RQD 53%	R-3	*201	Medium hard gray SANDSTONE, fine grained, highly weathered, argillaceous, micaceous, carbonaceous, contains carbonized plants. Soft to medium hard dark gray and black CLAYSTONE; decomposed to highly weathered to decomposed, argillaceous, carbonaceous. Soft to medium hard gray and black SHALE; moderately weathered, carbonaceous, thinly laminated to thinly bedded.								

Client:					_		Project: SCI-823-0.00							Job No.	0121	-3070	.03
LOG C	F: Bo	ring	R-144		_	ocation: Sta	. 259+85.0, 148.2 ft. LT of SR 823 CL Date Drilled: 10	0/6/0			<u> </u>	i					
Depth (ft)	Elev. (ft) 830.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natui PL	NDARD ral Moiste - Immorphise Blows points 0 20	ure Con er foot	ntent, %	-
30 — - - - -35.3 — -	824.7-	Core 120"	Rec 120"	RQD 76%	R-4	*490	Soft to medium hard gray SHALE; highly weathered to decomposed, carbonaceous, broken to highly fractured. Hard to medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly to slightly fractured, contains moderate to few argillaceous laminations.										
40 —		Core 120"	Rec 120"	RQD 92%	R-5	*468	@ 38.0'-38.2',38.7'-38.8', high angle clay filled fractures. @ 37.1'-38.1', 39.8'-39.2', abundant argillaceous zones. @ 40.4', 40.8', 42.8', 46.2', low angle fractures. @ 41.1'-41.7', broken to highly fractured. @ 50.3'-52.2', interbedded SHALE.										
55 —		Core 120"	Rec 120"	RQD 100%	R-6	*71	@ 52.8', clay filled fractures.@ 52.7'-52.9', abundant argillaceous laminations.										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121	-3070.C)3
LOG C	F: Bo	ring	R-144		_	ocation: Sta	. 259+85.0, 148.2 ft. LT of SR 823 CL Date Drilled: 10)/6/(
Depth (ft)	Elev. (ft) 800.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	ON Silt	% Clay	Natur PL		ure Con er foot -	_	•
60 — - - 65 — - - 70 —		Core 120"	Rec 120"	RQD 96%	R-7	*465	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 67.0'-67.5', 58.1'-58.7', 71.4'-72.1', contains few to moderate argillaceous laminations.	d d									
 75 	780 0	Core 120"	Rec 108"	RQD 87%	R-8	*684											
	-						Bottom of Boring - 80.0'										

Client:					_		Project: SCI-823-0.00								Job Λ	<i>lo.</i> 0	121-	3070	.03
LOG C	F: Bo	ring	R-145		_	ocation: Sta	. 260+14.3, 158.4 ft. RT of SR 823 CL Date Drilled: 10)/6/(745	A T1	247							
Depth (ft)	Elev. (ft) 831.6	Blows per 6"	Recovery (in)	Samp No.	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.2' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	al Moi ⊢— Blows	isture		_	- (
- - -		2 4 5	9	1		2.0	No topsoil/12" soil removed before drilling Very stiff dark brown SANDY SILT (A-4a), trace clay; damp.												
5 	-	3 5 5	13	2		3.5											1		1 1 1
—5.5 — -	826.1-	2 3 4	9	3		2.25	Very stiff dark brown CLAY (A-7-6), "and" fine to coarse sand, trace gravel; damp.	1	8		28	29	34						1 1 1
8.0 10	- 823.6-	5 8 11	14	4		4.0	Very stiff to hard brown and gray SILTY CLAY (A-6b), little fine to coarse sand; moist.	0	5		7	27	61		.		1 1		
_		4 9 13	14	5		4.0											7		
-13.0— -13.5— - 15 — - - -	-818.6- -818.1-	50/3 Core 18"	3 Rec 15"	6 RQD 28%	R-1	*557	Severely weathered gray SANDSTONE, argillaceous, micaceous. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle clay filled fractures. @ 14.8', low angle rust stained fracture.												50
20 —		Core 120"	Rec 120"	RQD 48%	R-2	*530	 @ 19.8'-20.2', moderate to abundant argillaceous laminations, poorly cemented, decomposed zone. @ 22.5'-22.8',23.8'-24.0',24.7'- 25.0', broken zones. @ 22.5'-30.0', abundant argillaceous laminations, poorly cemented, decomposed zone. @ 27.9'-28.1',30.4'-30.9', broken with typical low angle fractures. @ 26.9'-28.2', contains abundant to moderate argillaceous laminatons, decomposed to highly weathered, highly 												
- 30		Core 120"	Rec 120"	RQD 79%	R-3		fractured. @ 29.3', fractured, argillaceous lamination.									1 1 1	1.1		

_	TranSy				_		Project: SCI-823-0.00							Job i	Vo. 012	1-3070.03
LOG (DF: Bo	ring	R-145		_	Location: Sta	260+14.3, 158.4 ft. RT of SR 823 CL Date Drilled: 10)/6/(T		RAD.	<u> </u>	<u> </u>				
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.2' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natural Mo PL ⊢ Blows	isture Co s per foot	_
30 —	801.6	1	1	7	1	*456	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures.		01	0	6	0	6	10	20	30 40
35 —	-	Core	Rec	RQD			@ 29.8'-31.8', moderate argillaceous laminations, decomposed to highly weathered.									
40 —	700.0	120"	120"	83%	R-4	*574	 @ 39.4'-39.7', 39.9'-40.0', 43.6'-44.5', contains moderate to abundant argillaceous laminations, poorly cemented, decomposed to highly weathered. @ 32.7', low angle clay filled fractures. 									
-45.0	-786.6- - - - -	Core	Rec 120"	RQD 100%	R-5	5 *538	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 47.3', 51.9', 53.1', low angle fractures.									
-3070-03 [11/7/2007	-		0		-		@ 55.7',57.1',57.2', low angle fractures.									
EITE: 0121-3070-03	771.6	Core 60"	Rec 60"	RQD 80%	R-6	*500	Bottom of Boring - 60.0'									

Client: T	ΓranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	0 10					J	ob No.	012	1-307	0.03
LOG O	F: Bo	ring	R-145		_	ocation: Sta	a. 263+43.1, 175.4 ft. LT of SR 823 CL Date Drilled: 10)/7/0										
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water) DESCRIPTION	% Aggregate	© C. Sand	% M. Sand		N Silt	% Clay		Moisti ⊢—— lows p	ure Co er foot	ntent, % 	6 - •
-0.3 - - -3.0	898.4 -898.1- -895.4-	4 8 9	9	1 2	1	2.5	Topsoil - 4" Very stiff brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist. Very stiff to hard brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.	0\	6	0.	6	0\	6	10			30	40
5 — - - -8.0—	- 890.4-	8 15 22	2	3		3.5	Hard gray SILT AND CLAY (A-6a), little fine to coarse sand,	0	7		6	52	35			<u> </u>		
9.5— 10— - - 12.5—		19 31 43 18 34 50/5	18	5		4.5+	trace gravel; dry to damp. Severely weathered gray SHALE.	1	11		7	51	30					74-
15 —		Core 120"	Rec 120"	RQD 91%	R-1	*26	Soft to medium hard gray and brown SHALE; highly weathered to decomposed, micaceous, arenaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle rust stained fractures.											
	- 874.7-	Core 120"	Rec 120"	RQD 29%	R-2		@ 14.7'-14.8', high angle rust stained fracture. Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay fillled fractures.	-										
30							@ 29.8'-30.5', broken zone.											

OG OF: Bor	ing R-14			Location: S	a. 263+43.1, 175.4 ft. LT of SR 823 CL Date Drilled: 10)/7/()4							
			/ .			T T			A T !	24/				
Depth (ft) Elev. (ft) 868.4	Blows per 6" Recovery (in)		mple No.	Hand Penetro- meter (tsf) / * Point-Loa	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Me PL ⊢	s per foot	TRATION (I ntent, % -
35 —	Core Rec 120" 120	e RO	QD %	-3 *25	Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay fillled fractures. @ 31.5'-41.4', contains abundant to moderate arenaceous laminations. @ 37.5'-38.8', qu = 703 psi, SDI = 45.2%.									
40 — 41.4 — 857.0 —					@ 39.4'-39.6',40.7'-41.0', broken zones. Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded									
	Core Rec 120" 41"			.4 *199	to thickly bedded, highly fractured, with typical low angle clay filled fractures, contains moderate to few argillaceous laminations. Medium hard brown SANDSTONE; fine to medium grained, highly weathered, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle rust stained fractures moderately to poorly cemented. @ 47.3'-48.7', qu = 4,072 psi, SDI = 76.3%.	-								
52.9 	Core Rec		QD % R		 @ 44.8'-45.3', broken zone. Soft to medium hard gray SHALE; highly weathered to decomposed, thinly laminated to thinly bedded. @ 54.7'-55.7', SDI = 11.4%. @ 59.3'-60.6', broken zone. 	_								

Client:					_	-	Project: SCI-823-0.00						·	lob No.	0121	-3070	.03
LOG C	F: Bo	ring	R-145		_	ocation: Sta	a. 263+43.1, 175.4 ft. LT of SR 823 CL Date Drilled: 10)/7/(
Depth (ft)	Elev. (ft) 838.4	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt %	% Clay	Natura PL	DARD I I Moistu I ————————————————————————————————————	re Cont er foot -	rent, % L	-
60 —							Soft to medium hard gray SHALE; highly weathered to decomposed, thinly laminated to thinly bedded.										
64.1—65—65—65—65—65—6—64.1—6—64.1—6—64.1—6—64.1—6—64.1—6—64.1—6—64.1—6—64.1—6—64.1—64.1	-834.3-	Core 120"	Rec 112"	RQD 56%	R-6	*59	@ 63.3'-64.1', COAL blossom. Soft to medium hard dark gray to black SHALE; highly weathered to decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures. @ 65.7'-66.7', SDI = 3.1%.										
72.3— 75— 75— 80—	826.1-	Core 120"	Rec 120"	RQD 82%	R-7	*483	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures. @ 73.0'-73.6', 74.6'-74.7', 78.6'-79.2', contains moderate argillaceous laminations, decomposed to highly weathered. @ 82.3', clay filled fracture. @ 85.3'-86.0', contains few argillaceous laminations. @ 80.8'-82.2', qu = 11,150 psi, SDI = 96.3%.										
85 — - - - - 90		Core 120"	Rec 116"	RQD 84%	R-8	*579	@ 87.8'-89.9', contains moderate argillaceous laminations.										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00						Job N	o. 0121-3070.03
LOG (F: Bo	ring	R-145		_	Location: Sta	263+43.1, 175.4 ft. LT of SR 823 CL Date Drilled: 10	0/7/						
Depth (ft)	Elev. (ft) 808.4	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natural Mois PL ⊢ Blows	D PENETRATION (Noture Content, % - LL per foot - 0 20 30 40
90 —		Core 120"	Rec 120"	RQD 89%			Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to moderately fractured, with typically low angle clay filled fractures. @ 92.5'-97.4', contains few argillaceous laminations. @ 104.6'-104.9', 119.1'-119.6', contains few to moderate argillaceous laminations. @ 118.6', low angle fracture.							
105 —		Core 120"	Rec 120"	RQD 93%	R10	*378								
- - 115.0	783 4-	Core 30"	Rec 30"	RQD 100%	R11	*490								
 115.0	-						Bottom of Boring - 115.0'							

Client: 1					_		Project: SCI-823-0.00							J	lob No. 012	1-3070	.03
LOG O	F: Bo	ring	R-146		_	Location: Sta	1. 266+62.3, 205.4 ft. LT of SR 823 CL Date Drilled: 10)/06				<u> </u>					
Depth (ft)	Elev. (ft) 897.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.4' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	Sand	% F. Sand		% Clay	Natura. PL	lows per foo	ontent, % 	-
0 —		7 10 13	18	1		4.5+	No topsoil Hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand; contains sandstone fragments; damp.										
—5.0— —	-892.8-	14		2		4.5+	Severely weathered gray and brown SHALE.										
10 —	– 890.3 –	34 50/4 Core 66"	16 Rec 66"	3 RQD 79%	R-1	*21	Soft to medium hard brown SANDSTONE interbedded with SHALE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures.										56
-13.0— 	- 884.8 -	Core 120"	Rec 120"	RQD 73%	R-2	*30	Soft to medium hard gray SANDSTONE interbedded with SHALE, very fine to fine grained, decomposed to highly weathered, argillaceous, carbonaceous, thinly laminated to thinly bedded, turbidity bedded, poorly cemented, contains rust colored weathered zones. @ 19.8'-20.7',22.7'-23.0', broken zones.										
	- 877.4-				-		Medium hard to hard gray SANDSTONE, very fine to fine grained, highly weathered, argillaceous, carbonaceous, thinly laminated to thinly bedded, poorly cemented, contains abundant to moderate argillaceous laminations, contains interbedded zones. @ 22.0'-32.3', qu = 2,324 psi, SDI = 67.0%.										
- - 30		Core 120"	Rec 120"	RQD 95%	R-3	*57											

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00						Jol	No. 01	21-3070	0.03
LOG C	F: Bo	ring	R-146		_	ocation: Sta	a. 266+62.3, 205.4 ft. LT of SR 823 CL Date Drilled: 10	0/06								
Depth (ft)	Elev. (ft) 867.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	ON Silt	% Clay	Natural N PL ⊢	Noisture C	ot -	-
30 —		Core 120"	Rec 120"	RQD 91%	R-4	*68	Medium hard to hard gray SANDSTONE, very fine to fine grain, highly weathered, argillaceous, carbonaceous, thinly laminated to thinly bedded, poorly cemented, contains abundant to moderate argillaceous laminations, contains interbedded zones.									
45 — - - - - 50 —		Core 120"	Rec 120"	RQD 100%	R-5	*161	@ 50.6'-51.6', SDI = 84.4%.									
55.1 55.1	- 842.7-	Core 120"	Rec 120"	RQD 72%	R-6	*101	@ 54.0'-54.1', high angle clay filled fracture. Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical high angle rust stained fractures, contains poorly cemented zone.							11 111		

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00							Job No.	0121-	-3070	.03
LOG (F: Bo	ring	R-146		_	ocation: Sta	a. 266+62.3, 205.4 ft. LT of SR 823 CL Date Drilled: 10	/06									
Depth (ft)	Elev. (ft) 837.8	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.4' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	IDARD I Il Moistu Il Il Moistu Blows pe	re Cont er foot -	tent, % — L	- •
65 —	835.5	Core	Rec 120"	RQD 68%	R-7	*319	Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical high angle rust stained fractures, contains poorly cemented zone. @ 61.2'-62.4', coal blossom. Very soft to soft black SHALE, decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, broken to highly fractured, contains few arenaceous laminations. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured to slightly fractured.										
75 — - - - - 80 — -		Core 120"	Rec 120"	RQD 100%	R-8	*454	 @ 73.0'-74.7', contains few to moderate argillaceous laminations. @ 75.7'-77.5', clay filled fractures. @ 75.8',86.5',86.7', low angle clay filled fractures. 										
85 — - - - -		Core 120"	Rec 120"	RQD 98%	R-9	*405	@ 78.0'-78.2', inbedded SHALE. @ 85.7'-86.7', contains few to moderate argillaceous laminations, broken to highly fractured.										

	FranSy				_	. 0:	Project: SCI-823-0.00	100	10.					Job No	o. 0121-3070.0
.OG C	F: Bo	ring	R-146	Sam		<i>₋ocation:</i> Sta	a. 266+62.3, 205.4 ft. LT of SR 823 CL Date Drilled: 10)/06 T			ATI	ON			
Depth (ft)	Elev. (ft) 807.8	Blows per 6"	Recovery (in)	Duive Orive	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.4' (includes drilling water)	% Aggregate		Sand		% Silt	% Clay	Natural Mois PL ⊢ Blows ¡	D PENETRATION ture Content, % - LL per foot -
90 —	807.8	Core 120"	Rec 120"	RQD 100%			Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 94.0'-94.1', contains moderate SHALE laminations.		0.	05					20 30 40
		Core 120"	Rec 120"	RQD 100%	R11	*778									
- 15.0 -	- 782.8-	Core 24"	Rec 24"	RQD 100%	R12	*367	Bottom of Boring - 115.0'								
- - -															

Client: T					_		Project: SCI-823-0.00						U	lob No. 012	1-3070.03
LOG O	F: Bo	ring	R-147		_	ocation: Sta	i. 266+41.3, 183.1 ft. RT of SR 823 CL Date Drilled: 10	/07			to		10/11/04	1	
Depth (ft)	Elev. (ft) 867.5	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	I Moisture Co 	—— <i>LL</i>
0 - -		4 7 10		1		4.25	No topsoil Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.								
5.0	-862.5-	12 17 36	18	2		4.5+	Severely weathered brown SHALE, arenaceous, micaceous.								553
	-860.0	18 23 36	18	3											
10 —	000.0	Core 66"	Rec 66"	RQD 58%	R-1	*40	Medium hard to hard brown SHALE; decomposed, arenaceous, micaceous, thinly bedded to thinly laminated, contains moderate arenaceous laminations. @ 9.5',12.1',12.6',14.3',19.2', low angle fractures.								
15 —		Core 120"	Rec 120"	RQD 58%	R-2	*296	@ 15.8'-17.6', SANDSTONE seam with few to moderate argillaceous laminations.								
19.9 	-847.6-						Medium hard to hard gray SHALE; highly weathered, moderately weathered, arenaceous, micaceous, thinly laminated to thinly bedded, highly fractured, contains moderate arenaceous laminations.								
25 -		Coro	Pag				@ 23.0'-25.5', black decomposed, carbonaceous.								
28.5 - 30	-839.0	Core 120"	Rec 120"	RQD 67%	R-3		Soft to medium hard gray SANDSTONE, interbedded with								

Client:					_	_	Project: SCI-823-0.00							Job No. 0121-3070	0.03
LOG C	F: Bo	ring	R-147		_	ocation: Sta	a. 266+41.3, 183.1 ft. RT of SR 823 CL Date Drilled: 10)/07				to	-	10/11/04	
Depth (ft)	Elev. (ft) 837.5	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand		% Clay	STANDARD PENETRATION Natural Moisture Content, % PL	5 - •
30 —			Rec 120"	RQD 94%	R-4	*40	SHALE, decomposed to highly weathered. Soft to medium hard gray SANDSTONE, interbedded with SHALE, decomposed to highly weathered, argillaceous, arenaceous, moderately to poorly cemented, highly fractured to broken. Soft to medium hard gray to black SHALE; decomposed to highly weathered, contains few arenaceous laminations. @ 33.0'-43.0', SDI = 12.7%.								
45 — -48.2 — 50 —	- 819.3-	Core 120"	Rec 120"	RQD 87%	R-5	*438	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded moderately to highly fractured. @ 48.2', 48.4', 49.3', 50.7', 51.8', 52.2', low angle fractures. @ 50.1'-50.4', broken zone. @ 53.1', 53.4', 53.5', 54.8', 54.9', 55.0, low angle fractures. @ 55.5'-56.0', broken zone, contains moderate argillaceous laminations.								
55 — — — — —		Core 120"	Rec 120"	RQD 80%	R-6	*516	@ 57.5'-60.0', contains moderate argillaceous laminations.@ 57.6', 57.9', 59.0', 59.6', low angle fractures.								

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	0.0						Job No.	0121	-3070	.03
	F: Bo			i	1	ocation: Sta	ı. 266+41.3, 183.1 ft. RT of SR 823 CL Date Drilled: 10)/07	/04			to	1	0/11/				
Depth (ft)	Elev. (ft) 807.5	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARD ral Moist L ⊢—— Blows p 0 20	ure Con er foot	ntent, % 	-
60 —		Core 120"	Rec 120"	RQD 92%	R-7	*504	Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 60.0'-63.2',64.7'-67.5', contains moderate argillaceous laminations. @ 60.2', 64.9', 65.2', 65.4', 65.7', 65.9', 66.4', 67.5', 68.3', 72.2', low angle fractures. @ 74.4', 76.0', 76.1', 80.8', 81.7', low angle fractures.											
75 — - - - - 80 — -		Core 120"	Rec 120"	RQD 92%	R-8	*601											1 1 1 1	
85 — - - - - - 90.0	777.5	Core 84"	Rec 84"	RQD 100%	R-9		Bottom of Boring - 90.0'											1 1 1 1

Client:					_		Project: SCI-823-0.00							Job No. 0121-30	70.03
LOG C	F: Bo	ring	R-148		_	Location: Sta	. 270+53.0, 112.3 ft. LT of SR 823 CL Date Drilled: 10)/06				to	10	/07/04	
Depth (ft)	Elev. (ft) 849.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	. Sand	% F. Sand	Silt	% Clay	STANDARD PENETRAT Natural Moisture Content, PL	% - (LL
-0.3 - - -	-848.7- -	4 4 7	18	1		4.0	Topsoil - 3" Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; contains sandstone fragments; dry to damp.	-						Q	
5 —		8 12	18	2		4.5+									
-8.0	841.0-		18	3		4.5+	Hard brown and gray CLAY (A-7-6), trace fine to coarse sand,								
10 —	-	6 13 21	18	4		4.5+	trace gravel; damp.							<i>\\</i>	
-	-	8 11 12 5	18	5		4.5+	@ 11.0'-15.0', contains coal fragments.						1		
15 —	-	10 14 7	18	6		4.5+									
_	-	9 18 6	18	7		4.5+									
20 —	-	11 13	18	8		4.5+							1.1		
- - -	-	18 27	18	9		4.5+									
-24.5 	- 824.5-	Core 66"	Rec 66"	RQD 88%	R-1	*489	Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures. @ 26.4'-26.9', argillaceous, broken zone. @ 24.8', 27.5', 27.7', 28.8', low angle fractures.								

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-	3070.03
LOG (DF: Bo	ring	R-148		_	ocation: Sta	. 270+53.0, 112.3 ft. LT of SR 823 CL Date Drilled: 10	0/06			to		10/07/0	4		
Depth (ft)	Elev. (ft) 819.0	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt %	% Clay	Natur PL	al Moistu ⊢—— Blows pe	re Conte	
35 — - - - - -	7-819.0-	Core 120"	Rec 120"	RQD 88%	R-2	*699	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures. @ 30.6', low angle clay filled fracture. @ 35.6'-36.0', broken zone. @ 35.6'-37.1', gray SHALE highly weathered. @ 32.5', 33.0', 35.3', 37.2', 39.7', low angle fractures. @ 40.4', 41.0', 42.5', 43.4', 45.5', low angle fractures. @ 45.6'-46.3', highly fractured.									
40 — 50 —	- - - - - - - - -	Core 120"	Rec 120"	RQD 92%	R-3	*506	 @ 41.0'-44.4', contains few argillaceous laminations. @ 46.0', slightly fractured. @ 56.5', 56.6', 56.8', low angle fractures. 									
- - - 55 — - - - -	-	Core 120"	Rec 120"	RQD 97%	R-4	*709										

	ΓranSy				_		Project: SCI-823-0.00								o. 012	1-3070.	03
_OG C	F: Bo	ring	R-148		_	Location: Sta	a. 270+53.0, 112.3 ft. LT of SR 823 CL Date Drilled: 10	0/06			to	1	0/07/	04			
Depth (ft)	Elev. (ft) 789.0	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	Ĭ.,	% Silt	% Clay	Natu F	ıral Mois L ⊢— Blows	sture Co per foot	TRATION ntent, %	- L
60 —		Core 60"	Rec 60"	RQD 90%	R-5	*518	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured.										
5.0— — — —	- 784.0−						Bottom of Boring - 65.0'										
70 — — — —																	
- 75 -																	
- 80 															1 1 1 1	1 1 1 1	
- 35 																	
-																	

	ΓranSy				_		Project: SCI-823-0.00							Job No.	0121	-3070	.03
og o	F: Bo	ring	R-149		_	ocation: Sta	. 270+86.6, 45.0 ft. RT of SR 823 CL Date Drilled: 10)/07		\ A T!	24.						
pth ft)	Elev. (ft) 809.5	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moisti ⊢—— Blows pe	PENET ure Cont er foot -	tent, % ── L	-
.2 <u></u> - -	- 809.3-	7 9 11	18	1		4.5+	Topsoil - 2" Hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; contains sandstone fragments; damp.	-							7		
_ 5 —		16 21 25	18	2		4.5+											
_ _ 5 	-802.0-	27 35 50/2	14	3			Severely weathered brown and gray SANDSTONE, argillaceous.						1111	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
0 —		Core 66"	Rec 66"	RQD 73%	R-1	*68	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures, contains decomposed argillaceous zones. @ 7.8'-8.3',9.1'-9.3',10.9'-11.0 ', high angle rust stained										
_	- 791.3-	Core 84"	Rec 84"	RQD 83%	R-2	*514	fractures. @ 16.9'-17.1', high angle clay filled fracture. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly	_									
	,						bedded. Bottom of Boring - 20.0'	_									
_													1111			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1

Client: T	ΓranSy	stems	, Inc.		_		Project: SCI-823-0.00							Job No. 012	1-3070.03
LOG O	F: Bo	ring	R-150		_	ocation: Sta	. 274+98.0, 115.8 ft. LT of SR 823 CL Date Drilled: 10	/05			to	-	10/06/0	4	
Depth (ft)	Elev. (ft) 867.1	Blows per 6"	Recovery (in)	Samp No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	% Silt	% Clay	Natura PL	IDARD PENE Il Moisture Co I Blows per foot 20	ntent, % - ── LL
-0.2 - - -	- 866.9-	4 7 9	18	1		4.5+	Topsoil - 2" Hard brown SANDY SILT (A-4a), trace clay, trace gravel; contains sandstone fragments; dry to damp.	-						 	
5 -5.5	- 861.6-	11 13	18	2		4.5+	Hard brown and gray CLAV (A. 7.6) trace fine to coorse condi-								
 8.0	- 859.1-	13 24 38	18	3		4.5+	Hard brown and gray CLAY (A-7-6), trace fine to coarse sand; dry to damp.								
- 10 		50/2	2	4			Severely weathered brown SANDSTONE.								5
-10.5 - - - - - -	- 856.6-	Core 66"	Rec 66"	RQD 58%	R-1	*36	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures, contains moderate argillaceous laminations.								
-16.3 - - - - - 20	- 850.8-	Core 120"	Rec 120"	RQD 75%	R-2	*122	Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, moderately to thinly bedded.								
- - 23 5	- 843.6-						@ 14.5'-15.4', high angle rust stained fracture.								
25.5 — 25 — — —	070.0						Medium hard to very soft brown, black and gray SHALE; decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, contains few arenaceous laminations. @ 28.4'-28.9', broken zone.								
30		Core 120"	Rec 120"	RQD 67%	R-3										

Client:	<u> FranSy</u>	stems	s, Inc.				Project: SCI-823-0.00	00 0							Job N	o. 012	21-307	0.03
LOG C					_	.ocation: Sta	i. 274+98.0, 115.8 ft. LT of SR 823 CL Date Drilled: 10)/05				to	1	0/06/0)4			
Depth (ft)	Elev. (ft) 837.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	Silt	% Clay	Natu Pl	ral Mois L ⊢— Blows			% - • LL
30 — 35 —						*57	Medium hard to very soft brown, black and gray SHALE; decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, contains few arenaceous laminations. @ 31.2'-31.7', COAL blossom. @ 34.0'-34.4', qu = 2,270 psi.											
-	-826.8-	Core 120"	Rec 120"	RQD 79%	R-4	*476	@ 40.2'-40.3', clay filled fracture. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured.											
45 — - - - 50 — -		Core 120"	Rec 120"	RQD 88%	R-5	*302	@ 42.4'-42.5', moderate argillaceous laminations.											
55 — - - - - -		Core	Rec 120"	RQD 94%	R-6		@ 54.7',55.7', low angle clay filled fractures.											1 1 1 1

Client:	TranSy	/stems	s, Inc.				DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)89 Project: SCI-823-0.00	00-0	040						Job No	. 012	1-307	0.03
LOG C	F: Bo	ring	R-150		_	ocation: Sta	a. 274+98.0, 115.8 ft. LT of SR 823 CL Date Drilled: 10	/05				to	1	0/06/0)4			
Depth (ft)	Elev. (ft) 807.1	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi	NDARE al Mois	ture Co per foot	ntent, % 	6 - •
60 —						*347	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 61.1'-62.5', qu = 9,870 psi.											
70 —		Core 120"	Rec 120"	RQD 98%	R-7	*373												
80 —		Core 120"	Rec 120"	RQD 100%	R-8	*479												
-85.0 - - - - -	-782.1- -						Bottom of Boring - 85.0'											

	ΓranSy				_		Project: SCI-823-0.00								Job No	. 0121	-3070).03
.OG C	F: Bo	ring	R-152		_	ocation: Sta	. 274+93.1, 175.7 ft. RT of SR 823 CL Date Drilled: 10)/7/(040	A T1	<u> </u>						
Depth (ft)	Elev. (ft) 813.3	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.7'(includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moist . ⊢—— Blows p	PENET ure Con er foot 0 3	tent, %	· -
- -	813.0	7 8 12	8	1		4.25	Topsoil - 3" Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.									- 		
5 - 5 -	- 809.8 -	17 50/3	9	2			Severely weathered brown SANDSTONE.											-5
.5—	-805.8- -801.4-	24 50/1 Core 66"	13 Rec 66"	RQD 83%		*26	Medium hard to soft It. brown SHALE, decomposed to highly weathered, arenaceous, highly fractured, thinly laminated to thinly bedded.											
	- 798.5-	Core 120"	Rec 120"	RQD 84%	R-2	*384	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures, contains few argillaceous laminations. @ 13.0'-13.3', iron stained broken zone. @ 13.6',13.9', low angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures. @ 16.8'-17.1', 18.3'-20.0', contains moderate to abundant argillaceous laminations. @ 23.0'-24.4', contains moderate argillaceous laminations, broken.											
- 25 - - - - -		Core 120"	Rec 120"	RQD 87%	R-3	*421	@ 24.3',24.5', low angle clay filled fractures.@ 26.4', 27.1' 28.6', 28.7' 29.4', low angle fractures.											

lient: TranSy			_		Project: SCI-823-0.00								Job No.	0121	-3070	.03
OG OF: Bo	oring R-1		_	ocation: Sta	i. 274+93.1, 175.7 ft. RT of SR 823 CL Date Drilled: 10)/7/0		7.4.5	4							
Depth Elev. (ft) (ft) 30 783.3	Blows per 6" Recovery (in)	- 11		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.7'(includes drilling water) DESCRIPTION	% Aggregate	C. Sand	M. Sand	% F. Sand	Silt	% Clay	Natu P	NDARD ral Moisto L ⊢—— Blows po	ure Con er foot	tent, % —	-
- - - -	Core Re 24" 24	e RQD	R-4	*390	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures.											
35.0 — 778.3·					Bottom of Boring - 35.0'											

	ΓranSy				<u> </u>		Project: SCI-823-0.00							ob No.	0121-30	70.03
.OG C	F: Bo	ring	R-152		_	ocation: Sta	. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 1	0/04			to		10/05/04			
Depth (ft)	Elev. (ft) 882.3	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	F.	% Silt	% Clay	Natural PL Bi	Moistur		
-0.3 - - -	-882.0- -	4 6 11	18	1		4.5+	Topsoil - 3" Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.									
5 -5.5	876.8		18	2		4.5+	Severely weathered brown SANDSTONE.	_								
- -	-874.8-	11 30 50/4	12	3			•									11 \(\text{\formula} \)
7.5— - - 10 —	- 874.8-	Core 30"	Rec 30"	RQD 85%	R-1		Soft brown SHALE; very fine to fine grained, highly weathered, argillaceous, thinly laminated to thinly bedded, decomposed to highly fractured, with typical low angle clay filled fractures, contains moderate to few argillaceous									5
15 — - - - - -		Core 120"	Rec 120"	RQD 53%	R-2		laminations. @ 14.0'-18.1', dark gray to black, carbonaceous.									
20.5— - 25 — -	861.8-	Core 120"	Rec 120"	RQD 16%	R-3		Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 20.5'-23.4', contains moderate argillaceous laminations. @ 25.3'-25.6', 27.8'-28.0', broken zones.									

	TranSy				7	0:	Project: SCI-823-0.00	2/0 1	1/0.4	1		1.			No. 0121-30	<i>i</i> 0.03
<u>.0G 0</u>	F: Bo	ring	K-152	Sam	_	ocation: Sta	n. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 10	J/U4 T			ATI	to		10/05/04		
Depth (ft)	Elev. (ft) 852.3	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water)	% Aggregate		M. Sand		Į į	% Clay	Natural M PL ⊢ Blov	RD PENETRAT pisture Content, rs per foot - (20 30	% - LL
30 —	96=16						Medium hard to hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.									
35 		Core 120"	Rec 120"	RQD 73%	R-4		@ 35.4',41.6', low angle clay filled fractures.									
40 — - - - 45 —		Core 120"	Rec 120"	RQD 93%	R-5		@ 41.2'-41.4',44.9'-45.0',48.2'- 48.4', high angle clay filled fractures.									
- 8.4 50	-833.9-						Medium hard dark gray SHALE; highly weathered, carbonaceous, thinly laminated to thinly laminated to thinly bedded, moderately fractured.									
- - - 55 —		Core 120"	Rec 108"	RQD 27%	R-6		@ 50.5'-50.9', COAL blossom. @ 50.9'-55.3', decomposed. @ 55.3'-60.0', arenaceous, thinly bedded. @ 56.0'-56.2', decomposed.									
_ _ _																1 1 1 1 1 1 1

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-3	3070.03
LOG C	F: Bo	ring	R-152		_	ocation: Sta	. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 1	0/04			to	•	10/05/0	4		
Depth (ft)	Elev. (ft) 822.3	Blows per 6"	Recovery (in)	Sam No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natura PL	al Moistui House Blows pe	re Conte r foot -	ATION (N) nt, % - ■
60 — - -63.0— - 65 — - - - - -	819.3-	Core 120"	Rec 120"	RQD 97%	R-7		Medium hard dark gray to black SHALE; highly weathered, carbonaceous, thinly laminated to thinly bedded, moderately fractured. @ 61.7'-62.3', gray SILTSTONE seam. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 63.6'-64.4', SDI = 18.7%. @ 64.5'-64.9', qu = 5,416 psi.									
75 — 75 — 80 —		Core 120"	Rec 120"	RQD 100%			arginaceous raminations.									
85 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-9											

	TranSy						Project: SCI-823-0.00								Job N	o. 012	21-307	70.03
LOG C	DF: Bo	ring	R-152		_	ocation: Sta	a. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 10	/04				to	1	0/05/0)4			
Depth (ft) 90 —	Elev. (ft) 792.3	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pi	ral Mois L ⊢— Blows	sture Co	ontent,	ION (N) % - (LL) 40
95 —	782.3	Core 120"	Rec 120"	RQD 100%	R10		Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. Bottom of Boring - 100.0'											

Client: T					_		Project: SCI-823-0.00									0121	-3070	.03
LOG O	F: Bo	ring	R-153		_	ocation: Sta	. 282+05.8, 76.5 ft. RT of SR 823 CL Date Drilled: 10	/04				to	1	10/05/04	1			
Depth (ft)	Elev. (ft) 892.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	l Moistu ⊢—— Blows pe	PENET	tent, % L	- (
0 		9 12 15	18	1		4.5+	No topsoil Hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace clay; dry to damp.											
5 		15 17 21	18	2		4.5+												1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
- 	-884.0-	17 21 23	16	3		4.5+												
- 10 —		50/4	4	4			Severely weathered brown and gray SHALE, arenaceous.											5
	-880.5- -879.0-	50/5 Core 18"	5 Rec 18"	5 RQD 100%	R-1	*50	Soft to medium hard brown and gray SHALE; highly weathered to decomposed, arenaceous.											5
- 15 - - -		Core 120"	Rec 120"	RQD 92%	R-2	*29	Soft to medium hard gray, black and brown SHALE; highly weathered to decomposed, micaceous, arenaceous, highly to moderatly fractured, with typical low angle clay filled fractures, contains abundant to moderate arenaceous laminations.											
20 							@ 20.6'-21.8', interbedded SANDSTONE and SHALE.											
- - 25 							@ 23.5',24.3',25.0', low angle iron stained fractures. @ 23.0'-24.5', qu = 699 psi, SDI = 14.6%.											
		Core 120"	Rec 120"	RQD 93%	R-3	*28	@ 26.2'-28.0', SDI = 64.2%.											
_ 30		120	120	90 /0														1

Client:					_		Project: SCI-823-0.00						,	Job No.	0121-	-3070	.03
LOG C	F: Bo	ring	R-153		_	Location: Sta	i. 282+05.8, 76.5 ft. RT of SR 823 CL Date Drilled: 10	/04			to	•	10/05/04	4			
Depth (ft)	Elev. (ft) 862.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	N Silt	% Clay	Natura PL	Blows pe	re Cont er foot -	tent, % L	-
30 — — 40 — — 41 9—	-850.1-	Core 120"	Rec 120"	RQD 69%	R-4	*148	Soft to medium hard gray, black, and brown SHALE highly weathered to decomposed, micaceous, arenaceous, highly to moderately fractured, with typical low angle clay filled fractures, contains abundant to moderate arenaceous laminations. @ 23.0'-24.0', 24.8'-27.9', 27.6'-27.8', interbedded SHALE with SANDSTONE. @ 33.0'-33.8', 34.1'-34.4', 34.6'-35.2', interbedded SANDSTONE with SHALE. @ 38.4'-38.8', broken zone. @ 39.4'-39.5', high angle clay filled fracture.										
43.5 44.8 	-848.5- -847.2- -846.3-	Core 120"	Rec 120"	RQD 89%	R-5	*182	Medium hard brown SANDSTONE; fine to medium grained, highly weathered, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures. Soft gray SHALE; decomposed. Medium hard white and brown SANDSTONE; fine to medium grained, highly weathered, thinly bedded to thickly bedded, poorly cemented. @ 45.6'-45.7', carbonaceous shale seam. Medium hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures, contains few argillaceous laminations.							1 1 1 1			
55 — 57.0— 60	835.0	Core 120"	Rec 120"	RQD 81%	R-6	*161	 @ 53.0'-54.0', SDI = 80.9%. @ 53.1', light brown, turbidity bedded, highly fractured to broken. @ 56.0'-56.5', qu = 6,492 psi. Soft to medium hard black SHALE; highly weathered to decomposed, arenaceous, carbonaceous. @ 57.0'-58.0', SDI = 1.4%. 										

Client:					_		Project: SCI-823-0.00						J	ob No. 0°	21-3070	0.03
LOG C	F: Bo	ring	R-153		_	ocation: Sta	i. 282+05.8, 76.5 ft. RT of SR 823 CL Date Drilled: 10	/04			to	-	10/05/04			
Depth (ft)	Elev. (ft) 832.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand		% Clay	Natural PL	Moisture	_	6 - •
60 	-						Soft to medium hard black SHALE; highly weathered to decomposed, arenaceous, carbonaceous. @ 61.1'-61.2', 61.8'-62.0', SILTSTONE seams.									
63.0—65—65—65—65—65—65—65—65—65—65—65—65—65—	829.0-	Core 120"	Rec 120"	RQD 100%	R-7	*369	Medium hard to hard dark gray to black SHALE; moderately weathered, arenaceous, carbonaceous, thinly bedded to thinly laminated, slightly fractured, with typical low angle clay filled fractures, contains moderate to few arenaceous laminations. @ 64.8'-65.8', SDI = 41.1%. @ 66.2'-66.7', qu = 1,891 psi.									
- - -74.9 -	- 817.1-				_		 @ 71.9'-73.0', SDI = 38.8%. @ 71.9',73.9', low angle fractures. Soft to medium hard gray SHALE; highly weathered to decomposed. @ 77.0', low angle clay filled fracture. 									
80 		Core 120"	Rec 120"	RQD 73%	R-8	*118	@ 81.3'-82.8', qu = 5,348 psi, SDI = 41.9%.									
	806.9	Core 120"	Rec 120"	RQD 91%	R-9	*286	Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured.									111111111111111111111111111111111111111

	ΓranSy				_		Project: SCI-823-0.00								0121-30	70.03
_OG C	F: Bo	ring	R-153		_	Location: Sta	. 282+05.8, 76.5 ft. RT of SR 823 CL Date Drilled: 10)/04			to		10/05/04	ļ		
Depth (ft)	Elev. (ft) 802.0	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natura PL			% - (
90 — - - - 93.8—	-798.2-						Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured. @ 92.4'-95.2', slightly to moderately weathered. Hard to medium hard SHALE, highly weathered, arenaceous,									
95.0 	797.0-	Core 120"	Rec 120"	RQD 96%	R10	*224	Contains few arenaceous laminations. Hard to medium hard, gray fine to very fine grained SANDSTONE, highly weathered, argillaceous, thickly to thinly bedded, slightly fractured.	-								
00 -							 @ 92.5'-93.0',101.5'-102.0',107 broken zones, contains few to moderate argillaceous laminations. @ 101.5'-101.8', carbonaceous SHALE seam. @ 102.0'-103.0', SHALE, arenaceous. 									
- 05 - - - -		Core 120"	Rec 120"	RQD 91%	R11	*395	 0 103.0'-104.4', qu = 8,845 psi, SDI = 88.1%. 0 105.5'-108.9', contains moderate to abundant argillaceous laminations, moderately to highly weathered. 0 108.9'-117.6' contains moderate to few argillaceous laminations. 									
10 					_		@ 113.8'-114.2', qu = 9,960 psi.									1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
15 — - - - - 20		Core 120"	Rec 120"	RQD 100%	R12	*373										

Client: Tr					_		Project: SCI-823-0.00								o. 012	1-307	0.03
OG OF	: Bo	ring	R-153		_	ocation: Sta	i. 282+05.8, 76.5 ft. RT of SR 823 CL Date Drilled: 10)/04		A T1/	to	1	0/05/	04			
(ft)	Elev. (ft) 772.0	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, 9	% - (LL
120		Core	Rec	RQD 100%	R13	*286	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded.	k									
25.0	767.0	24"	24"	100%	•		Dattere of Davis v. 105 0	-									
30 —							Bottom of Boring - 125.0'										
40 —																	

Client:	TranSy	stems	, Inc.		_		Project: SCI-823-0.00							Job No. 0121-3070.03
LOG C	F: Bo	ring	R-154		_	ocation: Sta	i. 286+20.8, 25.0 ft. RT of SR 823 CL Date Drilled: 10)/01				to	•	10/04/04
Depth (ft)	Elev. (ft) 836.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - PL LL Blows per foot - 10 20 30 40
0.3 _ _ _	835.9	2 3 4	18	1		2.75	Topsoil - 4" Very stiff to hard brown and gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.	_						
5 		4 4	18	2		4.5+								
 8.0	828.2		18	3		4.5+	Severely weathered gray and brown SHALE, arenaceous.	_						
10 —		13 19 27	18	4			Severely weathered gray and brown Shall, arenaceous.							
- -		17 35 48	18	5										83
15 —		21 39 50/4		6										.5c
_ _17 5—	818.7 -	23 35 50	15	7										85
20 —	-815.6-	Core		RQD 67%	R-1	*350	Soft to medium hard gray and brown SANDSTONE; fine grained, decomposed to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle rust stained fractures contains coarse grained sand, BRECCIA, CONGLOMERATE and decomposed shale lenses. @ 18.2'-18.3', coal seam.							
25 — - - - - - -		Core 120"	Rec 120"	RQD 93%	R-2	*426	 20.3'-20.5', shale seam. 20.5'-20.6', conglomerate. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, highly fractured. 22.0'-29.8', numerous low angle fractures. 25.0'-27.3',28.7'-29.8', contains moderate argillaceous laminations. 							

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-3070.03
LOG (F: Bo	ring	R-154		_	ocation: Sta	. 286+20.8, 25.0 ft. RT of SR 823 CL Date Drilled: 10	0/01				to	•	10/04/04	
Depth (ft)	Elev. (ft) 806.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moiste PL ⊢ Blows p	er foot -
30 —	-						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately to highly fractured. @ 31.0'-31.1', argillaceous zone, broken.								
35 — 40 —	-	Core 120"	Rec 120"	RQD 85%	R-3	*115	@ 35.7'-37.7', contains moderate argillaceous laminations. @ 37.1'-37.3', high angle fracture. @ 38.4'-38.5',39.7', contains moderate argillaceous laminations. @ 33.4',33.7',34.1',34.4', 34.9',35.1',35.2',36.2', 37.5',37.6', 39.7',42.3', low angle fractures. @ 40.0'-40.4', qu = 10,607 psi. @ 44.5', low angle fracture.								
	- - -	Core 120"	Rec 120"	RQD 84%	R-4	*432	@ 45.3'-45.8', broken zone, argillaceous.								
50 — - - - 55 — - -					-		@ 48.7'-49.5', high angle clay filled fracture.@ 56.6'-56.8', high angle iron stained fracture.								
- - 60	_	Core 120"	Rec 120"	RQD 98%	R-5	*564									

OG OF: Boring R-154 Location: Sta. 286+20.8, 25.0 ft. RT of SR 823 CL Date Drilled: 10 WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.0' (includes drilling water) DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, argillaceous, thinly bedden	% Aggregate 0\0	C. Sand	RAL	Sand	to	V			04 ANDARD Iral Moist		
Depth (ft) (ft) (776.2 Mo. No. Hand Penetrometer (tsf) / Q Q Q Q Q Q Q Q Q Q	% Aggregate	C. Sand	Sand	Sand	3						
Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, argillaceous, thinly bedded		%	\ \ \ \	% F.	% Silt	% SIII	% Clay	Pl	L	er foot	 LL) 40
to thickly bedded, slightly to moderately fractured. Core Rec 120" R-6 *194 Core Rec 24" ROD R-7 *18 Core Rec 24" ROD R-7 *18 Bottom of Boring - 75.0' Bottom of Boring - 75.0'	_	0	0				6				

Client: ☐	TranSy	/stems	s, Inc.				Project: SCI-823-0.00							J	ob No.	012	1-3070.03
LOG C	F: Bo	ring	R-156		_	ocation: Sta	. 285+89.0, 293.9 ft. RT of SR 823 CL Date Drilled: 9/	30/0				to	_	10/04/04			
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water) DESCRIPTION	% Aggregate		Ź.	and	Silt	% Clay	Natural PL Bi	Moistu ⊢—— ows pe	ire Col er foot	_
0.3 	874.4 874.1			7	1		`\Topsoil - 3"	0\	0	0	0	0	0	10		, ;	<u>30 40 </u>
_	-	2 4 4	. 18	1		4.5+	Very stiff to hard reddish brown CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; damp.	0	4		5	37	54				
5 5.5		3 4 5	18	2		2.5		2	8		7	41	42				
5.5 -	868.9	2 6 11	18	3		4.5+	Hard brown SILT AND CLAY (A-6a), trace gravel, trace to little fine to coarse sand; contains shale fragments; dry to damp.	3	7		6	49	35				
10 —		5 21 33	18	4		4.5+									1 T		5
_		10 28 41	18	5		4.5+								iiiiiii			6
-13.5 - 15 —	860.9	12 26 41	18	6		4.5+	Severely weathered dark brown SANDSTONE.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
_		12 50/4	6	7		4.5+											
-17.0 - -	- 857.4-	90, 1				•	Medium hard to hard light gray and dark gray SANDSTONE, interbedded with dark SHALE, highly weathered.										
_20.0 _ _ _ _ _ _ 25	- 854.4-	Core		RQD 20%	R-2	*136	Medium hard to hard tan SANDSTONE, medium grained, highly weathered, argillaceous, thinly bedded, highly fractured @ 20.0'-27.5', decomposed argillaceous zone.										
		120"	114"	20%		.30	@ 27.5'-28.2, broken.										

Client:					_		Project: SCI-823-0.00									o. 012	1-307	0.03
LOG C	F: Bo	ring	R-156		_	ocation: Sta	. 285+89.0, 293.9 ft. RT of SR 823 CL Date Drilled: 9/	30/0			A T/	to	_	0/04/	04			
Depth (ft)	Elev. (ft) 844.4	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent,	% - (LL
	844.4-	Core 120"	Rec 114"	RQD 50%	R-3	*194	Hard light gray SANDSTONE, fine grained, moderately to highly weathered, thickly bedded, moderately fractured; fractures follow cross bedding, moderately to poorly cemented. @ 35.2'-35.9', broken, rust stained.									1111		
40 —		Core 120"	Rec 116"	RQD 46%	R-4	*240	Very soft to soft dark gray to black SHALE, decomposed to highly weathered, thinly laminated, arenaceous, carbonaceous, broken to highly fractured. @ 38.5'-39.8', broken. @ 49.6'-50.0', IRONSTONE inclusion.											
50 — - - - 55 — - -		Core 120"	Rec 120"	RQD 96%	R-5													1 1 1 1 1 1

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00							J	lob No. 0	121-3	070.03
LOG (DF: Bo	ring	R-156		_	ocation: Sta	a. 285+89.0, 293.9 ft. RT of SR 823 CL Date Drilled: 9/	30/0				to	_	10/04/04			
Depth (ft)	Elev. (ft) 814.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	Sand	% F. Sand	Silt %	% Clay	Natura. PL	DARD PE Moisture lows per t	Conten	aTION (N) t, % -
60.0	814.4-	Core 120"	Rec 120"	RQD 97%	R-6	*95	Medium hard dark gray to black SHALE, highly to moderately weathered, thinly laminated, slightly fractured. @ 62.5'-63.5', SDI = 61.3%. Medium hard light gray SILTSTONE, slightly to moderatly weathered, arenaceous, slightly fractured. @ 67.0'-79.1', hard, dark and light gray, red, and brown, medium bedded. @ 64.0'-64.4', COAL blossom.									1 1 1 1	
- - -	800.2-	Core 120"	Rec 120"	RQD 90%	R-7	*248	@ 64.4', light gray. Hard light and dark gray SANDSTONE, very fine to fine grained, slightly weathered, argillaceous, thick bedded, slightly fractured. @ 80.0'-82.8', contains carbonaceous laminations.										
 85 —- - - - -	-	Core 120"	Rec 120"	RQD 100%	R-8	*335											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	040						Job No.	0121	-3070.0	03
LOG (_	ocation: Sta	a. 285+89.0, 293.9 ft. RT of SR 823 CL Date Drilled: 9/3	30/0				to	1	0/04/0	4			
Depth (ft)	Elev. (ft) 784.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	% Clay	Natur PL	al Moistu . ⊢—— Blows pe	ure Con er foot		- •
90 —		Core 120"	Rec 120"	RQD 100%	R-9	492	Hard light and dark gray SANDSTONE, fine grained, slightly weathered, highly argillaceous interbedding, thick bedded, slightly fractured, contains silty lenses.								1 1 1 1			
100 —		Core 120"	Rec 120"	RQD 100%	R100	*570	@ 100.0'-100.9', SDI = 91.1%. @ 101.1'-101.5', qu = 2,974 psi.											
115 —	754.4	Core 120"	Rec 118"	RQD 98%	R11	*344	Bottom of Boring - 120.0'											1.1.1.1

Client:	TranSy	stems	, Inc.		_		Project: SCI-823-0.00								Job No	. 0121	-3070	.03
LOG C	F: Bo	ring	R-215		_	Location: Sta	. 286+03.1, 117.5 ft. LT of SR 823 CL Date Drilled: 1/	11/0										
Depth (ft)	Elev. (ft) 787.9	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 9.0' Water level at completion: None (prior to coring) 20.7' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moist ⊢—— Blows p	PENET ure Con er foot	tent, % — L	- (
— 0 —-0.8	787.1-						Topsoil - 9"								1 1 1 1			
- -	107.1	20 13 17 50/5	12	1 2			Severely weathered brown SANDSTONE, argillaceous.											
E 0	700 0																1 1 1 1	3
-5.0	- 782.9-	Core 103"	Rec 103"	RQD 77%	R-1	*658	Medium hard to hard grayish brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately to highly fractured. @ 5.0'-6.2', high angle, filled fracture. @ 11.3'-11.6', high angle fracture.											
- - 15 —							 @ 13.2'-13.4', 14.2'-14.5', 16.1'-16.3', high angle iron stained fractures. @ 13.6'-14.0', broken zone. 											
17.5— - 20 — -	-770.4- - -	Core 120"	Rec 120"	RQD 63%	R-2	*278	Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately fractured, contains moderate to abundant argillaceous laminations. @ 17.7'-18.1', high angle, iron stained fracture. @ 22.1'-22.9', vertical fracture, iron stained.											
25 — -27.1— - -	760.8-	Core 120"	Rec 120"	RQD 88%	R-3	*928	Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, massive, slightly fractured.											

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No.	0121	-3070.03
LOG (4	L	Location: Sta	ı. 286+03.1, 117.5 ft. LT of SR 823 CL Date Drilled: 1.	/11/0	06								
				Samp No.		Hand	WATER			RAD	ATI	ON					
Depth (ft)	Elev. (ft) 757.9	Blows per 6"	Recovery (in)	Drive	Press / Core	Penetro- meter	Water seepage at: 9.0' Water level at completion: None (prior to coring) 20.7' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moist . ⊢—— Blows p	ure Con er foot -	_
30 —	742.9	Core 120"	Rec 120"	RQD 100%			Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, iron stained. ② 27.1'-31.0', iron stained. Bottom of Boring - 45.0'										

	ranSy				_		Project: SCI-823-0.00	4 F 1					Jo	b No. 012	1-3070.03
.OG O	F: Bo	ring	R-169	Sam	_	.ocation: Sta	a. 306+94.8, 116.0 ft. RT of SR 823 CL Date Drilled: 9/ WATER	15/0 T	RΔΓ	ATI	ON		<u> </u>		
Depth (ft)	Elev. (ft) 762.8	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None	% Aggregate	M. Sand		% Silt	% Clay	Natural PL	Moisture Co	TRATION (I ontent, % -
-0.4 	- 762.4-	12 12 12	18	1		4.5+	Topsoil - 5" Hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.								
5 —	-757.3-	15 15 30	18	2		4.5+									7
_		21 50/5	10	3		4.5+	Hard brown gray and black SILTY CLAY (A-6b), trace gravel, trace fine to coarse sand; moist. Medium hard to hard brown and gray SANDSTONE; very fine								
- 10 		Core 72"	Rec 72"	RQD 82%	R-1	*363	to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured, with typical low angle rust stained fractures.								
_ _ _ 15 							@ 10.8'-10.9', high angle rust stained fracture.								
6.2 <u> </u>	- 746.6-	Core 120"	Rec 120"	RQD 86%	R-2	*559	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured.								
20 —							@ 16.2',16.5', 17.2' low angle rust stained fractures.								
_ _ 25 _ _							@ 23.6' contains pyritic grains								
-		Core 120"	Rec 120"	RQD 100%	R-3	*512									

	TranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-3070	0.03
LOG (OF: Bo	ring	R-169		_	ocation: Sta	a. 306+94.8, 116.0 ft. RT of SR 823 CL Date Drilled: 9/	15/0										
Depth (ft)	Elev. (ft) 732.8	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	-	ture Co per foot	ntent, %	5 - (
30 —	722.8	Core 84"	Rec 84"	RQD 100%	R-4	*465	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 38.2', low angle fractures with fossils. Bottom of Boring - 40.0'											
45 —	- - - - - - -																1 1 1 1	1 1
55 —	-																	

Client: T					_		Project: SCI-823-0.00							Job N	<i>lo.</i> 012	21-3070	.03
OG O	F: Bo	ring	R-171	Sam	_	Location: Sta	306+41.8, 398.7 ft. RT of SR 823 CL Date Drilled: 9/	22/(T	RAD	ATIC)N/						
Pepth (ft)	Elev. (ft) 646.1	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.5' (includes drilling water) DESCRIPTION	% Aggregate	Sand	and	% Silt	% Clay	Natu F	ıral Moi L ⊢	isture C		- (
0.3	- 645.8 -						Topsoil - 3"	-									Hii
		25 50/3	9	1			Severely weathered brown SANDSTONE.							1 1 1			1 1 1 1 1 1 1
		50/1	1	2													
5.0	- 641.1-	Core 96"	Rec 96"	RQD 57%		*202	Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical high angle rust stained fractures.										
- 15 -		Core 84"	Rec 84"	RQD 88%	R-2		@ 15.2', low angle rust stained fracture.										
8.0	-628.1-	_					Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly										1 1
20.0 	- 626.1-						bedded, slightly fractured. Bottom of Boring - 20.0'										1 1 1 1 1 1 1 1 1 1
 25 -																	
30																	1.1

	ΓranSy				_		Project: SCI-823-0.00								Job No.	0121	-3070	.03
.OG C	F: Bo	ring	R-172		_	ocation: Sta	. 306+32.2, 647.2 ft. RT of SR 823 CL Date Drilled: 9/	15/0			A T1	<u> </u>						
Depth (ft)	Elev. (ft) 569.3	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	IDARD I al Moistu House Blows pe	re Cont r foot -	tent, % —	-
-0.3 - - -	- 569.0 -	5 5 7	18	1		2.25	Topsoil - 4" Very stiff brown SANDY SILT (A-4a), some gravel, little clay; damp.	26	11		7	40	16			 		
5 5.5 	-563.8-	12 14 13	18	2		3.0		-										
_	- 562.3 -	30 50/5	10	3			Severely weathered brown and gray SANDSTONE, argillaceous. Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous,	-										
0 —		Core 72"	Rec 72"	RQD 14%	R-1		micaceous, thinly bedded to thickly bedded, highly fractured, with typical high angle rust stained fractures.											
5 	556.3	Core 84"	Rec 84"	RQD 90%	R-2	*612	Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains few argillaceous laminations. @ 13.1',14.0',18.7', low angle rust stained fractures.											
).0— — — — — — 25 —	- 549.3-						Bottom of Boring - 20.0'											
_ _ _ 30																	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1

	ΓranSy				_		Project: SCI-823-0.00							Job No.	0121	-3070	0.03
LOG (F: Bo	ring	R-173		_	ocation: Sta	. 308+74.9, 173.1 ft. RT of SR 823 CL Date Drilled: 9/	14/	D 4 5	\ A T !	<u> </u>						
Depth (ft)	Elev. (ft) 696.8	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natui Pl	NDARD ral Moist . ⊢—— Blows p 0 2	ure Cor er foot	ntent, % 	, -
-0.3 - - -	696.5	6 8 11	18	1		3.0	Topsoil - 3" Very stiff to hard brown SANDY SILT (A-4a), trace clay, trace gravel; contains sandstone fragments; damp.										
5 — -6.0 -	-690.8 -	7 8 16	18	3		4.5+	Severely weathered brown SANDSTONE, argillaceous, micaceous.										
10 11.0 - -	-685.8-	50/2	0	5			Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured with trained law angle along filled fractures.										
15 —		Core 120"	Rec 120"	RQD 58%	R-1	*350	highly fractured, with typical low angle clay filled fractures, contains moderate argillaceous laminations. @ 11.7'-11.9', high angle clay filled fracture. @ 15.2'-21.0', contains abundant argillaceous laminations. @ 17.5'-17.8', broken zone.										
21.0— - - 25 — - - -	-6 75.8 -						Bottom of Boring - 21.0'										

Client: Tr					_		Project: SCI-823-0.00						,	Job No.	012	1-3070	0.03
OG OF	F: Bo	ring	R-174		_	<i>ocation:</i> Sta	u. 308+61.6, 410.4 ft. RT of SR 823 CL Date Drilled: 9/ WATER	14/0	240	ATIC	20/						
(ft)	Elev. (ft) 651.0	Blows per 6"	Recovery (in)	Sam _i No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura PL	I Moisti ⊢—— Blows p	ure Col er foot	_	6 - (
	650.7	1 5 5 3 4 6	18	1 2			Topsoil - 4" Medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.										
8.0 —	-643.0-	8 4 6 10 10 11 11	18	4 5			Severely weathered grayish brown SANDSTONE, argillaceous.										
15 —		21 7 7 7 8 15 29	14	6													
20 — 23.9 — 25 — _	-633.5 -	Core 120"		RQD 75%	R-1		Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, broken to highly fractured, with typical high angle fractures. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.										
7.5	- 623.5 -						Bottom of Boring - 27.5'										

lient: Tran					_		Project: SCI-823-0.00							Job No.	0121-30	070.03
OG OF:	Borir	ng R ⊢	175	Samp	_	Location: Sta	. 308+55.3, 525.3 ft. RT of SR 823 CL Date Drilled: 9	/14/0 T	RAF	ATIO	ON					
Depth Ele (ft) (ft)	t) 3.2	Blows per 6"	Recovery (in)	Drive No.		Penetro- meter (tsf) / * Point-Load	OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moistui ⊢—— Blows pe	r foot - (•
0.2 	0	15 12	16	1			Topsoil - 2" Medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.									
5.0 622	2.2 15	16	18	2		_	Severely weathered brown SANDSTONE, argillaceous.									
3.0 620	С		Rec 60"	RQD 67%	R-1	*360	Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded. @ 8.0'-8.3',9.9'-10.5', decomposed, broken zones.									
5 — - - 7.3 — 610	8		Rec 84"	RQD 83%	R-2	*293	 @ 11.0'-11.2',13.0'-13.4', high angle fractures. @ 12.4'-13.0',15.1'-16.0', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, thinly bedded to thickly bedded,									
25	3.2						Bottom of Boring - 20.0'									

	TranSy				_		Project: SCI-823-0.00								Job N	lo. 012	21-3070	0.03
.OG C	F: Bo	ring	R-177	Cama	_	ocation: Sta	. 310+79.1, 269.6 ft. RT of SR 823 CL Date Drilled: 8/3	31/(T		240	ATIO	24/						
Depth (ft)	Elev. (ft) 581.1	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 5.6' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moi L ⊢	sture C		-
-0.3 - - -	-580.8- -	9 9 10	18	1			Topsoil - 4" Medium dense brown SANDY SILT (A-4a), little gravel; damp.											
5 —		9 9	18	2												2		
- 3.5 	572.6	8 12 11	18	3			Logge to modium dones brown and area CUT (A 4b) trace											1 1 1 1 1 1 1
- 10 — -	-	4 4	18	4			Loose to medium dense brown and gray SILT (A-4b), trace fine to coarse sand, trace gravel; damp to moist. @ 11.0'-12.5', some fine to coarse sand.											
- - 1.0—	567.1-	16 19 50/0	18	5				2	11		23	51	13				Nor	/
4.0 15 -	307.1	Core 72"	Rec 72"	RQD 54%	R-1	*244	Medium hard gray and brown SANDSTONE; very fine to fine grained, slightly to highly weathered, argillaceous, micaceous, thinly laminated to thickly bedded, moderately to highly fractured.											
0.0	561.1-						@ 13.3'-13.4',18.2'-18.5',19.5'- 19.6', broken with typical low angle clay filled fractures.											1 1 1 1
-	-						Bottom of Boring - 20.0'							$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 1 1			1
_ _ 25 —	_																	
_	-																	1 1 1 1 1 1

Client: 1					_		Project: SCI-823-0.00							Job No. 0121-3070.03
LOG O	F: Bo	ring	R-178		_	ocation: Sta	. 310+11.3, 568.7 ft. RT of SR 823 CL Date Drilled: 8/3	31/0		D 4 5	A	to	9.	/1/04
Depth (ft)	Elev. (ft) 566.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 2.5' Water level at completion: None (prior to coring) 4.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	M. Sand	% F. Sand	t	% Clay	STANDARD PENETRATION (N Natural Moisture Content, % - PL
-0.2 - -	- 566.0-	2 1 9	18	1			\Topsoil - 2" Loose to medium dense brown SANDY SILT (A-4a), little gravel, trace clay; damp to moist.							
_	-563.2-	24 50/6	10	2			Severely weathered brown SANDSTONE.							
_	-561.2- -559.1-						Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, medium to thickly bedded, broken, with typical low angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, slightly							
10 —		Core 120"	Rec 120"	RQD 85%	R-1		weathered, argillaceous, micaceous, thinly laminated to thickly bedded, slightly fractured.	,						
15 —					_		@ 13.4', low angle clay filled fracture.							
_ _ _ 20.0—	-546.2-	Core 60"	Rec 60"	RQD 87%	R-2	*656	Bottom of Boring - 20.0'							
_							Bottom of Borning 20.0							
25 														
_ 30														

	ranSy				_		Project: SCI-823-0.00							Job No	o. 012	1-307	0.03
OG O	F: Bo	ring	R-179		_	ocation: Sta	. 313+45.2, 377.7 ft. RT of SR 823 CL Date Drilled: 9/3	24/(D 4 5	\ A = '	<u> </u>	- 1					
Depth (ft)	Elev. (ft) 742.1	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 35.3' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	П.	% Silt	% Clay	Natui PL	NDARD ral Moisi -	ture Co	ntent, 9	% - LL
	-741.7- -739.6-	Core 30"	Rec 30"	RQD 77%	R-1	*288	Topsoil - 5" Medium dense to dense brown SANDY SILT (A-4a); contains sandstone fragments; damp. Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical high angle rust stained fractures. @ 3.9',7.8', low angle rust stained fractures.										
10 —		Core 60"	Rec 60"	RQD 77%	R-2	*285	@ 9.5'-10.0', broken zone light brown low angle fractures.										
3.1	-729.0-	Core 120"	Rec 120"	RQD 100%	R-3	*409	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured. @ 13.5'-13.7', light brown, broken zone with low angle fractures.										
20 — - - - - 25 — -		Core 120"	Rec 120"	RQD 100%	R-4	*485	@ 18.4',24.7', low angle clay filled fractures.@ 24.7', low angle clay filled fractures.										

Client:	TranSy	stems	. Inc.				Project: SCI-823-0.00	00-0	040						Job No.	0121	-3070.	03
	DF: Bo				1	ocation: Sta	a. 313+45.2, 377.7 ft. RT of SR 823 CL Date Drilled: 9/	24/0)4									
Depth (ft)	Elev.	Blows per 6"	Recovery (in)	Sam _i No	ole	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 35.3' (includes drilling water)	% Aggregate	GI	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARD I ral Moistu L ⊢—— Blows pe	ire Con er foot	tent, % — Ll	-
30 — - - - 35 — - -	712.1	Core 120"	Rec 120"	RQD 100%		*489	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured. @ 37.4-37.9', rust stained zone with fossils.	9%	0/	0/	8	66	6) 3	0 40	9
40 —		Core 120"	Rec 120"	RQD 100%	R-6	*518												
55 — - - - - - - - 60.0	682.1	Core 120"	Rec 120"	RQD 100%	R-7	*331	Bottom of Boring - 60.0'											

Client: 7	ΓranSy	stems	, Inc.			-	Project: SCI-823-0.00		0 10						Job N	o. 012	1-3070	0.03
LOG C	F: Bo	ring l	₹-180			ocation: Sta	a. 315+33.5, 92.5 ft. RT of SR 823 CL Date Drilled: 9/	23/0										
Depth (ft)	Elev. (ft) 764.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Mois PL ⊢— Blows		_	6 - (
0.2 	-764.5- -761.7-	2 2 4	12	1		4.0	\Topsoil - 2" Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.											
-3.0 - 5 	701.7	4 7 10	13	2		4.5+	Hard brown and gray CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; damp.	3	5		5	46	41					
_	750.0	6 10 14	18	3		4.5+												
8.5 	-756.2- -754.2-	14 24 50/5	12	4			Severely weathered dark brown SANDSTONE.											50
10.5 _ _ _ _ 15 _	704.2	Core 54"	Rec 54"	RQD 51%	R-1		Medium hard to hard brownish gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured, contains few argillaceous laminations. @ 10.5'-11.0',11.6'-11.7', high angle rust stained fracture. @ 11.5', 11.8', 12.2', low angle rust stained fracture. @ 12.5'-12.7', high angle clay filled fracture.											
20 —		Core 120"	Rec 120"	RQD 67%	R-2	*328	@ 12.5-12.7, nigh angle clay filled fracture.											
- - - - 25 —		0	0	0. %			@ 22.5', browm and gray. @ 22.5', slightly to moderately fractured.											
- - -		Core 120"	Rec 120"	RQD 100%	R-3		@ 25.5', gray with occassional brown layer.											

Client:	TranSv	stems	Inc				Project: SCI-823-0.00	00 0	0+0						Joh Nr	012	1-3070	03
LOG C					7	ocation: Sta	a. 315+33.5, 92.5 ft. RT of SR 823 CL Date Drilled: 9/2	23/0)4						300 NC	. 012	1 0070	.00
		<u>g</u>	100	Samp	_		WATER			RAD.	ATIC	ON						
Depth (ft)	Elev. (ft) 734.7	Blows per 6"	Recovery (in)	Drive	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water) DESCRIPTION	% Aggregate	انا	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows p	ture Co per foot		-
30 —						*438	Hard gray SANDSTONE; very fine to fine grained, moderately weathered to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.											
40 —		Core 120"	Rec 120"	RQD 100%	R-4	*490												
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*495												
-55 — - - - -		Core 120"	Rec 120"	RQD 100%	R-6													

Client:	TranSv	stems	s, Inc.				Project: SCI-823-0.00								Job No	0121	-3070.03
LOG C					L	ocation: Sta	. 315+33.5, 92.5 ft. RT of SR 823 CL Date Drilled: 9/	23/0)4					<u> </u>			
				Samp No.	le		WATER			RAD	ATI	ON					
Depth (ft)	Elev. (ft) 704.7	Blows per 6"	Recovery (in)		Press / Core	Penetro- meter (tsf) / * Point-Load Strength (psi)	Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natui Pl		ure Con er foot	_
60 —						*218	Hard gray SANDSTONE; very fine to fine grained, moderately weathered to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to unfractured, contains few argillaceous laminations.	/							1 1 1 1		
65 — — — 70 — —		Core 120"	Rec 120"	RQD 100%	R-7	*268											
-75.0	689.7-						Bottom of Boring - 75.0'	-									
- - 90	-													1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

Client:					_		Project: SCI-823-0.00							Job No.	0121-	3070.0	3
LOG C	F: Bo	ring	R-216		_	ocation: Sta	. 307+10.1, 146.4 ft. LT of SR 823 CL Date Drilled: 12	2/13			to		12/14/05	5			
Depth (ft)	Elev. (ft) 808.4	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water) DESCRIPTION	% Aggregate	Sand	π.	NO NSilt	% Clay	Natura PL E	I Moistui ⊢—— Blows pei	e Conte	RATION (ent, % -	
-0.3 - - -3.0 -	-808.1- -805.4-	1 3 5	13	1 2			Topsosil - 4" Loose gray SILT (A-4b), little fine to coarse sand, trace clay, trace gravel; damp to moist. Severely weathered brown SANDSTONE, argillaceous.										50
_	-803.4- -800.9-	Core 108"	Rec 108"	RQD 96%	R-1	*1146	Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, laminated to thickly bedded, highly fractured, decomposed zones at fractures. Hard light brown to gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, moderately to highly fractured. @ 8.6',9.0',9.6',10.3',10.4' 12.4', low angle fractures. @ 9.1'-9.5', qu = 5,323 psi.										
- 15 — - - - 20 — -		Core 120"	Rec 120"	RQD 100%	R-2	*940	@ 14.2'-19.3', contains few to moderate argillaceous laminations. @ 14.5',15.7',16.2',16.9',17.8', 18.2',21.0',22.1', low angle fractures.							i i i i i			
25 -	-784.4- -780.5-	Core 120"	Rec 120"	RQD 79%	R-3	*879	Hard to very hard brown to gray SANDSTONE; fine to medium grained, moderately weathered, carbonaceous, argillaceous. @ 24.7',27.9', low angle fractures. @ 25.0'-26.8',27.1'-27.3', high angle rust stained fractures. @ 25.0'-27.1', calcareous. Hard gray SANDSTONE; very fine to fine grained.										

	ranSy			20	٦.	C+	Project: SCI-823-0.00	2/4.0	/05			to		Job No. 0121-3070.03
.OG 0	F: Bo	ring	R-216	9 Sam	_	Location: Sta	a. 307+10.1, 146.4 ft. LT of SR 823 CL Date Drilled: 12	2/13 T			ATI	to ON		12/14/05 T
Depth (ft)	Elev. (ft) 778.4	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water)	% Aggregate		M. Sand		t t	% Clay	STANDARD PENETRATION (I Natural Moisture Content, % - PL
30 —	776.1						@ 28.2',30.0', low angle fractures. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations.							
35 							@ 34.7', low angle fracture.							
40 —		Core 120"	Rec 120"	RQD 100%	R-4	*241	@ 36.5'-37.0', qu = 8,478 psi.							
45 -		Core	Rec	RQD		*070	@ 44.6', 44.7', low angle fractures.							
50 — 50.6— —	- 757.8 -	120"	120"	RQD 100%	H-5	*673	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.	-						
55 														
- 60		Core 120"	Rec 120"	RQD 100%	R-6	*1859								

Client:					_		Project: SCI-823-0.00								o. 01 2	1-307	0.03
LOG C	F: Bo	ring	R-216		_	ocation: Sta	a. 307+10.1, 146.4 ft. LT of SR 823 CL Date Drilled: 12	2/13			to	1	12/14/)5			
Depth (ft)	Elev. (ft) 748.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	NDARL ral Mois L Blows	ture Co	ontent, 9	% - (LL
60 —		Core 120"	Rec 120"	RQD 100%			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 67.7', low angle fracture along argillaceous zone.										
-80.0— - - - 85 — - -	+728.4-						Bottom of Boring - 80.0'										1

	TranSy				_		Project: SCI-823-0.00								o. 012	1-307	'0.03
.OG C	F: Bo	ring	R-217		_	ocation: Sta	ı. 308+35.4, 167.2 ft. LT of SR 823 CL Date Drilled: 12	2/14			to		2/16/	05			
Depth (ft)	Elev. (ft) 794.6	Blows per 6"	Recovery (in)	Sam No enive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	Silt	% Clay	Natu P		ture Co	ontent, '	% - LL
-0.4 —	794.2						Topsoil - 5"/2.0' soil removed before drilling				-					<u> </u>	1
-		7 18 27	14	1			Severely weathered brown SANDSTONE, argillaceous, micaceous.										
_	-	50/2	_ 5	2													
10 —	- 789.6-	Core 120"	Rec 120"	RQD 80%	R-1	*647	Medium hard gray SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured. @ 5.0'-5.5', 10.3'-10.6', high angle fractures. @ 6.4'-8.5', calcareous sandstone. @ 10.9'-11.2', high angle fracture. Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous,										
15 — - - 20 — - -		Core 120"	Rec 120"	RQD 99%	R-2	*504	massive, slightly to moderately fractured. @ 16.3',16.8',17.4',17.5',19.1', low angle fractures. @ 18.8'-19.1', high angle fracture. @ 19.4', gray.										
25.0— — — —	- 769.6 -	Core	Rec	RQD			Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, argillaceous, slightly fractured, contains few to moderate argillaceous laminations. @ 27.3'-27.5', high angle fracture.										

Client:	ΓranSy	stems	, Inc.				Project: SCI-823-0.00								Job No.	0121	-3070.03	,
LOG C	F: Bo	ring	R-217		_	ocation: Sta	. 308+35.4, 167.2 ft. LT of SR 823 CL Date Drilled: 12	2/14				to	1	2/16/	05			
Depth (ft)	Elev. (ft) 764.6	Blows per 6"	Recovery (in)	Sam No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	% M. Sand	% F. Sand	N Silt	% Clay	Natu P		ure Con er foot	FRATION (N tent, % - 	
30 —						*189	Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, argillaceous, slightly fractured, contains few to moderate argillaceous laminations.											
35 — - 37.6—	-757.0-						 @ 36.3'-37.4', very fine grained sandstone. @ 37.4'-37.6', rust stained conglomerate and sandstone. @ 37.6', low angle fracture. 											
40 —	737.0	Core 120"	Rec 120"	RQD 99%	R-4	*1047	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive unfractured to slightly fractured, turbidity. @ 37.4'-37.6', calcareous. @ 41.4'-42.0', iron stained, calcareous.	,										
45 — - - - - 50 —		Core 120"	Rec 120"	RQD 100%		*1227												
55 — - - -		Core	Rec	RQD														

	TranSy				_		Project: SCI-823-0.00								o. 012	1-307	0.03
.OG C	F: Bo	ring	R-217		_	ocation: Sta	. 308+35.4, 167.2 ft. LT of SR 823 CL Date Drilled: 12	2/14			to	1	2/16/	05			
Depth (ft) 60 —	Elev. (ft) 734.6	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ıral Mois L ⊢— Blows	D PENE sture Co per foot 20	ntent, %	6 -
65 —							Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive unfractured to slightly fractured, turbidity. @ 65.0'-70.0', unweathered.	5							1111		
- - - 0.0	- -724.6-	Core 60"	Rec 60"	RQD 100%	R-7	*1868	@ 65.3',66.3',66.9',67.6', 67.7',68.2',69.3', low angle fractures.										
- - - 75 - -							Bottom of Boring - 70.0'										
- 80 - - -													$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1111	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
- 35 - - - -															1 1 1 1		

	TranSy				_		Project: SCI-823-0.00							Job N	lo. 012	21-307	70.03
OG C	F: Bo	ring	R-218		_	ocation: Sta	a. 315+05.5, 121.1 ft. LT of SR 823 CL Date Drilled: 12	2/21									
Depth (ft)	Elev. (ft) 718.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.8' (includes drilling water, with augers removed) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Moi PL ⊢—	D PENI sture Co per foo 20	ontent,	% - LL
-0.2 - - -	 718.0 - 	4 4 7	14	1		3.25	Topsoil - 2"/6" soil removed before drilling Very stiff brown SANDY SILT (A-4a), trace to little clay; contains sandstone fragments; dry to damp.	-									
4.5— 5 —	713.7-	42 50/5	14	2a 2b			Severely weathered brown SANDSTONE.	-									5
- - 10 	-711.9-	Core 93"	Rec 93"	RQD 81%	R-1		Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured to broken. @ 10.6'-10.8', filled fracture. Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, slightly to highly fractured. @ 12.3'-12.6', gray.	-									
- 5 — - - -		Core 72"	Rec 72"	RQD 100%	R-2		@ 12.3'-12.6', gray. @ 12.8',13.0',13.1',13.4',14.7' 15.1', 18.7', low angle fractures. @ 19.3', gray.										
25 — - - - 25 —	-6 98.2-						Bottom of Boring - 20.0'										

	TranSy				_		Project: SCI-823-0.00							Job N	o. 012	21-307	70.03
LOG C	F: Bo	ring	R-186		_	ocation: Sta	. 324+37.9, 54.6 ft. RT of SR 823 CL Date Drilled: 8/	31/		A T /	21/						
Depth (ft)	Elev. (ft) 717.6	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.0' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	ON Silt	% Clay	Natu F	ıral Moi. ℃L ⊢—	sture Co	ontent,	
-0.3	717.3- -715.1-	5 11 36 50/5	11	1 2			Topsoil - 3"/2.5' soil removed before drilling Dense light brown SILT AND CLAY (A-6a); contains sandstone fragments; dry. Severely weathered brown SANDSTONE.										50
-5.0 - - -	- 712.6-	Core 60"	Rec 60"	RQD 52%	R-1	*390	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly to moderately fractured, with typically low angle fractures.										
10 — - - - 15 — - -16.5 — -	701.1-	Core 120"	Rec 118"	RQD 61%	R-2	*337	@ 10.0'-10.5', 12.0'-12.4', 12.9'-13.3', abundant argillaceous laminations. Soft to medium hard gray SANDSTONE interbedded with SILTSTONE, very fine grain to fine grain, highly weathered, micaeous, thinly bedded to very thinly bedded, broken. @ 19.0'-19.3', broken zone.	_									
25 —		Core 120"	Rec 120"	RQD 29%	R-3	*400	@ 26.0'-26.3', 26.9'-27.1', argillaceous interbeds.@ 22.2'-23.7', qu = 7,168 psi, SDI = 97.0%.										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No	. 012	-3070	.03
LOG (F: Bo	ring	R-186		_	ocation: Sta	. 324+37.9, 54.6 ft. RT of SR 823 CL Date Drilled: 8/	31/0									
Depth (ft)	Elev. (ft) 687.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natui Pl	ral Mois -	ture Cor per foot		-
35 — - - - - -	687.6-	Core 120"	Rec 117"	RQD 36%	R-4	*478	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle fractures. ② 31.4'-31.6',32.5'-39.1', abundant argillaceous laminations. ② 33.6',33.9', low angle clay filled fractures. ② 39.0'-39.4', fine to medium grained, poorly cemented. Bottom of Boring - 40.0'										

Client: 7					_		Project: SCI-823-0.00								Job No	. 012	1-307	70.03
LOG O	F: Bo	ring	R-188		_	Location: Sta	a. 324+74.3, 265.2 ft. RT of SR 823 CL Date Drilled: 9/	1/04		745	A T/	24.		1				
Depth (ft)	Elev. (ft) 679.7	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natui Pl	NDARL ral Mois -	ture Co	ontent,	% - (
_	- 679.5 -	5 15 34	13	1		3.5	Topsoil - 2"/12" soil removed before drilling Very stiff reddish brown SILT (A-4b), little clay, little fine to coarse sand, trace gravel; damp.	1	9		9	62	19		•	 	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
-3.0 - 5	- 676.7 -	12 13 15	15	2		4.0	Very stiff brown SILT AND CLAY (A-6a), trace gravel, trace fine to coarse sand; damp.											
_		5 7 10	17	3		4.0		3	4		4	62	27				- 	
10 —		5 18 21	17	4		3.75	@ 8.5', contains sandstone fragments.									<u> </u>		
- - -13.0 	-666.7-	8 16 29	16	5		3.5	O ANDOTONE											
_		50/5	4	6			Severely weathered brown SANDSTONE.											5
15.0— — — — 20 — 21.0—	-664.7- -658.7-	Core 72"	Rec 72"	RQD 22%	R-1		Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to massive, highly fractured. @ 15.1'-15.7',16.2'-17.1',18.9'- 19.1', broken with typical low angle rust stained fractures.											
25 — - - 25 — -	333.7						Bottom of Boring - 21.0'											

Client: 7					_		Project: SCI-823-0.00						Jo	ob No. 012	1-3070.00
LOG C	F: Bo	ring	R-189	Sam	_	ocation: Sta	1. 326+76.5, 9.4 ft. RT of SR 823 CL Date Drilled: 8/	31/(T	DAF	ATIO	<u> </u>				
Depth (ft)	Elev. (ft) 762.6	Blows per 6"	Recovery (in)	No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water) DESCRIPTION	% Aggregate	M. Sand	and	% Silt	% Clay	Natural PL	ows per foot	ntent, % -
-0.2 -	- 762.4-	4 7 8	9	1		2.5	Topsoil - 2" Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.								
4.0	-758.6- -757.6-	8 21 50/6	16	2			Severely weathered brown SANDSTONE.	1							
5.0	737.6	Core 120"		RQD 32%	R-1	*137	Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, highly fractured, with typical low angle rust stained fractures, contains moderate to abundant argillaceous laminations. @ 5.0'-6.0', SDI = 89.2%. @ 7.0'-7.4', qu = 4,621 psi. @ 12.1'-12.5', broken. @ 12.5', few argillaceous laminations.								
15 — — — 20 — — — — —		Core 120"	Rec 118"	RQD 41%	R-2	*268	 @ 17.6'-17.8', argillaceous, highly weathered. @ 17.8', gray with brown weathered zones. @ 17.8',18.2',18.5',20.9', 21.3',21.7', low angle fractures. @ 25.6'-26.2', moderate argillaceous laminations. @ 27.9'-28.1', SHALE. 								
	- 734.5-	Core	Rec 117"	RQD 70%	R-3		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous.	_							

Client:	TranSy	stems	s, Inc.		_		Project: SCI-823-0.00							Job No	0121	-3070	.03
LOG C	F: Bo	ring	R-189		_	ocation: Sta	. 326+76.5, 9.4 ft. RT of SR 823 CL Date Drilled: 8/3	31/0		A = :	<u> </u>						
Depth (ft)	Elev. (ft) 732.6	Blows per 6"	Recovery (in)	Samp No.	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natui Pl	NDARD al Moist .	ure Con er foot	tent, %	-
30 —	-					*320	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures; contains few argillaceous laminations. @ 35.7',37.9',40.5', low angle fractures.										
35 —		Core 120"	Rec 118"	RQD 75%	R-4	*373	 @ 35.8'-37.5', qu = 8,880 psi, SDI = 97.9%. @ 42.8'-43.0', 44.0'-44.3', 44.7'-44.8', low angle fractures, moderate argillaceous laminations. @ 45.3',45.8',47.9',51.2', low angle fractures, argillaceous lamination zones. @ 50.0'-50.2', argillaceous zone with fractures. @ 52.7',59.8'-66.3', few to moderate argillaceous laminations. @ 53.5', 53.7', low angle fractures with argillaceous zones. 										
50 —		Core 120"	Rec 120"	RQD 75%	R-5	*496	@ 59.6', 59.8',60.4', 62.3',69.8', low angle fractures. @ 60.8'-61.1', 62.5'-63.3', broken.										1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
55 — - - - -	-	Core 120"	Rec 120"	RQD 61%	R-6												

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00								Job No	0121	-3070.03
	DF: Bo				Locatio	ion: Sta.	326+76.5, 9.4 ft. RT of SR 823 CL	/31/0	04								
				Sample No.	•	1	WATER			RAD	ATIO	ON					
Depth (ft)	Elev. (ft) 702.6	Blows per 6"	Recovery (in)		The Street of th	enetro- neter itsf) / int-Load rength (psi)	Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natur PL	al Moist . ⊢——	ure Con er foot	_
60 —	-687.6-	Core 120"	Rec 120"	RQD 57% F		483	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures. @ 65.5',65.9',69.2',69.3', 70.8',71.3',71.6',71.7', 71.8',73.9', low angle fractures. @ 70.7'-75.0', moderate argillaceous laminations. @ 72.3'-73.0', broken.										

Client:	TranSy	stems	s, Inc.				DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)8 Project: SCI-823-0.00							Job No.	0121	-307	0.03
LOG (DF: Bo	ring	R-191		_	ocation: Sta	a. 326+88.4, 236.5 ft. RT of SR 823 CL Date Drilled: 9/	2/04									
Depth (ft)	Elev. (ft) 727.1	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natur PL	NDARD al Moiste H Blows pe	ure Cor er foot	ntent, %	6 -
0.2 - - - -	- 726.9	20 32 50 25 50/4	12	1 2			Topsoil - 2"/12" soil removed before drilling Severely weathered brown SANDSTONE.										
-5.0	722.1- - - - -	Core 60"	Rec 58"	RQD 37%	R-1	*19	Medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured; contains few argillaceous laminations.										50
-10.7- - - - 15	-716.4- - - - - - - - - - - - - - - - - - -	Core 120"	Rec 120"	RQD 38%	R-2	*340	Soft to medium hard brown SANDSTONE interbedded with SHALE; very fine to fine grained, decomposed to highly weathered, micaceous, broken. @ 15.2'- 17.2', SILTSTONE layer. Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, hightly weathered, argillaceous, micacious, broken to highly fractured; contains few argillaceous	-									
25 — - - 25 — - - -	- - - - - - - -	Core 120"	Rec 120"	RQD 53%	R-3	*304	 @ 22.0'-25.0', high angle fracture. @ 26.5'-27.5', interbedded with SHALE. @ 27.6'-29.0', argillaceous broken zone. 										

Client: Ti					_		Project: SCI-823-0.00								Job No	o. 012	1-307	0.03
LOG O	F: Bo	ring	R-191		_	ocation: Sta	. 326+88.4, 236.5 ft. RT of SR 823 CL Date Drilled: 9/3	2/04		745	A T.	24.						
-30	Elev. (ft) 697.1	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pi	NDARD ral Mois L ⊢— Blows p 0 2	ture Co	ntent, %	% -
35 —	-696.6- -687.1-	Core 120"	Rec 120"	RQD 14%	R-4	*317	Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately to highly fractured; contains moderate to abundant argillaceous laminations.											
45 — 55 — 55 — -	307.1						Bottom of Boring - 40.0'											

Client:					_		Project: SCI-823-0.00							Job No. 0121-3070.03
LOG C	F: Bo	ring	R-218		_	ocation: Sta	i. 324+28.8, 133.1 ft. LT of SR 823 CL Date Drilled: 12	2/27				to		12/28/05
Depth (ft)	Elev. (ft) 767.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate		M. Sand	% F. Sand		% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - PL LL Blows per foot - 10 20 30 40
0 		5 4 11	10	1		3.75	Topsoil - 0" Very stiff to hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains sandstone fragments; damp to moist. @ 3.0', brown and gray.	10	7		5	38	40	
5 —		5 10 12 5 12 22		2		3.5 4.5		8	6		6	43	37	
_	- 759.7-		12	4			Severely weathered dark brown SANDSTONE, argillaceous.							\(\sigma\) \(\frac{1}{2}\) \(\frac{1}2\) \(\frac{1}2
- - - 15 —	- 757.7-	Core 120"	Rec 117"	RQD 88%	R1	*1059	Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately to highly fractured. @ 10.1'-11.2', calcareous.							
17.1 - 20 -	- 750.6-						Hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, massive, moderately fractured. @ 18.5', 19.3', 21.5', 25.8', low angle fractures.							
25 — - - -		Core 120"	Rec 119"	RQD 98%	R2	*1137	@ 25.8', gray and slightly weathered.							

	TranSy				_	_	Project: SCI-823-0.00								Job N	o. 012	21-307	0.03
LOG	OF: Bo	ring	R-218		_	ocation: Sta	a. 324+28.8, 133.1 ft. LT of SR 823 CL Date Drilled: 1	2/27				to	12	2/28/0)5			
Depth (ft)	Elev. (ft) 737.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu Pi	ral Mois L ⊢— Blows			
35.0 <u> </u>		Core 120"	Rec 120"	RQD 100%	R3		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.										1 1 1 1	
45 — 50 —		Core 120"	Rec 120"	RQD 100%	R4													
55 —		Core 120"	Rec 119"	RQD 98%	R5		@ 55.2', low angle fracture.											

	TranSy				_		Project: SCI-823-0.00									lo. 012	1-307	0.03
_OG (DF: Bo	ring	R-218		_	ocation: Sta	ı. 324+28.8, 133.1 ft. LT of SR 823 CL Date Drilled: 12	2/27				to	1	2/28/	05			
Depth (ft) 60 —	Elev. (ft) 707.7	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	Silt	% Clay	Natu F	ıral Moi. PL ⊢—	D PENE sture Co per foo 20	ontent, %	6 -
60 —	697.7-	Core 120"	Rec 118"	RQD 98%	R6		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. Bottom of Boring - 70.0'											

	<u>FranSy</u>				_		Project: SCI-823-0.00	100	/6.=						Job N	<i>lo.</i> 0	121-3	070.03	3
.OG C	F: Bo	ring	R-218	7 Sam	_	<i>_ocation:</i> Sta	1. 326+69.3, 125.1 ft. LT of SR 823 CL Date Drilled: 12 WATER	2/28 T			ATIO	ON.							_
Depth (ft)	Elev. (ft) 774.6	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natui PL		sture	Conten	ATION (i nt, % -	
0 —		2 4 14	21	1		3.5	\Topsoil - 0" Very stiff brown SILT AND CLAY (A-6a), trace gravel, trace fine to coarse sand; damp.	6	4		4	52	34						1 1 1 1 1 1 1 1
5 —		12 38 50/5	10	2		4.5+	@ 3.5', contains sandstone fragments.										/		
_		8 22 30	14	3		4.5+													5
0 —		30 38		4		4.5+		0	2		6	58	34						Έ
_		8 17 31	14	5		4.5+	@ 13.5', dark brown.												
5.0—	-759.6-	18 50/2 Core 120"	Rec 118"	6 RQD 78%	R-1	*711	Very hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, calcareous, medium bedded to massive, highly fractured to broken. @ 15.8'-15.9',17.3'-17.4', broken. @ 16.1'-18.3', calcareous. @ 22.5'-26.0', moderately to highly weathered, contains gray colored zones.												5
25 — 6.0— – – 30	- 748.6-	Core	Rec 119"	RQD 98%	R-2		Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured.												

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							lob No. (121-30	70.03
LOG C	F: Bo	ring	R-218		_		. 326+69.3, 125.1 ft. LT of SR 823 CL Date Drilled: 12	2/28								
Depth (ft)	Elev. (ft) 744.6	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natura	I Moisture ⊢——Blows per		% - • LL
30 — - - - - 35 —						*1320	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows.						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
40 —		Core 120"	Rec 120"	RQD 100%	R-3	*1511										
50 —		Core 120"	Rec 120"	RQD 100%		*1500										
55 — - - - - -		Core 120"	Rec 119"	RQD 99%	R-5		@ 59.6', low angle fracture.									

Sample Hand Penetro-meter Water level at completion: Not reported STANDARD PENETRATION (Not very fine to fine grained, slightly weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows. Bottom of Boring - 70.0' Bottom	Sample Hand Penetrometer Water level at completion: Not reported STANDARD PENETRATION (Not the public field) Not the public field Not the penetrometer Not the public field Not the public fie		TranSy				_		Project: SCI-823-0.00								Job N	o. 0 12	1-307	0.03
STANDARD PENETRATION (No. No. Penetrometer (Ist) Penetrometer (I	STANDARD PENETRATION (No. Penetro-meter	OG (OF: Bo	ring	R-218		_	Location: Sta		2/28										
Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows. Core Rec 60" 59" 98% R-6 *1227 Bottom of Boring - 70.0'	Hard gray SANDS IONE; very line to fine grained, slightly weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows. Core Rec 60" 59" 88% R-6 *1227 DOD 704.6 Bottom of Boring - 70.0"	Depth (ft)	(ft)	Blows per 6"	1 1	No		Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: Not reported DESCRIPTION	% Aggregate	Sand	Sand	F. Sand	Silt	% Clay	Natu P	ıral Mois L ⊢— Blows	per foot	ontent, %	% - LL
	75—	 65 — 			Rec	RQD 98%	R-6		weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows.											

Core Rec Rob Rol		TranSy				_		Project: SCI-823-0.00								Job N	o. 012	1-307	0.03
Alica Alic	LOG (DF: Bo	ring	R-193		_	ocation: Sta		2/04			A T (211						
Medium dense brown SANDY SILT (A-4a); damp. Severely weathered gray SANDSTONE, argillaceous. Medium hard gray SANDSTONE, argillaceous. Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, broken to highly fractured, contains moderate argillaceous laminations. © 5.0'-7.6', highly fractured, with typically low angle clay filled fractures. Core Rec 120" 120" 88% R-2 @ 17.0',17.1',19.7', low angle clay filled fractures. Bottom of Boring - 20.0'	0	(ft) 642.0	Blows per 6"		No	/ Core	Penetro- meter (tsf) / * Point-Load Strength	OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) DESCRIPTION	% Aggregate	C. Sand	M. Sand	F. Sand	Silt	% Clay	Natu F	ıral Mois PL ⊢— Blows	sture Co per foot	ntent, s	% - LL
Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, broken to highly fractured, contains moderate argillaceous laminations. © 5.0'-7.6', highly fractured, with typically low angle clay filled fractures. Core 120" Rec 12	-	_	5 <u>24</u>		1 2			Medium dense brown SANDY SILT (A-4a); damp.							1 1 1 1				
Core Rec 120" ROD 88% R-2 @ 17.0',17.1',19.7', low angle clay filled fractures. Bottom of Boring - 20.0'	- - -	637.0	Core		RQD 62%	R-1		slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, broken to highly fractured, contains moderate argillaceous laminations. @ 5.0'-7.6', highly fractured, with typically low angle clay filled								1111	1 1 1 1		
0.0 622.0 Bottom of Boring - 20.0'	- - -	-			RQD 88%	R-2		tractures.											
Bottom of Boring - 20.0'	-							@ 17.0',17.1',19.7', low angle clay filled fractures.											
	- - -							Bottom of Boring - 20.0'											

Client:					_		Project: SCI-823-0.00							Job No. 01	21-3070	.03
LOG (DF: Bo	ring	R-194		_	ocation: Sta	a. 332+21.8, 8.6 ft. LT of SR 823 CL Date Drilled: 9/	2/0			to	9	/6/04			
Depth (ft)	Elev. (ft) 747.2	Blows per 6"	Recovery (in)	Sam). Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate	M. Sand	П.	Silt	% Clay	Nati	ANDARD PEN ural Moisture C PL Hows per for 10 20	content, % tot -	-
0.3 - - - -	-746.9- - - -	10 27 50/5	12	1 2			Topsoil - 4" Severely weathered orangish brown SANDSTONE.	-								50+
5 — -6.0 - - -	-741.2- - -	Core 48"	Rec 48"	RQD 81%	R-1	*340	Medium hard to hard gray to brown SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, highly fractured.	_								
- 15 — - - -	734.1-	Core 120"	Rec 120"	RQD 100%) R-2	*423	 @ 6.9'-7.0',10.0'-10.2',10.5'-1 .6', high angle rust stained fractures. @ 7.5',7.6',13.0', low angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured. 									
20 —		Core 120"	Rec 120"	RQD 100%) R-3	*492	@ 21.1',25.7', low angle rust stained fractures.@ 24.4'-24.5', high angle rust stained fracture.									

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00 0	040					_	Job No.	0121-3	070.03
LOG (DF: Bo	ring	R-194		L	Location: Sta	n. 332+21.8, 8.6 ft. LT of SR 823 CL Date Drilled: 9/	2/04				to	9/	6/04	,		
Depth (ft)	Elev. (ft) 717.2	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ANDARD F ural Moistui PL	re Conter	. ,
30 — - - - 35 — - - - 40 —	-	Core 120"	Rec 118"	RQD 98%	R-4	*445	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured. @ 35.6'-35.7', high angle rust stained fracture.										
45 — 	- - - - - - - -	Core 120"	Rec 120"	RQD 100%	R-5	*528											
55 — - - - - - - -	687.2	Core 120"	Rec 120"	RQD 100%	R-6	*621	@ 57.3'-57.6' abundant argillaceous laminations. Bottom of Boring - 60.0'										

	TranSy				_		Project: SCI-823-0.00							Job No	o. 012 1	-3070	0.03
.OG C	F: Bo	ring	R-195		_	ocation: Sta	1. 332+24.3, 245.1 ft. RT of SR 823 CL Date Drilled: 9/	1/04		A T.	241						
Depth (ft)	Elev. (ft) 743.9	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.8' (includes drilling water) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Mois L ⊢— Blows ¡	O PENET ture Cor per foot	ntent, %	6 -
-0.2 	-743.7- - - -740.9-	5 9 11 40 50/3 60 50/4	18 6	2			Topsoil - 2" Medium dense brown and gray SANDY SILT (A-4a); contains sandstone fragments; damp. Severely weathered brown and gray SANDSTONE.	-									50
9.0— 10 — 15 —	-734.9-	50/5 Core 6"	5 Rec 6"	4 RQD 0%	D o	*273	Medium hard gray to brown SANDSTONE; very fine to fine grained, highly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, broken to slightly fractured. @ 9.0'-9.5', broken with typical low angle rust stained fractures. @ 10.2',11.7',12.8', low angle fractures. @ 17.0'-17.3',17.7'-17.8',22.3'- 22.5',27.8-28.0', high angle rust stained fractures.										59
20 —		Core 120"	Rec 120"	RQD 97%	R-3	*362											

Depth (it) (it) 8 8 8 8 8 8 8 8 9 8 8 8 8 8 8 8 8 8 8	C. Project: SCI-823-0.00		Job No. 0121-3070.03
Depth Felev. 10 10 10 10 10 10 10 1		i	
Medium hard gray to brown SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, moderately to slightly fractured. 33 - 704.4 45 - Core 120° 120° 120° 120° 120° 120° 120° 120°	No. Hand Penetro- meter Water level at completion: None (prior to coring) 27.8' (includes drilling water)	ST. Nati	Blows per foot -
Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive. Core 120" 120" 100% R-5 *503 © 53.4'-53.5', moderately argillaceous. © 54.8'-55.9', high angle rust stained fracture.	grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, moderately to slightly fractured. @ 34.8'-34.9', high angle clay filled fracture.	1 1 1 1	
Core 120" Rec 120" R-6 *330 @ 54.8'-55.9', high angle rust stained fracture.	grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive.		
	ec RQD 0" 100% R-6 *330		

	TranSy				_		Project: SCI-823-0.00							Job No.	0121	-3070.03	3
LOG (DF: Bo	ring	R-195		_	ocation: Sta	a. 332+24.3, 245.1 ft. RT of SR 823 CL Date Drilled: 9	/1/0		\ A = 1	21/						_
Depth (ft) 60 —	Elev. (ft) 683.9	Blows per 6"	Recovery (in)	Sam _l No	Press / Core	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Sitt	% Clay	Natu P		ure Con er foot		
-60.5	-683.4-	12"	12"	100%			Hard gray SANDSTONE. Bottom of Boring - 60.5'										

	TranSy				_		Project: SCI-823-0.00						J	ob No. 01	21-307	0.03
LOG (DF: Bo	ring	R-196			ocation: Sta	a. 333+98.8, 17.6 ft. LT of SR 823 CL Date Drilled: 9	/14/	D 4 5	\ <u> </u>	<u> </u>					
Depth (ft)	Elev. (ft) 733.6	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.0' (includes drilling water) DESCRIPTION	% Aggregate	Sand	% F. Sand	N Silt	% Clay	Natural PL	DARD PEN Moisture (Hows per fo	Content, S	% - (
-0.3 - - - -	733.3	2 2 4 3 16 24	12	1 2		2.5	Topsoil - 3" Very stiff brown SANDY SILT (A-4a), trace gravel; dry to damp.								7 1411	
5 — -5.5 — -10 — -11.5 — -15 —	-728.1- -722.1-	Core 114"	Rec 114"	RQD 63%	R-1	*451	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured. @ 5.5'-5.8',10.2'-10.6', broken with typical low angle rust stained fractures. @ 6.4'-6.5', high angle rust stained fracture. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured.									
20 —		Core 120"	Rec 120"	RQD 100%	R-2	*411	@ 23.2',24.5', low angle fractures.									
25 — - - - 30		Core	Rec 120"	RQE 100%	R-3											1 1 1

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job N	o. 0121-3070.03
LOG (F: Bo	ring	R-196		_	Location: Sta	. 333+98.8, 17.6 ft. LT of SR 823 CL Date Drilled: 9/	14/0							
				Sam _l No		Hand Penetro-	WATER OBSERVATIONS: Water seepage at: None		G	RAD	ATI	ON 			
Depth (ft)	Elev. (ft) 703.6	Blows per 6"	Recovery (in)	Drive	Press / Core	meter (tsf) / * Point-Load Strength (psi)	Water level at completion: None (prior to coring) 4.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Mois PL ⊢ Blows	D PENETRATION (N, sture Content, % - (L) per foot - () 20 30 40
30 — - - - - 35 —						*417	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to massive, slightly fractured.								
 40 —- 		Core 120"	Rec 120"	RQD 100%	R-4	*506									
 45 — 	-	Core	Rec	RQD			@ 44.5'-44.6', shale interbed.								
- - -	-683.5- - - -	120"	120"	RQD 100%	R-5	*507	Medium hard to hard gray SHALE interbedded with SANDSTONE; slightly to moderately weathered, micaceous, thinly bedded.								
55.0 	- 678.6-						Bottom of Boring - 55.0'								

Client: T					_		Project: SCI-823-0.00								Job	No. 0	121-3	070.03
LOG O	F: Bo	ring	R-199		_	ocation: Sta	. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/	15/0				to	9	/22/0	4			
Depth (ft)	Elev. (ft) 820.4	Blows per 6"	Recovery (in)	Samp No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water) DESCRIPTION	% Aggregate	G. Sand	M. Sand	% F. Sand	Silt	% Clay	Natu F	ıral Mo L ⊢		Conten	TION (I t, % - ⊣ LL ○ 40
-0.5 - -	- 819.9 -	3 6 7	18	1		4.5+	Topsoil - 6" Hard brown CLAY (A-7-6), little fine to coarse sand; damp.								Q			
_ 5 —		5 9 11	18	2		4.5+		0	11		7 3	37	45				11 11	
_		9 11 16	18	3		4.5+												
10 	-809.9-	5 9 16	18	4		4.5+												
- - -	003.3	7 14 21	18	5		4.5+	Hard brown and gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp.		12		14	36	34		• ; ; ; ; • ; ; ; ;			
_ 15 —		7 24 41	18	6		4.25												
18.0	-802.4-	13 32 40	12	7		4.5+	@ 16.0', possible sandstone layer.											7
20 —		16 33 39	15	8		4.5+	Hard brown CLAY (A-7-6), little fine to coarse sand, trace gravel; damp.											7
- - -		16 27 32	18	9		4.5+												5
25 25.5 	-794.9-	11 23 50/5	16	10		4.5+	Constant was thought and constant for	6	4		10	33	47		•		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
- - -		27 50/5	10	11			Severely weathered gray SHALE, arenaceous.											
30		28 50/5	8	12														

	ΓranSy						Project: SCI-823-0.00							Job	No. 012	1-3070.03
_OG O	F: Bo	ring	R-199		_	ocation: Sta	i. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/	15/				to	9	9/22/04		
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water) DESCRIPTION	% Aggregate		M. Sand	% F. Sand		% Clay	Natural Mo PL ⊢	s per foot	TRATION (Nontent, % -
30 —	790.4				Р		Severely weathered gray SHALE, arenaceous. @ 32.0'-37.0', micaceous.	%	%	%	%	%	%	10		30 40
35 —		30 50/5 50/5	5	13			& JZ.O JT.O, IIIIOAOGOUS.									5
_	- 779.4- -776.9-	Core 108"	Rec 108"	RQD 0%	R-1	*76	Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered, micaceous, thinly bedded, broken, with typically low angle clay filled fractures. @ 42.5'-43.5', SDI = 18.6%. Soft to medium hard gray to brown SANDSTONE; medium to coarse grained, decomposed to highly weathered, massive, broken to highly fractured, with typically low angle clay filled fractures, poorly cemented; contains moderate argillaceous laminations. @ 46.0'-47.4', qu = 1,701 psi, SDI = 63.5%.									
50 —		Core 120"	Rec 120"	RQD 36%	R-2	*215										
_	-761.8- -760.9-						Medium hard gray SILTSTONE.	 - 								

	TranSy				_		Project: SCI-823-0.00									o. 012	1-307	0.03
LOG (F: Bo	ring	R-199		_	ocation: Sta	. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/	15/0		745	A T1	to	9	/22/0	4			
Depth (ft)	Elev. (ft) 760.4	Blows per 6"	Recovery (in)	Samp No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu F	ıral Mois PL ⊢— Blows	D PENE sture Co per foot 20	ntent, 9	6 -
65 —		Core 120"	Rec 120"	RQD 83%	R-3	*461	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured. @ 62.7',68.1',68.2', low angle clay filled fractures. @ 68.1', 68.2', low angle clay filled fractures.											
70 — 80 —		Core 120"	Rec 120"	RQD 100%	R-4	*378	@ 72.5'-74.2', qu = 9,933 psi, SDI = 98.1%.											
85 —		Core 120"	Rec 120"	RQD 100%	R-5	*367	@ 85.3', low angle fracture.											

	TranSy				_		Project: SCI-823-0.00								Job No	. 012	1-307	0.03
LOG C	F: Bo	ring	R-199		_	ocation: Sta	a. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/	15/0				to	9	9/22/04	<u> </u>			
Depth (ft)	Elev. (ft) 730.4	Blows per 6"	Recovery (in)	Sam No Prive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natui Pl	NDARD ral Mois -	ture Co per foot	ntent, 9	% - (LL
90 —	-	Core 120"	Rec 117"	RQD 98%	R-6	*299	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured.											
		Core 120"	Rec 116"	RQD 96%	R-7	*467												
15 — - - 15 — - -	-	Core 120"	Rec 120"	RQD 100%	R-8	*395												

	ΓranSy				_		Project: SCI-823-0.00								. 0121-3070.	.03
.OG C	F: Bo	ring	R-199		_	ocation: Sta	. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/	15/0				to	9/22/0	4		
Depth (ft)	Elev. (ft) 700.4	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water) DESCRIPTION	% Aggregate	C. Sand	% M. Sand	% F. Sand	Silt	Natu F	ural Moist PL ⊢— Blows p	PENETRATION ure Content, % Liver foot - 0 30 4	-
120 — - - - 125 — - -		Core 120"	Rec 120"	RQD 100%	R-9	*565	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive. @ 128.9'-129.0', argillaceous laminations.									
	-682.9-	Core 120"	Rec 120"	RQD 100%	R10	*440	@ 130.0'-131.5', qu = 12,224 psi, SDI = 96.5%. @ 132.5'-134.0', qu = 11,781 psi, SDI = 96.5%.									
_	-680.4-						Medium hard gray SHALE interbedded with SANDSTONE; slightly weathered, micaceous, thinly bedded. Bottom of Boring - 140.0'	-					1 1 1 1	1 1 1 1		1
- 45 -																

	ΓranSy				<u> </u>		Project: SCI-823-0.00								Job N	o. 012	21-307	0.03
LOG C	F: Bo	ring	R-201		_	ocation: Sta	a. 338+44.5, 150.8 ft. RT of SR 823 CL Date Drilled: 9/	15/0										
Depth (ft)	Elev. (ft) 762.5	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate		% M. Sand	Ä.	% Silt		Natu P		sture Co	ontent, s	% - (
-0.3 - - -	-762.2-	6 23 12	18	1		4.5+	Topsoil - 3" Hard brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp.	-										
5 		7 13 20	18	2		4.5+		15	4		14	47	20		,	 		
-6.0 - - - 10 -	-756.5-	Core 108"	Rec 108"	3 RQD 34%	R-1	4.5+ *254	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken, with typically low angle rust stained fractures. @ 8.2'-8.5',12.2'-13.8', broken with typical high angle rust stained fractures.	-										-50
 15 		Core	Rec	RQD 96%			@ 19.8'-20.0', interbedded shale.@ 20.3', low angle rust stained fracture.											
0.2 	-742.3- - -	120"	120"	96%	R-2	*294	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, pyrtic, thinly bedded to massive, moderately to slightly fractured. @ 28.2', low angle fracture.											
- -		Core	Rec 120"	RQD 100%	R-3													

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	000-0							Job No.	0121-3	3070.03
LOG C	F: Bo	ring	R-201		_	ocation: Sta	. 338+44.5, 150.8 ft. RT of SR 823 CL Date Drilled: 9)/15/									
		per 6"	, (in)	Sam _l No		Hand Penetro- meter (tsf) /	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	rate			ATIO	ON					ATION (N nt, % -
Depth (ft)	Elev. (ft) 732.5	Blows pe	Recovery	Drive	Press / C	* Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL	⊢—— Blows pe	r foot -	111, % -
- - -						*409	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured.								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
35 —					-		@ 34.0', weathered low angle fracture.								1 1 1 1		
40		Core 120"	Rec 118"	RQD 100%	R-4	*340											
- - - 50 —	-	Core 120"	Rec 120"	RQD 100%		*360	@ 52.1'-52.2', argillaceous.										
55 —					-		@ 54.8'-55.0', argillaceous, poorly laminated.@ 55.0'-55.9', high angle rust stained fracture.										
- - 60		Core 120"	Rec 120"	RQD 95%	R-6												

Client: Tran	Systems	s, Inc.			Project: SCI-823-0.00								Job No.	0121-	-3070.03	}
LOG OF: I	Boring	R-201			a. 338+44.5, 150.8 ft. RT of SR 823 CL Date Drilled: 9/	15/0										
Depth Ele (ft) (ft)) Nows	Recovery (in)		Hand Penetro- meter (tsf) / Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None DESCRIPTION	% Aggregate			% F. Sand	% Silt	% Clay	Natur	al Moistu . ⊢—— Blows pe	re Cont er foot -	_	
60 702	.5 Ш		RQD 100%	*503	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to massive. @ 64.2'-64.7', 65.8'-70.0', moderately argillaceous.	_	07	07	%	%	%	1		30) 40	
75 — 80 — 85 —	.5				Bottom of Boring - 70.0'											

	TranSy				_		Project: SCI-823-0.00							Job No.	0121	-3070).03
OG C	DF: Bo	ring	R-219	4 Sam	_	Location: Sta	331+97.8, 163.1 ft. LT of SR 823 CL Date Drilled: 12	2/30 T		ATIO	ON.		1				
Depth (ft)	Elev. (ft) 780.4	Blows per 6"	Recovery (in)	Drive		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natura PL	IDARD F al Moistur I Hows Blows per 20	e Con	ntent, % ——⊢ l	6 -
0 —		18 21 27	20	1		3.25	\Topsoil - 0" \ Very stiff brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; moist.	4	2	 10	61	23			 		
3.0 5 -	 -777.4- -	22 40 50/4	18	2		•	Severely weathered brown and gray SILTSTONE, arenaceous.										
-		18 50/6	13	3													1
-	-772.4- -770.4-	36 50/3	12	4			Severely weathered brown and gray SHALE, arenaceous.										1 1 1 1 1 1
- - - 15 — - -	-	Core 120"	Rec 114"	RQD 82%	R-1	*133	Soft brown and gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered to decomposed, arenaceous, massive, highly fractured.						1 1 1 1	1 1 1 1 1			
20 — - 21.7— - - 25 — - -	- -758.7- - -	Core 120"	Rec 120"	RQD 88%	R-2	*1108	 @ 21.0',21.3', low angle fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured. @ 21.7'-21.8', conglomerate bed. @ 21.8', 23.6',23.8',23.9',25.5', low angle fractures. @ 25.3'-25.5', iron stained, vuggy zone. 	-									

Client:	ΓranSy	stems	, Inc.				Project: SCI-823-0.00							Job No.	0121-	3070.03
LOG C	F: Bo	ring	R-219		_	ocation: Sta	a. 331+97.8, 163.1 ft. LT of SR 823 CL Date Drilled: 12	2/30								
Depth (ft)	Elev. (ft) 750.4	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Clay	Natur PL	al Moistu . ⊢—— Blows pe	re Cont er foot -	_
_30.0 - - - 35 — - - - 40 —	750.4-	Core 120"	Rec 120"	RQD 100%	R-3	*1213	Very hard gray SANDSTONE; very fine to fine grained, argillaceous, laminated, unfractured to slightly fractured, turbidity.									
45 — - - - - - - - - -		Core 120"	Rec 120"	RQD 100%	R-4	*2016										
55 — - - - - - -		Core 120"	Rec 120"	RQD 100%	R-5	*1102										

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	00-0	040						Job No.	0121	-3070.0	03
	F: Bo			4	1	Location: Sta	a. 331+97.8, 163.1 ft. LT of SR 823 CL Date Drilled: 12	2/30	/05									
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _i No	ple	Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours)	% Aggregate	C. Sand	M. Sand	F. Sand	Silt	Clay	Natu	NDARD ral Moistu L ⊢—— Blows pe	ıre Con	tent, % - — ⊢ LL	
60 — - - - 65 — - - - 70 —	720.4	Core 120"	Rec 120"	RQD 100%			Very hard gray SANDSTONE; very fine to fine grained, argillaceous, laminated, unfractured to slightly fractured, turbidity.	%	%	%	%	%	%		10 20)
75 — 80 —		Core 120"	Rec 120"	RQD 100%	R-7	*1543											1 1 1 1	
85 — - - - - - - 90.0	690.4	Core 120"	Rec 120"	RQD 100%	R-8	*1265	Bottom of Boring - 90.0'											$1 + 1 + 1 + \dots$

Client:	TranSy	stems	, Inc.			L	Project: SCI-823-0.00		3.0					Job No.	0121-	3070.03	3
LOG C	F: Bo	ring	R-219		_	ocation: Sta	a. 333+85.2, 168.7 ft. LT of SR 823 CL Date Drilled: 1/4	4/00									
Depth (ft)	Elev. (ft) 766.9	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours) DESCRIPTION	% Aggregate		pu	Silt	% Clay	Natu F	ANDARD P ural Moistur PL Blows per 10 20	e Cont	ent, % -	-
0.4 	- 766.5 -	14 44 50/5	18	1 2		4.5+ 4.5+	Topsoil - 5"/6" soil removed before drilling Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry.										50+
10 —	-761.9-	Core 120"	Rec 42"	RQD 11%	R-1	*577	Medium hard brown SANDSTONE; fine grained, highly weathered to decomposed, argillaceous, thickly bedded, broken. @ 5.0'-7.3', broken zone. @ 7.3'-10.5', 11.1'-13.8', core loss.										
-15.0— - - - 20— - - - - 25—	- 751.9-	Core 120"	Rec 120"	RQD 100%		*1184	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.	,					$\begin{smallmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{smallmatrix}$				1.1
- - - - 30		Core 120"	Rec 120"	RQD 100%	R-3												1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Client:	TranSv	stems	Inc				Project: SCI-823-0.00	00 0	040						Job No	012	1-3070.	03
LOG C				6	1	ocation: Sta	a. 333+85.2, 168.7 ft. LT of SR 823 CL Date Drilled: 1/4	4/06	3						000710			
				Sam _l No	ole	Hand	WATER			RAD.	ATIC	ON						
Depth (ft)	Elev. (ft) 736.9	Blows per 6"	Recovery (in)	Drive	Press / Core	Penetro- meter (tsf) / * Point-Load Strength (psi)	Water seepage at Notice Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours)	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moisi L ⊢— Blows p	ture Co	TRATION ntent, % -	- • L
30 —	-					*1790	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.											
40 —		Core 120"	Rec 120"	RQD 100%	R-4	*1465												
45 —		Core 120"	Rec 120"	RQD 100%	R-5	*1810												
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-6													

	TranSy						Project: SCI-823-0.00							J	ob No. C	121-3	3070.03
.OG C	F: Bo	ring	R-21		_	Location: Sta	a. 333+85.2, 168.7 ft. LT of SR 823 CL Date Drilled: 1/4	4/00									
				San N		Hand Penetro-	WATER OBSERVATIONS: Water seepage at: None		GI	RAD.	ATIO	ON					
epth (ft)	Elev. (ft) 706.9	Blows per 6"	Recovery (in)	Drive	Press / Core	meter (tsf) / * Point-Load Strength (psi)	Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural PL	Moisture	Conte	PATION (I ent, % - → LL → 40
60 						*1430	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive unfractured to slightly fractured.	,									
5.0 -	- 701.9-						Bottom of Boring - 65.0'	_									
70 —																	
- - 75 - -																	
80 															iiili		
- 85 																	
-																	

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00	<i>.</i>	J-10						Job No	. 012	I-3070	0.03
LOG C	F: Bo	ring	R-220		_	ocation: Sta	. 342+27.0, 64.3 ft. RT of SR 823 CL Date Drilled: 1/9	9/0										
Depth (ft)	Elev. (ft) 721.9	Blows per 6"	Recovery (in)	Sam		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours) DESCRIPTION	% Aggregate	Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natu Pi	NDARD ral Moist -	ure Cor er foot	ntent, % 	- •
- - - 5 		9 11 13 28 33 50/4		1 2			Topsoil - 4"/12" soil removed before drilling Severely weathered brown SANDSTONE, argillaceous.											
5.5 - - - 10 - -	- 716.4-	Core 114"	Rec 114"	RQD 70%	R-1	*978	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, moderately to highly fractured. ② 5.5'-6.2', high angle fracture. ② 12.4'-12.6', high angle fracture. ② 13.0'-13.3', core loss. ② 14.9'-14.9', high angle fracture.											
	706.8-	Core 120"	Rec 120"	RQD 93%	R-2	*1259	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly to moderately fractured. @ 15.9'-16.1',15.3'- 18.6',18.8'-19.0', iron staining. @ 16.0',17.8',18.4',19.0', low angle fractures with iron staining.											
- - - - - 30		Core 120"	Rec 120"	RQD 85%	R-3		 @ 25.6',27.1',29.1', shale seams with low angle fractures. @ 27.2'-27.7', high angle fracture. @ 29.1', low angle fracture. @ 29.3' to 29.5', high angle, rust-stained fracture. 											

Client:	TranSy:	stems	, Inc.				Project: SCI-823-0.00	_	_						Job No.	0121	-3070	.03
LOG C	F: Bo	ring	R-220		_	ocation: Sta	. 342+27.0, 64.3 ft. RT of SR 823 CL Date Drilled: 1/	9/0										
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours)	Aggregate		Sand	F. Sand	% Silt	% Clay	Natur PL	NDARD al Moist . ——— Blows p	ure Con	ntent, % ——∣ L	-
_	689.4-	Blc	Re	Dri	Pre	(psi) *1334	DESCRIPTION Hard gray SANDSTONE; fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 30.4',30.5',32.1', low angle fractures. Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, laminated to thinly bedded, slightly fractured.	' %	3%	% M.	1%	8 %	%	1.			_	10
35 — 35.8 — — — — — — — — — — — — — — — — — — —	686.1	Core 120"	Rec 120"	RQD 84%	R-4	*847	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive slightly fractured. @ 35.8'-36.4', 37.7'-38.1', fine to coarse gravel seams.	3										
50 —		Core 120"	Rec 120"	RQD 100%		*1447												
55 — - - - - -		Core 120"	Rec 120"	RQD 100%	R-6										1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

	TranSy				_		Project: SCI-823-0.00							Job N	o. 012	1-307	0.03
.OG (DF: Bo	oring	R-220		_	Location: Sta	a. 342+27.0, 64.3 ft. RT of SR 823 CL Date Drilled: 1,	9/0			<u> </u>						
Depth (ft) 60 —	Elev. (ft) 661.9	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours) DESCRIPTION	% Aggregate	% M. Sand	% F. Sand	% Silt	% Clay	Natu P		ture Co per foot	ntent, %	% - LL
65 —	651.9	Core 60"	Rec 60"	RQD 100%	R-7	*1505	Medium hard to hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, massive, unfractured to slightly fractured. Bottom of Boring - 70.0'										

Client:					_		Project: SCI-823-0.00								Job	No. (0121	-307	0.03
LOG C	F: Bo	ring	R-206	Sam	_	ocation: Sta	i. 349+77.5, 31.4 ft. LT of SR 823 CL Date Drilled: 9/	1/04 I		240	ATIO	Λ/							
Depth (ft)	Elev. (ft) 674.4	Blows per 6"	Recovery (in)	No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: 21.0' Water level at completion: None (prior to coring) 6.0' (includes drilling water) DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	F. Sand	Silt	% Clay	Natu F	ıral Me L ⊢	oisture	re Con	TRATIO	% - LL
- - -		10 10 10	18	1		2.5	No topsoil Very stiff brown SILT AND CLAY (A-6a), little fine sand; damp to moist.												
5 		8 10 12	18	2		2.75		0	0		11	61	28						
 	-666.4-	3 5 7	18	3		2.0													
10 —		8 11 17	18	4		4.5	Hard light brown and gray CLAY (A-7-6), "and" silt, trace fine sand; damp.	0	1		6	53	40						
_ _ -13 0	-661.4 -	6 6 8	18	5		1.5											1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
- 15 	658.9	4 7 11	18	6		1.25	Stiff light gray SILT (A-4b), little to some fine sand, little clay; contains sand seams; moist.												
-15.5 - -	030.9	6 11 50/5	17	7			Dense brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist.										<u> </u>		6
20 —		7 23 25	18	8															
_		10 16 25	18	9				5	10		40	29	16						
25 —	-650.9 -		11	10			Severely weathered gray SANDSTONE, argillaceous.												5
-26.1	648.3	50/1	0	11			Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured. @ 26.8'-26.9', high angle clay filled fracture.												5

Client:	TranSy	stems	, Inc.				Project: SCI-823-0.00							Job No	0121	-3070.	03
LOG C						ocation: Sta	. 349+77.5, 31.4 ft. LT of SR 823 CL Date Drilled: 9	/1/0					•				
Depth (ft)	Elev. (ft) 644.4	Blows per 6"	Recovery (in)	Sam No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 21.0' Water level at completion: None (prior to coring) 6.0' (includes drilling water) DESCRIPTION	% Aggregate		% F. Sand	% Silt	% Clay	Natui PL		ure Cor er foot	FRATION tent, % ── Ll - ○ 0 4	- • L
30 — - - - 35 — -36.1—	-638.3-	Core 120"	Rec 120"	RQD 91%	R-1		Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured. @ 27.1',30.4',32.0',32.5', 35.6', low angle clay filled fractures. Bottom of Boring - 36.1'										
 40 - - - 45	-																
													1.1.1.1	1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1		1.1.1
55 — - - - -																	

	ΓranSy				_		Project: SCI-823-0.00								Job N	lo. 01	21-30	70.03
OG C	F: Bo	ring	R-207	Com	_	Location: Sta	i. 349+57.4, 156.5 ft. RT of SR 823 CL Date Drilled: 9/	1/04 T		240	ATI	۸۷/						
Depth (ft)	Elev. (ft) 654.2	Blows per 6"	Recovery (in)	Sam _l No		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	OBSERVATIONS: Water seepage at: None Water level at completion: 3.7' (includes drilling water) DESCRIPTION	% Aggregate		% M. Sand	% F. Sand	% Silt	% Clay	Natu P	ral Moi L ⊢			% - LL
0 		10 27 36	18	1		4.5+	No topsoil Hard brown and gray SANDY SILT (A-4a), little gravel, trace clay; dry to damp.											
5 		10 12 13	18	2		4.5+		3	7		43	25	23					
-		9 9 10	18	3		1.5	@ 6.0', stiff, damp.											
1.5— 10 —	645.7-	5 7 21	18	4		0.25	Very soft to soft gray SILT AND CLAY (A-6a), little clay, little gravel; moist.	12	15		24	31	18					
1.5 - -	642.7-	40 50/3	9	5			Severely weathered gray SANDSTONE.											75
- 15 5.5 	638.7	50/1	_ 1	6											 	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
20 —	000.7	Core 120"	Rec 116"	RQD 78%	R-1		Medium hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive. @ 15.5'-16.1',18.6'-20.1', broken with typical low angle clay filled fractures. @ 16.1'-16.9', core loss, possible void. @ 16.9'-17.1',20.1'-20.2', high angle clay filled fractures. @ 18.6'-20.5', laminated beds.											
25 — 25.5— - -	628.7 -						Bottom of Boring - 25.5'	_								1.1.1		







APPENDIX C ODOT General Earthwork Design Checklist - Centerline Cuts Checklist