Geotechnical Engineering Report
Longboat Solar Project
EDF Renewable Development, Inc.
San Bernardino County, California

Prepared for
EDF Renewable Development, Inc.

September 2014

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EDF Renewable Development, Inc.
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Certification

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of California.

DRAFT FOR REVIEW

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Christopher A. Kopchynski, P.E.

Date: September 12, 2014

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly licensed Certified Engineering Geologist under the laws of the State of California.

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Date: September 12, 2014

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Executive Summary

Barr Engineering Company (Barr) under authorization and contract with EDF Renewable Development, Inc. (EDF) completed a geotechnical investigation of the proposed Longboat Solar Project near Lenwood in San Bernardino County, California.

The geotechnical investigation consisted of test pit excavations, soil sampling, general laboratory soil testing, field electrical resistivity testing, and thermal resistivity testing. This testing program was selected to supplement the in-situ testing completed during the previous investigation (Barr, 2013), to develop final design parameters of the soils at the project site, and to provide a general discussion of construction considerations.

In general, the field investigation encountered generally sandy soils, with varying amounts of gravel, silt, and clay. The sand encountered at the project site was most commonly classified as clean sand to silty sand. Occasional layers of lean clay, silt, and gravelly sand were also observed. The presence of small cobbles was noted in a few of the test pits. The soils encountered can be considered consistent with alluvial deposits.

The project site can generally be characterized as broad with a gradual downward slope to the southeast towards the Mojave River. Site vegetation generally consists of small scrub brush scattered loosely across the land with little or no topsoil. The surficial soils in the area north of Community Boulevard, as well as the area west of Markham Road, were observed to be mixed or covered with manure for fertilizing purposes. Vegetation in these areas was generally absent. Much of the surficial soils in the upper 6 inches at the site consist of silty sand and poorly-graded sand in a relatively loose condition.

The primary findings of the geotechnical exploration and analyses indicate:

- The soils at the site are predominantly comprised of sand. The sand was most commonly classified as silty sand (SM) and poorly graded sand with silt (SP-SM) in accordance with the Unified Soil Classification System (USCS). Some of the sand encountered was classified as silty to clayey sand (SC-SM), clayey sand (SC) and poorly graded sand (SP). Based the results of the investigation and an understanding of the geology, the sands can often be considered fine to medium grained and poorly graded, with varying portions of coarse sand. The sand particle shape can generally be considered sub-angular. A majority of the sand encountered contained none or trace amounts of gravel.
- Occasional layers with coarser materials such as gravel and small cobbles mixed with the sands were encountered at various depths during the investigation. The gravel and cobbles were generally sub-rounded and particle sizes observed varied from small gravel (passing No. 4 sieve) to approximately 2.5 inches in diameter.

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- Based on the results of the investigation, much of the soils across the site exhibit weak cementation. Soil samples obtained from the test pits were commonly observed to react weakly with acid, indicating the presence of carbonate minerals within the soil matrix.
- Groundwater was not encountered during the investigation and is not anticipated to influence the foundation design.
- FEMA flood zone maps designate the immediately south of the project area as Zone AE. The Zone AE designation if used for high risk areas considered to have a 1% chance of annual flooding. Base flood Elevations in the FEMA Zone AE near the project site are reported to range from elevation 2161 feet (NAVD88) southeast of the site to 2,175 feet southwest of the site. USGS mapping and site reconnaissance indicates that levees or berms are present along the Mojave River near the site; however, the condition of this levee system is unknown. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design
- The project site is located in an active seismic area with multiple faults located nearby. Based on the results of the investigation, the site can be generally classified as Seismic Site Class D. For a probability of exceedance of 2 percent in 50 years, the peak ground acceleration (PGA) is 0.552g for the general project site.
- Based on the results of the geotechnical investigation, both shallow foundations and shallow pile foundation systems appear to be feasible for support of the solar arrays. Of primary concern for deep foundations is the presence of very dense, strongly cemented, and/or coarser soil layers, and cobbles and boulders which could result in lack of penetration at shallow depths. The CPT soundings performed in the previous investigation indicated that the prevalence of denser/coarser materials appears to increase with depth across the project site. Due to the nature of alluvial fans, the presence of coarser materials such as gravel and cobbles is expected to vary widely. In summary, the results of the investigation indicate that some gravel and small cobbles are present within the upper 10 feet but limited layers across portions of the site. The potential for widespread refusal on large cobbles or boulders, and/or dense gravel layers in the upper 10 feet is low
- For any foundation type considered, it is recommended that the foundation designer and/or contractor evaluate the results of the geotechnical investigations with respect to constructability.

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1.0 Introduction

The Longboat Solar Project is a proposed 20-MW solar project consisting of a series of solar photovoltaic (PV) modules spread across approximately 200 acres. This report describes the investigation and testing performed, presents the results of this work, and provides geotechnical analyses and recommendations for structure foundations, as well as general construction considerations. This report addresses geologic and geotechnical risks and summarizes the geotechnical investigation completed at selected locations spread throughout the proposed development.

1.1 Site Location

The proposed Longboat Solar Project is located in San Bernardino County, in south-central California, along the Barstow-Bakersfield Highway (Highway 58) approximately 2 miles north of Lenwood as shown in Figure 1. Figure 2 shows the general project layout as indicated by EDF in August 2014. The coordinates of the geotechnical field test locations are provided in Table 1. All geotechnical field work was completed within approximately 5 to 10 feet of the noted test locations.

1.2 Site Geology

The Longboat Solar Project site is in the western portion of the Mojave Desert, bordered by the Mojave River floodplain to the south and adjacent to the site, the Waterman Hills mountain range to the northeast, and other numerous small mountain ranges. These mountain ranges are a part of the Basin and Range Province, a series of narrow mountains and valleys with abrupt elevation changes. There are numerous active faults in the region, including the Lenwood-Lockhart fault zone (Figure 3).

The project site is adjacent to the Mojave River, an active desert drainage system. This river system is susceptible to flash flooding during periods of intense rainfall. Precipitation usually occurs in high-intensity, convective thunderstorms during the summer months. Typical of desert drainage systems, flash flooding occurs rapidly in the form of sheet wash at higher elevations and moves downslope into larger drainage systems, commonly forming large alluvial fans that extend out from the mountains into a dry lake bed. The alluvium in the fans likely consists of material derived from the weathering and erosion of the bedrock in the surrounding mountains, likely Jurassic-aged quartz monzonite/granite, and/or poorly sorted continental deposits of sandstone and conglomerate. Numerous hills and buttes in the area are expressions of the bedrock rising above the alluvial deposits, indicating its surface topography is very uneven. However, it is likely that the alluvial fan deposits are hundreds of feet thick below the site. The alluvial fan likely varies in age from Pleistocene to Holocene.

Alluvial fans are the accumulation of sediments washed off of rising mountain ranges. In cross section, they are wedge-shaped, thin near the mountains and thick in the valleys, where the fan deposits inter-finger with the valley deposits (typically aeolian sand dunes and dry lake deposits). Alluvial fans are composed largely of debris flow deposits, sheet flow deposits, and colluvium (loose weathered rock moved down-slope by gravity). The top of the alluvial fan is close to the source of sediment—the eroding

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mountains—so the sediment is coarse and angular. The sediments tend to get finer toward the bottom of the fan. The nature of the deposits also changes over time as the fan builds up higher on the mountain and further out into the valley, generally getting finer.

The State of California maintains a database of hydrologic data, some of which is available over the internet (CA Dept. of Water Resources) where water elevation data from select wells can be accessed. Several wells are near the project area. Several wells in the area indicate the groundwater surface is at least 25 feet below the ground surface.

The USDA/NRCS soil mapping indicates that the site soils are derived from granite alluvium and have a low potential for soil erosion (Figure 4). However, the site soils are mostly poorly-graded sands with silt and may be susceptible to wind erosion.

Mining in the region has included gold, boron, manganese, and sand/gravel. The past metal mining production has typically come from areas with bedrock exposure. These are typically located at higher elevations than the site. Mining should pose no risk to the project.

Table 2 is a summary of geologic and geotechnical hazards for the site. Of these, seismicity and flooding are the most significant:

- The Lenwood-Lockhart fault zone is an active fault zone that runs roughly northwest-southeast, and is located about 1.5 miles southwest of the project site. Other nearby active fault zones include the Gravel Hills – Harper fault zone, which is approximately 4.5 miles northeast of the site.

- The project site is located at the toe of an alluvial fan, and near an active river flood plain in a region of arid climate. In arid climates, it is common for flash floods to mobilize coarse unsorted sediments in debris flows, relatively low moisture-high solids mixes that move very quickly due to the slope of the terrain. These debris flows come to rest and dry out quickly. If there is a binding of plastic clays, these debris flow deposits can retain a collapsible fabric. The collapsibility is less than is typical for loess, but the alluvial fan deposits can be hundreds of feet thick so the aggregate collapse potential in extreme cases can be on the order of feet. Soil collapse is generally triggered by two things: increased moisture and applied load. The proposed solar development will not introduce increased moisture; however, periodic flooding or heavy precipitation events may be a source of increased moisture. The proposed solar structures impose a relatively minor load on the soils and any movement from soil collapse will likely be inconsequential.

- FEMA maps (Figure 5) note that there is potential for flooding on the southern portions of the project site. The FEMA Zone AE designation, considered high risk, is mapped immediately to the south of the site. The formal definition:

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> "Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown."

Base flood Elevations in the FEMA Zone AE near the project site are reported to range from elevation 2161 feet (NAVD88) southeast of the site to 2,175 feet southwest of the site. These studies are conducted by or on behalf of FEMA as part of the National Flood Insurance Program, and the flooding areas are designated on Digital Flood Insurance Rate Maps (DFIRMs).

The project site is generally flat with a gradual downward slope to the southeast towards the Mojave River. USGS mapping and site reconnaissance indicates that levees or berms are present along the Mojave River near the site; however, the condition of this levee system is unknown. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design.

1.3 Previous Investigation

A preliminary geotechnical investigation was completed for the project by Barr in October of 2013 (Barr, 2013). The preliminary investigation consisted of cone penetration test (CPT) soundings with seismic testing.

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2.0 Geotechnical Investigation Methods

The geotechnical investigation for the Longboat Solar Project consisted of test pit excavations, soil sampling, general laboratory soil testing, field electrical resistivity testing, and thermal resistivity testing. This testing program was selected to supplement the in-situ testing completed during the previous investigation (Barr, 2013), to develop final design parameters of the soils at the project site, and to provide a general discussion of construction considerations.

Figure 6 shows the plan location of all test pits and resistivity testing completed for the investigation. The geotechnical investigation was conducted in early August of 2014. A summary of the geotechnical test locations is included in Table 1.

Prior to the start of field work, coordinates of the geotechnical investigation locations were selected by Barr and approved by EDF. In general, the site investigation locations were selected to provide spatial coverage of the site and for comparison with the cone penetrometer testing completed in the previous investigation. The test locations were staked in the field by Section 37 Consultants under contract with EDF. All test location coordinates were verified in the field by Barr personnel with a hand-held GPS unit prior to commencing the field work.

2.1 Subsurface Exploration

2.1.1 Test Pit Excavations

A total of 16 test pit excavations were conducted as part of this geotechnical investigation. Four of the test pits were completed along the proposed underground collection alignment in support of sample collection for thermal resistivity testing. The remaining 12 test pits were completed within the proposed solar array area to evaluate subsurface conditions and obtain samples for general laboratory testing. Test pits along the collection alignment were completed to a depth of approximately 5 feet below existing grade, and test pits completed within the solar array area were completed to a depth of approximately 10 feet below existing grade. Test locations were selected by EDF to provide spatial coverage over the project site. The test pits were completed in August of 2014.

Samples obtained from the test pit excavations included bulk samples and grab samples from various depths. Additionally, 6-inch by 2.5-inch diameter liners were hand driven from to depths ranging from 3 to 4.5 feet to obtain relatively undisturbed samples of the soil at each test pit within the proposed solar array.

Test pits were performed by Don Brown (formerly Don's Backhoe Service) of Hinkley, California, with a rubber-tired 97-HP JCB 214S backhoe. The backhoe had a 36-inch bucket equipped with ripping teeth, with a rated digging force of approximately 12,000 pounds. The test pit locations are indicated on Figure 6. Test pit logs can be found in Appendix B. Photos of the test pit excavations can found in Appendix C.

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2.2 Laboratory Testing

The following tests were performed by Soil Engineering Testing (SET) of Richfield, MN:

- Moisture content testing in accordance with ASTM D2216, "Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass"
- Dry density testing in accordance with ASTM D7263, "Standard Test Methods for Laboratory Determination of Density (Unit Weight) of Soil Specimens"
- Sieve and hydrometer analyses in accordance with ASTM D422, "Standard Test Method for Particle-Size Analysis of Soils"
- Atterberg limit determinations in accordance with ASTM D4318, "Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils"
- Direct shear testing in accordance with ASTMD3080, "Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions"
- Standard proctor density testing in accordance with ASTM D698, "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))"
- California Bearing Ratio tests in accordance with ASTM D1883, "Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils"
- Soil electrical resistivity in accordance with ASTM G187, "Standard Test Method for Measurement of Soil Resistivity Using the Two-Electrode Soil Box Method"
- Soil pH testing in accordance with ASTM D4972 "Standard Test Method for pH of Soils"
- Soluble chloride and soluble sulfate of soils in accordance with EPA Method 9056 "Determination of Inorganic Anions by Ion Chromatography"

Laboratory test results can be found in Appendix C

2.3 Soil Electrical Resistivity Testing

Soil resistivity testing was completed by Barr personnel during the geotechnical investigation in August 2014. At selected locations, measurements were taken to determine average soil resistivity at five "a"-spacings of 2, 5, 10, 20, and 40 feet in two perpendicular arrays. Values were determined at four locations selected by EDF (Figure 6) and noted in Table 1.

The equipment used to collect the data consisted of a resistivity meter, four metal electrodes and connecting wire. A Mini-Res Ultra resistivity meter manufactured by L & R Instruments, Inc. was used to collect the data. The resistivity meter read in resistance (Ω) directly, and did not require the conversion of electrical potential (V) and inductance (I) to calculate resistance (V/I in Ω). Before and after each array was completed, the resistivity meter was connected to a resistor of known resistance, and the resulting values were compared to the known resistance value for quality assurance and quality control purposes.

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The meter was properly calibrated for all test locations and no instrument adjustments had to be made. Work was completed in accordance with ASTM method G57 "Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method" (equivalent to IEEE Std. 81).

Co-linear arrays of four electrodes were placed in the ground for each measurement. In order to check the accuracy of the single resistivity array, a perpendicular array was set up at each test location for all electrode spacings. Electrical current was input to the ground through the two outer electrodes of the array. The voltage drop produced by the resulting electrical field was measured across the two inner electrodes. The "a" spacing was increased with each measurement, expanding the array about a common center. Increasing the electrode separation increases the depth of investigation, and indicates vertical variation in resistivity.

The results of the soil electrical resistivity testing are discussed in Section 3.7 and included in Appendix E.

2.4 Soil Thermal Resistivity Testing

Bulk soil samples were collected at four locations by Barr personnel for thermal resistivity testing (Figure 6 and Table 1) during the geotechnical investigation. Bulk samples were obtained from a depth of approximately 3 to 5 feet below the surface and placed in sealed 5-gallon buckets. The samples were transported to Soil Engineering Testing, Inc. (SET) of Richfield, Minnesota. SET performed the thermal resistivity tests in August and September of 2014.

The results of the soil thermal resistivity testing are discussed in Section 3.8 and included in Appendix F.

2.5 Field Reconnaissance

In addition to a review of available maps and published data, a Barr geotechnical engineer performed site reconnaissance of the overall project site area for potential geotechnical and geological concerns in August of 2014. The site reconnaissance was focused primarily on surficial features such as slope stability, the presence of cobbles, boulders, or bedrock outcrops, and any low areas or drainage channels that may have the potential to flood or scour. This work was performed based on the project boundary provided to Barr (Rev2 dated 8-5-2014).

The project site can generally be characterized as broad with a gradual downward slope to the southeast towards the Mojave River. Site vegetation generally consists of small scrub brush scattered loosely across the land with little or no topsoil. Vegetation was absent from the project area north of Community Boulevard. The surficial soils in this area, as well as the area west of Markham Road, were observed to be mixed or covered with manure for fertilizing purposes. However, there were no indications that any of the project area is actively used for agricultural purposes at this time. Much of the site appears to have been used for agricultural purposes in the past, based on general site observations and the presence of irrigation infrastructure such as piping and water retention ponds. The two water retention/irrigation ponds at the

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project site were dry at the time of this investigation. An underground pipeline (PG&E) runs east-west through the southern portion of the site, approximately parallel to the Mojave River.

Much of the surficial soils in the upper 6 inches at the site consist of silty sand and poorly-graded sand with silt in a relatively loose condition. Only minor amounts of gravel and occasional small cobbles were observed at the ground surface across the project site.

Overall, the field review identified the presence of loose surficial silty sand across the project, and potential flooding in areas adjacent to the Mojave River as features of concern.

General site photographs taken during the field reconnaissance and geotechnical investigation are provided in Appendix G.

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3.0 Results

Section 2.0 described the field investigation procedures. Section 3.0 presents data from the investigation and provides further analysis of these results.

3.1 Soil Lithology

The results of the previous investigation (Appendix A) and the test pits and laboratory testing from this investigation (Appendix B and Appendix C) were compiled to obtain an understanding of the lithology of the study areas.

3.1.1 Typical Stratigraphy

The existing conditions, as determined from field data, consist of generally sandy soils, with varying amounts of gravel, silt, and clay. The sand encountered at the project site was most commonly classified as clean sand to silty sand. Occasional layers of lean clay, silt, and gravelly sand were also observed. The presence of small cobbles was noted in a few of the test pits. The soils encountered can be considered consistent with alluvial deposits.

Based on the results of the investigation, much of the soils across the site exhibit weak cementation. Soil samples obtained from the test pits were commonly observed to react weakly with acid, indicating the presence of carbonate minerals within the soil matrix.

3.1.1.1 Topsoil

Topsoil at the site consists primarily of fine to medium grained silty sand and, due to the lack of moisture associated with soil horizon development, its thickness is governed by the depth of the primary root system as there is not a distinct variation in soil type between the topsoil and underlying soil. Due to the sparseness of vegetation in the area, topsoil can generally be considered not present over much of the site. Where observed, the root zone varied from approximately 1 to 4 inches.

Topsoil in the form of imported fill (manure) was observed in the area of the site north of Community Boulevard the area west of Markham Road. The thickness of the mixture of fill and sand typically ranged from 2 to 5 inches, but may be thicker in localized areas.

3.1.1.2 Alluvium/Sand

The formation of alluvial fans includes the rapid loss of energy as water leaves a steep canyon with a saturated sediment load resulting in a poorly sorted deposit of clay- to boulder-sized particles. Gravels and cobbles are commonly suspended in the clay/silt/sand matrix as a result of the poor sorting associated with this quick deposition of the alluvium.

The sand encountered at the project site was most commonly classified as silty sand (SM) and poorly graded sand with silt (SP-SM) in accordance with the Unified Soil Classification System (USCS). Some

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of the sand encountered was classified as silty to clayey sand (SC-SM), clayey sand (SC) and poorly graded sand (SP). Based the results of the investigation and an understanding of the geology, the sands can often be considered fine to medium grained and poorly graded, with varying portions of coarse sand. The sand particle shape can generally be considered sub-angular. A majority of the sand encountered contained none or trace amounts of gravel.

Occasional layers with coarser materials such as gravel and small cobbles mixed with the sands were encountered at various depths during the investigation. The gravel and cobbles were generally sub-rounded and particle sizes observed varied from small gravel (passing No. 4 sieve) to approximately 2.5 inches in diameter.

3.1.1.3 Silt

Layers of silt were encountered within test pits TP-04 and TP-07. The silt was classified as silt with sand and sandy silt (ML). The thickness of these layers ranged from approximately 3 to 3.5 feet. Given the alluvial fan geology of the project site, lenses and laminations of silt are likely present at various depths.

3.1.1.4 Clay

Layers of clay are generally not present or are very limited in alluvial fan soils. Clay layers, classified as lean clay with sand and sandy lean clay, were encountered across the project site. The clays were encountered at depths 6.5 feet or greater below existing grade within test pits TP-04, TP-09, and TP-11. The thickness of these layers ranged from 1 to 2.7 feet. Thin lenses and laminations of clay were also observed at a few other test locations throughout the site.

3.2 Groundwater Conditions

Groundwater was not observed in the test pit excavations completed during the geotechnical investigation. Based upon these observations and the regional groundwater information summarized in Section 1.2, no special design or construction considerations associated with groundwater and buoyancy are anticipated for the project.

3.3 General Laboratory Testing

3.3.1 Moisture Content Testing

A total of 26 moisture content tests were carried out on soil samples collected from the test pit excavations. The soils tested largely consisted of silty sand and poorly graded sand with silt, with some poorly graded sand, clayey sand, silt, and lean clay. The sandy soils had moisture contents ranging from approximately 1 to 6 percent, with an average moisture content of 3 percent. Two silt samples tested had moisture contents between 6 and 7 percent, and three clay samples tested had moisture contents between 8 and 29 percent. Moisture content test results are summarized in Table 3 and included in Appendix D.

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3.3.2 Unit Weight

A total of 12 dry density tests were run on collected from the test pit excavations. Samples were collected by using 6-inch by 2.5-inch diameter brass liners hand driven from within the excavations. As such, these samples are not considered undisturbed, but test results on these samples provide an approximate estimate of the in-situ density of the sands present at the site. The soils tested included silty sand, clayey sand, poorly graded sand with silt and silt. The dry density of the sand samples obtained ranged from approximately 81 pounds per cubic foot (pcf) to 106 pcf, with an average of 91 pcf. One silt sample tested indicated a dry density of 80 pcf. Dry density test results are summarized in Table 3 and included in Appendix D.

3.3.3 Grain Size Analysis

Grain size analyses (hydrometer and/or sieve analyses) were performed on 21 selected soil samples from the soil borings. Based on the results of the grain size analyses, the samples were classified as poorly graded sand (SP), poorly graded sand with silt (SP-SM), silty sand (SM), silt (ML), and lean clay (CL). The percent fines (percent by weight passing the number 200 sieve) of the sands tested ranged from approximately 1 to 45 percent in the samples tested, while the percent gravel (percent by weight retained on the number 4 sieve) ranged from approximately 0 to 20 percent. The percent fines of the silt samples tested ranged from approximately 65 to 81 percent with no gravel present (no particles retained on the number 4 sieve). The percent fines of the clay samples tested ranged from approximately 67 to 86 percent with no gravel present (no particles retained on the number 4 sieve).

The results of the hydrometer testing indicated the clay-size fraction of the granular soils (sands and silts) at the site ranged from approximately 1 to 16 percent. Gradation test results are partially summarized in Table 3 and included in Appendix D.

3.3.4 Atterberg Limits

Atterberg limits testing was performed on samples of clay encountered in the investigation to evaluate the classification and behavior of the clays. A total of three Atterberg limits tests were conducted, with test results indicating the clay soils at the site have liquid limits ranging from 34 percent to 46 percent and plastic limits ranging from 16 to 25 percent. This results in plasticity indices varying between 13 and 24 percent, classifying the materials mainly as lean clay (CL) in accordance with the Unified Soil Classification System (USCS).

3.4 Shear Strength

3.4.1 Friction Angle

The results of the investigation indicate primarily granular soils. The shear strength of these soils was measured using the direct shear test on two remolded samples. One sample of sandy silt (ML) and one sample of poorly graded sand with silt (SP-SM) were remolded to the same density indicated from the unit weight testing (Section 3.3.2). The results of the direct shear testing indicate a friction angle of 28.5 degrees for the silt and 34 degrees for the sand.

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These results tend to be lower than the friction angles correlated from the CPT data in the preliminary investigation (Appendix A). Direct shear test results are summarized in Table 3 and included in Appendix D.

3.4.2 Undrained Shear Strength

Clay soils were encountered in limited layers at some tested locations (Section 3.1.2.2). The undrained shear strength of the clay soils at this site was calculated based on CPT data from the preliminary investigation. For the undrained shear strength analysis from CPT data, an empirical cone factor (N_{kt}) of 16 was used based upon previous experience at sites with similar geologic conditions. Based on this analysis (Appendix A) the undrained shear strength of the minor clay layers ranged from approximately 1,400 pounds per square foot (psf) to over 5,000 psf, with an average of approximately 3,000 psf.

3.5 Soil Chemical Content Testing

Chemical tests were performed on four soil samples, taken from test pits to provide spatial coverage across the project site. The results of the chemical testing indicate that the soils have a pH ranging from 7.9 to 8.0. The soils contain from 15 to 160 mg/kg chloride (dry weight), and from less than 50 to 110 mg/kg sulfate (dry weight). Chemical test results are included in Appendix D and summarized in Table 4.

3.6 Standard Proctor Density Testing

Standard Proctor tests were performed on samples collected at the test pit locations in conjunction with the thermal resistivity testing and subgrade testing. A total of six tests were performed and the results are summarized in Table 5. Maximum dry density testing on recompacted native soils ranged from approximately 98 to 110 pcf, with an average of 105 pcf. Corresponding optimum moisture contents ranged from 13 to 19 percent with an average of approximately 15 percent. Standard Proctor test results are included in Appendix D.

3.7 California Bearing Ratio Testing

Design for roads and general working areas is based in part on the strength of the subgrade that can be reasonably achieved. California Bearing Ratio (CBR) tests were completed on soil samples collected from the selected locations across the site to determine the field strength of the subgrade.

Two samples of the shallow subgrade soils were collected from the project site. The bulk samples were collected from soil immediately below the existing topsoil or primary roots, which typically corresponded to a depth of approximately 3 inches below the surface. The soil samples were prepared to approximate three densities: 90, 95, and 98 percent of the maximum standard Proctor density at the optimum moisture content. The results of the CBR testing are presented in Table 6.

Results from the testing conducted on the subgrade samples indicate that CBR values at 0.1 inch under a surcharge of 50 psf range from 5.1 to 11.6 percent, when compacted to 95 percent of the standard Proctor density at optimum moisture. CBR values for samples tested at 90 percent of standard Proctor density at

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optimum moisture ranged from 2.6 to 3.7 percent, while those tested at 98 percent of standard Proctor density ranged from 11.5 to 14.2 percent.

Based on these results, a CBR value of 11.5 percent is recommended for road design in Section 4, provided the exposed subgrade soils are compacted to a minimum of 98 percent of the standard Proctor maximum dry density.

3.8 Field Electrical Resistivity Testing

Field electrical resistivity testing was completed at four locations selected by EDF (Table 1) and discussed in Section 2.3.

Apparent resistivity (ρ_a) was calculated for each measurement and corresponding electrode spacing (a) using the resistance measurement (Ω) and the geometric factor (K) as follows:

$$\rho_a = K\left(V/I\right)$$

where:

$$K = 2\pi a$$

The apparent resistivity measurements for the entire site ranged from approximately 26,200 to 766,000 ohm centimeters (Ωcm). The average apparent resistivity for the entire data set was approximately 101,300 Ωcm. The average electrical resistivity, on a per test location basis, for electrode spacing from 5 to 40 feet ranged from 45,600 to 204,800 Ωcm. Soil resistivity variations are likely associated with degree of saturation in the near surface soils. Higher moisture contents and higher clay contents generally reduce the electrical resistivity of a soil.

The results of the soil electrical resistivity field testing are included in Appendix E.

3.9 Laboratory Electrical Resistivity Testing

Laboratory resistivity testing in addition to the field testing (Section 3.7) was completed to assist in evaluation of soil corrosivity at the site. Laboratory resistivity testing was performed on one bulk soil samples, taken from test pits to provide spatial coverage across the site. The resistivity measurement at approximate in-situ moisture content was greater than 50,000 ohm-centimeters (Ω-cm). The sample was also tested in a saturated condition. The resistivity measurement under saturated soil conditions was 4,625 Ω-cm. Laboratory electrical resistivity results are summarized in Table 7 and included in Appendix D.

3.10 Laboratory Thermal Resistivity Testing

Laboratory thermal resistivity testing was completed on samples collected at four locations selected by EDF (Table 1) and discussed in Section 2.4.

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SET completed the testing in accordance with ASTM method D5334 "Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure." Laboratory tests included measurement of the soil's in-situ moisture content, standard Proctor density and optimum moisture content and thermal dryout characteristics, which is a function of moisture content. All of the bulk samples collected were re-compacted to a density equivalent to approximately 85 percent and 90 percent of standard Proctor density at their as-received moisture contents for testing. The soil specimens were compacted in four layers in test molds (75 mm diameter by 150 mm high) to minimize contact resistance at the soil/probe interface and to provide for a uniform density.

The resistivity measurements at the in-situ moisture contents ranged from 84 degrees Celsius-centimeters per Watt (°C-cm/W) to 103 °C-cm/W when re-compacted to 85 percent of standard Proctor density. The resistivity measurements under fully dried soil conditions ranged from 259 to 105 °C-cm/W when re-compacted to 85 percent of standard Proctor density. The resistivity measurements at the in-situ moisture contents ranged from 73 to 88 °C-cm/W when re-compacted to 90 percent of standard Proctor density. The resistivity measurements under fully dried soil conditions ranged from 199 to 333 °C-cm/W when re-compacted to 90 percent of standard Proctor density.

Laboratory thermal resistivity results are included in Appendix F.

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4.0 Road Section Recommendations

Results of the field and laboratory investigation have been presented in Section 3. Based on these results, Section 4 provides analysis, conclusions and recommendations for the design and construction of site access roads.

For roads, the primary factors addressed include road base thickness and subgrade preparation.

4.1 Surface Preparation

Site preparation for roadways should be initiated by removing all surface vegetation, root zones, organic topsoil (if present), and loose, soft or otherwise unsuitable materials. Based upon information collected during the field investigation, the topsoil thickness/root zone at the site is generally less than 6 inches, if present. Actual stripping depths will likely vary and should be evaluated by a geotechnical engineer at the time of construction. Organic soils removed during site stripping should be graded into existing site topography. Soils stripped from the roadway surface should be placed so as to not impede the flow of existing drainage swales and intermittent steams while simultaneously keeping the depressed roadways from becoming preferred drainage paths. Incorporation of organic soils in compacted fill sections is not recommended.

4.2 Subgrade Preparation

After stripping or excavating to rough grade is complete, the exposed subsurface along the entire roadway should be compacted with a minimum of one pass of a smooth drum roller. Vibratory versions of these compactors may be used.

After completion of the first subgrade compaction pass, but prior to placement and compaction of granular fill, the entire roadway length should be proof-rolled. Proof- rolling should be performed with a fully loaded tandem axle dump truck having a minimum gross weight of 25 tons. Proof-rolling should be performed in the presence of a geotechnical engineer or person under direct supervision of this engineer. Typical standards for proof-rolling should include no rutting greater than 1 to 1 ½ inch, and no "pumping" of the soil behind the wheels. Proof-rolling is not an indication that the subgrade strength is adequate or that it meets design requirements, but simply highlights potentially unsuitable subgrade conditions.

Areas which fail proof-rolling tests should be sub-cut and replaced with suitable fill. Alternatives for subgrade stabilization include the following:

- **Crushed Stone** – The use of crushed stone could be used to improve subgrade stability. Typically, sub-cut depths in this locale range from ½-foot to 1½ feet below finished subgrade elevation. The use of high modulus geotextiles (i.e., engineering fabric or geogrid) could also be considered after underground work such as utility construction is completed. The maximum particle size of crushed

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rock placed over geotextile fabric or geogrid should be selected in accordance with the manufacturer's directions. Equipment should not be operated directly on top of the fabric or geogrid, except in accordance with manufacturer's directions.

- **Scarification and Re-compaction** – It may be feasible to scarify, dry, and re-compact the exposed soils. The success of this procedure would depend primarily upon favorable weather and sufficient time to dry the soils. Even with adequate time and weather, however, stable subgrades may not be achievable if the thickness of the soft soil is greater than 1 to 1 ½ feet.

- **Chemical Stabilization** – The use of cement could also be considered and should be further evaluated if it is considered for stabilization.

Placed fill for subgrade stabilization shall be compacted with a sheepsfoot or pad-foot compactor for cohesive material and a smooth drum roller for granular and gravel fill material. The number of passes required will vary depending upon the equipment used, fill material type, and moisture condition of the fill.

Imported fill material may consist of sand, silty sand, clayey sand, or more granular material. Most on-site materials are suitable as roadway fill materials.

All compaction of the road subgrade, including the initial pass, shall be performed so as to meet or exceed 95 percent of the standard Proctor maximum dry density (ASTM D698). It is recommended that compaction testing be performed by an independent contractor hired by the owner on the order of one test per 2,500 square feet of fill per lift.

The roadway surfaces should be crowned or sloped to prevent water ponding on or around the roadway surfaces. The roadway crowns and slopes should have a 2 percent slope to promote drainage. Drainage ditches may be incorporated into the roadway section design to protect again erosion, as surface water flows can be high during periods of significant rainfall. Culverts should be used where needed to allow drainage underneath the roadways and to prevent ponding either over or on the side of the roadways.

If rain occurs during roadway construction, the subgrade should be allowed to dry prior to continuing work.

4.3 Road Base Design Considerations

The design thickness of placed granular fill is determined using CBR values. Based on the results presented in Section 3.10, a design CBR value of 5.2 percent is recommended for road section design at a subgrade compaction value of 95 percent of the standard Proctor maximum dry density. A CBR value of 11.5 percent is recommended for road section design at a subgrade compaction value of 98 percent of the standard Proctor maximum dry density.

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4.3.1 Road Section Design

The compacted surface thickness required to support the design loads was determined utilizing the Giroud-Han iterative equation (J.P. Giroud and Jie Han, 2004):

$$h = \frac{0.868 + \left(0.661 - 1.006J^2\right)\left(\frac{r}{h}\right)^{1.5} \log N}{\left[1 + 0.204\left(\frac{3.48CBR_{bc}^{0.3}}{CBR_{sg}} - 1\right)\right]} \left(\sqrt{\frac{\frac{P}{\pi r^2}}{\frac{s}{f_s}\left[1 - 0.9e^{-\left\{\frac{r}{h}\right\}^2}\right] N_c f_c CBR_{sg}}} - 1\right) r$$

where:

h = recommended thickness (meters)

J = aperture stability modulus (m-N/degree)

P = wheel load = axle load/2

r = radius of tire print

N = number of axle passes

CBR_{sg} = Subgrade CBR

CBR_{bc} = Aggregate Base CBR

f_s = rut depth factor = 75 mm

s = maximum rut depth

N_c = bearing capacity factor (3.14 for unreinforced roads, 5.14 for geotextile reinforced roads, and 5.71 for geogrid reinforced roads)

f_c = factor relating CBR of subgrade to equivalent c_u value = 30

For subgrades compacted to a minimum of 95 percent of the material's standard Proctor maximum dry density, a roadway base aggregate thickness of 6 inches is recommended.

Alternatively, based on the analysis completed for road section design, the on-site soils are considered suitable for use as the road base without the addition of surficial gravel or aggregate for most site roads. The exposed road surface comprised of on-site soils should be compacted to a minimum of 98 percent of the material's standard Proctor maximum dry density. It should be noted that additional roadway maintenance may be required is on-site soils are used for roadway surfacing.

Following construction of the project, it is recommended that roads be re-graded to reestablish the road surface. Due to the potential for roadways to be washed out during large storm events, ongoing maintenance consisting primarily of localized re-grading may be required during the operations and maintenance period.

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5.0 Geotechnical Recommendations

Results of the preliminary geotechnical investigation have been presented in Section 3. Based on these results, Section 4 provides preliminary analysis, conclusions and recommendations for the design and construction of foundations, as well as general construction considerations.

5.1 General Excavation and Fill

The following sub-sections present general recommendations for site clearing, grading, and compaction for the project site.

5.1.1 Clearing and Grubbing

The project site is predominantly undeveloped arid land and clearing and grubbing will generally be restricted to the removal of small brush and the primary root zone. Based on the results of the field investigation, topsoil is generally not present and vegetation is sparse with root zone thickness on the order of approximately 1 to 4 inches.

Existing organic fill material (manure) was observed in the area of the site north of Community Boulevard the area west of Markham Road. The thickness of the mixture of fill and sand typically ranged from 2 to 5 inches, but may be thicker in localized areas. Removal limits may be adjusted accordingly during clearing.

Any topsoil or organic material should not be used for structural fill and shall be placed separately to avoid contamination with other excavated soils. This material could be used in grading non-structural fill such as fields or service areas in which compressibility of the material does not have an impact on structures.

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5.1.2 Site Grading

Results of the preliminary geotechnical investigation indicate that cut and fill of the subsoil in the area can be achieved with conventional machinery.

5.1.3 Sloping in Excavations

In general, the soils across the site can be classified as Type B and C from OSHA soil classifications (29 CFR 1926 Subpart P-Excavations). It is the responsibility of the competent field personnel to verify the in-situ soil classification at each excavation and that the benching or slopes are adequate during construction.

5.1.4 General Excavation, Backfill, and Compaction for Foundations

Following excavation, the exposed base should be inspected by the construction phase geotechnical engineer of record or authorized representative. If the excavation base surface is found to contain groundwater or is deemed unsuitable for construction in the opinion of the construction phase

geotechnical engineer of record or authorized representative, the conditions shall be noted and communicated to the foundation designer for appropriate foundation modifications.

Any soil placed as engineered fill should be an approved material classified as SM, SC, SP-SM, or more granular. It should be free of organic matter or debris, rocks greater than 3 inches in diameter, and have a Liquid Limit and Plasticity Index less than 45 and 20, respectively. High plasticity silt or clay (MH, CH) soils should not be used as structural fill within 4 feet of footings or within 2 feet of slab or pavement subgrades. Fill should be placed in lifts not exceeding 8 inches in loose thickness or one third the diameter of the roller, whichever is less, and moisture conditioned to within ±3 percent of the optimum moisture content. It is recommended that each lift be compacted to a minimum of 95 percent of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor Method. In areas where the depth of the fill is 5 to 10 feet, the fill should be compacted to 98 percent of the maximum standard Proctor dry density for the entire height of the fill. Fills placed in excess of 10 feet will require further evaluation at the time of the final geotechnical investigation. The backfill surface should be graded such that water is directed away from the foundations to prevent moisture infiltration (¼" per foot). Backfill density should be checked in the field periodically (approximately one test per 2,500 square feet per lift) to confirm adequate compaction.

5.2 Seismicity Considerations

As mentioned previously, the project site is located in a highly active seismic area with multiple faults located nearby (Figure 3).

Seismic design parameters for the general project site were determined based on the ASCE 7-10 Standard, which uses the 2008 USGS seismic hazard data. Based on the results of the investigation, the site conditions can be generally classified as Seismic Site Class D. For an earthquake return period of approximately 2,500 years (equivalent to a probability of exceedance of 2 percent in 50 years), the peak ground acceleration (PGA) is 0.552g for the general project site. These parameters are preliminary in nature, and they should be further evaluated through additional investigation by the geotechnical engineer and reviewed by the foundation designer during the final design phase of the project. A summary of seismic design parameters is provided in Table 8.

5.3 Liquefaction Potential

Liquefaction of a soil due to seismic loading often occurs in saturated sands and silts when the increase in shear-induced pore-water pressure due to seismic loading decreases the effective stress within the soil, resulting in a temporary loss of shear strength. There is an absence of saturated conditions at this site and the potential for liquefaction of soils supporting the proposed structures is very low.

5.4 Shrink-Swell Potential

Soils considered to have shrink-swell potential generally consist of plastic clays subject to changes in moisture content. The results of the investigation indicate the soils encountered on site are primarily granular and do not have appreciable shrink-swell potential. While clay soils were encountered at the site,

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these soils were only observed at depths of 6.5 feet or greater below existing grade. The depth of these clays will likely inhibit large changes in moisture content sufficient for large changes in volume associated with shrink-swell. Furthermore, the overburden pressure at these depths is sufficient to resist some swell pressure.

5.5 Potential for Soil Collapse

As noted previously in the geology section of this report, the project site is located at the toe of an alluvial fan in a region of arid climate. In arid climates, it is common for flash floods to mobilize coarse unsorted sediments in debris flows, relatively low moisture-high solids mixes that move very quickly due to the slope of the terrain. These debris flows come to rest and dry out quickly. If there is a binder of plastic clays, these debris flow deposits can retain a soil matrix that has the potential to be collapsible. Soil collapse is generally triggered by two factors: increased moisture levels and the application of load.

While soils commonly known to be collapsible, such as loess, can be tested in the laboratory to determine collapse potential, it is not typically possible to follow this approach on alluvial fan soils. Due to the general composition of alluvial fan soils, collection of undisturbed samples is not feasible utilizing a drill rig. While undisturbed bulk samples can be collected in shallow test pits, the corresponding results do not provide an indication of the collapse potential of deeper soil layers not accessible to the reach of a backhoe. Therefore, laboratory testing to determine the collapse potential of alluvial fan soils is not typically performed.

As a result, other means of evaluation of collapse potential in alluvial soils are typically performed. The results of this investigation and the preliminary investigation (Appendix A) indicate the sands are in a medium dense to dense condition. In general, sands with relative densities in excess of 65 percent (medium dense to dense) have a very low potential for soil collapse.

While the proposed solar development will not introduce increased moisture to the general project area, periodic flooding or periods of heavy rainfall may be a source of increased moisture. With the occasional potential for increased moisture levels in the soil, the relative density values estimated at the site, there is low potential for soil collapse. Should pile foundations be used for support of the solar modules, installation methods including driving, vibration, and spinning will likely break down any adhesion in the soil surrounding the pile which will further reduce the any potential for collapse. Additionally, the proposed solar structures impose a relatively minor load on the soils and any movement will likely be inconsequential. Therefore, no special means of mitigation of soil collapse are recommended for the project based on the data collected as part of this preliminary geotechnical investigation.

5.6 Slope Stability

The results of the investigation indicate generally dense sand soils. Slope stability in the area of the proposed solar array locations is not considered a significant risk based on the subsurface conditions encountered, the general topography and low relief at the site, and the lack of evidence for existing slope instability.

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5.7 Recommended Geotechnical Parameters

Geotechnical parameters recommended for design, based on the results of the geotechnical investigation, are summarized in Table 9 and discussed in the following sections.

5.7.1 In-Situ Dry Unit Weight

Based on the results of the sampling and laboratory testing, a dry unit weight of 90 pcf is recommended for soils in the upper 5 feet of the ground surface, and a dry unit weight of 100 pcf is recommended for soils at depths greater than 5 feet below ground surface.

5.7.2 Shear Strength

Based on the results of the CPT soundings from the preliminary investigation, and laboratory testing completed on samples obtained from the test pits, the recommended drained shear strength design value for the sandy soils (for use in foundation design) is 32 degrees. The recommended undrained shear strength for the clay soils at the site is 2,000 psf.

5.8 Design Recommendations

In Barr's experience, solar modules for utility scale arrays are typically supported on pile foundations. Discussion of various foundation systems for design of the solar arrays, based on the results of the geotechnical investigation, is provided in the following sections.

5.8.1 Driven Piles

The results of the test pit excavations completed for this investigation, and the CPT soundings from the preliminary investigation, indicate that shallow driven piling is a feasible foundation system to be considered. Special considerations for driven pile systems at this project site include:

- Driving refusal on cobbles, boulders, and/or dense gravel layers.
    - In cases of shallow refusal during pile installation, remedial options to be considered include removal and/or extraction of the obstruction and replacement with compacted engineered fill and then re-driving the pile.
    - Pre-drilling through obstructing layers is another option to be considered for pile installation.
- Evaluation of the suitability and constructability of various pile type/configurations should be performed by the foundation engineer taking into account the subsurface conditions described in this report.

5.8.2 Shallow Foundations

The results of the investigations indicate that a shallow footing is a feasible foundation system to be considered. Special considerations for shallow foundations at this project site include:

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- Cobbles and/or boulders at the foundation subgrade.
    - Subgrade elevation and conditions should be uniform across the foundation footprint. In cases of cobbles and boulders present at the subgrade surface, remediation options to be considered include removal and/or extraction of the obstruction and replacement with compacted engineered fill.

5.8.3 Other Foundation System Options

Other foundation types that can be considered based on the results of the investigation include:

- Augercast Piles
    - Augercast piles are a deep foundation system that is cast-in-place using a hollow-stem auger drilled to design depth.
    - Augercast piles may not be economically feasible in ground containing cobbles and boulders due to lack of penetration with the auger. These conditions can be overcome with the use of micropiles.
- Micropiles
    - Micropiles are high-capacity drilled and grouted small diameter piles (typically 5 to 12 inches in diameter).
    - Micropiles can be drilled through a wide range of materials and obstructions.

5.8.4 Other Foundation Design Considerations

Of primary concern for deep foundations is the presence of very dense, strongly cemented, and/or coarser soil layers, and cobbles and boulders which could result in lack of penetration at shallow depths. The CPT soundings performed in the previous investigation indicated that the prevalence of denser/coarser materials appears to increase with depth across the project site. Due to the nature of alluvial fans, the presence of coarser materials such as gravel and cobbles is expected to vary widely.

Potential obstructions or encountered within the test pits in this investigation include:

- Small to large gravel within the sand from 8.5 feet to the termination depth of test pit TP-12. Laboratory testing indicated approximately 20 percent gravel by weight.
- Gravel and a few small cobbles within the sand from 6 to 8.5 feet in TP-09.
- Occasional small cobbles within the sand from 4 to 6 feet in Therm-02.

In summary, the results of the investigation indicate that some gravel and small cobbles are present within the upper 10 feet but limited layers across portions of the site. The potential for widespread refusal on large cobbles or boulders, and/or dense gravel layers in the upper 10 feet is low.

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Additionally, based on the results of the investigation much of the soils across the site exhibit weak cementation and should be taken into account when selecting appropriate deep foundation installation equipment and methods.

For driven piling, it is recommended that the foundation designer and/or contractor evaluate the results of the geotechnical investigations with respect to pile drivability and energy required.

5.8.5 Frost Depth

The approximate extreme frost penetration depth for this project location is approximately 5 inches (NAVFAC, 1986).

5.8.6 Bearing Capacity – Shallow Foundations

The ultimate bearing capacity of the soil supporting a spread footing can be determined using the Terzaghi-Meyerhoff equation as follows:

$$q_{ult} = \tfrac{1}{2}\gamma B N_\gamma + q N_q + s_u N_c \qquad \text{(Das, 2007)}$$

For foundations supported by primarily granular soils, the third term of the bearing capacity equation drops off, as the cohesion for these types of soils is typically taken as zero. The first and second terms remain, along with an additional term to calculate the net ultimate bearing capacity, resulting in the following equation:

$$q_{ult(net)} = \tfrac{1}{2}\gamma B N_\gamma + q N_q - q$$

where:

γ = soil unit weight

B = foundation width

q = effective stress at the foundation bearing depth

N_γ = bearing capacity factor = $2(N_q - 1)\tan\phi$ (Das, 2007)

N_q = bearing capacity factor = $\tan^2\left(45 + \phi/2\right)e^{\pi\tan\phi}$ (Das, 2007)

Calculation of the bearing capacity is a function of the soil shear strength and the foundation dimensions, so final estimates of the bearing capacity cannot be completed at this time. However, for an example foundation sized 3 feet square and bearing at least 2 feet below the ground surface, a net allowable bearing capacity of 2,800 psf is recommended for design purposes (using a factor of safety of 3).

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5.8.7 Load Capacity – Pile Foundations

If a pile foundation system is used for support of the solar modules, the pile will develop capacity through a combination of end bearing and skin friction. Lateral capacity is also taken into consideration in the design. The following sections describe recommendations for the design of pile foundation systems.

5.8.7.1 Axial Capacity

The axial capacity of pile foundation systems is based on the contribution of the skin friction and the end bearing that the soil provides. The design values established in Section 5.7 of this report are recommended for use in design of pile foundation systems.

Calculation of the end bearing in granular soils (sands) should be performed through the use of the following equation:

$$q_{p(all)} = \frac{A_p q'(N_q - 1) F_{qs} F_{qd}}{FS}$$ (Das, 2007)

where:

A_p = base area of pile

q' = vertical effective stress

N_q = bearing capacity factor = $\tan^2\left(45 + \phi'/2\right) e^{\pi \tan \phi'}$ (Das, 2007)

F_{qs} = shape factor = $1 + \tan \phi'$ (Das, 2007)

F_{qd} = depth factor = $1 + 2\tan\phi'(1 - \sin\phi')^2 \tan^{-1}\left(L/d\right)$ (Das, 2007)

ϕ' = soil friction angle

FS = factor of safety = 3.

As an example, for an assumed pile diameter of 6 inches extending to a depth of 15 feet below the ground surface, the calculated allowable end bearing is approximately 5 kips assuming a plug forms at the end of the pile.

Calculation of the skin friction in granular soils (sands) should be performed through the use of the following equation.

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$$q_{s(all)} = \frac{\pi d(1-\sin\phi')\int_0^{L_i}\sigma'_o \tan\delta' dz}{FS}$$ (Das, 2007)

where:

d = pile diameter

σ_o' = vertical effective stress

ϕ' = soil friction angle

δ' = soil-pile interface friction angle= ϕ'/2 (assuming driven pile conditions)

L_i = soil layer thickness

FS = factor of safety = 3

As an example, for an assumed pile diameter of 6 inches extending to a depth of 15 feet below the ground surface, the calculated allowable capacity from skin friction is approximately 0.8 kips, assuming δ = 0.5ϕ', which is generally accepted for driven pile installations.

The above values are provided as examples only in the absence of specific design information. For the final design phase, the structural engineer or foundation designer should compute the axial capacity of piles as a function of both skin friction and end bearing, in combination with an appropriate factor of safety. The design values established in Section 5.7 of this report are recommended for use in preliminary design.

5.8.7.2 Lateral Capacity

Based on the results of the geotechnical investigation, the following values of the lateral modulus of subgrade reaction are recommended for design of pile foundations under lateral loads (in addition to the values presented in Section 5.7):

$$k = n_h z$$ (Das, 2007)

where:

n_h = coefficient = 10 lb/in^3 for 1 ft < z < 5 ft

n_h = coefficient = 18 lb/in^3 for 5 ft < z < 10 ft

n_h = coefficient = 25 lb/in^3 for 10 ft < z < 20 ft

z = depth

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If saturated conditions are analyzed for foundation design, the recommended values should be reduced by 1/3.

5.9 Sliding Friction

The friction coefficient between the silty sand soil of the site and construction materials should be taken as 0.54 for steel foundations and 0.76 for concrete foundations (Potyandy, 1961).

5.10 Soil Stiffness

Based on the shear wave velocities measured in the preliminary investigation (Appendix A), a value of 780 ft/s is recommended for preliminary design purposes. Based on an average in situ soil moist unit weight of approximately 95 pcf, the small strain shear modulus G_{max} is approximately 1,750 ksf for the soil. For foundation design, the structural engineer will need to reduce the shear modulus based upon the level of strain imparted to the soil by the foundation.

5.11 Dewatering and Erosion Control

Based on results presented in Section 3, shallow groundwater was not observed at depths of at least 30 feet below the ground surface. It is anticipated that excavations will remain open for only short periods of time; therefore special provisions for erosion control of the excavation slopes are not anticipated. Measures should be taken to prevent runoff from depositing sediment in the excavations in the case of rain. Erosion of the roadways should be anticipated where they cross existing swales or act as preferred drainage paths; ongoing maintenance will be required following most rain events and appropriate equipment should be available onsite or nearby on a permanent basis throughout operation of the facility. The surficial soils across much of the project site are in a relatively loose condition, and in their current state are easily disturbed, allowing for greater potential for wind erosion.

Long term erosion control measures for the project site largely consist of revegetation for all areas of the project site where it can be performed following construction. Revegetation will help control erosion from both wind and water. In areas where revegetation is not possible, some wind erosion of the very fine soil may occur but will generally be limited to an inconsequential amount of soil immediately at the ground surface. Wind erosion of large sand and gravel particles is not anticipated. Control of water erosion will generally consist of the design of erosion control structures, berms, diversion devices, and other drainage control measures to limit drainage to confined zones away from the solar structures. The design of specific erosion control structures should be performed by a civil engineer that specializes in this practice.

5.12 Flooding and Scour

As noted previously in the geology section, the project site is adjacent to Mojave River, an active desert drainage system. This river system is susceptible to flash flooding during periods of intense rainfall.

FEMA flood zone maps (Figure 5) designate the area immediately south of the project area as Zone AE. The Zone AE designation if used for high risk areas considered to have a 1% chance of annual flooding. Base flood Elevations in the FEMA Zone AE near the project site are reported to range from elevation

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2161 feet (NAVD88) southeast of the site to 2,175 feet southwest of the site. USGS mapping and site reconnaissance indicates that levees or berms are present along the Mojave River near the site; however, the condition of this levee system is unknown. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design.

5.13 Cement Type

Based on the results of soil chemical testing presented in Section 3.5 and Table 4, the soils are not corrosive and Type I or Type II cement is suitable for use (ACI, 2008). The foundation engineer of record has final responsibility for selection of the appropriate cement mixture based on the results provided in this report.

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6.0 Limitations of Analysis

The analyses and conclusions provided are based on the results of fieldwork which focused on investigation of a limited number of test locations across the project site. Using generally accepted engineering methods and practices, the investigation performed has made every reasonable effort to characterize the investigated locations and provide general conclusions of the project area based on the data available. However, the likelihood that conditions may vary from any specific location tested is possible, and careful attention to soil conditions should still be undertaken during the time of construction by qualified personnel.

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Tables

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Table 1
Final Geotechnical Investigation Summary

Location ID	Description	Geographic Coordinates NAD 83		Approx. Surface Elevation	Test Pit	Resistivity Testing
		Longitude	Latitude			
TP-01	Test Pit (10')	34.90522	-117.11098	2179.2	X	
TP-02	Test Pit (10')	34.90528	-117.10818	2177.1	X	
TP-03	Test Pit (10')	34.90299	-117.09763	2168.2	X	
TP-04	Test Pit (10')	34.90255	-117.10948	2176.7	X	
TP-05	Test Pit (10')	34.90377	-117.10685	2174.8	X	
TP-06	Test Pit (10')	34.90381	-117.10440	2173.4	X	
TP-07	Test Pit (10')	34.90556	-117.10298	2172.3	X	
TP-08	Test Pit (10')	34.90239	-117.10210	2170.2	X	
TP-09	Test Pit (10')	34.90586	-117.09743	2168.5	X	
TP-10	Test Pit (10')	34.90350	-117.09536	2166.2	X	
TP-11	Test Pit (10')	34.90839	-117.09719	2167.7	X	
TP-12	Test Pit (10')	34.90988	-117.09943	2168.8	X	
Switch	Test Pit (5')	34.90659	-117.10397	2173.2	X	X
Therm-01	Test Pit (5')	34.90381	-117.10544	2175.0	X	X
Therm-02	Test Pit (5')	34.90885	-117.09834	2168.8	X	X
Therm-03	Test Pit (5')	34.90465	-117.09665	2167.3	X	X

*Orthometrically derived elevations from CORS (provided by EDF)

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Table 2
Summary of Geologic and Geotechnical Site Hazards

Hazard	Present at Site?	Comment
High groundwater	No	The CA Dept of Water Resources website indicates groundwater is at least 25 feet below ground surface.
Flooding	Yes	FEMA flood zone maps (Figure 5) indicate the area immediately to the south of the project is classified as Zone 'AE'. The Zone 'AE' designation is used for high risk areas that are considered to have a 1% chance of annual flooding.
Scour	Unlikely	The site is on an alluvial fan, which is generally a depositional environment. However, some scour may occur along channels and/or the Mojave River.
Wind erosion	Possibly	USDA/NRCS mapping indicates that the site soils across some portions of the project site have low erosion potential (Figure 4 and Section 4.11). However, site soils consisting of poorly-graded sands with silt may be susceptible to wind erosion
Slope failure	No	The project site has low-relief topography.
Subsidence – Pumping	No	The project site is not an area of oil and gas development. No concerns regarding pumping subsidence are known.
Subsidence – Mining	No	The site is underlain by a thick sequence of alluvial soil.
Subsidence - Caves/Karst	No	No known caves or karst geology exist in the project area.
Earthquake/Seismicity	Yes	The site is in a very seismically active area, adjacent to the Lenwood-Lockhart fault, and near many other active faults (Figure 3).
Earthquakes – Ground Rupture	Unlikely	There are mapped active faults at the site. However, the fault traces do not intercept the site (Figure 3).
Earthquakes - Liquefaction	No	The soils at the site are unsaturated and not susceptible to liquefaction.
Swelling/shrinking soil	No	Swelling soils are not known or likely to be present at the site.
Corrosive soil	No	Granular soils with low salinity, low clay content and low moisture indicate corrosive soils are unlikely to be present.
Made ground	Yes	While no major developments are currently within the boundary of the existing project site, the site is surrounded by existing developments of various type (residential, agricultural, etc.). The surficial soils at some areas of the site are mixed with manure for fertilizer, with several fill or stockpiles present in the northwest corner of the site. A dry irrigation pond was also noted on the west portion of the site. Much of the site appears to have at one time been irrigated for orchard and other agricultural purposes.
Collapsible soil	Possibly	The project site is located on an alluvial fan in a region of arid climate. Alluvial fan soils are potentially collapsible. See Section 4.5.
Volcanic action	No	No current volcanic action exists in the region.
Quick clay	No	No quick clay conditions are suspected based on site geology.

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Table 3
Summary of General Laboratory Testing

Test Location ID	Depth [ft]	USCS Classification	Moisture Content [%]	In-situ Dry Unit Weight [pcf]	Bulk Unit Weight [pcf]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	Percent Retained on #4 Sieve [%]	Percent Passing #200 Sieve [%]	Friction Angle from Direct Shear Test [°]
TP-01	3.5-4	SM/ SP-SM	1.9	94.5	96.3				0.2	14.5	
TP-01	8-9	SP/ SP-SM	1.1						0.0	4.6	
TP-02	3-3.5	SM	1.0	105.8	106.9						
TP-03	3-3.5	SM	4.9	89.5	93.9				0.0	34.9	
TP-03	7.5-8.0	SM	6.1						0.0	26.5	
TP-04	4-4.5	ML	6.2	79.7	84.6				0.0	65.3	28.5
TP-04	6-7	SM	3.1						0.0	30.8	
TP-04	7.5-8	SP-SM	4.8						0.0	10.8	
TP-04	9.5-10	CL	18.6			39.4	15.6	23.8	0.0	67.3	
TP-05	3-3.5	SM	2.9	81.3	83.7						
TP-05	9-9.5	SP	1.6						0.0	3.5	
TP-06	3.7-4.2	SM	3.3	86.9	89.8				0.0	16.0	
TP-07	3.5-4	SM	2.1	94.8	96.8						
TP-07	6-7	ML	6.9						0.0	80.8	
TP-08	3.5-4	SP-SM	1.9	93.3	95.1				0.0	8.4	34.1
TP-08	8-9	SP	1.6						0.0	3.6	
TP-09	3-3.5	SC-SM	4.9	86.5	90.7				0.0	44.8	
TP-09	8.5-9	CL	29.2			45.6	25.0	20.6	0.0	86.4	
TP-10	3.2-3.7	SC-SM	2.7	85.3	87.6				0.4	22.9	
TP-10	8-8.5	SP	2.6						0.0	3.0	
TP-11	3.5-4	SC	1.9	88.1	89.8						
TP-11	7-8	CL	8.2			33.8	20.3	13.5			
TP-12	3.5-4	SP/ SP-SM	1.9	89.5	91.2				0.0	4.4	
TP-12	9.0-10	SP	1.3						19.7	0.7	
Therm-01	3.0-5.0	SP-SM	1.1						0.7	9.1	
Therm-03	3.0-5.0	SC-SM	2.1						0.1	23.1	
Total Number of Tests			26	12	12	3	3	3	21	21	2
Mean			4.8	89.6	92.2	39.6	20.3	19.3	1.0	26.7	31.3
Standard Deviation			6.2	7.0	6.3	5.9	4.7	5.3	4.3	26.9	4.0
Minimum			1.0	79.7	83.7	33.8	15.6	13.5	0.0	0.7	28.5
Maximum			29.2	105.8	106.9	45.6	25.0	23.8	19.7	86.4	34.1

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Table 4
Summary of Chemical Test Results

Test Location ID	Depth [ft]	pH	Chloride [mg/kg]	Sulfate [mg/kg]
Therm-01	3.0-5.0	8.0	43	65
Therm-02	3.0-5.0	7.9	160	110
Therm-03	3.0-5.0	8.0	96	<50
Switch	3.0-5.0	8.0	15	<50
Mean		8.0	79	65
Standard Deviation		0.0	64	26
Minimum		7.9	15	< 50
Maximum		8.0	160	110

*Note that some of the test results were below the detection limit.
Detection limit for chlorides = 10 mg/kg, sulfates = 50 mg/kg.

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Table 5
Summary of Standard Proctor Density Test Results

Test Location ID	Depth [ft]	USCS	Maximum Dry Density [pcf]	Optimum Moisture Content [%]
Switch	3-5	SM	97.9	19.0
Therm-01	3-5	SP-SM	107.7	14.2
Therm-02	3-5	SM	109.4	12.8
Therm-03	3-5	SM	109.8	14.2
TP-01	0.2-1.2	SM	101.2	16.0
TP-03	0.2-1.2	SM	102.1	16.1
Mean			104.7	15.4
Standard Deviation			4.9	2.2
Minimum			97.9	12.8
Maximum			109.8	19.0

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Table 6
Summary of California Bearing Ratio Test Results

Test Location ID	Depth [ft]	USCS	CBR Value		
			90% Compaction	95% Compaction	98% Compaction
			Optimum Moisture Content	Optimum Moisture Content	Optimum Moisture Content
TP-01	0.2-1.2	SP-SM	2.6	5.2	11.5
TP-03	0.2-1.2	SP-SM	3.7	11.6	14.2
Mean			3.2	8.4	12.9
Standard Deviation			0.8	4.5	1.9
Minimum			2.6	5.2	11.5
Maximum			3.7	11.6	14.2

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Table 7
Summary of Laboratory Resistivity Test Results

Test Location ID (v1. 07/01/2013)	Depth [ft]	Resistivity in-situ moisture content	Resistivity saturated moisture content
		[ohm-cm]	[ohm-cm]
Switch	3.0-5.0	>50,000	4,625

Soil Resistivity [ohm-cm]	Corrosivity Rating
>20,000	Essentially non-corrosive
10,000 to 20,000	Mildly corrosive
5,000 to 10,000	Moderately corrosive
3,000 to 5,000	Corrosive
1,000 to 3,000	Highly corrosive
<1000	Extremely corrosive

*Corrosivity scale from *Corrosion Basics: An Introduction* (Roberge, 2006)

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Table 8
Summary of Seismic Design Parameters (ASCE 7-10)

Parameter	Design Value	Equation	Reference
Project Location	San Bernardino County, CA		
Latitude	34.90326°		Provided coordinates
Longitude	-117.10256°		
Seismic Site Classification	D		ASCE Table 20.3-1
0.2 sec Spectral Response, S_s	1.358		USGS
1 sec Spectral Response, S_1	0.526		USGS
Acceleration-Based Seismic Coefficient, F_a	1.0		ASCE Table 11.4-1
Velocity-Based Seismic Coefficient, F_v	1.5		ASCE Table 11.4-2
Seismic Coefficient, S_{MS}	1.358	F_aS_S	ASCE Equation 11.4-1
Seismic Coefficient, S_{M1}	0.789	F_vS_1	ASCE Equation 11.4-2
Seismic Coefficient, S_{DS}	0.905	$(2/3)S_{MS}$	ASCE Equation 11.4-3
Seismic Coefficient, S_{D1}	0.526	$(2/3)S_{M1}$	ASCE Equation 11.4-4
Spectral Response Acceleration Curve			
S_a (Periods < T_0)		$S_{DS}[0.4+0.6(T/T_0)]$	ASCE Equation 11.4-5
T_0	0.116	$0.2(S_{D1}/S_{DS})$	ASCE Equation 11.4-7
T_S	0.581	S_{D1}/S_{DS}	ASCE Equation 11.4-7
S_a (T_S < Periods ≤ T_L)		S_{D1}/T	ASCE Equation 11.4-5
S_a (Periods > T_L)		$S_{D1}T_L/T^2$	ASCE Equation 11.4-5
T_L	8 sec		ASCE Figure 22-12
Peak Ground Acceleration, PGA_M	0.552g	$F_{PGA}PGA$	ASCE Figure 22-7

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Table 9
Summary of Geotechnical Parameters for Final Design

Parameter	Value	Units
In Situ Dry Density [0 - 5 ft]	90	lb/ft^3
In Situ Dry Density [>5 ft]	100	lb/ft^3
Undrained Shear Strength (clays)	2,000	lb/ft^2
Friction Angle (sands)	32	degrees
Modulus of Subgrade Reaction, *k* [0 - 5 ft]	0 - 600	lb/in^2
Modulus of Subgrade Reaction, *k* [5 - 10 ft]	600 - 2,200	lb/in^2
Modulus of Subgrade Reaction, *k* [10 - 20 ft]	2,200 - 4,800	lb/in^2
Minimum Average Shear Wave Velocity	780	ft/s
Minimum Design Small Strain Shear Modulus	1,750	$kips/ft^2$
Poisson Ratio	0.25	
Frost Depth	5	inches

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Figures

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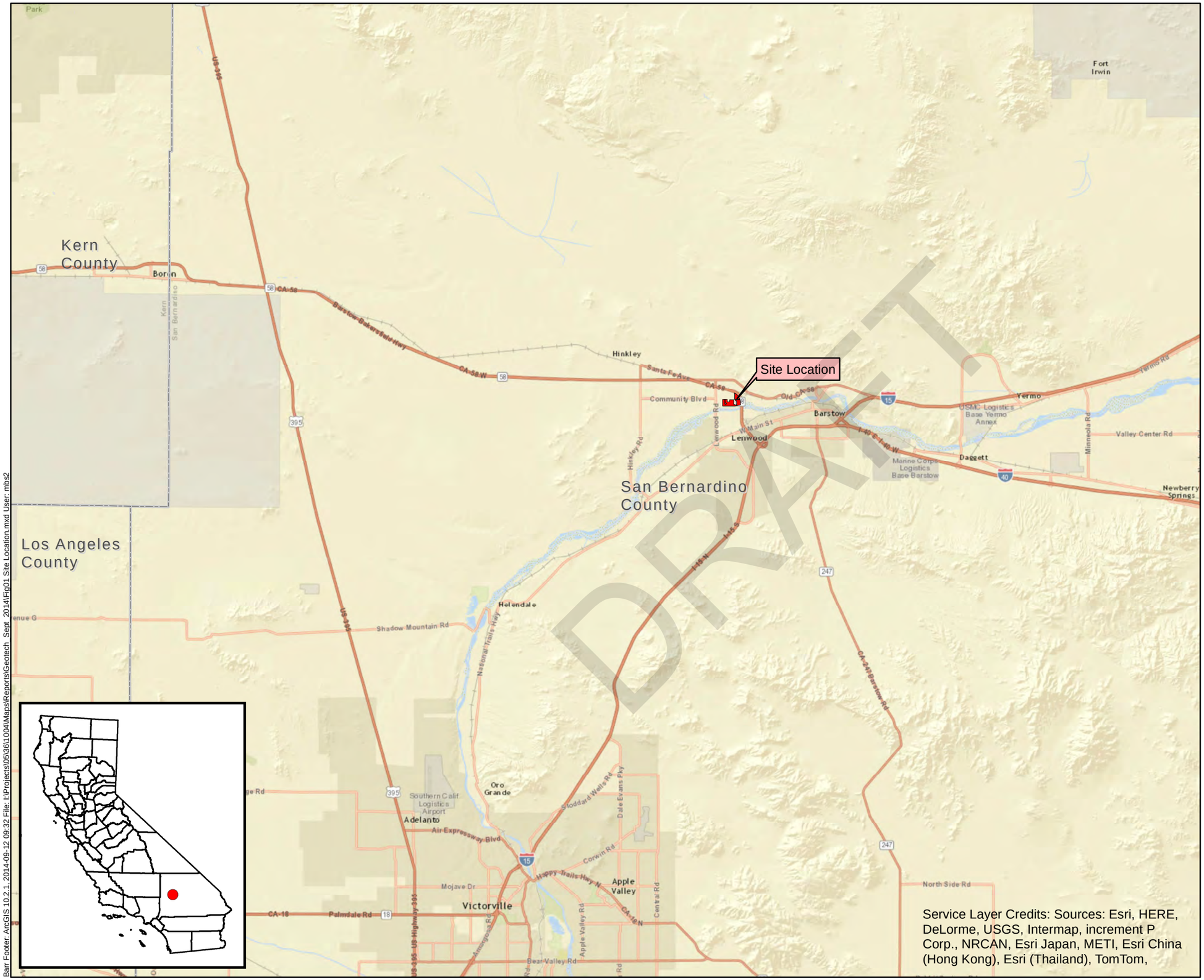


Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom,

Approximate Lease Area Boundary

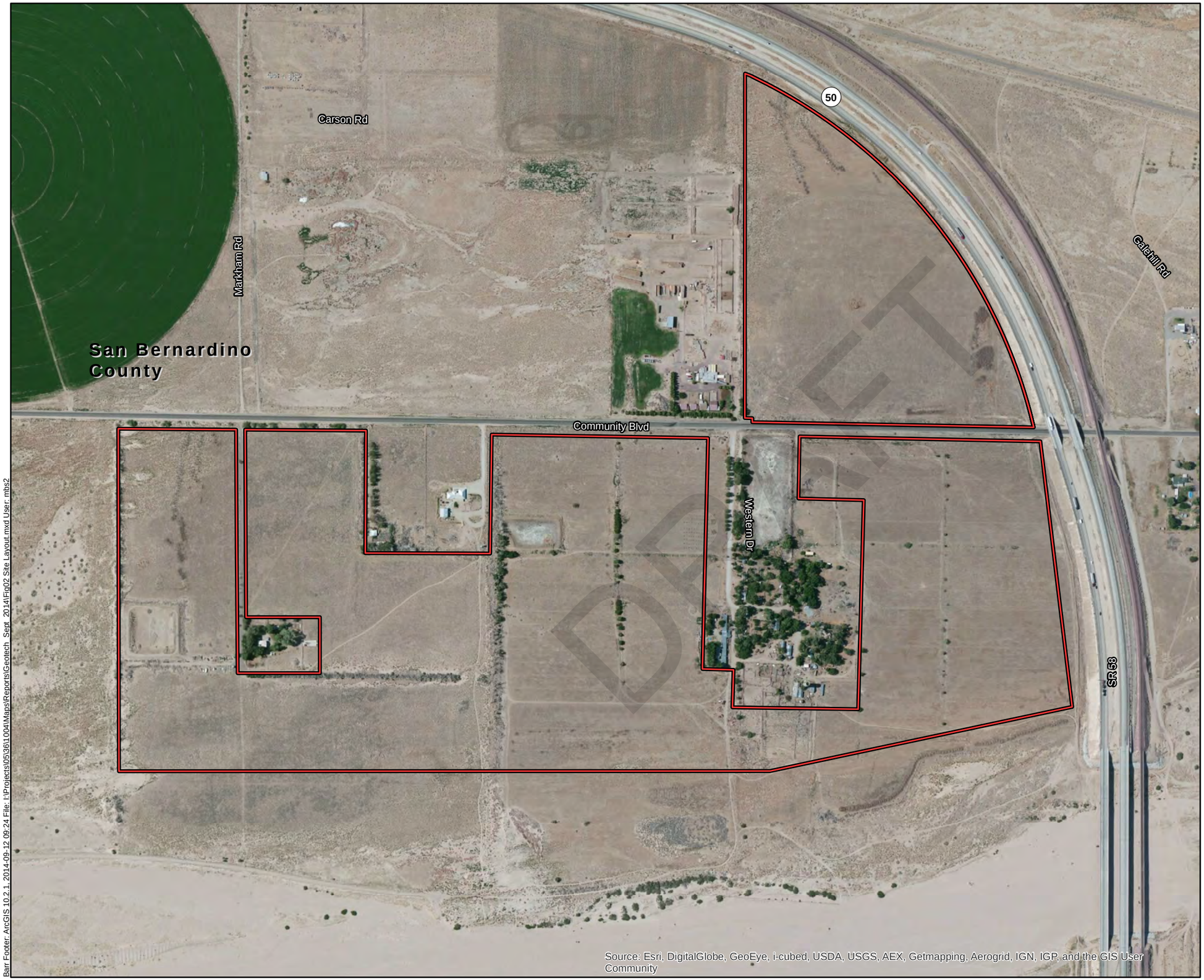
Miles
5 0 5

Kilometers
8 0 8

Figure 1

SITE LOCATION
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 09:32 File: I:\Projects\05\36\1004\Maps\Reports\Geotech Sept 2014\Fig01 Site Location.mxd User: mbs2



Approximate Lease Area Boundary

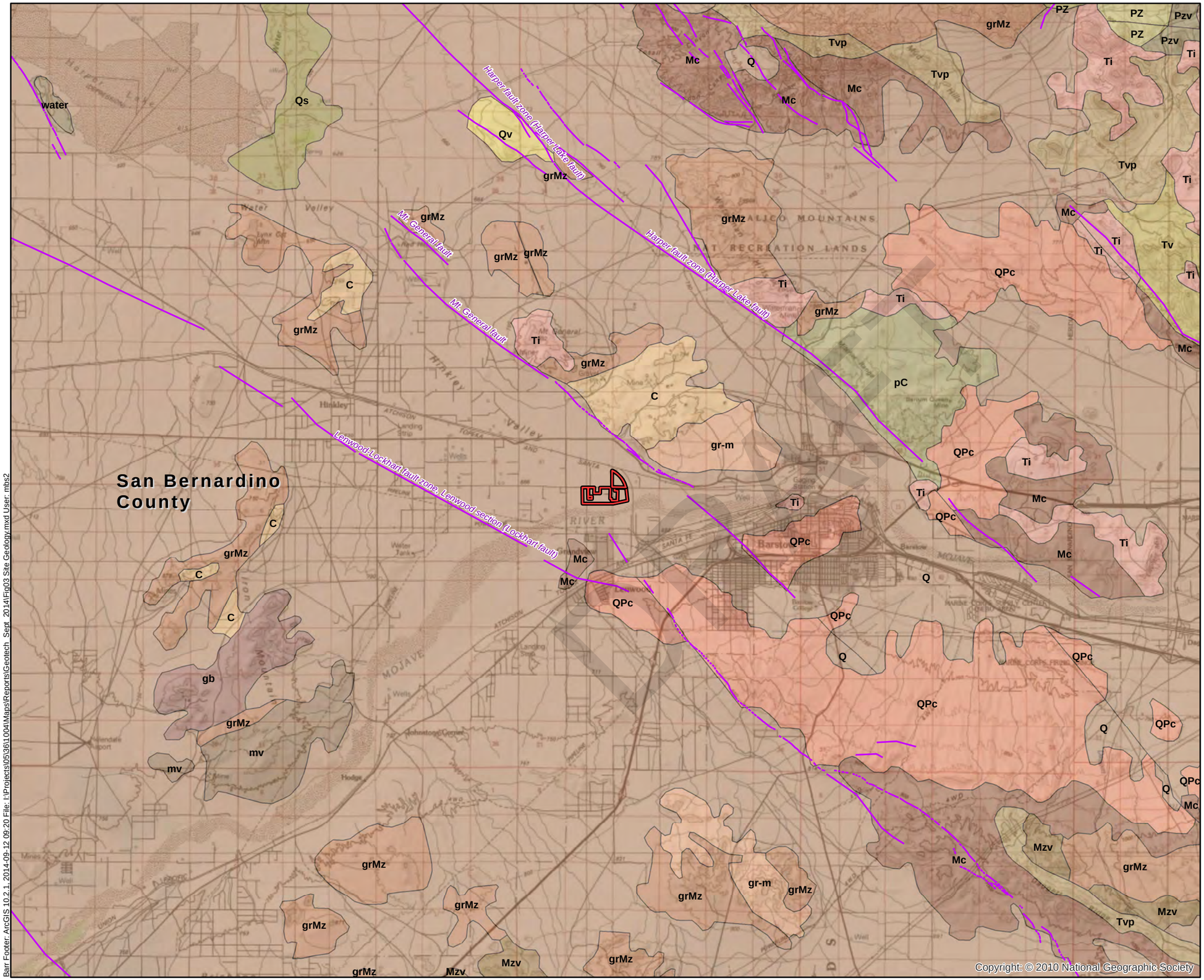
Feet
500 0 500

Meters
150 0 150

Figure 2

SITE LAYOUT
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 09:24 File: I:\Projects\05\36\11004\Maps\Reports\Geotech Sept 2014\Fig02 Site Layout.mxd User: mbs2



Quarternary Faults

Geology

- Q--Quaternary alluvium and marine deposits
- Qv--Quaternary volcanic flow rocks
- Qs--Quaternary sand deposits
- QPc--loosely consolidated deposits
- C--Carboniferous marine rocks
- Mc--Miocene nonmarine rocks
- Mzv--Mesozoic volcanic rocks
- Pz--Paleozoic marine rocks, undivided
- Pzv--Paleozoic metavolcanic rocks
- Ti--Tertiary intrusive rocks
- Tv--Tertiary volcanic flow rocks
- Tvp--Pyroclastic and volcanic mudflow deposits
- gb--Mesozoic gabbroic rocks
- gr-m--granitic and metamorphic rocks undivided
- grMz--Mesozoic granitic rocks
- mv--Undivided pre-Cenozoic metavolcanic rocks
- pC--Precambrian rocks, undivided
- water--water
- Approximate Lease Area Boundary

Miles

2 0 2

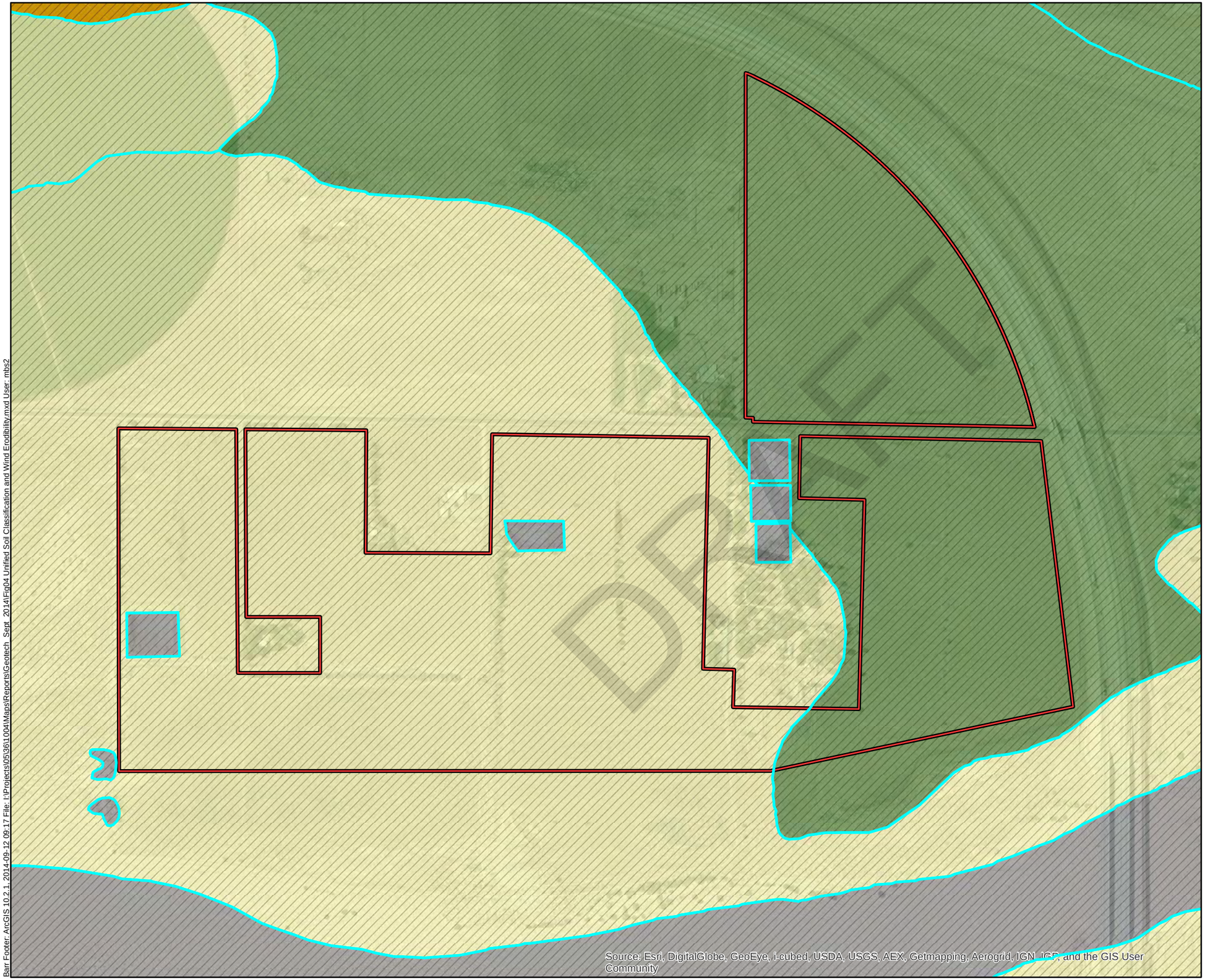
Kilometers

3 0 3

Figure 3

SITE GEOLOGY
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 09:20 File: I:\Projects\05\36\1004\Maps\Reports\Geotech Sept. 2014\Fig03 Site Geology.mxd User: mbs2



Soil Wind Erodibility Index
- 0 - 100 tons/year
- 100 - 200 tons/year
- 200 - 300 tons/year
- Unrated

Unified Soil Classifications
- Not Rated
- Approximate Lease Area Boundary

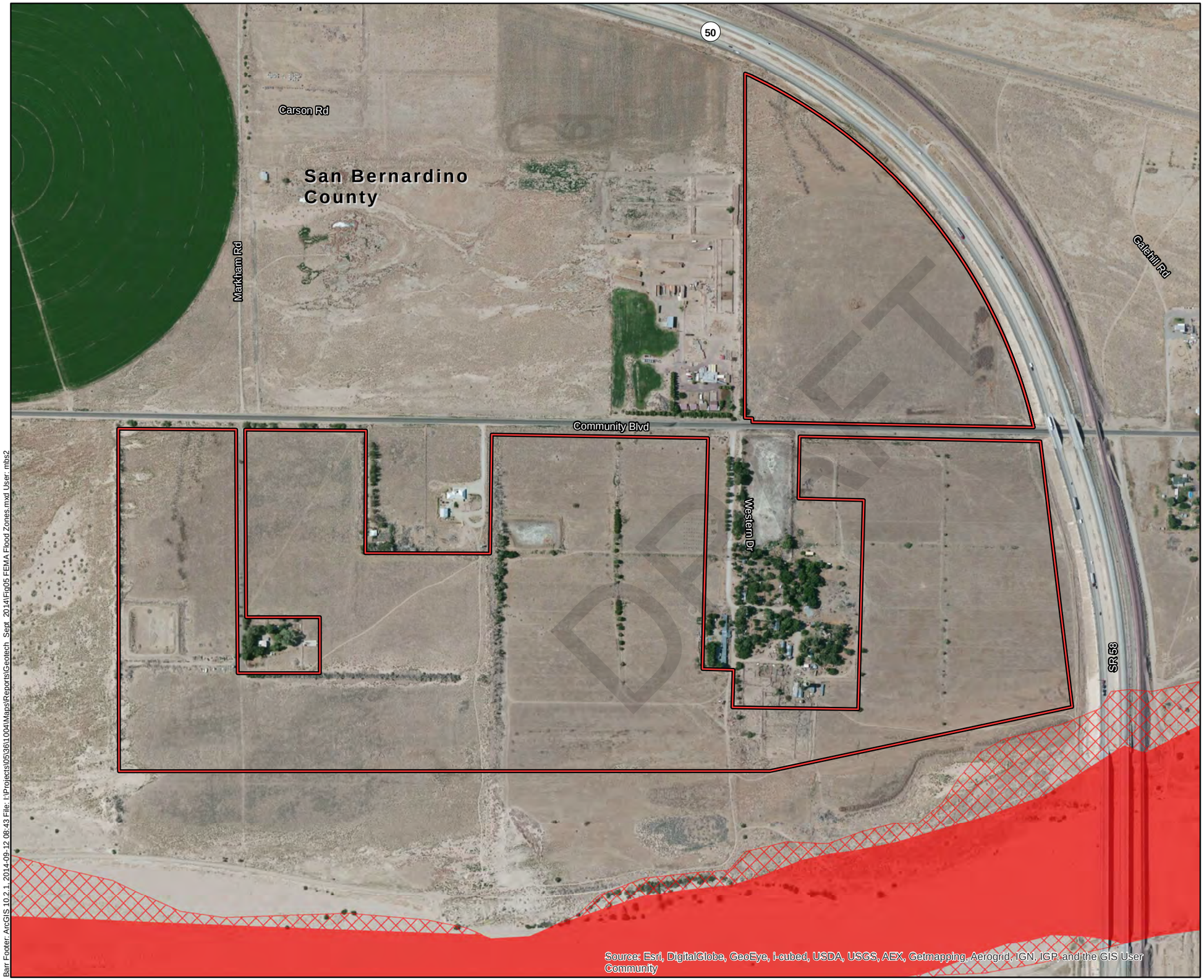
Feet
500 0 500

Meters
150 0 150

Figure 4

UNIFIED SOIL CLASSIFICATION
AND WIND ERODIBILITY INDEX
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 09:17 File: I:\Projects\05\36\1004\Maps\Reports\Geotech_Sept_2014\Fig04 Unified Soil Classification and Wind Erodibility.mxd User: mbs2



FEMA Flood Hazard Zone 'AE'

FEMA Floodway

Approximate Lease Area Boundary

Flood hazard zone AE: The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.

Floodway: the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without causing any cumulative increase in the watersurface elevation.The floodway is intended to carry the dangerous and fast-moving water.

N

Feet

500 0 500

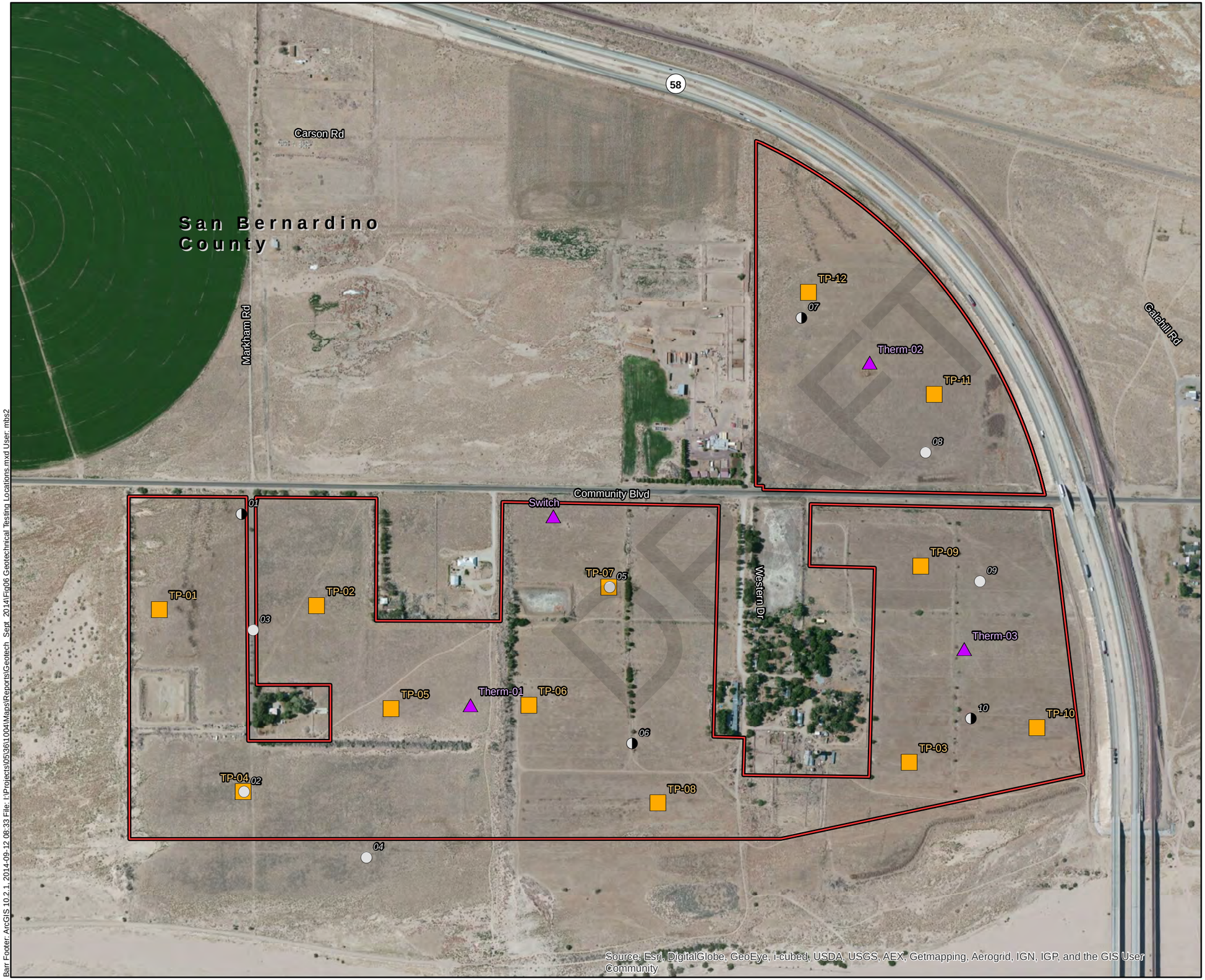
Meters

150 0 150

Figure 5

FEMA FLOOD ZONES
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 08:43 File: I:\Projects\05\36\1004\Maps\Reports\Geotech Sept 2014\Fig05 FEMA Flood Zones.mxd User: mbs2



Final Geotech Locations

- Thermal Resistivity Sample Location
- Test Pit Location

Preliminary Geotech Locations

- CPT and Seismic Location
- CPT Location
- Approximate Lease Area Boundary

Feet
500 0 500

Meters
150 0 150

Figure 6

GEOTECHNICAL TESTING LOCATIONS
Longboat Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.2.1, 2014-09-12 08:33 File: I:\Projects\05\36\10\041\Maps\Reports\Geotech Sept 2014\Fig06 Geotechnical Testing Locations.mxd User: mbs2

Appendix A

Preliminary Geotechnical Report, Viking Solar Project

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Preliminary Geotechnical Engineering Report
Viking Solar Project

EDF Renewable Development, Inc.
San Bernardino County, California

Prepared for
EDF Renewable Development, Inc.

October 2013

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Preliminary Geotechnical Engineering Report
Viking Solar Project
EDF Renewable Development, Inc.
San Bernardino County, California

Prepared for
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Preliminary Geotechnical Engineering Report
Viking Solar Project
EDF Renewable Development, Inc.
San Bernardino County, California

October 2013

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Certification

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of California.

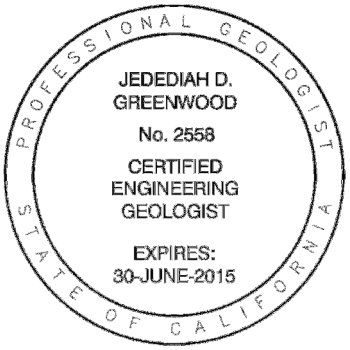
Chris Kopchynski

License No.: C 63328

Christopher A. Kopchynski, P.E.

Date: October 14, 2013

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly licensed Certified Engineering Geologist under the laws of the State of California.



Jedediah Greenwood

License No.: CEG 2558

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Executive Summary

Barr Engineering Company (Barr) under authorization and contract with EDF Renewable Development, Inc. (EDF) completed a preliminary geotechnical investigation of the proposed Viking Solar Project near Lenwood in San Bernardino County, California. The investigation was carried out to evaluate the geotechnical engineering characteristics of the proposed site, assess general construction considerations, and determine the most appropriate means of investigation for the final geotechnical investigation.

The geotechnical investigation consisted of cone penetration test (CPT) soundings with seismic testing. This program of preliminary geotechnical investigation was selected to develop preliminary design parameters of the soils at the project site, to provide a general assessment of construction considerations, and to evaluate suitability of various means of investigation for the final geotechnical investigation.

In general, the field investigation encountered generally sandy soils, with varying amounts of gravel, silt, and clay. The sand encountered at the project site was most commonly classified as clean sand to silty sand, with some layers of gravelly sand to sand, and occasional layers of sand and silt mixtures based on CPT soil behavior type. Based the results of the investigation and an understanding of the geology, the sands can often be considered poorly graded and have varying amounts of gravel. Occasional minor clay layers, typically several inches thick (based on soil behavior type from CPT), were observed at various depths in approximately half of the CPT soundings completed. Occasional layers of higher CPT tip resistance, well above average, were encountered in the soundings, generally at depths greater than 15 feet, which inferred the possible presence of denser and/or coarser materials such as cobbles, boulders or gravel layers. Such layers would be considered consistent with the geology of alluvial fans. In general, CPT tip resistances increased with depth.

The project site can generally be characterized as broad with a gradual downward slope to the southeast towards the Mojave River. Site vegetation generally consists of small scrub brush scattered loosely across the land with little or no topsoil. The surficial soils in the area north of Community Boulevard, as well as the area west of Markham Road, were observed to be mixed or covered with manure for fertilizing purposes. Vegetation in these areas was generally absent. Much of the surficial soils in the upper 6 inches at the site consist of silty sand and poorly-graded sand with silt and are likely wind-blown deposits or were previously disturbed. These materials are in a loose condition and they are easily disturbed by vehicle traffic.

The primary findings of the preliminary geotechnical exploration and analyses indicate:

- The soils at the site are predominantly comprised of sand. The sand was most commonly classified as clean sand to silty sand, with some layers of gravelly sand to sand, and occasional layers of sand and silt mixtures based on CPT soil behavior type classification. These soil behavior types indicate that the likely USCS classifications of the sands are predominantly poorly-graded sand with silt (SP-SM) and silty sand (SM), with some layers of poorly-graded sand (SP) and clayey sand (SC). Based

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the results of the investigation and an understanding of the geology, the sands can often be considered poorly graded and have varying amounts of gravel. CPT soundings were successfully performed to the target depth of 30 feet at eight of the ten locations tested. Refusal of the soundings occurred at the western portion of the site (CPT-01 and CPT-02), but at depths greater than 20 feet.

- Groundwater was not encountered during the investigation and is not anticipated to influence the foundation design.
- FEMA flood zone maps designate the southern extents of the project area as Zone AE. The Zone AE designation is used for high risk areas considered to have a 1% chance of annual flooding. Base flood elevations in the FEMA Zone AE near the project site are reported to range from Elevation 2,161 feet (NAVD88) near the southeast boundary of the site to 2,175 feet near the southwest boundary of the site. USGS mapping indicates that levees are present along a portion of the Mojave River near the site; however, the condition of this levee system is unknown. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design. In general, it is recommended that any solar array infrastructure be constructed outside of the FEMA Zone AE area.
- The project site is located in a highly active seismic area with multiple faults located nearby. Based on the results of the preliminary investigation, the site conditions can be generally classified as Seismic Site Class D. For a probability of exceedance of 2 percent in 50 years, the peak ground acceleration (PGA) is 0.552g for the general project site.
- Based on the results of the preliminary geotechnical investigation, both shallow foundations and pile foundation systems appear to be feasible for support of the solar arrays. The basis for this preliminary evaluation of foundation options, from a geotechnical standpoint, is derived from the CPT sounding results and the limited site reconnaissance. Of primary concern for deep foundations is the presence of very dense and/or coarser soil layers, and cobbles and boulders which could result in lack of penetration at shallow depths. CPT tip resistances generally increased with depth across the site, with substantially higher values observed below depths of approximately 15 feet. Due to the nature of alluvial fans, the presence of coarser materials such as gravel and cobbles is expected to vary widely. In general, only minor amounts of gravel and occasional small cobbles were observed at the ground surface across the project site. In summary, these preliminary findings indicate that there is a relatively low potential for cobbles, boulders, and/or dense gravel layers to be present at depths shallower than approximately 15 feet. However, isolated pockets of coarser materials may be present throughout the site. As such, the various foundation types and contingency options should be carefully considered.
- The recommended program for the final geotechnical investigation should consist of CPT soundings, with a limited number of soil borings utilizing hollow-stem auger to collect soil samples for laboratory testing and to evaluate certain areas of the site where the CPT encounters refusal.

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1.0 Introduction

The Viking Solar Project is a proposed 20-MW solar project consisting of a series of solar photovoltaic (PV) modules spread across approximately 250 acres. This report describes the investigation and testing performed, presents the results of this work, and provides geotechnical analyses and preliminary recommendations for structure foundations, as well as general construction considerations. This report addresses geologic and geotechnical risks and summarizes the preliminary geotechnical investigation completed at nine locations spread throughout the proposed development.

1.1 Site Location

The proposed Viking Solar Project is located in San Bernardino County, in south-central California, along the Barstow-Bakersfield Highway (Highway 58) approximately 2 miles north of Lenwood as shown in Figure 1. Figure 2 shows the general project layout as indicated by EDF in May 2013. The coordinates of the geotechnical field test locations are provided in Table 1. All geotechnical field work was completed within approximately 5 to 10 feet of the noted test locations.

Table 1. Geotechnical Investigation Summary

Location ID (v1. 05/30/2013)	UTM Zone 11N NAD 83 [m]		Geographic Coordinates NAD 83		CPT Testing ID	Seismic Testing	
	Easting	Northing	Latitude	Longitude		V_s	V_p
01	489995.0	3862693.0	34.906619	-117.109518	CPT-01	X	X
02	489999.0	3862241.0	34.902543	-117.109468	CPT-02		
03	490014.0	3862504.0	34.904915	-117.109307	CPT-03		
04	490198.0	3862134.0	34.901580	-117.107280	CPT-04		
05	490593.4	3862574.0	34.905552	-117.102966	CPT-05		
06	490629.9	3862319.7	34.903258	-117.102564	CPT-06	X	X
07	490905.3	3863012.0	34.909504	-117.099557	CPT-07	X	X
08	491106.9	3862792.8	34.907529	-117.097348	CPT-08		
09	491195.5	3862583.0	34.905638	-117.096375	CPT-09		
10	491180.6	3862359.6	34.903623	-117.096536	CPT-10	X	X

1.2 Site Geology

The Viking Solar Project site is in the western portion of the Mojave Desert, bordered by the Mojave River floodplain to the south and adjacent to the site, the Waterman Hills mountain range to the northeast, and other numerous small mountain ranges. These mountain ranges are a part of the Basin and Range Province, a series of narrow mountains and valleys with abrupt elevation changes. There are numerous active faults in the region, including the Lenwood-Lockhart fault zone (Figure 3).

The project site is adjacent to the Mojave River, an active desert drainage system. This river system is susceptible to flash flooding during periods of intense rainfall. Precipitation usually occurs in high-intensity, convective thunderstorms during the summer months. Typical of desert drainage systems, flash

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flooding occurs rapidly in the form of sheet wash at higher elevations and moves downslope into larger drainage systems, commonly forming large alluvial fans that extend out from the mountains into a dry lake bed. The alluvium in the fans likely consists of material derived from the weathering and erosion of the bedrock in the surrounding mountains, likely Jurassic-aged quartz monzonite/granite, and/or poorly sorted continental deposits of sandstone and conglomerate. Numerous hills and buttes in the area are expressions of the bedrock rising above the alluvial deposits, indicating its surface topography is very uneven. However, it is likely that the alluvial fan deposits are hundreds of feet thick below the site. The alluvial fan likely varies in age from Pleistocene to Holocene.

Alluvial fans are the accumulation of sediments washed off of rising mountain ranges. In cross section, they are wedge-shaped, thin near the mountains and thick in the valleys, where the fan deposits inter-finger with the valley deposits (typically aeolian sand dunes and dry lake deposits). Alluvial fans are composed largely of debris flow deposits, sheet flow deposits, and colluvium (loose weathered rock moved down-slope by gravity). The top of the alluvial fan is close to the source of sediment—the eroding mountains—so the sediment is coarse and angular. The sediments tend to get finer toward the bottom of the fan. The nature of the deposits also changes over time as the fan builds up higher on the mountain and further out into the valley, generally getting finer.

The State of California maintains a database of hydrologic data, some of which is available over the internet (CA Dept. of Water Resources) where water elevation data from select wells can be accessed. Several wells are near the project area. Several wells in the area indicate the groundwater surface is at least 25 feet below the ground surface.

The USDA/NRCS soil mapping indicates that the site soils are derived from granite alluvium and have a low potential for soil erosion (Figure 4). However, the site soils are mostly poorly-graded sands with silt and may be susceptible to wind erosion.

Mining in the region has included gold, boron, manganese, and sand/gravel. The past metal mining production has typically come from areas with bedrock exposure. These are typically located at higher elevations than the site. Mining should pose no risk to the project.

Table 1 is a summary of geologic and geotechnical hazards for the site. Of these, seismicity and flooding are the most significant:

- The Lenwood-Lockhart zone is an active fault zone that runs roughly northwest-southeast, and is located about 1.5 miles southwest of the project site. Other nearby active fault zones include the Gravel Hills – Harper fault zone, which is approximately 4.5 miles northeast of the site.

- The project site is located at the toe of an alluvial fan, and near an active river flood plain in a region of arid climate. In arid climates, it is common for flash floods to mobilize coarse unsorted sediments in debris flows, relatively low moisture-high solids mixes that move very quickly due to the slope of the terrain. These debris flows come to rest and dry out quickly. If there is a

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binding of plastic clays, these debris flow deposits can retain a collapsible fabric. The collapsibility is less than is typical for loess, but the alluvial fan deposits can be hundreds of feet thick so the aggregate collapse potential in extreme cases can be on the order of feet. Soil collapse is generally triggered by two things: increased moisture and applied load. The proposed solar development will not introduce increased moisture; however, periodic flooding or heavy precipitation events may be a source of increased moisture. The proposed solar structures impose a relatively minor load on the soils and any movement will likely be inconsequential.

- FEMA maps (Figure 5) note that there is potential for flooding on the southern portions of the project site. The FEMA Zone AE is classified as a high risk area. The formal definition:

  "Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown."

  Base flood Elevations in the FEMA Zone AE near the project site are reported to range from elevation 2161 feet (NAVD88) near the southeast boundary of the site to 2,175 feet near the southwest boundary of the site. These studies are conducted by or on behalf of FEMA as part of the National Flood Insurance Program, and the flooding areas are designated on Digital Flood Insurance Rate Maps (DFIRMs).

  The project site is generally flat with a gradual downward slope to the southeast towards the Mojave River. USGS mapping indicates that levees are present along a portion of the Mojave River near the site. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design.

Table 2. Summary of Geologic and Geotechnical Site Hazards

Hazard	Present at Site?	Comment
High groundwater	No	The CA Dept of Water Resources website indicates groundwater is at least 25 feet below ground surface.
Flooding	Yes	FEMA flood zone maps (Figure 5) indicate the southern area of the project is classified as Zone 'AE'. The Zone 'AE' designation is used for high risk areas that are considered to have a 1% chance of annual flooding.
Scour	Unlikely	The site is on an alluvial fan, which is generally a depositional environment. However, some scour may occur along channels and/or the Mojave River.
Wind erosion	Possibly	USDA/NRCS mapping indicates that the site soils across some portions of the project site have low erosion potential (Figure 4 and Section 4.11). However, site soils consisting of poorly-graded sands with silt may be susceptible to wind erosion.
Slope failure	No	The project site has low-relief topography.
Subsidence – Pumping	No	The project site is not an area of oil and gas development. No concerns regarding pumping subsidence are known.
Subsidence – Mining	No	The site is underlain by a thick sequence of alluvial soil.
Subsidence - Caves/Karst	No	No known caves or karst geology exist in the project area.
Earthquake/Seismicity	Yes	The site is in a very seismically active area, adjacent to the

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Hazard	Present at Site?	Comment
		Lenwood-Lockhart fault, and near many other active faults (Figure 3).
Earthquakes – Ground Rupture	Unlikely	There are mapped active faults at the site. However, the fault traces do not intercept the site (Figure 3).
Earthquakes - Liquefaction	No	The soils at the site are unsaturated and not susceptible to liquefaction.
Swelling/shrinking soil	No	Swelling soils are not known or likely to be present at the site.
Corrosive soil	No	Granular soils with low salinity, low clay content and low moisture indicate corrosive soils are unlikely to be present.
Made ground	Yes	While no major developments are currently within the boundary of the existing project site, the site is surrounded by existing developments of various type (residential, agricultural, etc.). The surficial soils at some areas of the site are mixed with manure for fertilizer, with several fill or stockpiles present in the northwest corner of the site. A dry irrigation pond was also noted on the west portion of the site. Much of the site appears to have at one time been irrigated for agricultural purposes.
Collapsible soil	Possibly	The project site is located on an alluvial fan in a region of arid climate. Alluvial fan soils are potentially collapsible. See Section 4.5.
Volcanic action	No	No current volcanic action exists in the region.
Quick clay	No	No quick clay conditions are suspected based on site geology.

1.3 Previous Investigation

No previous geotechnical investigations are known to have been completed at this project location.

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2.0 Geotechnical Investigation Methods

The preliminary geotechnical investigation for the Viking Solar Project consisted of cone penetration test (CPT) soundings with seismic testing. This in-situ testing program was selected to develop preliminary design parameters of the soils at the project site, to provide a general discussion of construction considerations, and to evaluate suitability of various means of investigation for the final geotechnical investigation. Soil sampling and laboratory testing was excluded from this preliminary investigation due to schedule constraints and at the request of EDF.

Figure 6 shows the plan location of all soundings and seismic wave velocity tests completed for the preliminary investigation. The preliminary geotechnical investigation was conducted in early June of 2013. A summary of the preliminary geotechnical test locations is included in Table 1.

Table 1. Geotechnical Investigation Summary

Location ID (v1. 05/30/2013)	UTM Zone 11N NAD 83 [m]		Geographic Coordinates NAD 83		CPT Testing ID	Seismic Testing	
	Easting	Northing	Latitude	Longitude		V_s	V_p
01	489995.0	3862693.0	34.906619	-117.109518	CPT-01	X	X
02	489999.0	3862241.0	34.902543	-117.109468	CPT-02		
03	490014.0	3862504.0	34.904915	-117.109307	CPT-03		
04	490198.0	3862134.0	34.901580	-117.107280	CPT-04		
05	490593.4	3862574.0	34.905552	-117.102966	CPT-05		
06	490629.9	3862319.7	34.903258	-117.102564	CPT-06	X	X
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09	491195.5	3862583.0	34.905638	-117.096375	CPT-09		
10	491180.6	3862359.6	34.903623	-117.096536	CPT-10	X	X

Prior to the start of field work, coordinates of the preliminary geotechnical investigation locations were selected by Barr and approved by EDF. During the field investigation, Barr moved the location of soundings CPT-01 through CPT-04 from their original planned locations due to access considerations from loose surficial soil conditions. These locations were generally shifted several hundred feet in order to be closer to existing roadways or trails, allowing for better accessibility with truck-mounted equipment. Actual test location coordinates are provided in Table 1. In general, the site investigation locations were selected to provide spatial coverage of the site. The test locations were staked in the field by EDF and coordinates were verified in the field by Barr personnel with a hand-held GPS unit prior to commencing the field work.

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2.1 Field Work

2.1.1 Cone Penetration Test Soundings

A total of ten CPT soundings were conducted as part of this preliminary geotechnical investigation (Figure 6). Each CPT sounding was completed to the target depth of 30 feet, with the exception of CPT-01 and CPT-02, where the sounding advancement was terminated at 24.2 and 22.4 feet due to refusal on a dense sand and gravel layers, respectively. The CPT sounding locations were selected to provide spatial coverage across the project site and were completed in early June of 2013. Logs of CPT soundings can be found in Appendix A.

The CPT soundings were performed by Kehoe Testing, Inc. (Kehoe) of Huntington Beach, California, under subcontract to Barr. The CPT testing was performed with a 30-ton truck-mounted rig with an enclosed work space. All work was performed in accordance with ASTM D-5778, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils". For the CPT test, a cylindrical cone is pushed vertically into the ground at a constant rate of penetration of 20 mm/sec. During penetration, measurements are made of the cone tip resistance (q_c), the side friction on the cylindrical shaft (f_s) just above the tip, and pore water pressure generated by cone penetration (u_2).

The cones used in the investigation have a 15 cm^2 base area and a 60 degree apex angle. The sleeve area of the cones is 225 cm^2. The fluid used for saturation of the filter was silicone. Kehoe provided Barr with complete records of tip resistance, sleeve friction, pore pressure, and friction ratio of all CPT soundings. These records were analyzed by Barr and graphical variations of all readings with depth, including an interpreted soil behavior type classification, were developed and can be found in Appendix A. Copies of the raw and analyzed data are included in Appendix B.

The cone was also equipped with a geophone that measured the arrival time of shear and compression waves generated at the ground surface. Shear and compression wave velocity testing was completed at four selected locations (CPT-01, CPT-06, CPT-07 and CPT-10). The shear waves were generated at the ground surface by the CPT rig, and arrival times were measured at depth intervals of 5 feet, beginning at a depth of approximately 5 feet, to determine the interval shear wave velocity. Similarly, the compression waves were generated at the ground surface by the CPT rig, and arrival times were measured at depth intervals of 5 feet, beginning at a depth of approximately 5 feet to determine the interval compression wave velocity. Locations were selected to provide spatial coverage over the project site. Shear and compression wave testing results can be found in Appendix C.

2.1.2 Field Reconnaissance

In addition to a review of available maps and published data, a Barr geotechnical engineer with experience in renewable power development performed site reconnaissance of the overall project site area for potential geotechnical and geological concerns in early June of 2013. The site reconnaissance was focused primarily on surficial features such as slope stability, the presence of cobbles, boulders, or bedrock outcrops, and any low areas or drainage channels that may have the

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potential to flood or scour. This work was performed based on the project boundary provided to Barr on May 30, 2013 (version 1).

The project site can generally be characterized as broad with a gradual downward slope to the southeast towards the Mojave River. Site vegetation generally consists of small scrub brush scattered loosely across the land with little or no topsoil. Vegetation was absent from the project area north of Community Boulevard. The surficial soils in this area, as well as the area west of Markham Road, were observed to be mixed or covered with manure for fertilizing purposes. However, there were no indications that any of the project area is actively used for agricultural purposes at this time. Much of the site appears to have been used for agricultural purposes in the past, based on general site observations and the presence of irrigation infrastructure such as piping and water retention ponds. The two water retention/irrigation ponds at the project site were dry at the time of this investigation. An underground pipeline (PG&E) runs east-west through the southern portion of the site, approximately parallel to the Mojave River.

Much of the surficial soils in the upper 6 inches at the site consist of silty sand and poorly-graded sand with silt and are likely wind-blown deposits or were previously disturbed. These surficial soils are in a loose condition and are easily disturbed by vehicle traffic, which resulted in difficult access with a truck-mounted CPT rig and support equipment in certain areas. Rutting from equipment was observed to be as much as 3 to 6 inches in the vicinity of CPT-01 through CPT-04. In general, only minor amounts of gravel and occasional small cobbles were observed at the ground surface across the project site.

Overall, the field review identified the presence of loose surficial silty sand across the project, and flooding in areas adjacent to the Mojave River in the southernmost portion of the site as features of concern.

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3.0 Results

Section 2.0 described the field investigation procedures. Section 3.0 presents data from the investigation and provides further analysis of these results.

3.1 Soil Lithology

The results of the CPT soundings and seismic tests (Appendices A through C) were compiled to obtain an understanding of the lithology of the study areas.

3.1.1 Cone Penetration Test Data Interpretation

The following describes the procedures used to interpret the CPT data and the interpreted lithology.

The CPT data interpretation was performed using an in-house program designed by Barr. The in-house program has been cross-checked with CPTINT version 5.2 for quality assurance and has been found to be compliant. The program uses the soil behavior type classification system from CPT data proposed by Robertson et al. (1990). The classification system is based on the corrected tip resistance, q_t, friction ratio, R_f; and pore-water pressure parameters, B_q; the classification includes a total of nine soil behavior types. These cone parameters are defined as follows:

$$q_t = q_c + (1-a)u_2 \qquad \text{(Lunne et al., 1997)}$$

$$R_f = \left(f_s / q_t \right) 100 \qquad \text{(Lunne et al., 1997)}$$

$$B_q = \frac{u_2 - u_o}{q_t - \sigma_{vo}} \qquad \text{(Lunne et al., 1997)}$$

where:

q_c = tip resistance measured by the cone, load per area

a = unequal end area ratio of the cone

u_2 = measured pore-water pressure during cone penetration, load per area

f_s = unit sleeve friction resistance, load per area

σ_{vo} = total overburden stress, load per area

u_o = in-situ pore water pressure, load per area

The results of the CPT data interpretation are presented in Appendix B.

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3.1.2 Typical Stratigraphy

The existing conditions, as determined from field data, consist of generally sandy soils, with varying amounts of gravel, silt, and clay. Occasional minor clay layers (based on soil behavior type from CPT) were observed at various depths in approximately half of the CPT soundings completed. These layers were classified as clayey silt to silty clay (soil behavior type from CPT), and ranged in thickness from several inches to nearly one foot. Occasional layers of higher CPT tip resistance, well above average, were encountered in the soundings, generally at depths greater than 15 feet, which inferred the possible presence of denser and/or coarser materials such as cobbles, boulders or gravel layers. Such layers would be considered consistent with the geology of alluvial fans. The soil conditions encountered during the preliminary geotechnical investigation generally agreed with the site geology summary included in Section 1.2 of this report.

3.1.2.1 Topsoil

Topsoil at the site consists primarily of fine to medium grained silty sand and, due to the lack of moisture associated with soil horizon development, its thickness is governed by the depth of the primary root system as there is not a distinct variation in soil type between the topsoil and underlying soil. Due to the sparseness of vegetation in the area, topsoil can generally be considered not present over much of the site. Where observed, the root zone varied from approximately 1 to 4 inches.

Topsoil in the form of imported fill (manure) was observed in the area of the site north of Community Boulevard the area west of Markham Road. The thickness of the mixture of fill and sand typically ranged from 2 to 5 inches, but may be thicker in localized areas.

3.1.2.2 Alluvium/Sand

The formation of alluvial fans includes the rapid loss of energy as water leaves a steep canyon with a saturated sediment load resulting in a poorly sorted deposit of clay- to boulder-sized particles. Gravels and cobbles are commonly suspended in the clay/silt/sand matrix as a result of the poor sorting associated with this quick deposition of the alluvium.

The sand encountered at the project site was most commonly classified as clean sand to silty sand, with some layers of gravelly sand to sand, and occasional layers of sand and silt mixtures based on CPT soil behavior type. These soil behavior types indicate that the likely USCS classifications of the sands are predominantly poorly-graded sand with silt (SP-SM) and silty sand (SM), with some layers of poorly-graded sand (SP) and clayey sand (SC). Based the results of the investigation and an understanding of the geology, the sands can often be considered poorly graded and have varying amounts of gravel. The CPT results indicate that the sands have a loose to very dense relative density, with most sands having a medium dense to dense relative density.

3.1.2.2 Clay

Layers of clay are generally not present or are very limited in alluvial fan soils. The few minor layers of clayey silt to silty clay, based on soil behavior type from CPT, were generally encountered between

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depths of approximately 9 to 25 feet. The typical thickness of these layers was on the order of several inches, with up one foot indicated at CPT-02 from a depth of approximately 9 to 10 feet. The CPT results indicate that the clays encountered at CPT-08 have a stiff to very stiff consistency.

3.2 Groundwater Conditions

Groundwater was not observed in the CPT soundings during the preliminary geotechnical investigation. Based upon these observations and the regional groundwater information summarized in Section 1.2, no special design or construction considerations associated with groundwater and buoyancy are anticipated for the project. A summary of the groundwater observations is provided in Table 3.

Table 3. Summary of Groundwater Levels

CPT Sounding ID (v1. 05/30/2013)	Depth to Groundwater During Sounding [ft]	Depth to Groundwater at End of Sounding [ft]
CPT-01	NE	NE
CPT-02	NE	NE
CPT-03	NE	NE
CPT-04	NE	NE
CPT-05	NE	NE
CPT-06	NE	NE
CPT-07	NE	NE
CPT-08	NE	NE
CPT-09	NE	NE
CPT-10	NE	NE

*NE = water not encountered.

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3.3 Shear Strength

The shear strength of the soils encountered during the preliminary geotechnical investigation was estimated through established correlations with CPT data.

3.3.1 Friction Angle

The shear strength of granular soil can be determined through correlations with CPT data using the expression derived by Kulhawy and Mayne (1990):

$$\phi' = 17.6 + (11)\log\left(\frac{q_c}{\sqrt{\sigma'_{vo}}}\right) \qquad \text{(Mayne, 2006)}$$

where:

ϕ' = drained friction angle

q_c = cone tip resistance, varies (from CPT data)

σ'_{vo} = effective in-situ vertical stress, varies (from CPT data)

Figure 7 shows a plot of the friction angle as correlated from the results of the CPT investigation. Table 4 summarizes the minimum and average friction angle values calculated from CPT data for each location tested during the preliminary geotechnical investigation. As shown in Table 4, the average friction angle in the upper 30 feet correlated from CPT data varies from approximately 42 to 44 degrees.

Table 4. Summary of Friction Angle Correlated from CPT

CPT ID (v1. 05/30/2013)	Minimum Friction Angle, ϕ' [degrees]	Average Friction Angle, ϕ' [degrees]
CPT-01	37.0	43.1
CPT-02	33.6	42.2
CPT-03	40.0	43.9
CPT-04	36.5	41.9
CPT-05	34.5	42.0
CPT-06	36.4	42.2
CPT-07	36.1	43.5
CPT-08	38.0	42.3
CPT-09	32.3	42.8
CPT-10	35.3	43.3

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3.3.2 Undrained Shear Strength

While clay soils were generally not encountered during the preliminary investigation, limited layers of clay soils were encountered at CPT-08 (Section 3.1.2.2). The undrained shear strength of the clayey soils at this location was calculated based on CPT data using the following equation:

$$s_u = \frac{q_t - \sigma_{vo}}{N_{kt}}$$ (Lunne et al., 1997)

where:

s_u = undrained shear strength

N_{kt} = empirical cone factor (16 was used for this project based upon previous experience at sites with similar geologic conditions and sites that are geographically close)

σ_{vo} = total in-situ vertical stress (from CPT data)

q_t = corrected cone tip resistance (from CPT data)

The undrained shear strength of the minor clay layers ranged from approximately 1,400 pounds per square foot (psf) to over 5,000 psf, with an average of approximately 3,000 psf. It should be noted that the clay layers encountered (based on soil behavior type from CPT) comprise less than 2 percent of the total data points from the CPT results.

3.4 Geophysical Testing

The results of the geophysical testing (shear and compression wave velocity testing) are included in Appendix C and summarized in Table 5.

Table 5. Summary of Geophysical Test Results from CPT

CPT ID (v1. 05/30/2013)	Average Shear Wave Velocity [ft/s]	Average Compression Velocity [ft/s]	Average Poisson's Ratio
CPT-01	912	1,576	0.25
CPT-06	826	1,697	0.34
CPT-07	973	1,910	0.32
CPT-10	778	1,581	0.34
Mean	872	1,691	0.31
Standard Deviation	87	156	0.04
Minimum	778	1,576	0.25
Maximum	973	1,910	0.34

*Due to shallow refusal, seismic wave velocities at CPT-09 were only measured to a depth of 23.2 feet

3.4.1 Shear Wave Velocity

The interval shear wave velocities were measured from a depth of 5 feet to the termination depth of the sounding (30 feet with the exception of CPT-01) at locations selected to provide spatial coverage across the project site. The average shear wave velocity (V_s) of the soil in the upper 30 feet varied from 778 to 973 feet per second (ft/s). The average shear wave velocity from CPT-01 was limited to only the upper 23.2 feet due to shallow refusal of the sounding.

3.4.2 Compression Wave Velocity

The interval compression wave velocities were measured from a depth of 5 feet to the termination depth of the sounding (30 feet with the exception of CPT-01) at locations selected to provide spatial coverage across the project site. The average compression wave velocity (V_s) of the soil in the upper 30 feet varied from 1,576 to 1,910 feet per second (ft/s). The average compression wave velocity from CPT-01 was limited to only the upper 23.2 feet due to shallow refusal of the sounding.

3.4.3 Poisson's Ratio

The compression and shear wave velocity information was used to compute Poisson's ratio (υ). The following equation relates shear and compression wave velocity with Poisson's ratio:

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$$\nu = \left(\frac{V_p^{\ 2}}{2V_s^{\ 2}} - 1 \right) \Big/ \left(\frac{V_p^{\ 2}}{V_s^{\ 2}} - 1 \right)$$ (Bowles, 1996)

Poisson's ratio ranges from approximately 0.25 to 0.34 for the locations tested.

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4.0 Preliminary Geotechnical Recommendations

Results of the preliminary geotechnical investigation have been presented in Section 3. Based on these results, Section 4 provides preliminary analysis, conclusions and recommendations for the design and construction of foundations, as well as general construction considerations.

4.1 General Excavation and Fill

The following sub-sections present general recommendations for site clearing, grading, and compaction for the project site.

4.1.1 Clearing and Grubbing

The project site is predominantly undeveloped arid land and clearing and grubbing will generally be restricted to the removal of small brush and the primary root zone. Based on the results of the field investigation, topsoil is generally not present and vegetation is sparse with root zone thickness on the order of approximately 1 to 4 inches.

Existing organic fill material (manure) was observed in the area of the site north of Community Boulevard the area west of Markham Road. The thickness of the mixture of fill and sand typically ranged from 2 to 5 inches, but may be thicker in localized areas. Removal limits may be adjusted accordingly during clearing.

Any topsoil or organic material should not be used for structural fill and shall be placed separately to avoid contamination with other excavated soils. This material could be used in grading non-structural fill such as fields or service areas in which compressibility of the material does not have an impact on structures.

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4.1.2 Site Grading

Results of the preliminary geotechnical investigation indicate that cut and fill of the subsoil in the area can be achieved with conventional machinery.

4.1.3 Sloping in Excavations

In general, the soils across the site can be classified as Type C from OSHA soil classifications (29 CFR 1926 Subpart P-Excavations). It is the responsibility of the competent field personnel to verify the in-situ soil classification at each excavation and that the benching or slopes are adequate during construction.

4.1.4 General Excavation, Backfill, and Compaction for Foundations

Following excavation, the exposed base should be inspected by the construction phase geotechnical engineer of record or authorized representative. If the excavation base surface is found to contain groundwater or is deemed unsuitable for construction in the opinion of the construction phase

geotechnical engineer of record or authorized representative, the conditions shall be noted and communicated to the foundation designer for appropriate foundation modifications.

Any soil placed as engineered fill should be an approved material classified as SM, SC, SP-SM, or more granular. It should be free of organic matter or debris, rocks greater than 3 inches in diameter, and have a Liquid Limit and Plasticity Index less than 45 and 20, respectively. High plasticity silt or clay (MH, CH) soils should not be used as structural fill within 4 feet of footings or within 2 feet of slab or pavement subgrades. Fill should be placed in lifts not exceeding 8 inches in loose thickness or one third the diameter of the roller, whichever is less, and moisture conditioned to within ±3 percent of the optimum moisture content. It is recommended that each lift be compacted to a minimum of 95 percent of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor Method. In areas where the depth of the fill is 5 to 10 feet, the fill should be compacted to 98 percent of the maximum standard Proctor dry density for the entire height of the fill. Fills placed in excess of 10 feet will require further evaluation at the time of the final geotechnical investigation. The backfill surface should be graded such that water is directed away from the foundations to prevent moisture infiltration (¼" per foot). Backfill density should be checked in the field periodically (approximately one test per 2,500 square feet per lift) to confirm adequate compaction.

4.2 Seismicity Considerations

As mentioned previously, the project site is located in a highly active seismic area with multiple faults located nearby (Figure 3).

Preliminary seismic design parameters for the general project site were determined based on the ASCE 7-10 Standard, which uses the 2008 USGS seismic hazard data. Based on the results of the preliminary investigation, the site conditions can be generally classified as Seismic Site Class D. For an earthquake return period of approximately 2,500 years (equivalent to a probability of exceedance of 2 percent in 50 years), the peak ground acceleration (PGA) is 0.552g for the general project site. These parameters are preliminary in nature, and they should be further evaluated through additional investigation by the geotechnical engineer and reviewed by the foundation designer during the final design phase of the project. A summary of preliminary seismic design parameters is provided in Table 6.

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Table 6. Summary of Preliminary Seismic Design Parameters (ASCE 7-10)

Parameter	Design Value	Equation	Reference
Project Location	San Bernardino County, CA		
Latitude	34.90326°		Provided coordinates
Longitude	-117.10256°		
Seismic Site Classification	D		ASCE Table 20.3-1
0.2 sec Spectral Response, S_s	1.358		USGS
1 sec Spectral Response, S_1	0.526		USGS
Acceleration-Based Seismic Coefficient, F_a	1.0		ASCE Table 11.4-1
Velocity-Based Seismic Coefficient, F_v	1.5		ASCE Table 11.4-2
Seismic Coefficient, S_{MS}	1.358	F_aS_S	ASCE Equation 11.4-1
Seismic Coefficient, S_{M1}	0.789	F_vS_1	ASCE Equation 11.4-2
Seismic Coefficient, S_{DS}	0.905	$(2/3)S_{MS}$	ASCE Equation 11.4-3
Seismic Coefficient, S_{D1}	0.526	$(2/3)S_{M1}$	ASCE Equation 11.4-4
Spectral Response Acceleration Curve			
S_a (Periods < T_0)		$S_{DS}[0.4+0.6(T/T_0)]$	ASCE Equation 11.4-5
T_0	0.116	$0.2(S_{D1}/S_{DS})$	ASCE Equation 11.4-7
T_S	0.581	S_{D1}/S_{DS}	ASCE Equation 11.4-7
S_a (T_S < Periods ≤ T_L)		S_{D1}/T	ASCE Equation 11.4-5
S_a (Periods > T_L)		$S_{D1}T_L/T^2$	ASCE Equation 11.4-5
T_L	8 sec		ASCE Figure 22-12
Peak Ground Acceleration, PGA_M	0.552g	$F_{PGA}PGA$	ASCE Figure 22-7

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4.3 Liquefaction Potential

Liquefaction of a soil due to seismic loading often occurs in saturated sands and silts when the increase in shear-induced pore-water pressure due to seismic loading decreases the effective stress within the soil, resulting in a temporary loss of shear strength. There is an absence of saturated conditions at this site and the potential for liquefaction of soils supporting the proposed structures is very low.

4.4 Shrink-Swell Potential

Soils considered to have shrink-swell potential generally consist of plastic clays subject to changes in moisture content. The results of the CPT soundings (Appendix A) performed as a part of this investigation indicate the soils encountered on site are primarily granular and do not have appreciable shrink-swell potential.

4.5 Potential for Soil Collapse

As noted previously in the geology section of this report, the project site is located at the toe of an alluvial fan in a region of arid climate. In arid climates, it is common for flash floods to mobilize coarse unsorted

sediments in debris flows, relatively low moisture-high solids mixes that move very quickly due to the slope of the terrain. These debris flows come to rest and dry out quickly. If there is a binder of plastic clays, these debris flow deposits can retain a soil matrix that has the potential to be collapsible. Soil collapse is generally triggered by two factors: increased moisture levels and the application of load.

While soils commonly known to be collapsible, such as loess, can be tested in the laboratory to determine collapse potential, it is not typically possible to follow this approach on alluvial fan soils. Due to the general composition of alluvial fan soils, collection of undisturbed samples is not feasible utilizing a drill rig. While undisturbed bulk samples can be collected in shallow test pits, the corresponding results do not provide an indication of the collapse potential of deeper soil layers not accessible to the reach of a backhoe. Therefore, laboratory testing to determine the collapse potential of alluvial fan soils is not typically performed.

As a result, other means of evaluation of collapse potential in alluvial soils are typically performed. A review of the relative density inferred from the CPT data collected in the upper 30 feet indicates the sands generally have a relative density ranging from 50 to 100 percent (Figure 9), with a majority of the results in excess of 80 percent. These data indicate the sands are in a medium dense to very dense condition. In general, sands with relative densities in excess of 65 percent (medium dense to dense) have a very low potential for soil collapse. Sands with less than 65 percent relative density, as indicated from the CPT data, comprise approximately 0 to 28 percent of the data points at the tested locations, with an overall average of approximately 11 percent.

While the proposed solar development will not introduce increased moisture to the general project area, periodic flooding or periods of heavy rainfall may be a source of increased moisture. With the occasional potential for increased moisture levels in the soil, the relative density values determined from the CPT soundings generally indicate there is low potential for soil collapse. Should pile foundations be used for support of the solar modules, installation methods including driving, vibration, and spinning will likely break down any adhesion in the soil surrounding the pile which will further reduce the any potential for collapse. Additionally, the proposed solar structures impose a relatively minor load on the soils and any movement will likely be inconsequential. Therefore, no special means of mitigation of soil collapse are recommended for the project based on the data collected as part of this preliminary geotechnical investigation.

4.6 Slope Stability

The results of the investigation indicate generally dense sand soils. Slope stability in the area of the proposed solar array locations is not considered a significant risk based on the subsurface conditions encountered, the general topography and low relief at the site, and the lack of evidence for existing slope instability.

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4.7 Recommended Geotechnical Parameters

The following parameters are recommended for preliminary design based on the results of the geotechnical investigation.

4.7.1 In-Situ Density

No soil borings or sampling was performed for in-situ density testing. However, based on the results of the CPT soundings and Barr's experience with similar soils, a dry unit weight of 110 pcf is recommended for preliminary design purposes (NAVFAC, 1986).

4.7.2 Shear Strength

Based on the results of the CPT soundings, the recommended shear strength design value (for use in preliminary foundation design) is 34 degrees. This value was selected as it is generally representative of a lower bound friction angle for the entire site.

4.8 Preliminary Design Recommendations

In Barr's experience, solar modules for utility scale arrays are typically supported on pile foundations. Discussion of various foundation systems for preliminary design of the solar arrays, based on the results of the preliminary geotechnical investigation, is provided in the following sections. The basis for this preliminary evaluation of foundation options, from a geotechnical standpoint, is derived from the CPT sounding results and the limited site reconnaissance.

4.8.1 Driven Piles

The results of the CPT soundings, and the success of completing soundings to target depth at approximately 80 percent of the preliminary test locations, indicate that driven piling is a feasible foundation system to be considered. While both soundings that reached refusal prior to the target depth were able to extend at least 20 feet below existing grade, it is possible that similar denser and/or coarser layers are present nearer the surface in other locations at the site. Special considerations for driven pile systems at this project site include:

- Driving refusal on cobbles, boulders, and/or dense gravel layers.
    - In cases of shallow refusal during pile installation, remedial options to be considered include removal and/or extraction of the obstruction and replacement with compacted engineered fill and then re-driving the pile.
    - Pre-drilling through obstructing layers is another option to be considered for pile installation.

4.8.2 Shallow Foundations

The results of the preliminary investigation indicate that a shallow footing is a feasible foundation system to be considered. Special considerations for shallow foundations at this project site include:

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- Cobbles and/or boulders at the foundation subgrade.
    - Subgrade elevation and conditions should be uniform across the foundation footprint. In cases of cobbles and boulders present at the subgrade surface, remediation options to be considered include removal and/or extraction of the obstruction and replacement with compacted engineered fill.

4.8.3 Other Deep Foundation System Options

Other foundation types that can be considered based on the results of the preliminary investigation include:

- Augercast Piles
    - Augercast piles are a deep foundation system that is cast-in-place using a hollow-stem auger drilled to design depth.
    - Augercast piles may not be economically feasible in ground containing cobbles and boulders due to lack of penetration with the auger. These conditions can be overcome with the use of micropiles.
- Micropiles
    - Micropiles are high-capacity drilled and grouted small diameter piles (typically 5 to 12 inches in diameter).
    - Micropiles can be drilled through a wide range of materials and obstructions.
- Helical Piers
    - Helical piers are small diameter steel shafts with discontinuous auger flights or helices at the tip that are rotated into the ground.
    - Helical piers may not be economically feasible in ground containing cobbles and boulders due to lack of penetration with the helices.
    - Helical piers can generally be designed for allowable capacities of up to 50 kips in tension and compression.
    - Lateral capacity of helical piers is generally less than other pile type alternatives and should be carefully considered.

4.8.4 Deep Foundation Design Considerations

Of primary concern for deep foundations is the presence of very dense and/or coarser soil layers, and cobbles and boulders which could result in lack of penetration at shallow depths. CPT soundings were performed to the target depths of 30 feet at eight of the ten locations tested. Refusal of the soundings occurred at the western portion of the site (CPT-01 and CPT-02), but at depths greater than 20 feet. The prevalence of denser materials appears to increase with depth across the project site. CPT tip resistances generally increased with depth across the site, with substantially higher values observed below depths of

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approximately 15 feet. Due to the nature of alluvial fans, the presence of coarser materials such as gravel and cobbles is expected to vary widely. In summary, these preliminary findings indicate that there is a relatively low potential for cobbles, boulders, and/or dense gravel layers to be present at depths shallower than approximately 15 feet. However, isolated pockets of coarser materials may be present throughout the site.

It is recommended that EDF develop preliminary pricing estimates for the various foundation options to determine the most economical option following preliminary foundation design.

The final geotechnical investigation should include a more comprehensive program of field work to evaluate the project site for suitability of various foundation systems and associated construction considerations.

It should be noted that for this preliminary investigation, the CPT soundings were performed with a 30-ton rig. The cone used had a base area of 15 cm^2, an apex angle of 60 degrees, and a friction sleeve area of 225 cm^2. The reported tip resistance and sleeve friction values were generated while advancing the cone at a constant rate of penetration of 20 mm/sec. This information, in combination with the CPT results, should be used by the foundation designer and/or contractor for preliminary evaluation of pile drivability and energy required.

Additionally, peak soil resistances measured by the CPT (Figure 7 and Appendix A) should be taken into consideration in the preliminary design and evaluation of constructability for any deep foundation system. Plots of tip resistance and degree of inclination for each sounding are also provided in Appendix A. These can be used by the foundation designer to qualitatively assess the potential for subsurface obstructions.

4.8.5 Frost Depth

The approximate extreme frost penetration depth for this project location is approximately 5 inches (NAVFAC, 1986).

4.8.6 Bearing Capacity – Shallow Foundations

The ultimate bearing capacity of the soil supporting a spread footing can be determined using the Terzaghi-Meyerhoff equation as follows:

$$q_{ult} = \tfrac{1}{2}\gamma B N_\gamma + q N_q + s_u N_c \qquad \text{(Das, 2007)}$$

For foundations supported by primarily granular soils, the third term of the bearing capacity equation drops off, as the cohesion for these types of soils is typically taken as zero. The first and second terms remain, along with an additional term to calculate the net ultimate bearing capacity, resulting in the following equation:

$$q_{ult(net)} = \tfrac{1}{2}\gamma B N_\gamma + q N_q - q$$

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where:

γ= soil unit weight

B = foundation width

q = effective stress at the foundation bearing depth

N_γ= bearing capacity factor = $2(N_q - 1)\tan\phi$ (Das, 2007)

N_q = bearing capacity factor = $\tan^2\left(45 + \phi/2\right)e^{\pi\tan\phi}$ (Das, 2007)

Calculation of the bearing capacity is a function of the soil shear strength and the foundation dimensions, so final estimates of the bearing capacity cannot be completed at this time. However, for an example foundation sized 3 feet square and bearing at least 2 feet below the ground surface, a net allowable bearing capacity of 4,300 psf is recommended for preliminary design purposes (using a factor of safety of 3).

4.8.7 Load Capacity – Pile Foundations

If a pile foundation system is used for support of the solar modules, the pile will develop capacity through a combination of end bearing and skin friction. Lateral capacity is also taken into consideration in the design. The following sections describe preliminary recommendations for the design of pile foundation systems.

4.8.7.1 Axial Capacity

The axial capacity of pile foundation systems is based on the contribution of the skin friction and the end bearing that the soil provides. The design values established in Section 4.7 of this report are recommended for use in preliminary design of pile foundation systems.

Calculation of the end bearing in granular soils (sands) should be performed through the use of the following equation:

$$q_{p(all)} = \frac{A_p q'(N_q - 1)F_{qs}F_{qd}}{FS}$$ (Das, 2007)

where:

A_p = base area of pile

q' = vertical effective stress

N_q = bearing capacity factor = $\tan^2\left(45+\phi'/2\right)e^{\pi\tan\phi'}$ (Das, 2007)

F_{qs} = shape factor = $1+\tan\phi'$ (Das, 2007)

F_{qd} = depth factor = $1+2\tan\phi'(1-\sin\phi')^2\tan^{-1}\left(L/d\right)$ (Das, 2007)

ϕ' = soil friction angle

FS = factor of safety = 3.

As an example, for an assumed pile diameter of 6 inches extending to a depth of 15 feet below the ground surface, the calculated allowable end bearing is approximately 7.2 kips assuming a plug forms at the end of the pile.

Calculation of the skin friction in granular soils (sands) should be performed through the use of the following equation.

$$q_{s(all)} = \frac{\pi d(1-\sin\phi')\int_0^{L_i}\sigma'_o\tan\delta' dz}{FS}$$ (Das, 2007)

where:

d = pile diameter

σ_o' = vertical effective stress

ϕ' = soil friction angle

δ' = soil-pile interface friction angle= $\phi'/2$ (assuming driven pile conditions)

L_i = soil layer thickness

FS = factor of safety = 3

As an example, for an assumed pile diameter of 6 inches extending to a depth of 15 feet below the ground surface, the calculated allowable capacity from skin friction is approximately 0.9 kips, assuming δ' = $0.5\phi'$, which is generally accepted for driven pile installations.

The above values are provided as examples only in the absence of specific design information. For the final design phase, the structural engineer or foundation designer should compute the axial capacity of piles as a function of both skin friction and end bearing, in combination with an appropriate factor of

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safety. The design values established in Section 4.7 of this report are recommended for use in preliminary design.

4.8.7.2 Lateral Capacity

Based on the results of the geotechnical investigation, the following values of the lateral modulus of subgrade reaction are recommended for preliminary design of pile foundations under lateral loads (in addition to the values presented in Section 4.7):

Based on the results of the geotechnical investigation, the following values of the lateral modulus of subgrade reaction are recommended for design of pile foundations under lateral loads (in addition to the values presented in Section 5.8):

$$k = n_h z \qquad \text{(Das, 2007)}$$

where:

n_h = coefficient = 10 lb/in^3 for 1 ft < z < 5 ft

n_h = coefficient = 18 lb/in^3 for 5 ft < z < 15 ft

n_h = coefficient = 20 lb/in^3 for 15 ft < z < 30 ft

z = depth

If saturated conditions are analyzed for foundation design, the recommended values should be reduced by 1/3.

4.9 Sliding Friction

The friction coefficient between the silty sand soil of the site and construction materials should be taken as 0.54 for steel foundations and 0.76 for concrete foundations (Potyandy, 1961).

4.10 Soil Stiffness

Elastic theory relates shear wave velocity with the shear modulus at small strain using the following equation:

$$G_{\max} = \rho (V_s)^2 = \frac{\gamma (V_s)^2}{g} \qquad \text{(Kramer, 1996)}$$

where:

G_{max} = shear modulus at small strain (psf)

V_s = shear wave velocity (ft/s)

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ρ = mass density (slugs/ft^3)

γ = unit weight (pcf)

g = acceleration of gravity (32.2 ft/s^2)

Based on the shear wave velocities measured (Section 3.8), a value of 780 ft/s is recommended for preliminary design purposes. Based on an estimated in situ soil moist unit weight of 110 pcf, the small strain shear modulus G_{max} is approximately 2,100 ksf for the soil. For final foundation design, the structural engineer will need to reduce the shear modulus based upon the level of strain imparted to the soil by the foundation.

4.11 Dewatering and Erosion Control

Based on results presented in Section 3, shallow groundwater was not observed at depths of at least 30 feet below the ground surface. It is anticipated that excavations will remain open for only short periods of time; therefore special provisions for erosion control of the excavation slopes are not anticipated. Measures should be taken to prevent runoff from depositing sediment in the excavations in the case of rain. Erosion of the roadways should be anticipated where they cross existing swales or act as preferred drainage paths; ongoing maintenance will be required following most rain events and appropriate equipment should be available onsite or nearby on a permanent basis throughout operation of the facility. The surficial soils across much of the project site are in a loose condition, and in their current state are easily disturbed, allowing for greater potential for wind erosion. The USDA/NRCS soil mapping indicates that the site soils have a low potential for soil erosion (Figure 4). However, the site soils are mostly poorly-graded sands with silt and may be susceptible to wind erosion.

Long term erosion control measures for the project site largely consist of revegetation for all areas of the project site where it can be performed following construction. Revegetation will help control erosion from both wind and water. In areas where revegetation is not possible, some wind erosion of the very fine soil may occur but will generally be limited to an inconsequential amount of soil immediately at the ground surface. Wind erosion of large sand and gravel particles is not anticipated. Control of water erosion will generally consist of the design of erosion control structures, berms, diversion devices, and other drainage control measures to limit drainage to confined zones away from the solar structures. The design of specific erosion control structures should be performed by a civil engineer that specializes in this practice. Barr may be able to assist in this design, if requested.

4.12 Flooding and Scour

As noted previously in the geology section, the project site is adjacent to Mojave River, an active desert drainage system. This river system is susceptible to flash flooding during periods of intense rainfall.

FEMA flood zone maps (Figure 5) designate the southern extents of the project area as Zone AE. The Zone AE designation if used for high risk areas considered to have a 1% chance of annual flooding. Base flood Elevations in the FEMA Zone AE near the project site are reported to range from elevation 2161 feet (NAVD88) near the southeast boundary of the site to 2175 feet near the southwest boundary of the

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site. USGS mapping indicates that levees are present along a portion of the Mojave River near the site; however, the condition of this levee system is unknown. Further review of flooding hazards by a hydrologist is recommended to assess risk to the proposed project and to determine the actual values for design. In general, it is recommended that any solar array infrastructure be constructed outside of the FEMA Zone AE area.

4.13 Access Roadway Considerations

Analysis and recommendations for design and construction of roadway sections was not included in the scope of this preliminary investigation. However, as discussed previously in this report, a substantial portion of the project site is overlain by a thin layer of loose sand and silty sand. This loose surficial layer is easily disturbed by vehicle traffic. Significant moisture conditioning and compaction of the access road subbase should be expected. In addition, the application of gravel surfacing over the subbase will likely be required to support vehicle and equipment traffic during construction. Alternatively, other options such as chemical stabilization could be considered.

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5.0 Final Geotechnical Investigation Recommendations

A comprehensive study of the subsurface conditions of the project site will be needed to determine the soil characteristics and design parameters for the proposed solar array foundations. The test results and recommendations provided herein are for preliminary scoping purposes and should not be relied solely upon for final design.

Prior to the final design, a geotechnical investigation must be conducted at the project site and should consist of the following scope:

- Detailed site reconnaissance focused on identifying geological and geotechnical hazards within the final project boundaries.
- A geotechnical field investigation program consisting of:
  - Cone penetration test (CPT) soundings at a frequency of approximately one 30-foot sounding for each approximately 5 acres of development.
  - CPT seismic testing at approximately 10 percent of the test locations.
  - Soil borings utilizing hollow-stem auger methods at approximately 10 percent of the CPT sounding locations to collect soil samples for laboratory testing. It is recommended that soil borings be performed to a depth of approximately 30 feet. Additional soil borings should be performed at any locations where the CPT soundings encounter shallow refusal.
  - Test pit explorations throughout the proposed solar arrays to collect bulk soil samples and to evaluate the composition of shallow soils at the site. Typical test pits can be completed to depths on the order of 5 to 10 feet.
- Explorations along proposed access road alignments scattered across the site to determine overlying topsoil thicknesses and to collect soil samples for road subgrade strength and compaction testing.
- Perform electrical resistivity testing and thermal resistivity testing for electrical design purposes at selected locations within the solar array and at the substation location.

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- Complete a laboratory testing program on soil samples collected during the field investigation to include some or all of the following:
    - Grain size analyses with hydrometer as required to adequately classify each soil type encountered in the borings.
    - Atterberg limit tests on any fine grained soil samples collected in the borings.
    - Direct shear testing on representative soil samples collected from the borings.
    - Unconsolidated-undrained triaxial strength testing on cohesive soil samples collected from the borings.
    - Moisture content and soil dry unit weight testing on representative soil samples as appropriate.
    - Chemical testing, consisting of pH, soluble sulfates, and soluble chlorides on representative soil samples collected from the borings.
- Summarize final geotechnical investigation with a report detailing the field and laboratory results, an evaluation of geologic and geotechnical hazards, and a summary of geotechnical recommendations for foundation design of the solar modules.

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6.0 Limitations of Analysis

The preliminary analysis and conclusions provided are based on the results of fieldwork which focused on investigation of ten locations spread across the project site. It should be noted that for this preliminary investigation an in-situ only approach was utilized and no sample collection or laboratory testing was completed. Using generally accepted engineering methods and practices, the preliminary investigation performed has made every reasonable effort to characterize the investigated locations and provide general conclusions of the project area based on the data available. However, the likelihood that conditions may vary from any specific location tested is possible, and following completion of the final geotechnical investigation careful attention to soil conditions should still be undertaken during the time of construction by qualified personnel.

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Tables

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Table 1
Geotechnical Investigation Summary

Location ID (v1. 05/30/2013)	UTM Zone 11N NAD 83 [m]		Geographic Coordinates NAD 83		CPT Testing ID	Seismic Testing	
	Easting	Northing	Latitude	Longitude		V_s	V_p
01	489995.0	3862693.0	34.906619	-117.109518	CPT-01	X	X
02	489999.0	3862241.0	34.902543	-117.109468	CPT-02		
03	490014.0	3862504.0	34.904915	-117.109307	CPT-03		
04	490198.0	3862134.0	34.901580	-117.107280	CPT-04		
05	490593.4	3862574.0	34.905552	-117.102966	CPT-05		
06	490629.9	3862319.7	34.903258	-117.102564	CPT-06	X	X
07	490905.3	3863012.0	34.909504	-117.099557	CPT-07	X	X
08	491106.9	3862792.8	34.907529	-117.097348	CPT-08		
09	491195.5	3862583.0	34.905638	-117.096375	CPT-09		
10	491180.6	3862359.6	34.903623	-117.096536	CPT-10	X	X

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Table 2
Summary of Geologic and Geotechnical Site Hazards

Hazard	Present at Site?	Comment
High groundwater	No	The CA Dept of Water Resources website indicates groundwater is at least 25 feet below ground surface.
Flooding	Yes	FEMA flood zone maps (Figure 5) indicate the southern area of the project is classified as Zone 'AE'. The Zone 'AE' designation is used for high risk areas that are considered to have a 1% chance of annual flooding.
Scour	Unlikely	The site is on an alluvial fan, which is generally a depositional environment. However, some scour may occur along channels and/or the Mojave River.
Wind erosion	Possibly	USDA/NRCS mapping indicates that the site soils across some portions of the project site have low erosion potential (Figure 4 and Section 4.11). However, site soils consisting of poorly-graded sands with silt may be susceptible to wind erosion
Slope failure	No	The project site has low-relief topography.
Subsidence – Pumping	No	The project site is not an area of oil and gas development. No concerns regarding pumping subsidence are known.
Subsidence – Mining	No	The site is underlain by a thick sequence of alluvial soil.
Subsidence - Caves/Karst	No	No known caves or karst geology exist in the project area.
Earthquake/Seismicity	Yes	The site is in a very seismically active area, adjacent to the Lenwood-Lockhart fault, and near many other active faults (Figure 3).
Earthquakes – Ground Rupture	Unlikely	There are mapped active faults at the site. However, the fault traces do not intercept the site (Figure 3).
Earthquakes - Liquefaction	No	The soils at the site are unsaturated and not susceptible to liquefaction.
Swelling/shrinking soil	No	Swelling soils are not known or likely to be present at the site.
Corrosive soil	No	Granular soils with low salinity, low clay content and low moisture indicate corrosive soils are unlikely to be present.
Made ground	Yes	While no major developments are currently within the boundary of the existing project site, the site is surrounded by existing developments of various type (residential, agricultural, etc.). The surficial soils at some areas of the site are mixed with manure for fertilizer, with several fill or stockpiles present in the northwest corner of the site. A dry irrigation pond was also noted on the west portion of the site. Much of the site appears to have at one time been irrigated for orchard and other agricultural purposes.
Collapsible soil	Possibly	The project site is located on an alluvial fan in a region of arid climate. Alluvial fan soils are potentially collapsible. See Section 4.5.
Volcanic action	No	No current volcanic action exists in the region.
Quick clay	No	No quick clay conditions are suspected based on site geology.

DRAFT

Table 3
Summary of Groundwater Levels

CPT Sounding ID (v1. 05/30/2013)	Depth to Groundwater During Sounding [ft]	Depth to Groundwater at End of Sounding [ft]
CPT-01	NE	NE
CPT-02	NE	NE
CPT-03	NE	NE
CPT-04	NE	NE
CPT-05	NE	NE
CPT-06	NE	NE
CPT-07	NE	NE
CPT-08	NE	NE
CPT-09	NE	NE
CPT-10	NE	NE

*NE = water not encountered.

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Table 4
Summary of Friction Angle Correlated from CPT

CPT ID (v1. 05/30/2013)	Minimum Friction Angle, ϕ' [degrees]	Average Friction Angle, ϕ' [degrees]
CPT-01	37.0	43.1
CPT-02	33.6	42.2
CPT-03	40.0	43.9
CPT-04	36.5	41.9
CPT-05	34.5	42.0
CPT-06	36.4	42.2
CPT-07	36.1	43.5
CPT-08	38.0	42.3
CPT-09	32.3	42.8
CPT-10	35.3	43.3

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Table 5
Summary of Geophysical Test Results from CPT

CPT ID (v1. 05/30/2013)	Average Shear Wave Velocity [ft/s]	Average Compression Velocity [ft/s]	Average Poisson's Ratio
CPT-01	912	1,576	0.25
CPT-06	826	1,697	0.34
CPT-07	973	1,910	0.32
CPT-10	778	1,581	0.34
Mean	872	1,691	0.31
Standard Deviation	87	156	0.04
Minimum	778	1,576	0.25
Maximum	973	1,910	0.34

*Due to shallow refusal, seismic wave velocities at CPT-01 were only measured to a depth of 23.2 feet

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Table 6
Summary of Preliminary Seismic Design Parameters (ASCE 7-10)

Parameter	Design Value	Equation	Reference
Project Location	San Bernardino County, CA		
Latitude	34.90326°		Provided coordinates
Longitude	-117.10256°		
Seismic Site Classification	D		ASCE Table 20.3-1
0.2 sec Spectral Response, S_s	1.358		USGS
1 sec Spectral Response, S_1	0.526		USGS
Acceleration-Based Seismic Coefficient, F_a	1.0		ASCE Table 11.4-1
Velocity-Based Seismic Coefficient, F_v	1.5		ASCE Table 11.4-2
Seismic Coefficient, S_{MS}	1.358	F_aS_S	ASCE Equation 11.4-1
Seismic Coefficient, S_{M1}	0.789	F_vS_1	ASCE Equation 11.4-2
Seismic Coefficient, S_{DS}	0.905	$(2/3)S_{MS}$	ASCE Equation 11.4-3
Seismic Coefficient, S_{D1}	0.526	$(2/3)S_{M1}$	ASCE Equation 11.4-4
Spectral Response Acceleration Curve			
S_a (Periods < T_0)		$S_{DS}[0.4+0.6(T/T_0)]$	ASCE Equation 11.4-5
T_0	0.116	$0.2(S_{D1}/S_{DS})$	ASCE Equation 11.4-7
T_S	0.581	S_{D1}/S_{DS}	ASCE Equation 11.4-7
S_a (T_S < Periods ≤ T_L)		S_{D1}/T	ASCE Equation 11.4-5
S_a (Periods > T_L)		$S_{D1}T_L/T^2$	ASCE Equation 11.4-5
T_L	8 sec		ASCE Figure 22-12
Peak Ground Acceleration, PGA_M	0.552g	$F_{PGA}PGA$	ASCE Figure 22-7

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Table 7
Summary of Geotechnical Parameters for Preliminary Design

Parameter	Value	Units
In Situ Dry Density	110	lb/ft^3
Undrained Shear Strength	-	lb/ft^2
Friction Angle	34	degrees
Modulus of Subgrade Reaction, *k* [0 - 5 ft]	0 - 600	lb/in^2
Modulus of Subgrade Reaction, *k* [5 - 15 ft]	600 - 3,300	lb/in^2
Modulus of Subgrade Reaction, *k* [15-30 ft]	3,300 - 7,200	lb/in^2
Minimum Average Shear Wave Velocity	780	ft/s
Minimum Design Small Strain Shear Modulus	2,070	$kips/ft^2$
Poisson Ratio	0.25	
Frost Depth	5	inches

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Figures

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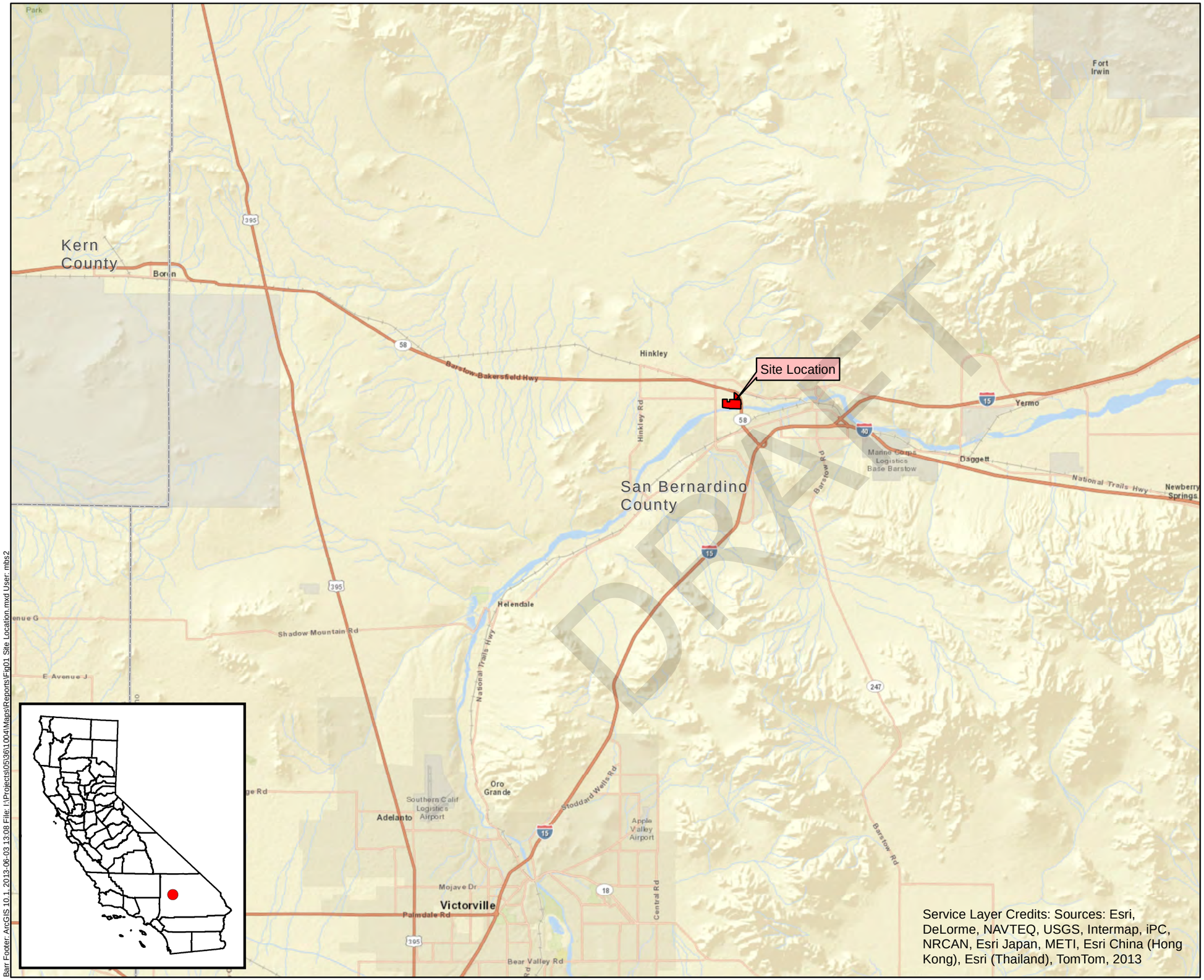


DRAFT

Project Boundary

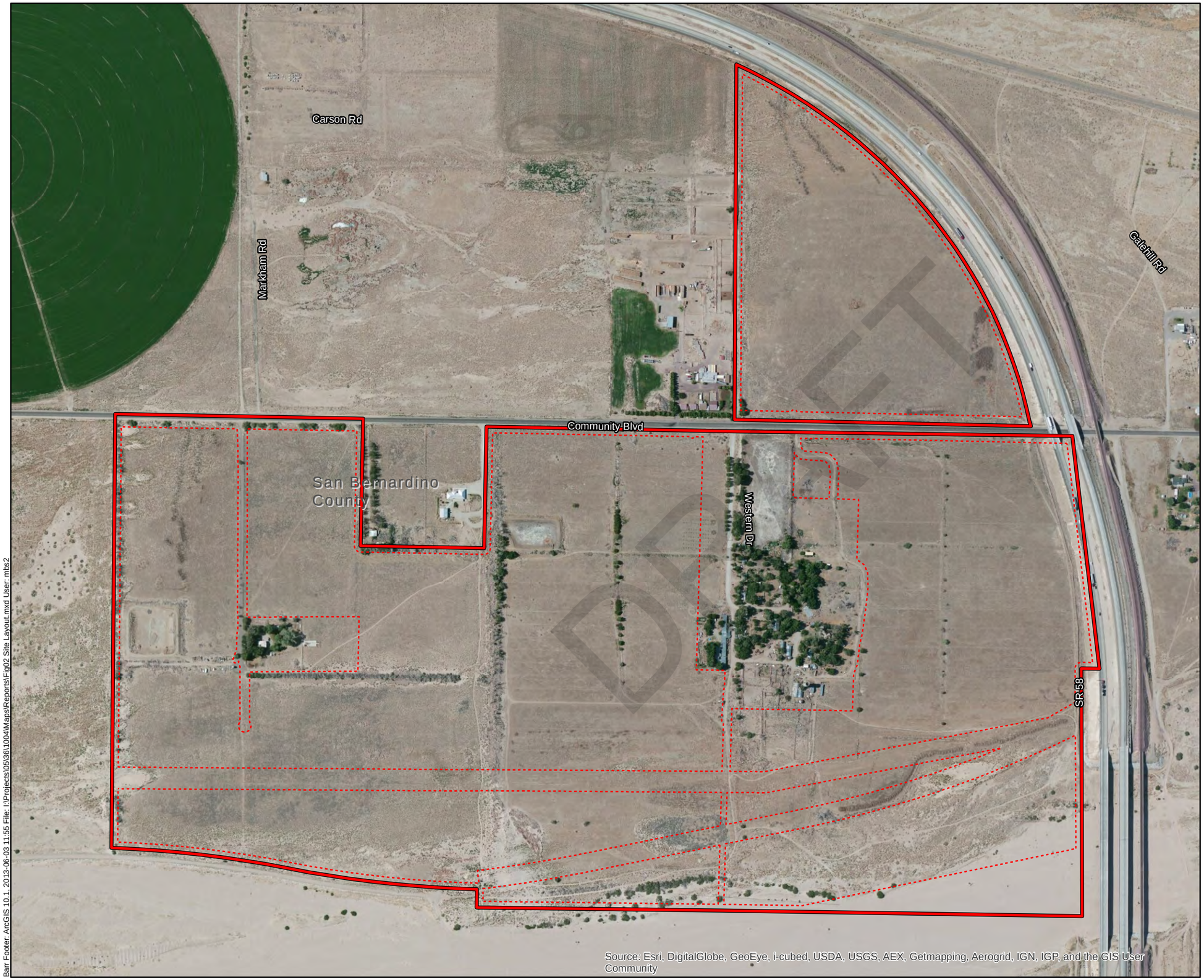
Miles
5 0 5

Kilometers
8 0 8

Figure 1

SITE LOCATION
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-03 13:08 File: I:\Projects\05\36\1.004\Maps\Reports\Fig01 Site Location.mxd User: mbs2



Buildable Land
Project Boundary

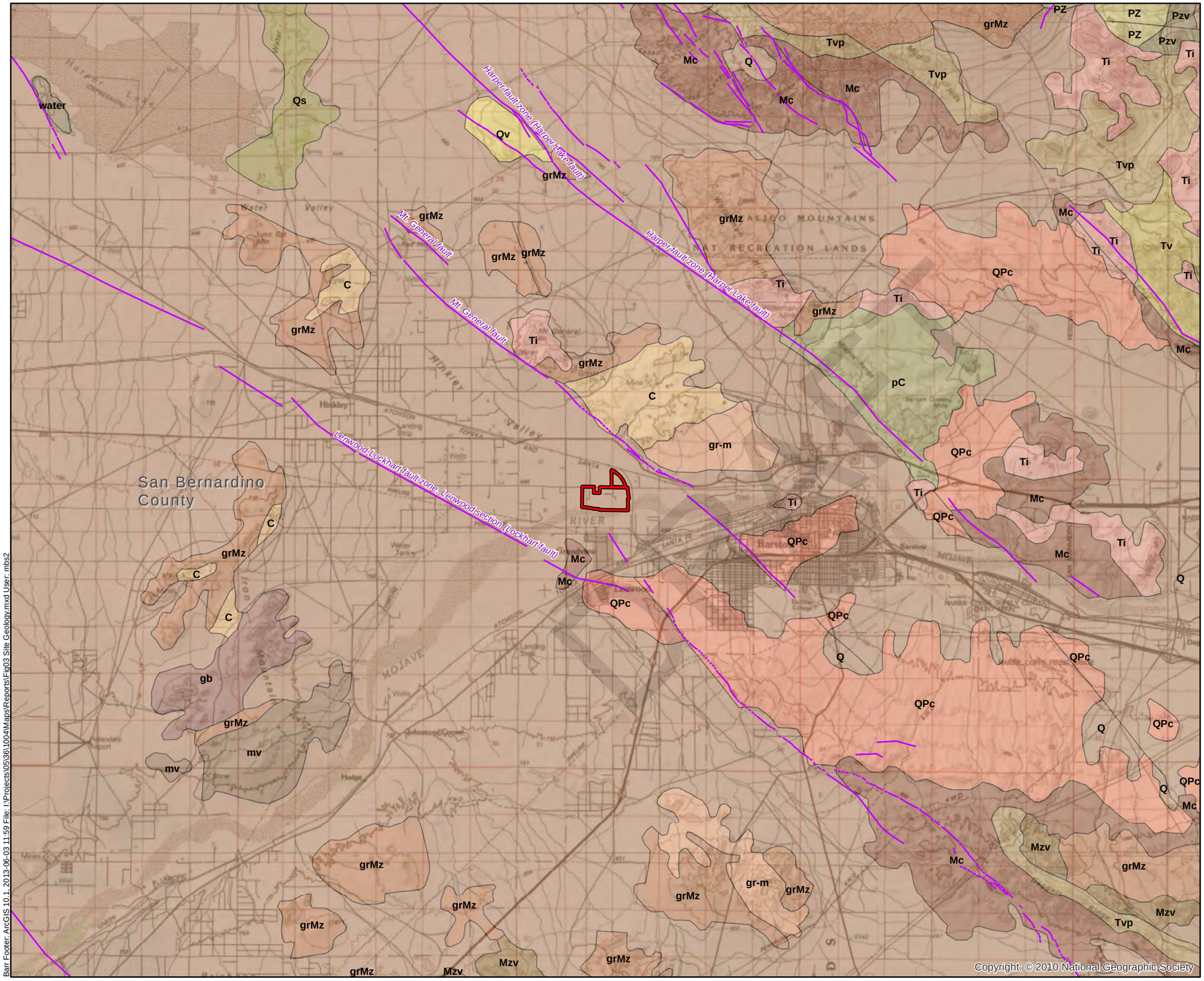
Feet
500 0 500

Meters
150 0 150

Figure 2

SITE LAYOUT
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-03 11:55 File: I:\Projects\05\36\1004\Maps\Reports\Fig02 Site Layout.mxd User: mbs2



Quarternary Faults

Project Boundary

Geology

- Q--Quaternary alluvium and marine deposits
- Qv--Quaternary volcanic flow rocks
- Qs--Quaternary sand deposits
- QPc--loosely consolidated deposits
- C--Carboniferous marine rocks
- Mc--Miocene nonmarine rocks
- Mzv--Mesozoic volcanic rocks
- Pz--Paleozoic marine rocks, undivided
- Pzv--Paleozoic metavolcanic rocks
- Ti--Tertiary intrusive rocks
- Tv--Tertiary volcanic flow rocks
- Tvp--Pyroclastic and volcanic mudflow deposits
- gb--Mesozoic gabbroic rocks
- gr-m--granitic and metamorphic rocks undivided
- grMz--Mesozoic granitic rocks
- mv--Undivided pre-Cenozoic metavolcanic rocks
- pC--Precambrian rocks, undivided
- water--water

Miles

2 0 2

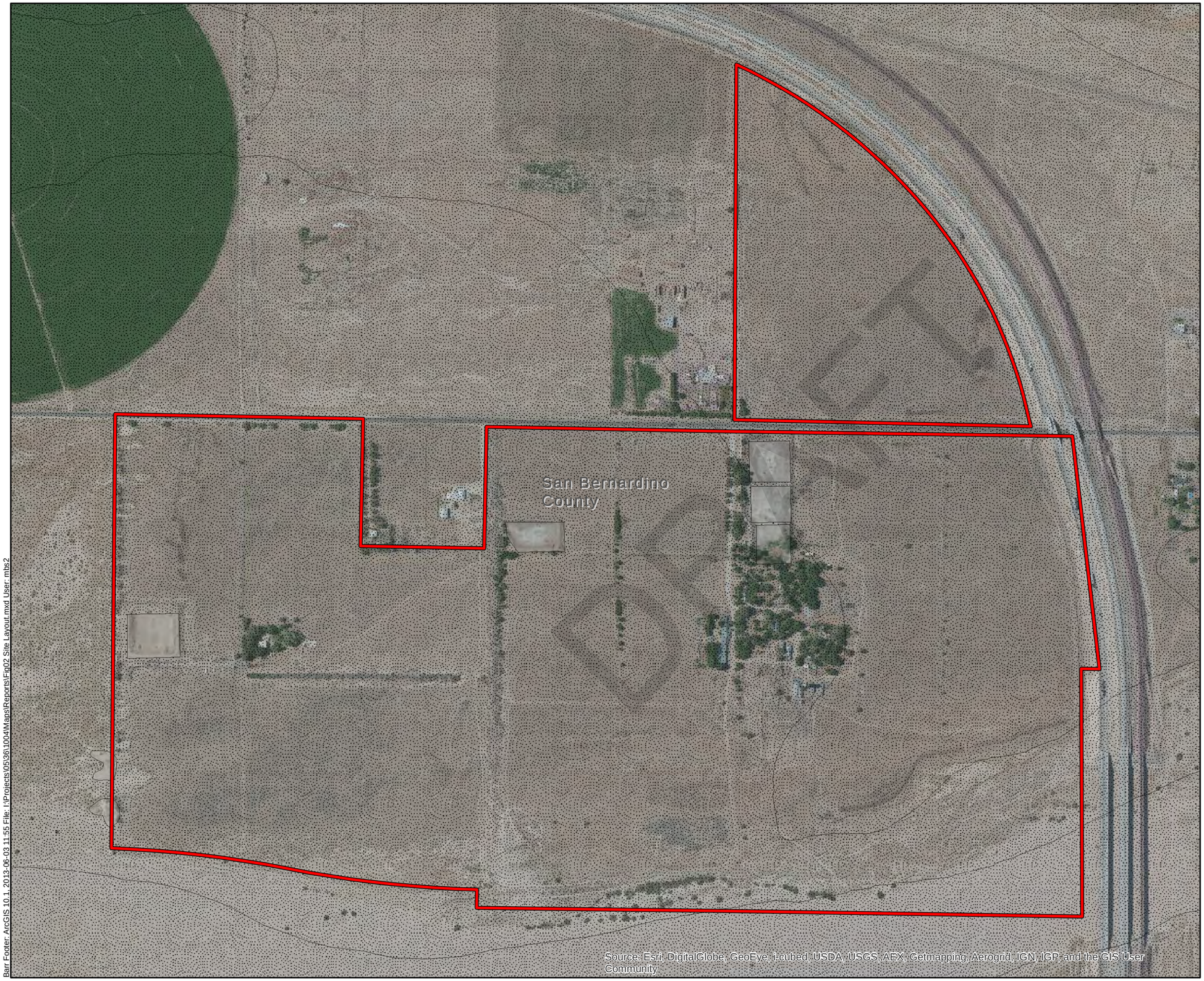
Kilometers

3 0 3

Figure 3

SITE GEOLOGY
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-03 11:59 File: I:\Projects\05\36\1004\Maps\Reports\Fig03 Site Geology.mxd User: mbs2



Project Boundary

Soil Wind Erodibility Index

0 tons/acre/yr

Not Rated

Unified Soil Classifciation

Not Rated

Feet

500 0 500

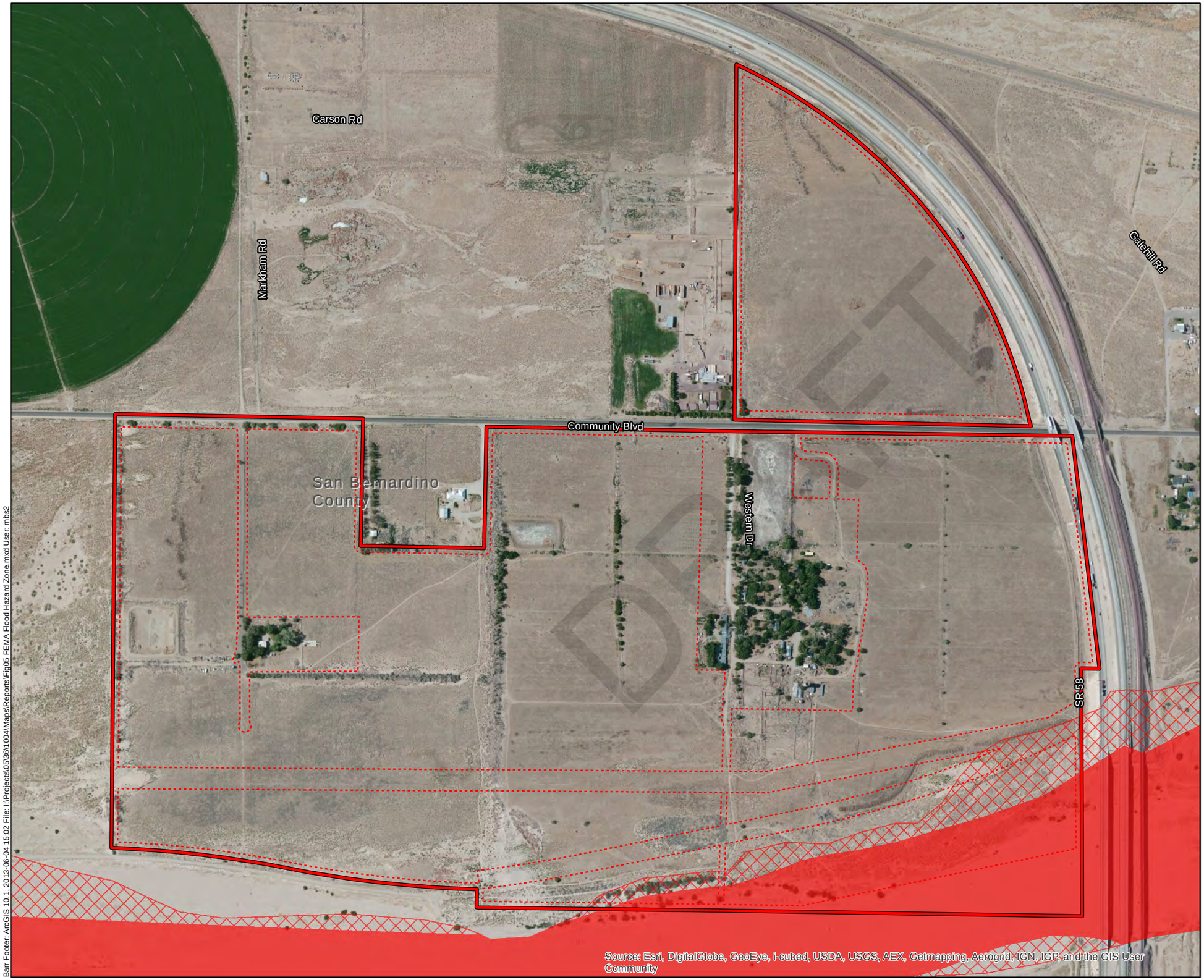
Meters

150 0 150

Figure 4

UNIFIED SOIL CLASSIFICATION
AND WIND ERODIBILITY INDEX
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-03 11:55 File: I:\Projects\05\36\1004\Maps\Reports\Fig02 Site Layout.mxd User: mhs2



Buildable Land
Project Boundary
FEMA Flood Hazard Zone 'AE'
FEMA Floodway

Flood hazard zone AE: The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.

Floodway: the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without causing any cumulative increase in the watersurface elevation.The floodway is intended to carry the dangerous and fast-moving water.

Feet
500 0 500

Meters
150 0 150

Figure 5

FEMA FLOOD HAZARD ZONE
Viking Solar Project
EDF Renewable Energy
Barstow, California

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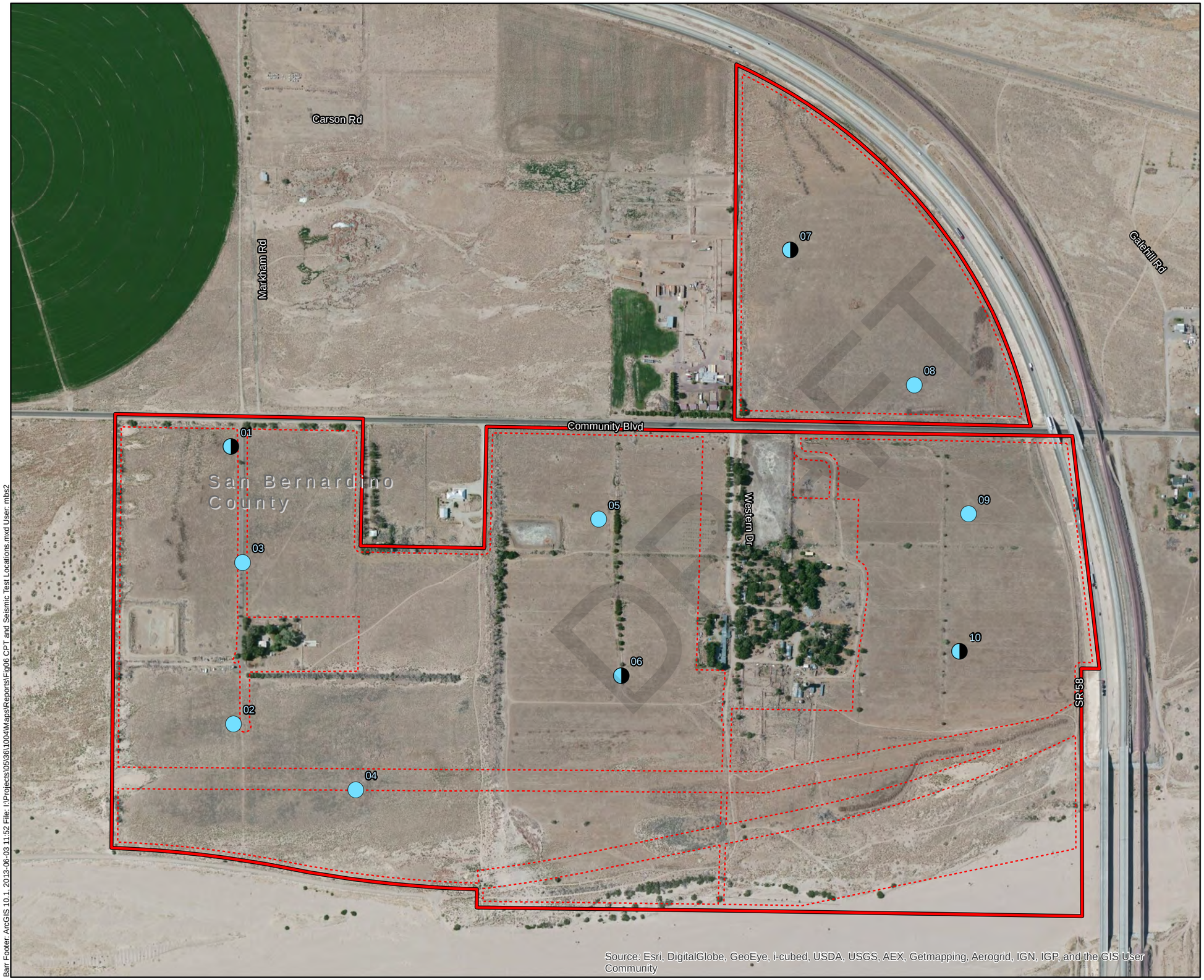

CPT Location
CPT and Seismic Location
Project Boundary

Feet
500 0 500

Meters
150 0 150

Figure 6

CPT AND SEISMIC
TEST LOCATIONS
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-03 11:52 File: I:\Projects\05\36\1004\Maps\Reports\Fig06 CPT and Seismic Test Locations.mxd User: mbs2

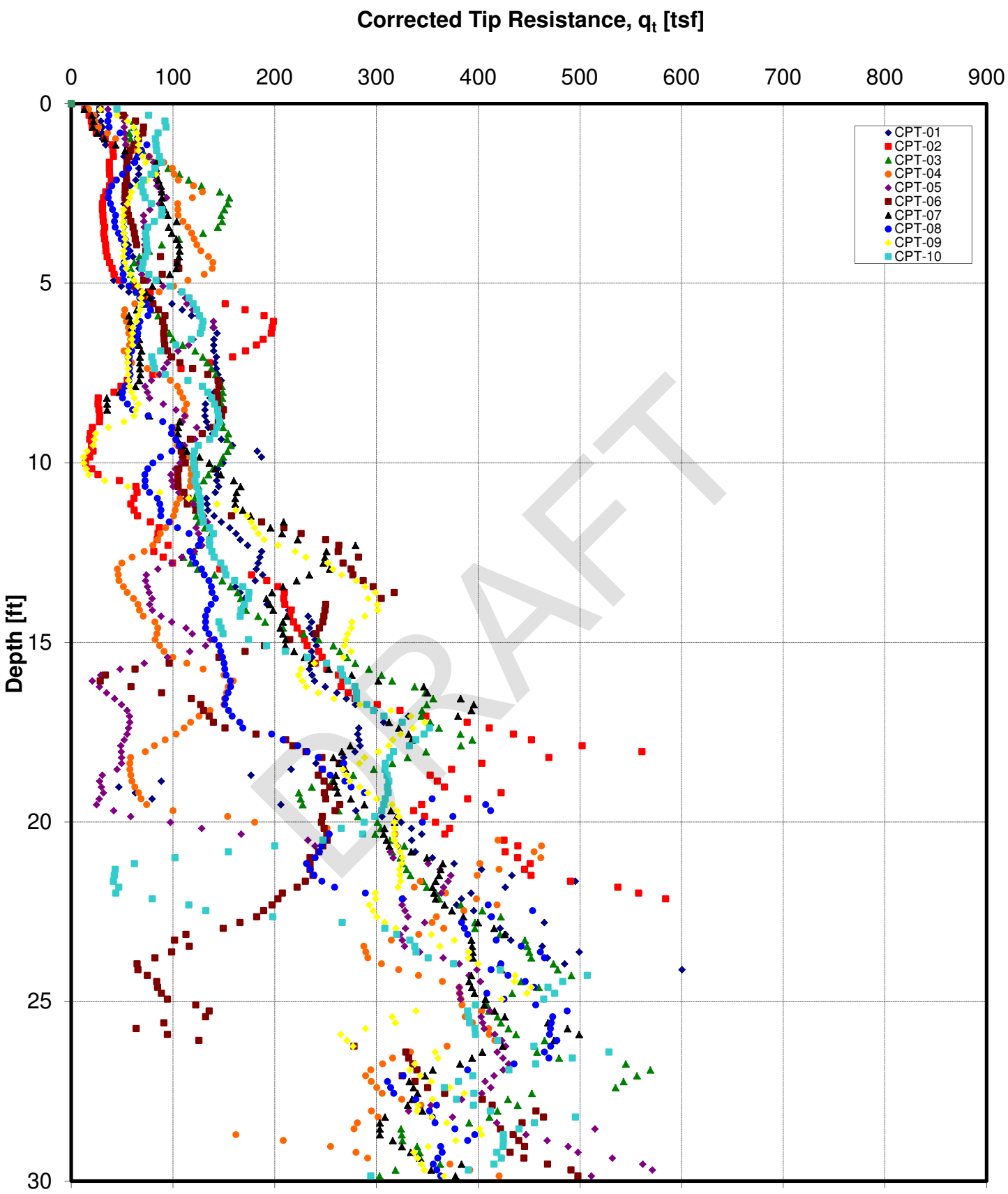

Figure 7. Tip Resistance vs. Depth from CPT

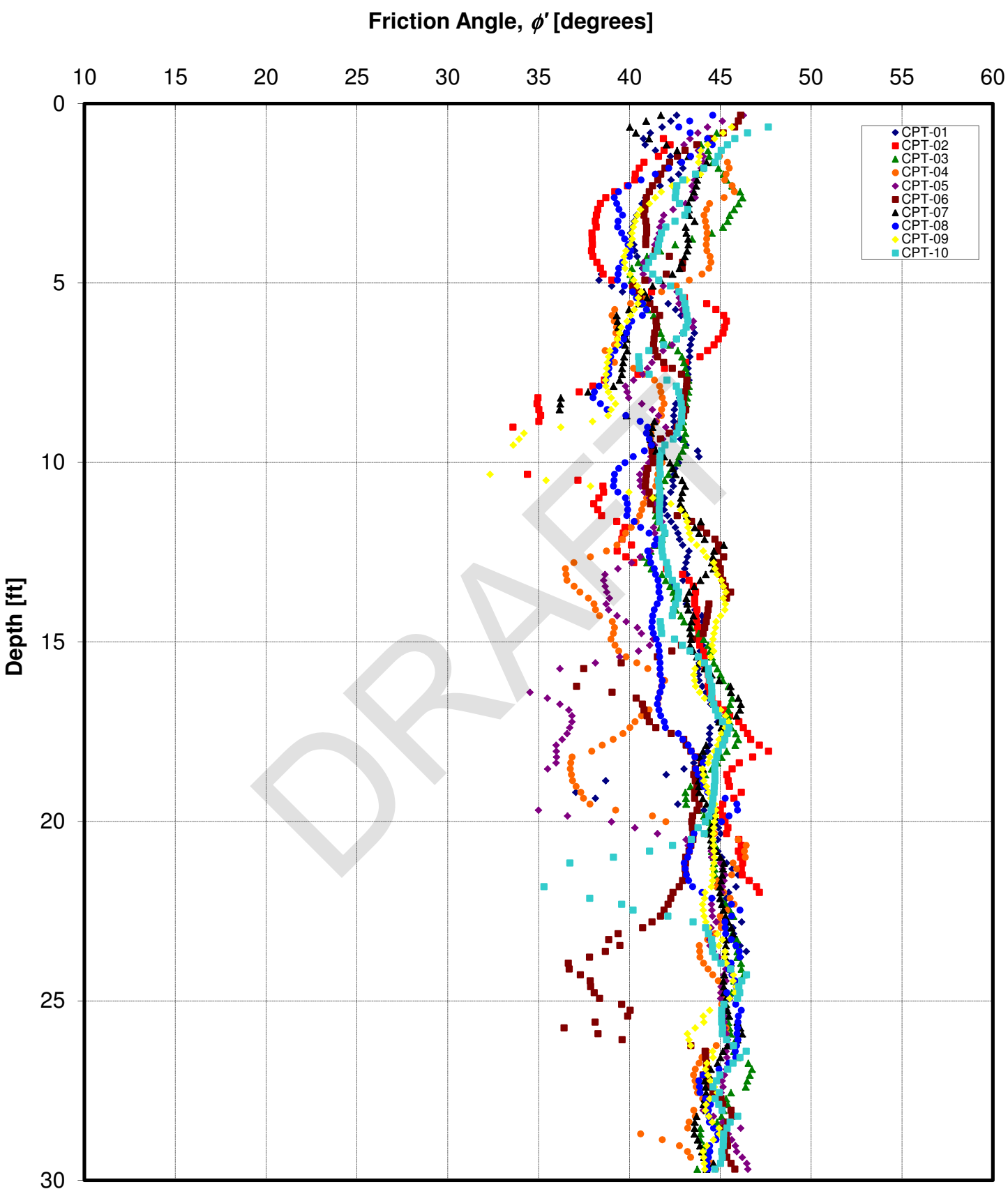

Figure 8. Friction Angle vs. Depth (Kulhawy & Mayne, 1990)

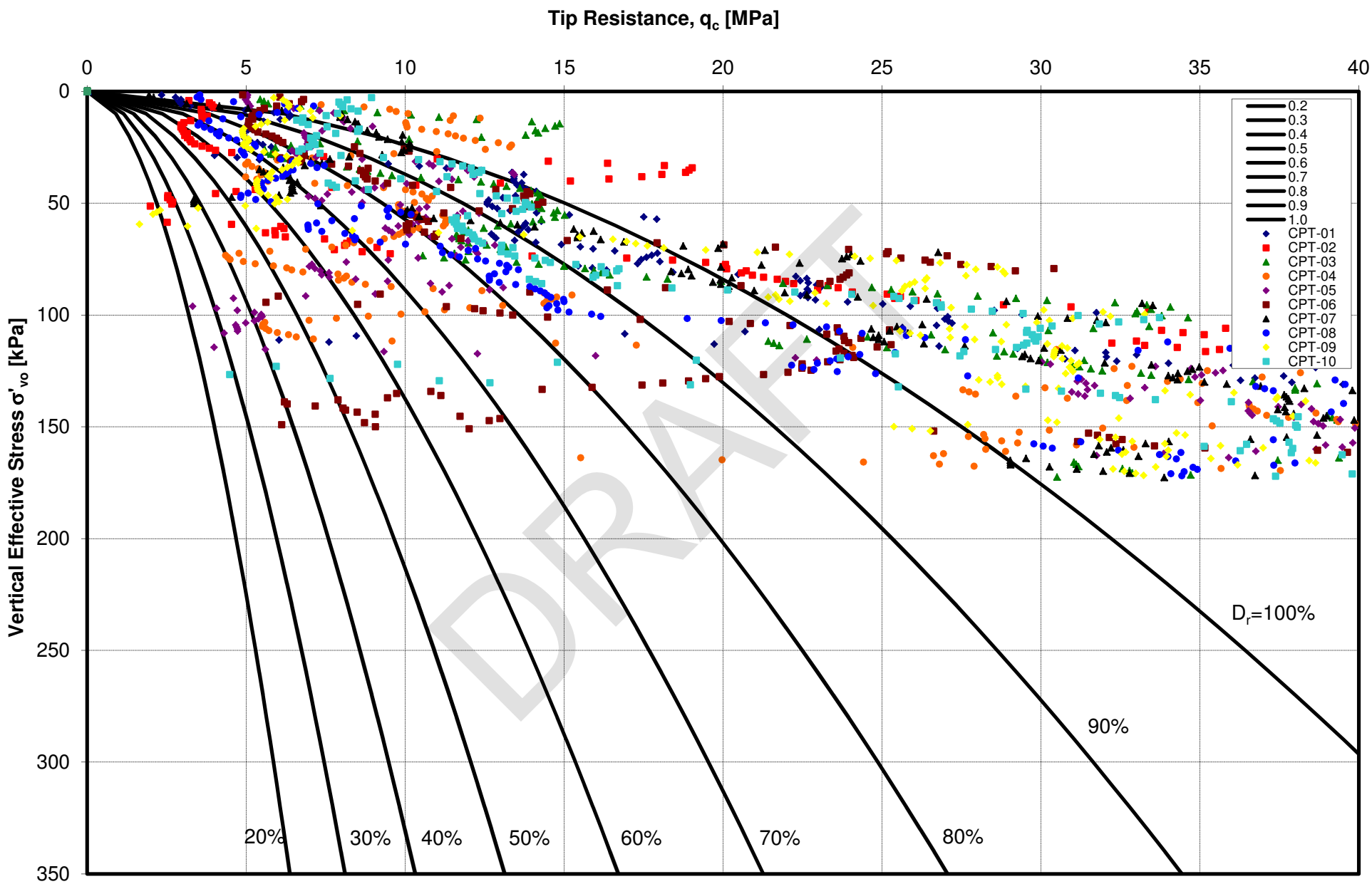

Figure 9. Relative Density Relationship for CPT (Baldi et *al.*, 1986)

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Appendix A

Cone Penetration Test Logs

DRAFT

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

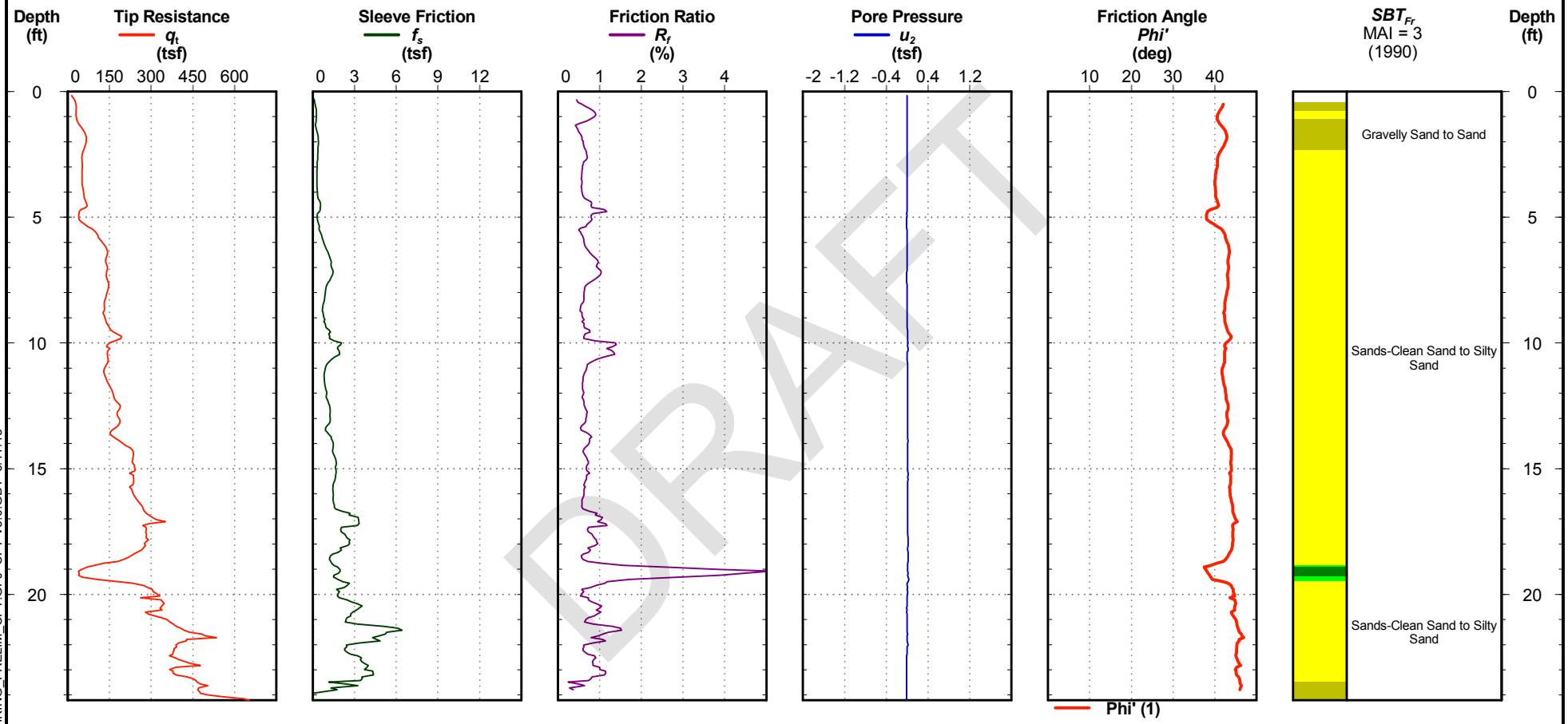
CPT Log

CPT-01

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.906619
Longitude: -117.109518
Elevation:

Total Depth: 24.2 ft
Termination Criteria: Maximum Reaction Force
Area Ratio: 0.83



DRAFT

CPT REPORT - DYNAMIC 05361004.00_VIKING_PRELIM_CPT.GPJ CPT V3.0.GDT 6/17/13

Electronic Filename: Z06U1307C.ECP

CPT-01

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

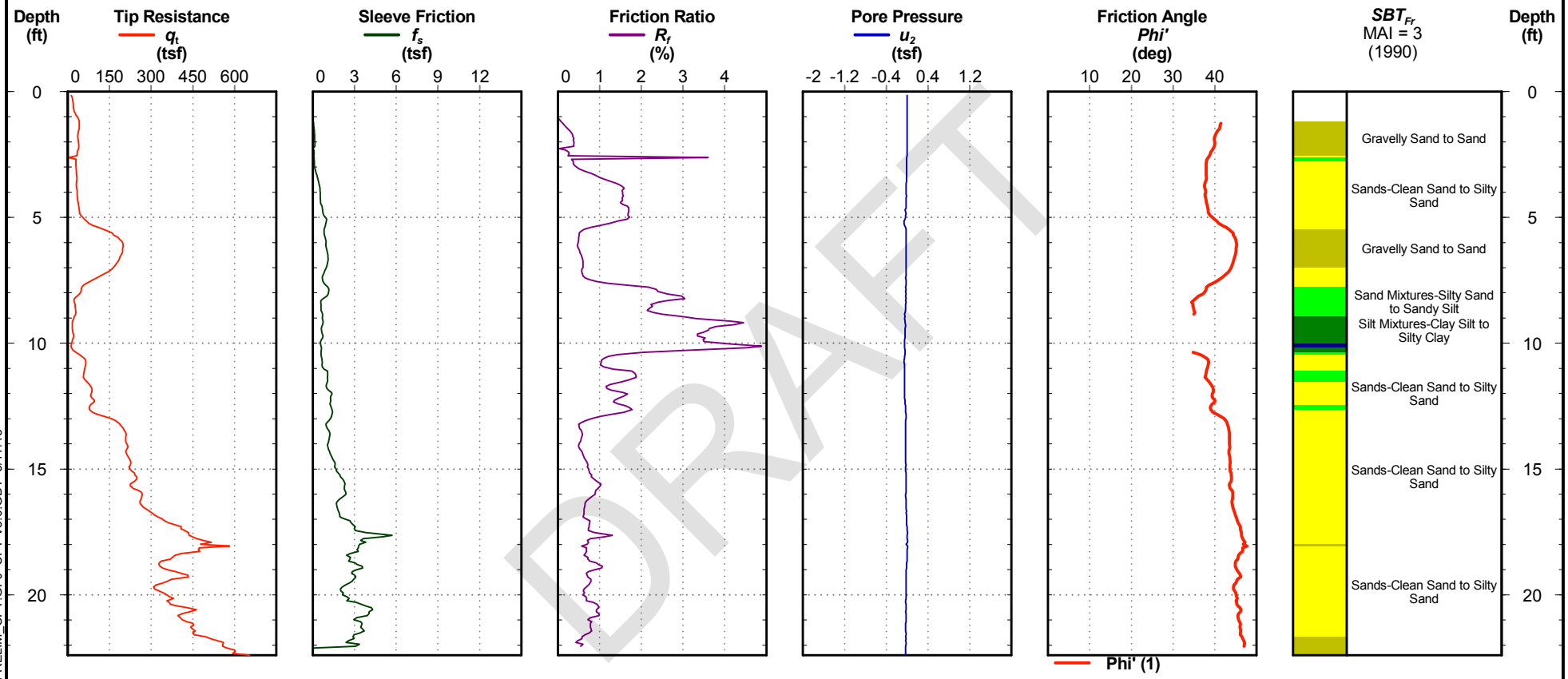
CPT Log

CPT-02

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.902543
Longitude: -117.109468
Elevation:

Total Depth: 22.4 ft
Termination Criteria: Maximum Reaction Force
Area Ratio: 0.83



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Electronic Filename: Z06U1308C.ECP

CPT-02

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

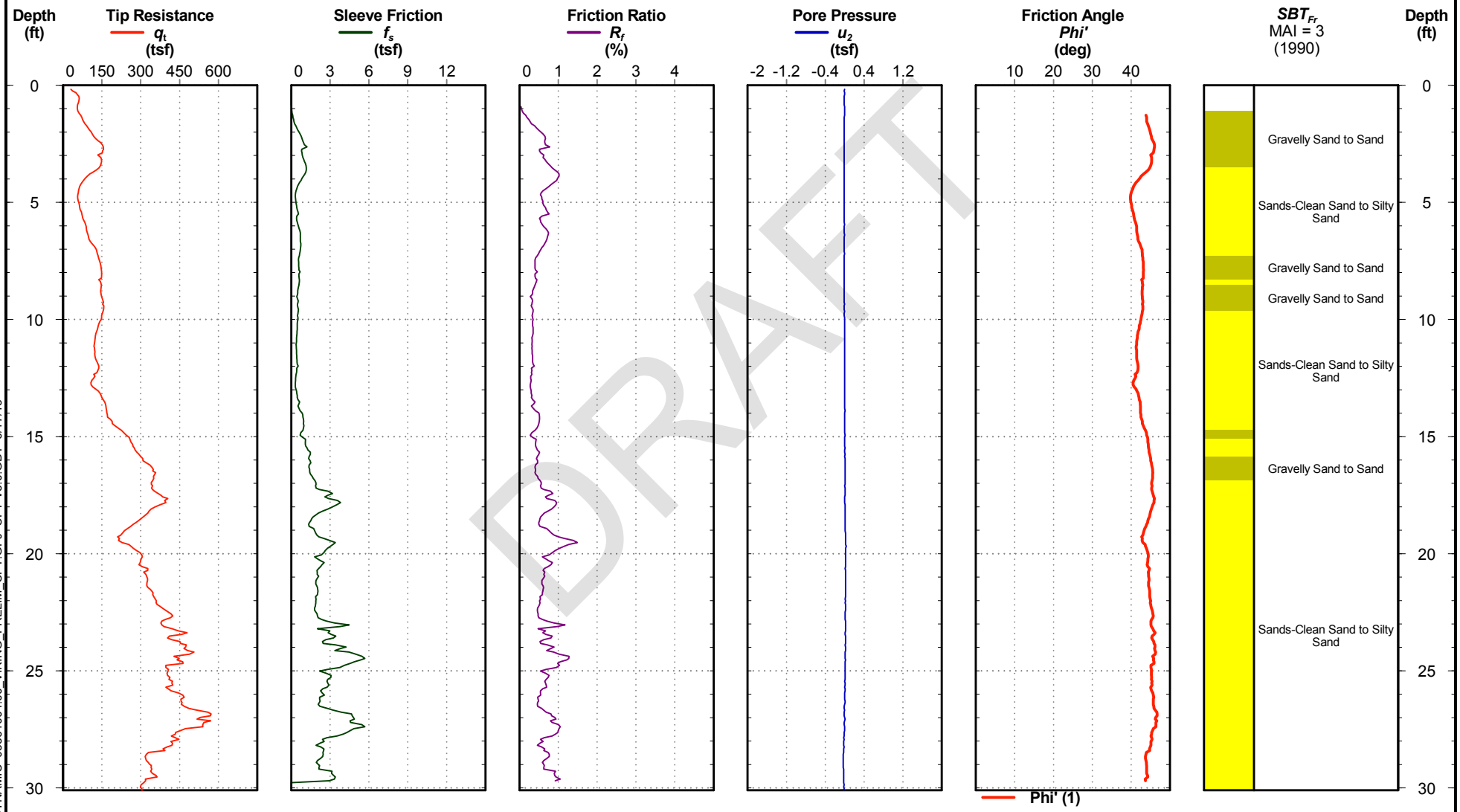
CPT Log

CPT-03

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.904915
Longitude: -117.109307
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



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CPT-03

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

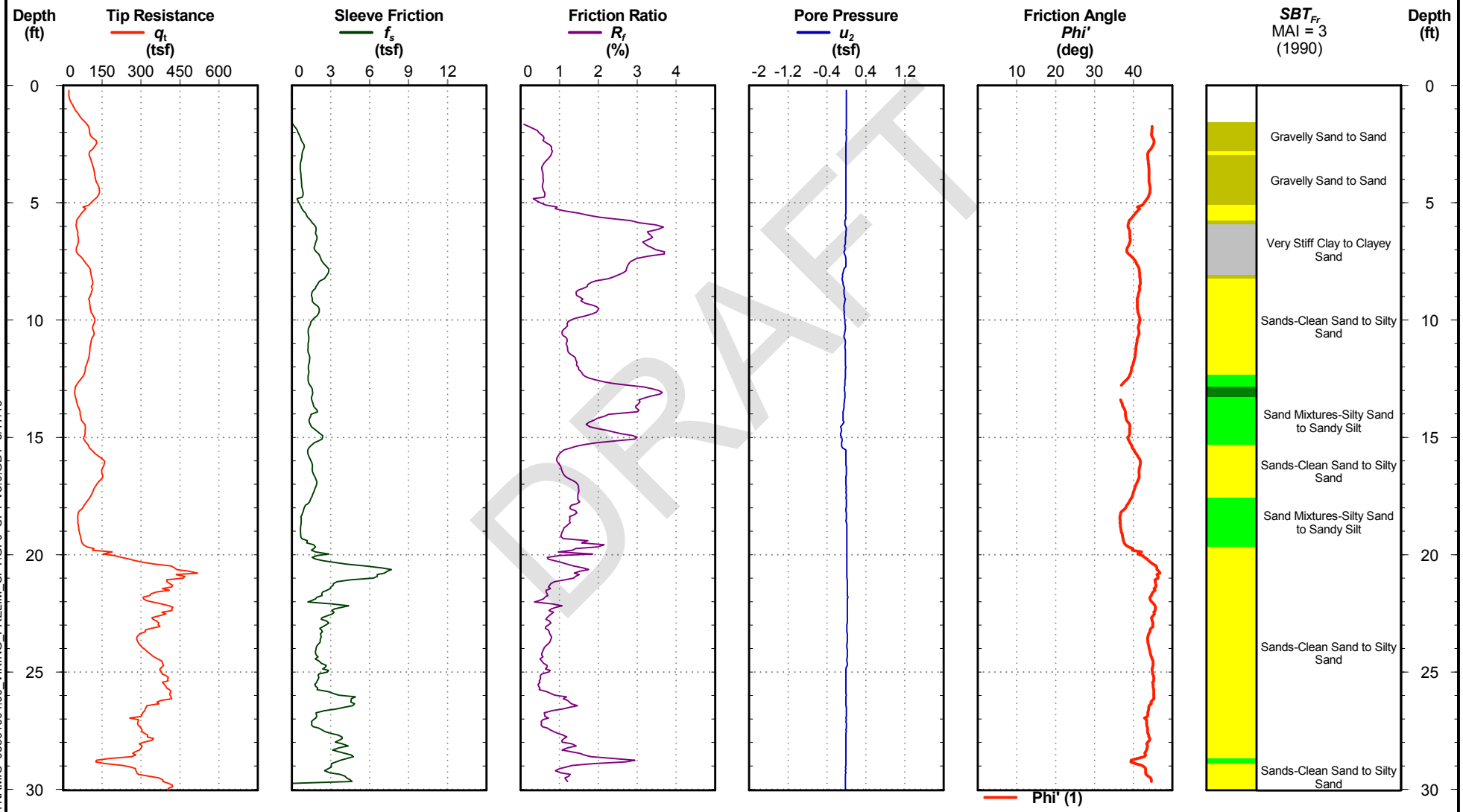
CPT Log

CPT-04

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.90158
Longitude: -117.10728
Elevation:

Total Depth: 30.0 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



DRAFT

Electronic Filename: Z06U1309C.ECP

CPT-04

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

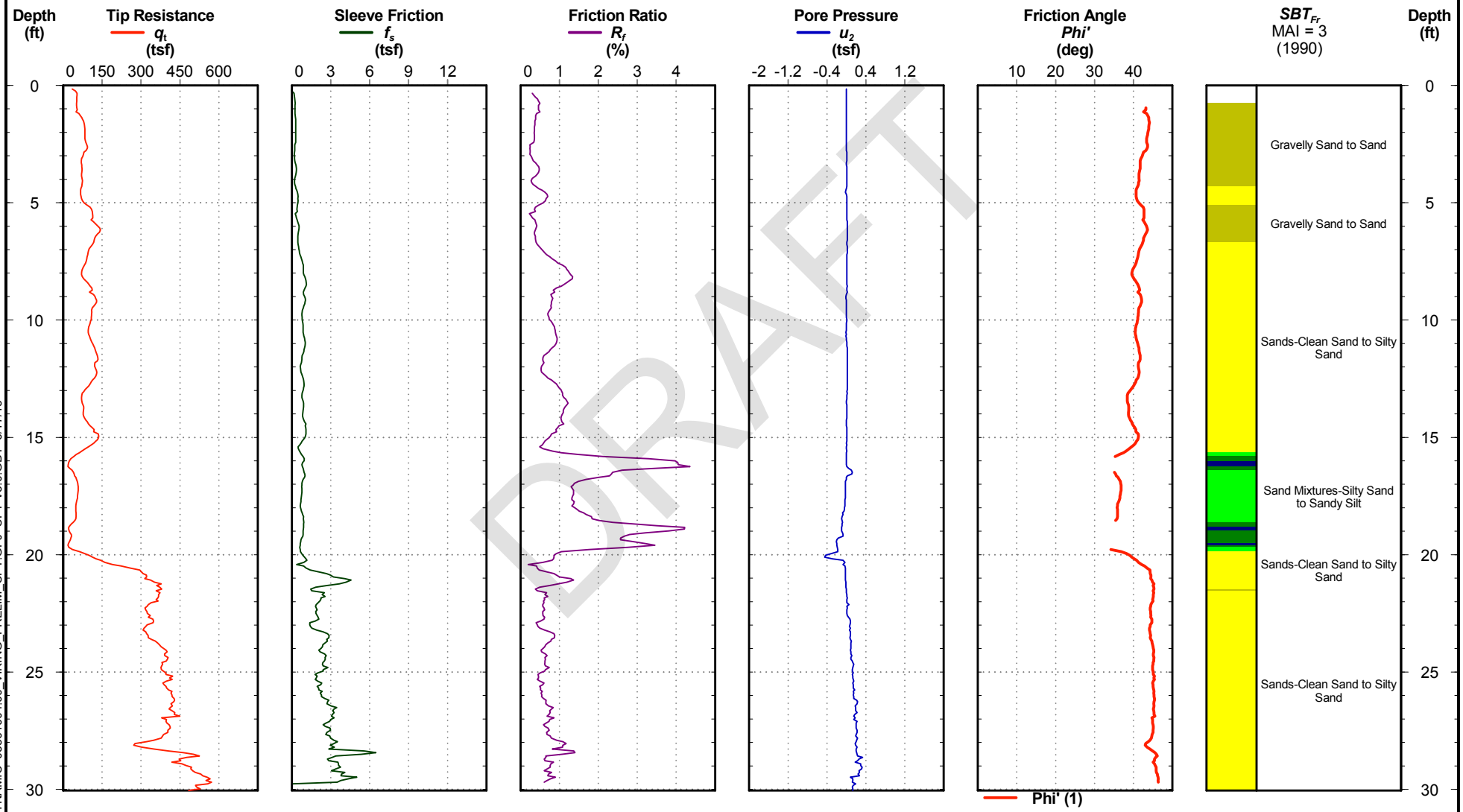
CPT Log

CPT-05

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.905552
Longitude: -117.102966
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



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CPT REPORT - DYNAMIC 05361004.00_VIKING_PRELIM_CPT.GPJ CPT V3.0.GDT 6/17/13

Electronic Filename: Z06U1301C.ECP

CPT-05

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

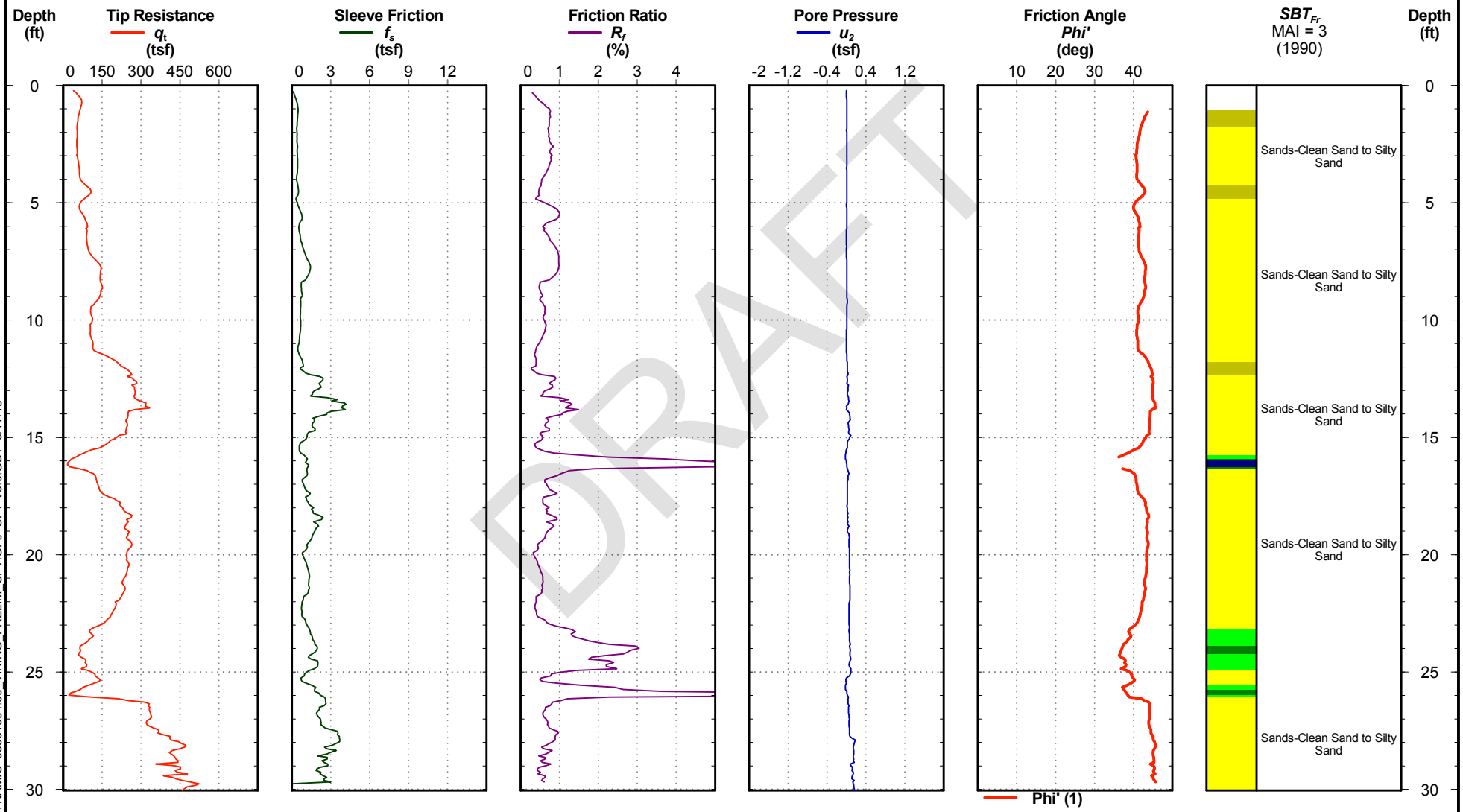
CPT Log

CPT-06

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.903258
Longitude: -117.102564
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



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CPT-06

CPT REPORT - DYNAMIC 05361004.00_VIKING_PRELIM_CPT.GPJ CPT V3.0.GDT 6/17/13

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

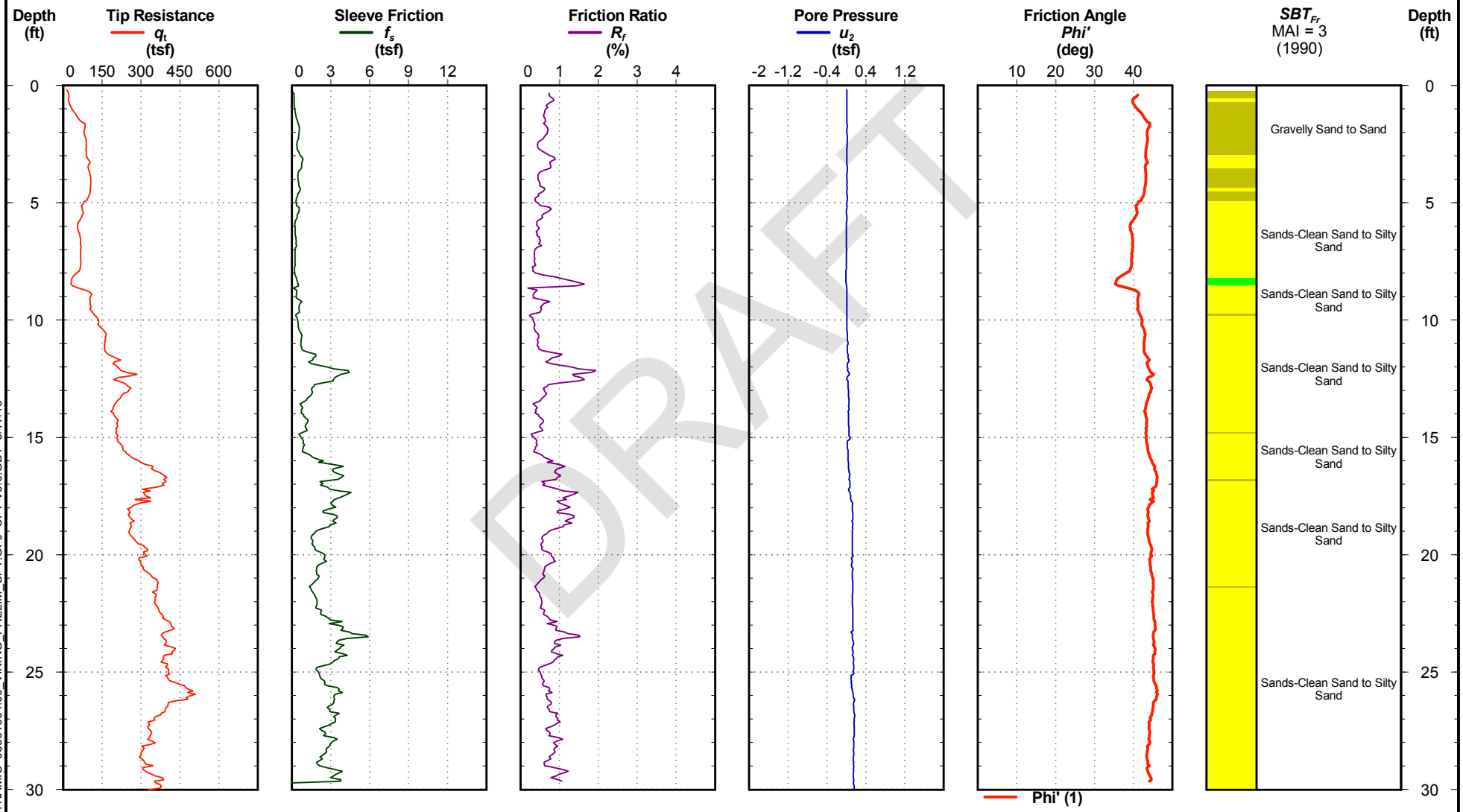
CPT Log

CPT-07

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.909504
Longitude: -117.099557
Elevation:

Total Depth: 30.0 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



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Electronic Filename: Z06U1303C.ECP

CPT-07

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

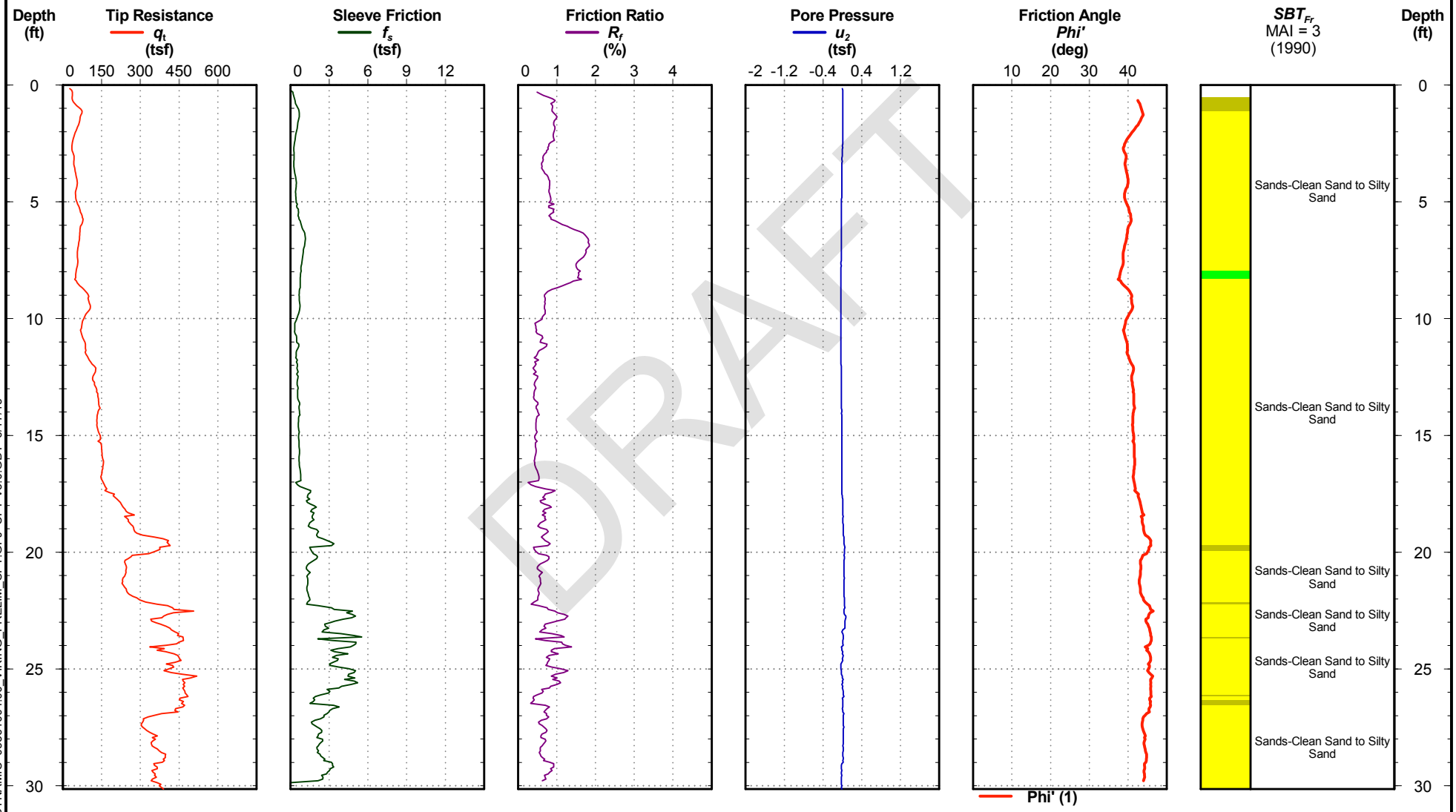
CPT Log

CPT-08

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.907529
Longitude: -117.097348
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



DRAFT

Electronic Filename: Z06U1304C.ECP

CPT-08

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

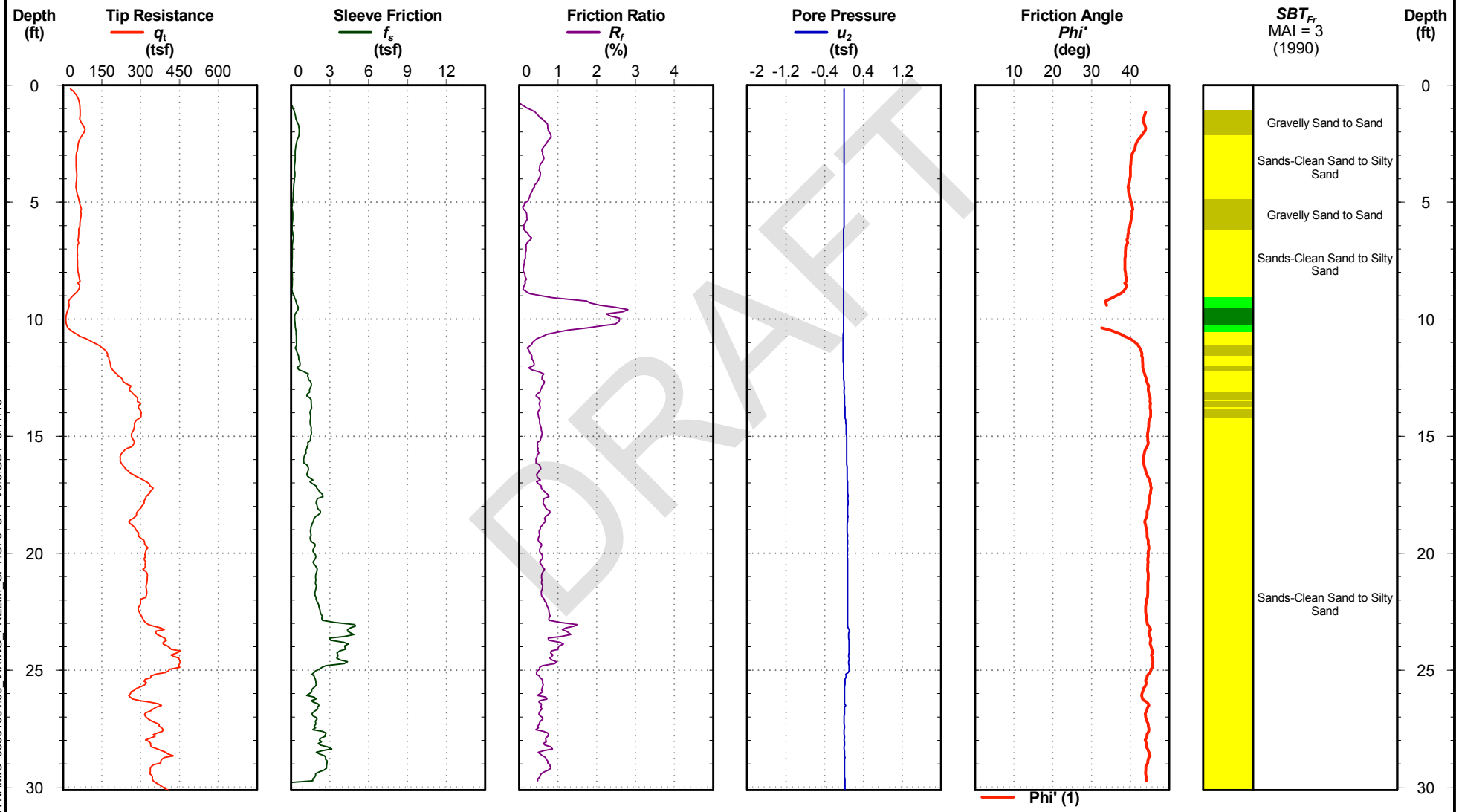
CPT Log

CPT-09

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.905638
Longitude: -117.096375
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



DRAFT

CPT REPORT - DYNAMIC 05361004.00_VIKING_PRELIM_CPT.GPJ CPT V3.0.GDT 6/17/13

Electronic Filename: Z06U1305C.ECP

CPT-09

BARR

Viking Solar Project
San Bernardino County (California)
Project No: 05361004.00

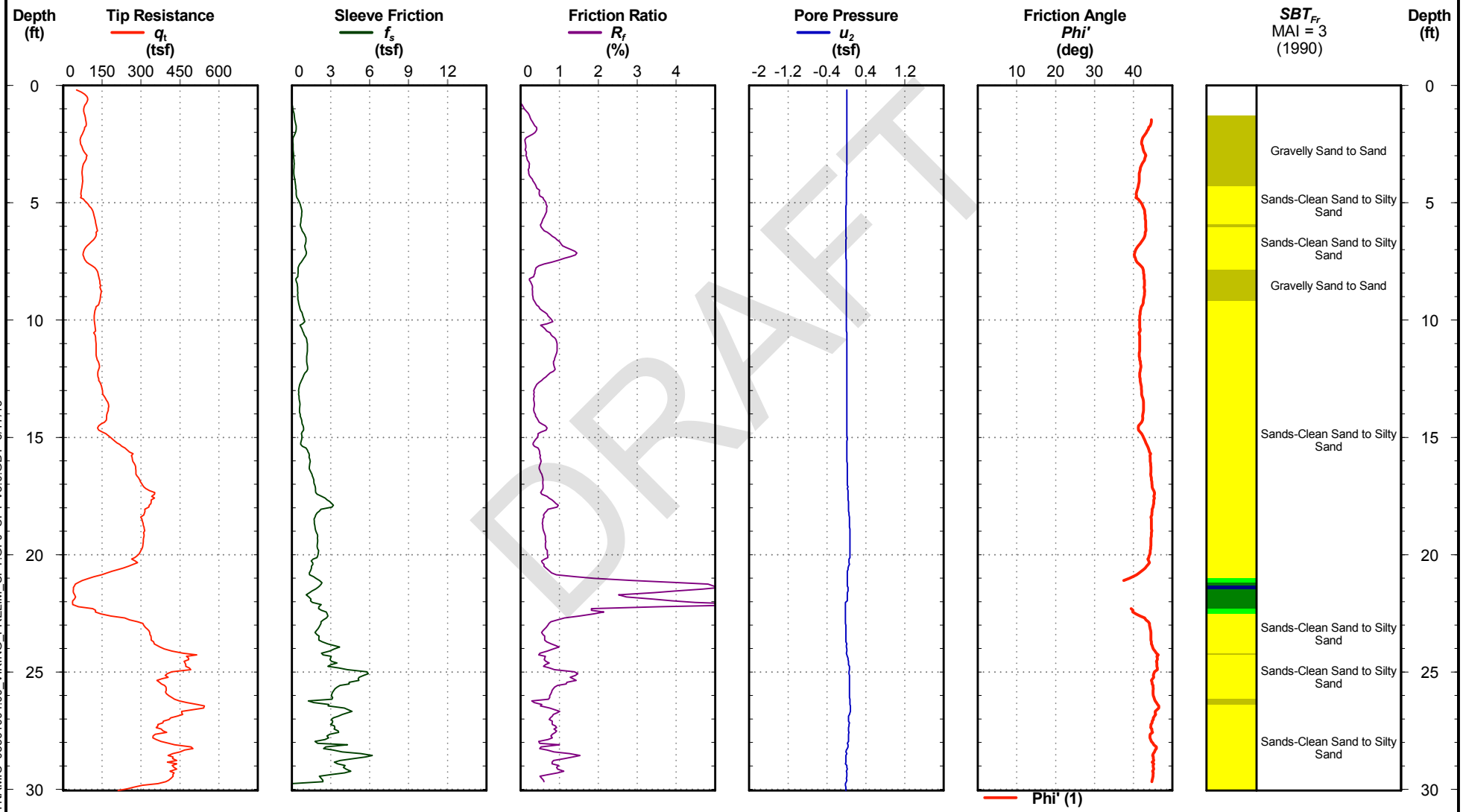
CPT Log

CPT-10

Date: Jun. 6, 2013
Estimated Water Depth: 50 ft
Rig/Operator: KTE, Inc.

Latitude: 34.903623
Longitude: -117.096536
Elevation:

Total Depth: 30.1 ft
Termination Criteria: Target Depth
Area Ratio: 0.83



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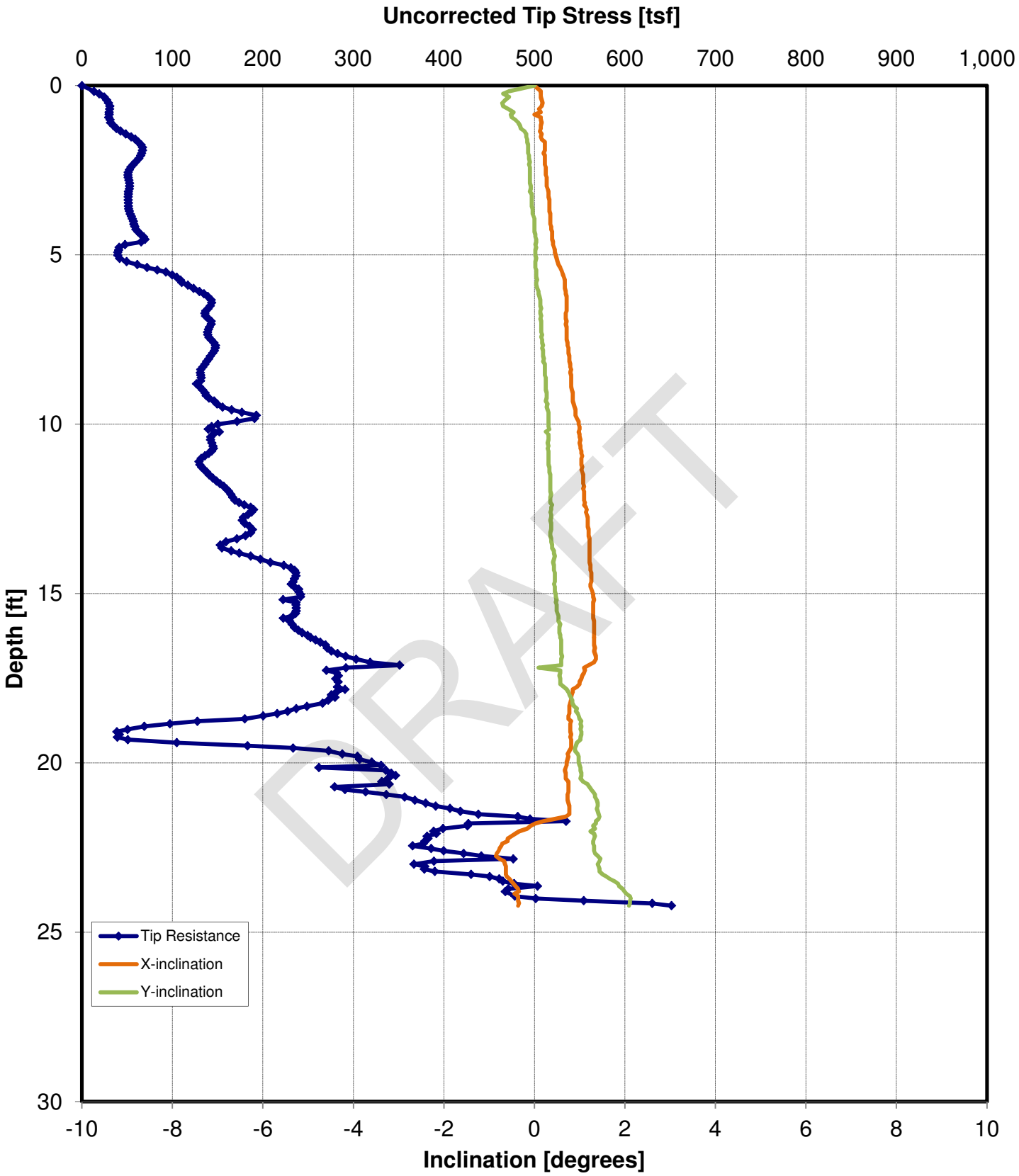
CPT-10



CPT-01 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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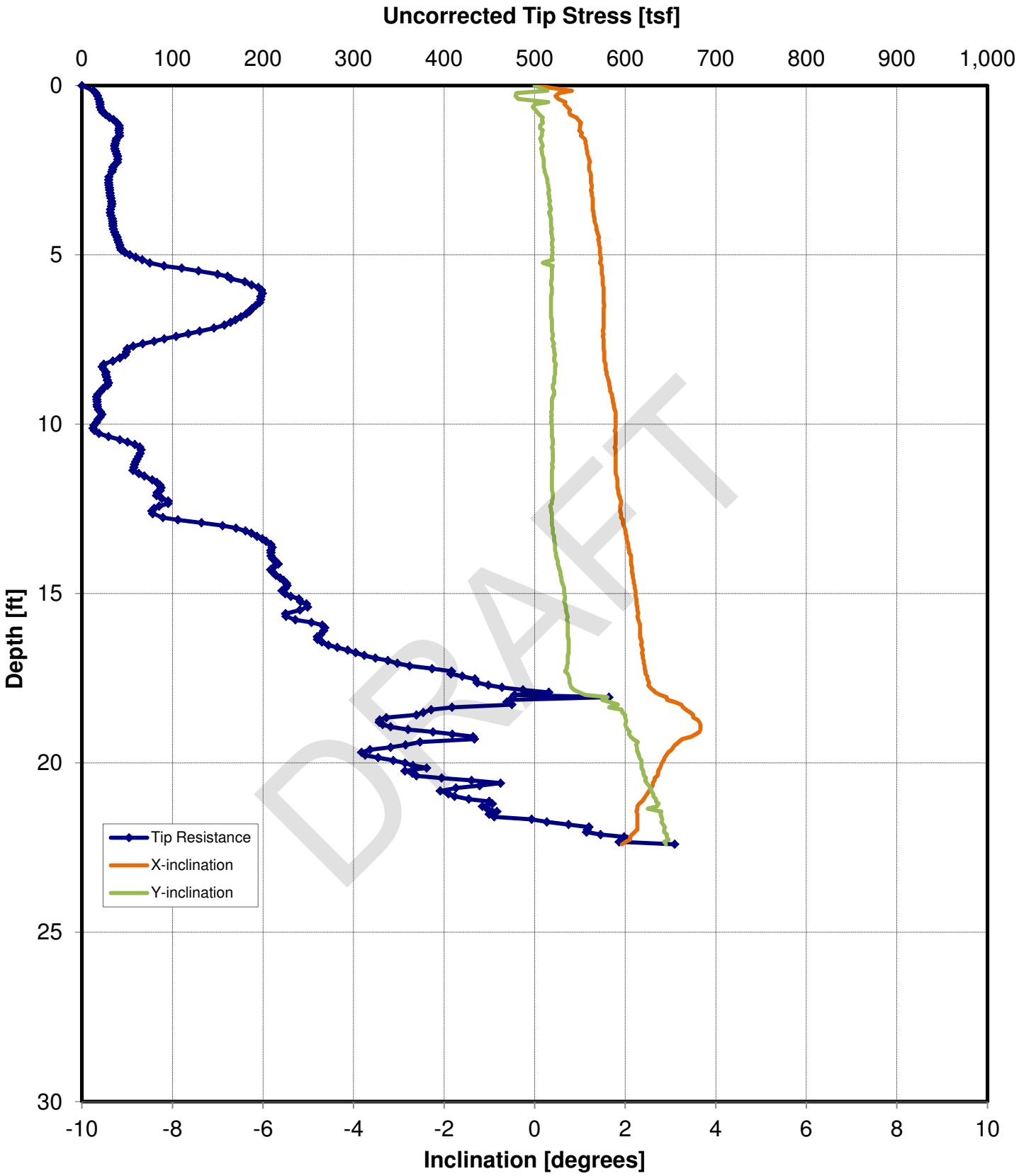
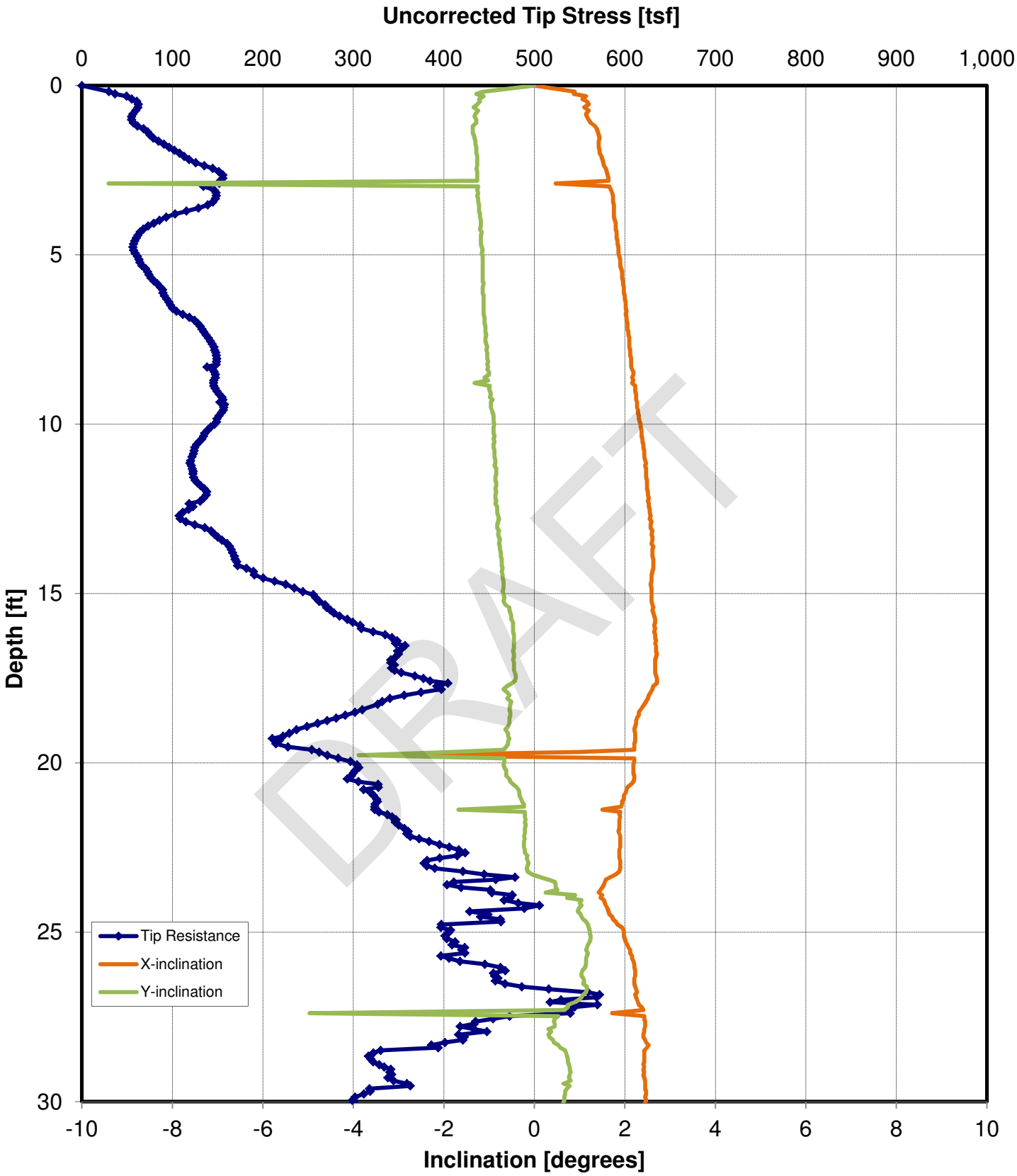


CPT-02 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

P:\Mpls\05 CA\36\05361004 edf viking\WorkFiles\Geotech- prelim\Field\CPT\Tip resistance and inclination.xlsx



CPT-03 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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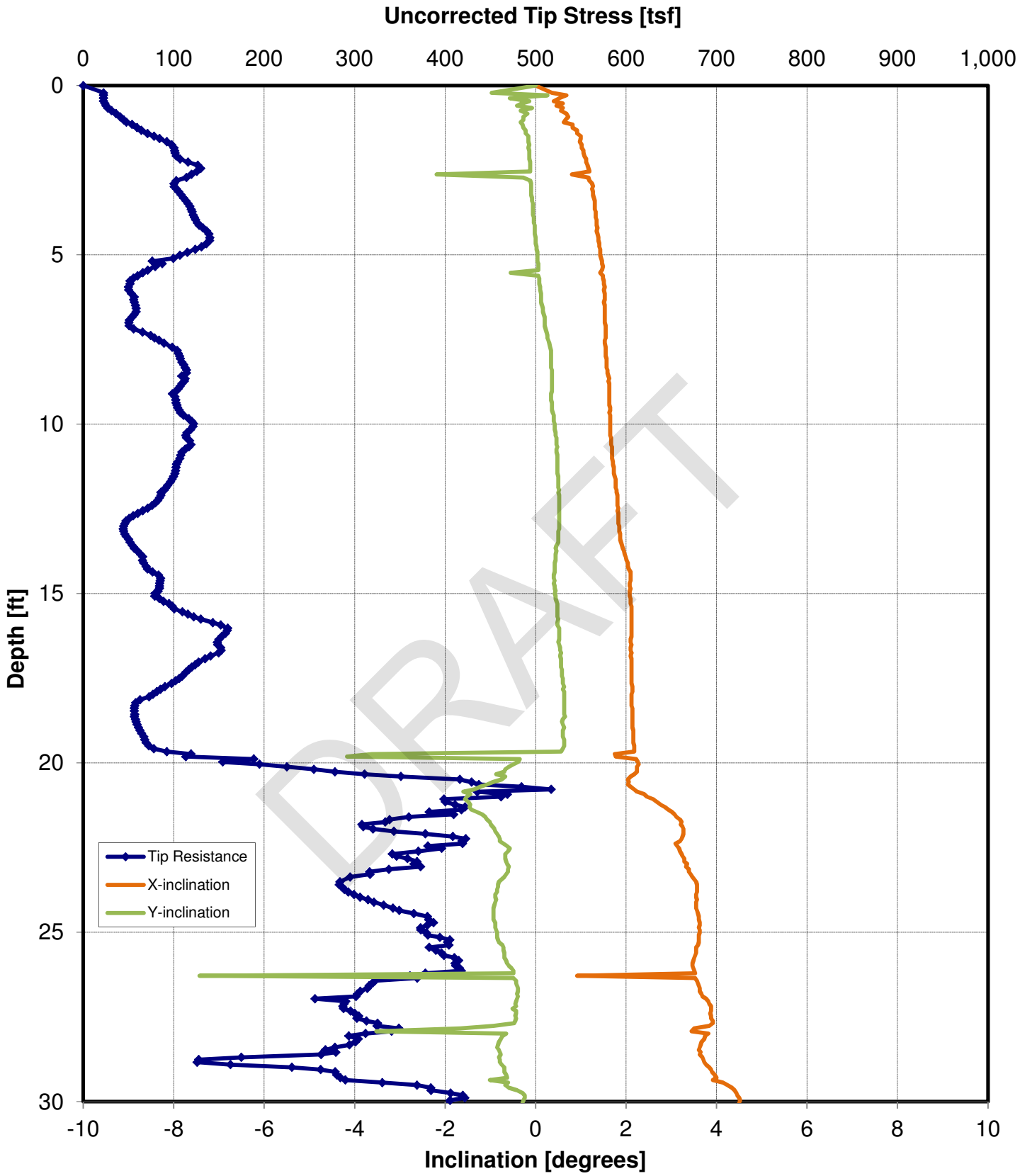

CPT-04 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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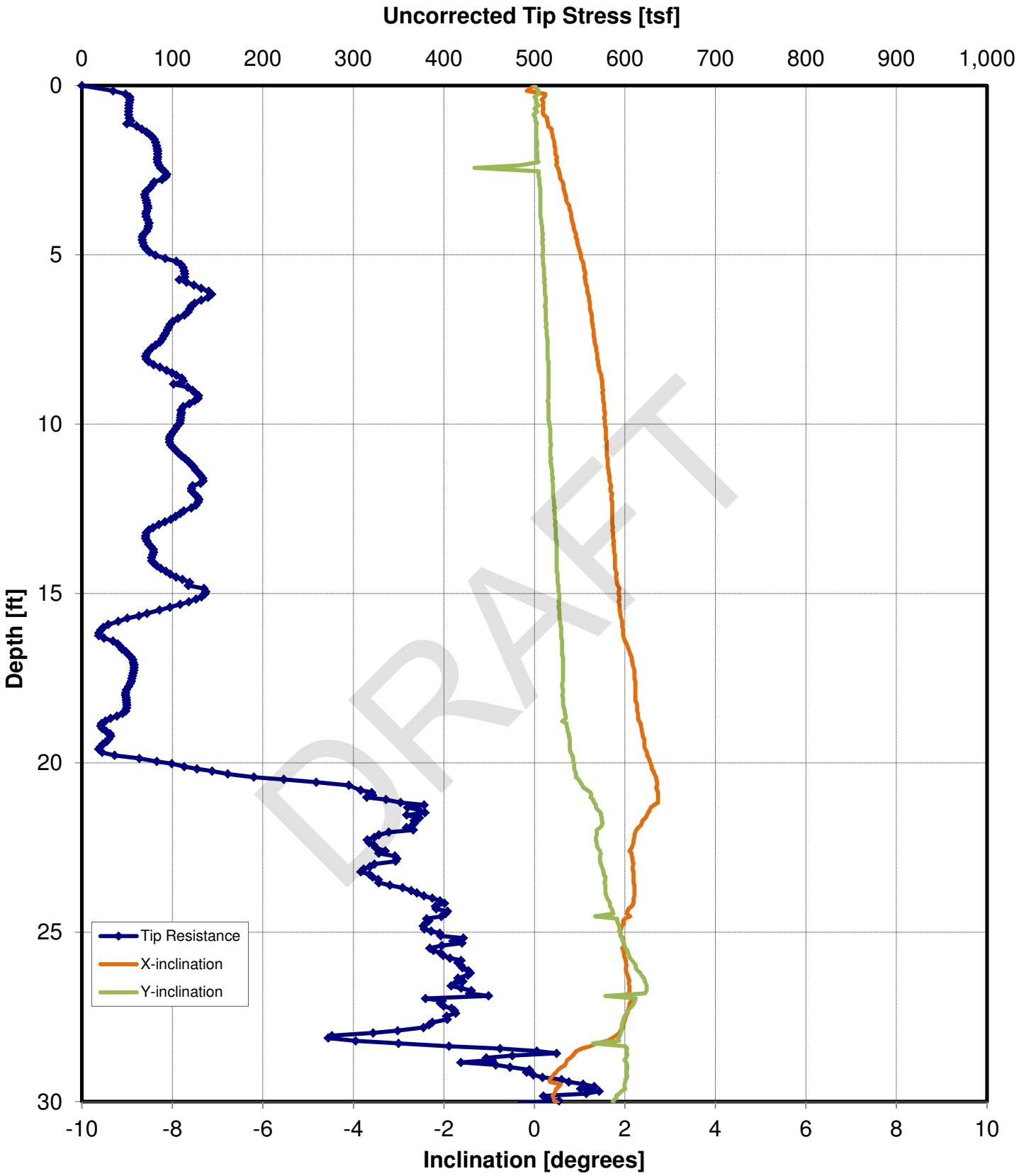

CPT-05 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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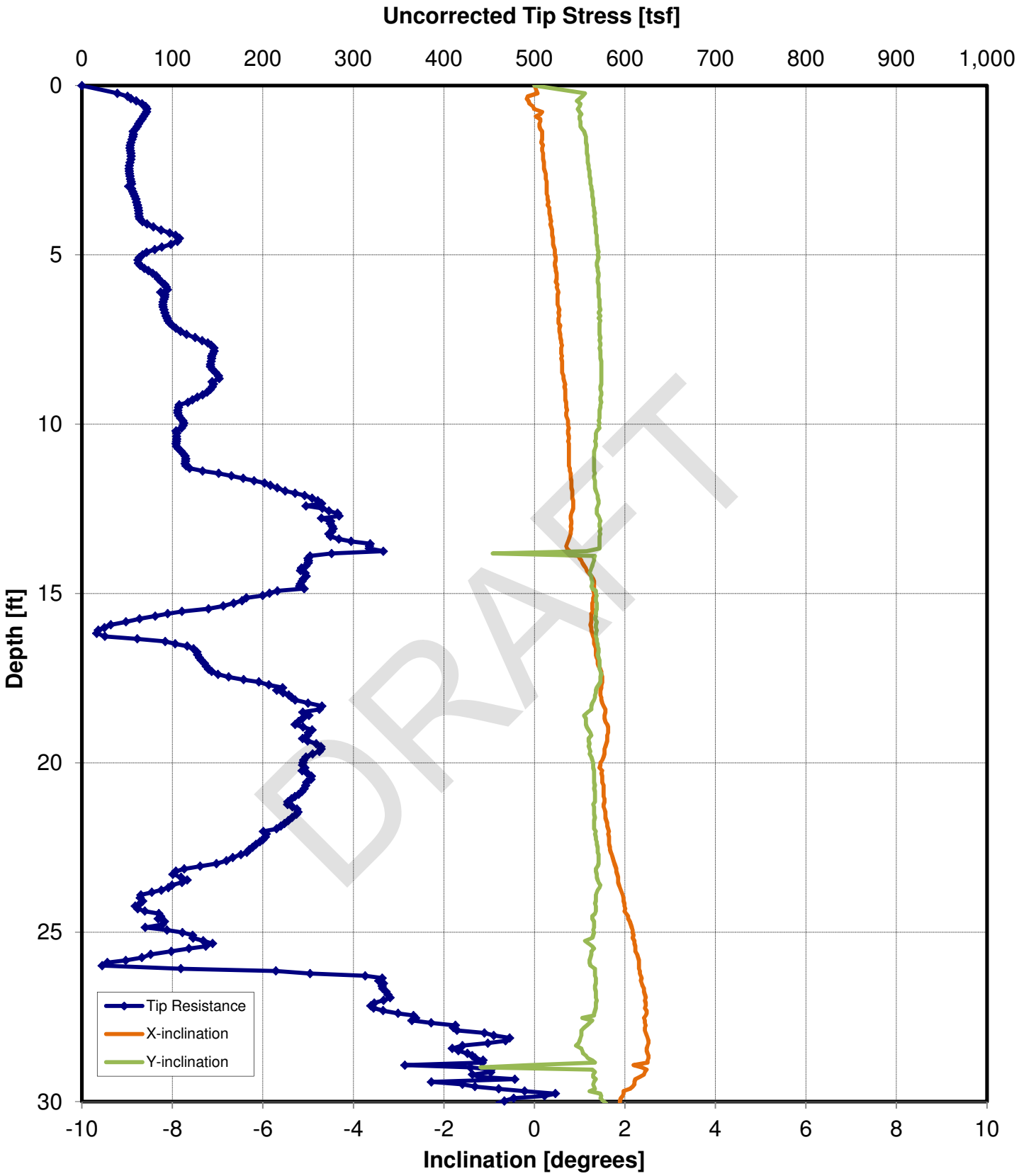

CPT-06 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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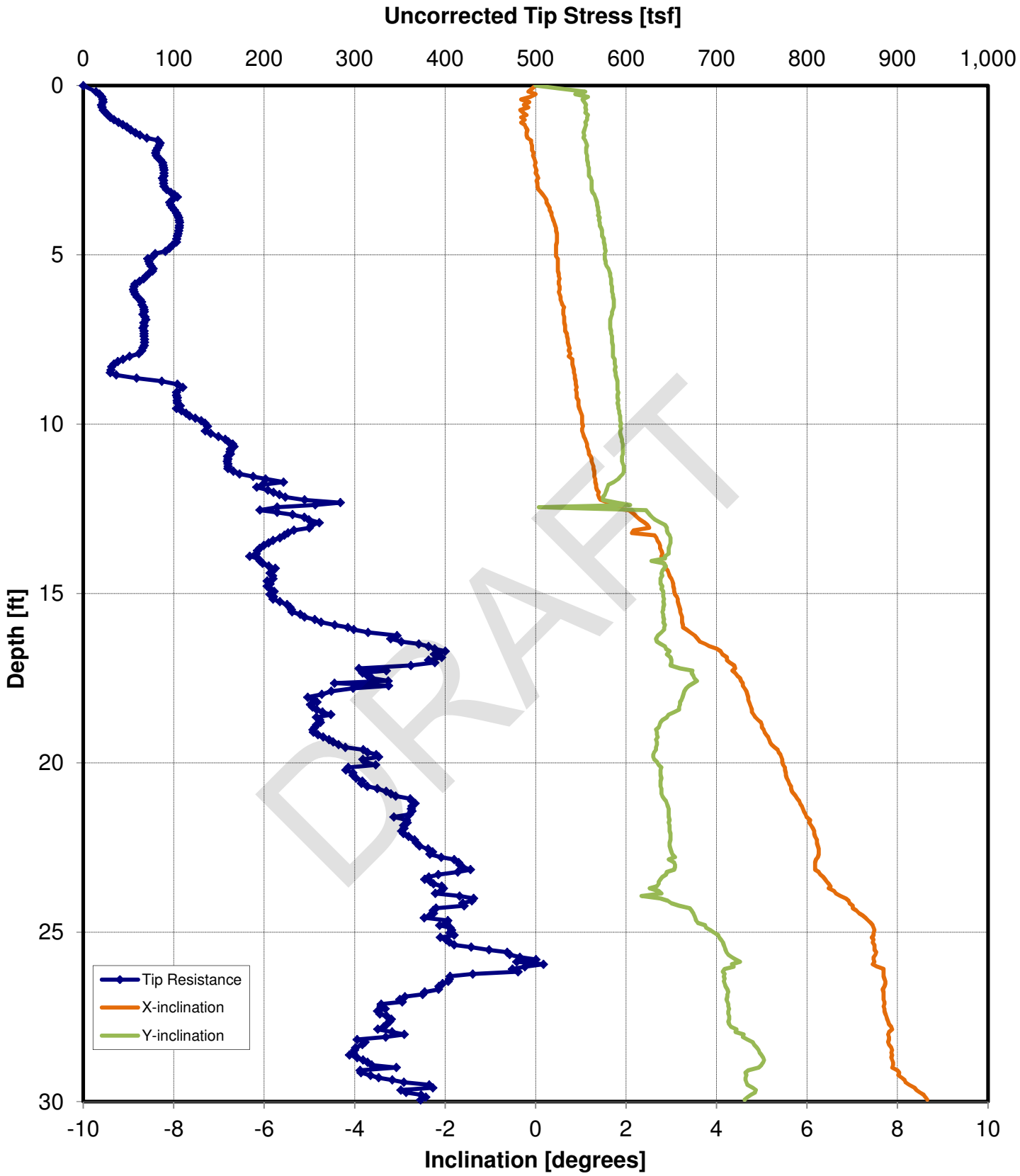

CPT-07 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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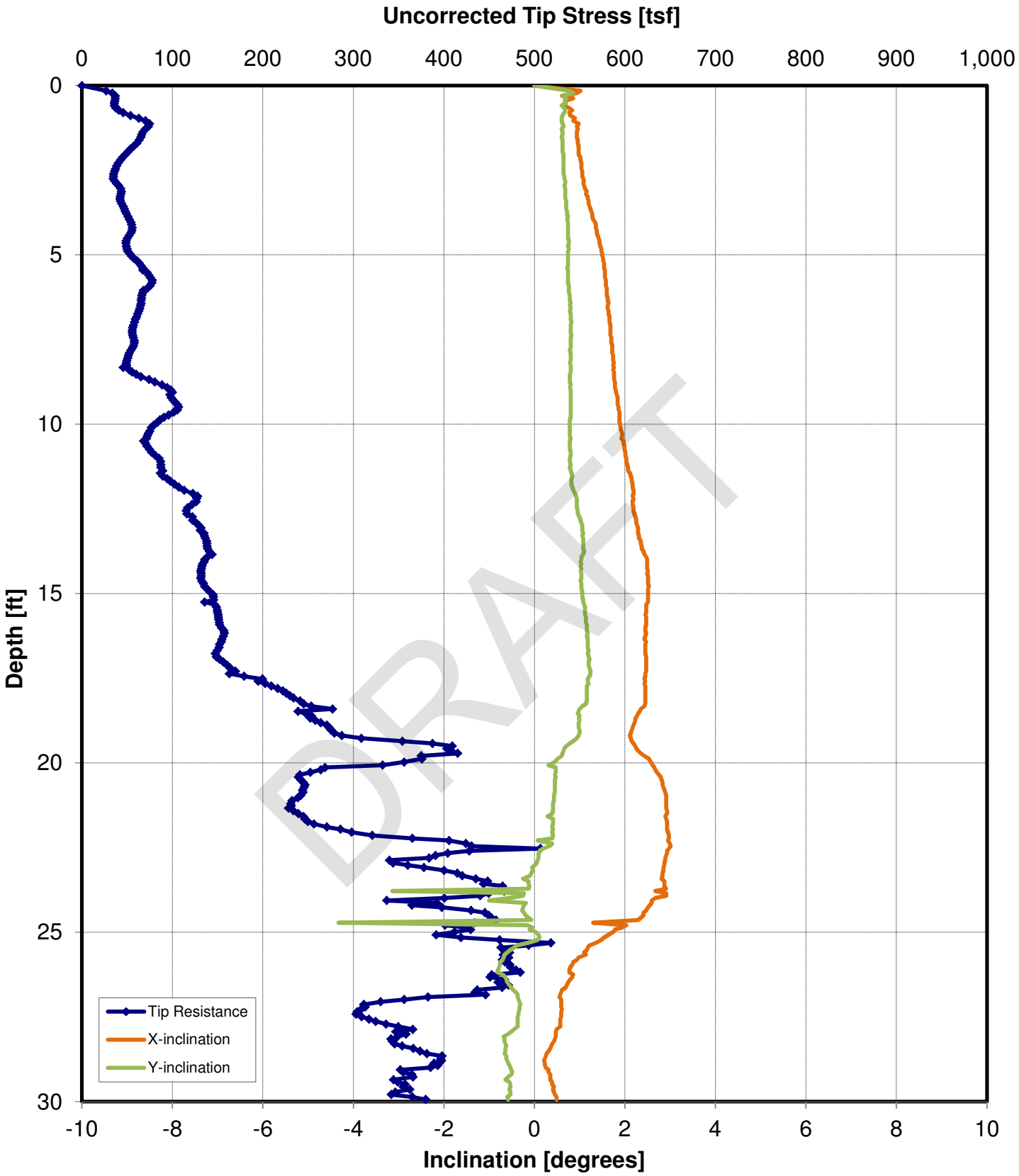

CPT-08 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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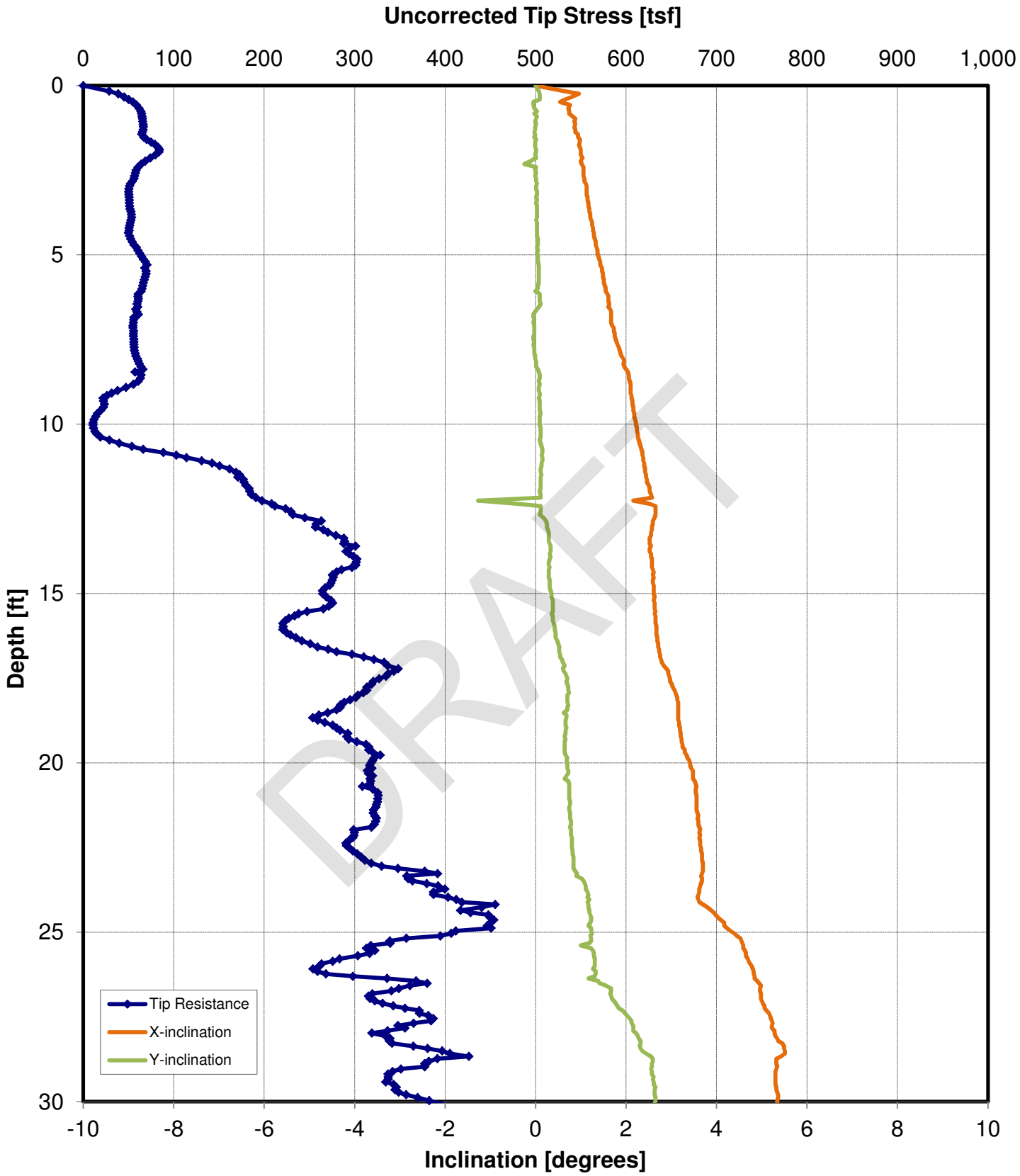

CPT-09 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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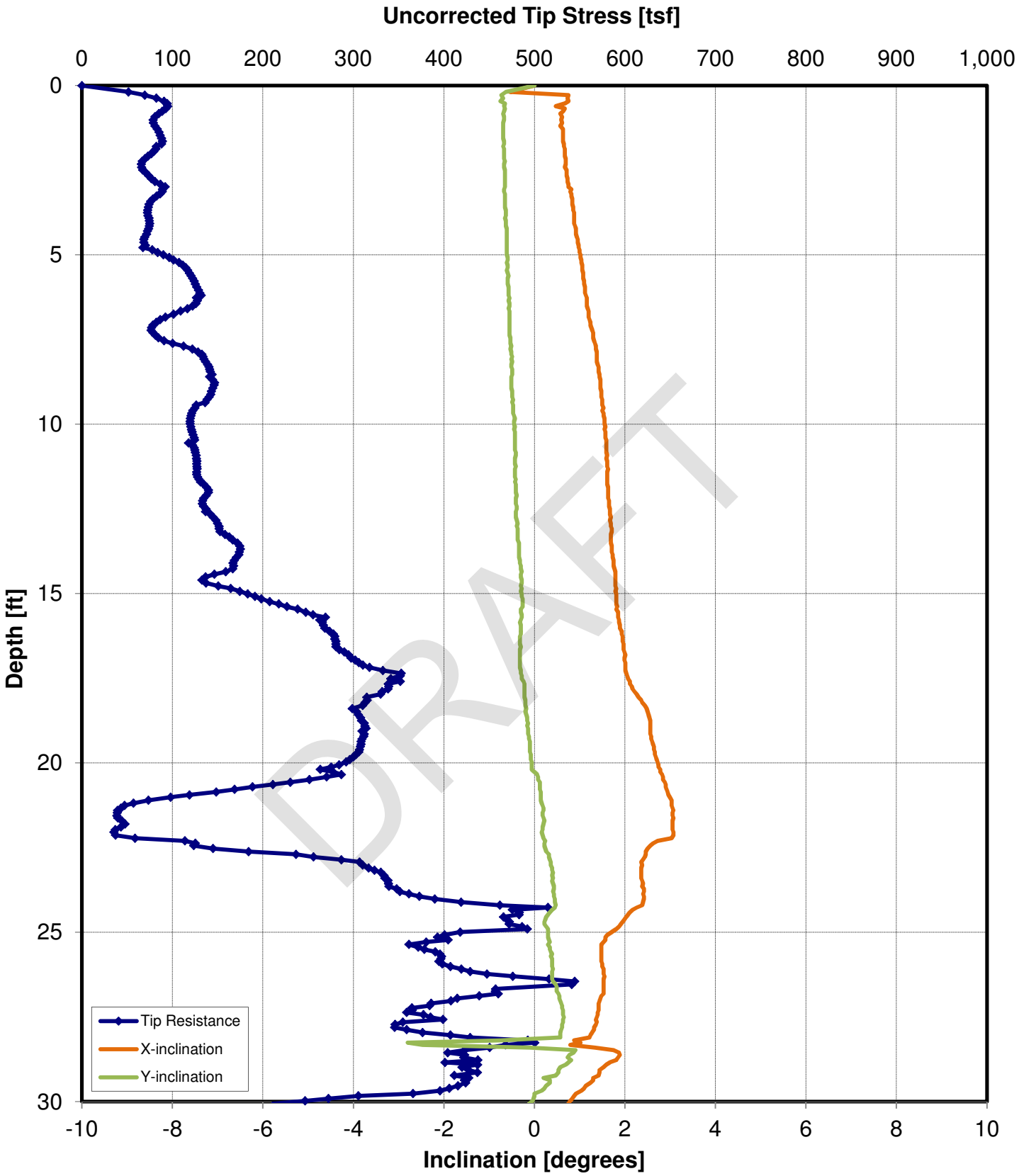

CPT-10 Tip Resistance and Inclination vs. Depth
Viking Solar Preliminary Geotechnical Investigation, 2013

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Appendix B

Cone Penetration Test Data

DRAFT

Sounding Name

CPT-01

Surface Elevation [ft]: 0.0 | Unequal End Area Ratio, a: 0.83 | Pre-drill Depth [ft]: 0.0 | Sat. Unit Weight for Pre-drill [pcf]: 110 | Depth to Water [ft]: 100.0 | From SBT, Iterated

Insert Raw Data

Davies 1999 | Robertson 1990 Norm. F_r/Q_t Chart | Baldi, et al. 1986 K_o 0.45 | R&C (1983) For friction angle plot / For friction angle plot | R&C (1983) | K&M (1990) | N_{kt} 16

Based on q_c, using n=1.0 for all | Based on q_c, using n=0.5 for I_c<2.6 | Recalc. | Recalc. | Based on q_c, using n=0.7 for I_c>2.6 | Recalc. | a_{max} (*g) 0.56 | Contractive/ Dilative Plot | Stark and Olson (1995) Boundary

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Elevation [ft]	q_t [tsf]	f_s [tsf]	R_f [%]	u_2 [ft]	u_0 [ft]	γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	FC [%]	SBT	SPT N_{60} [blows/ft]	SPT $(N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{vo} [kPa]	q_c [MPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}
0.050	13.20	0.00	0.14	0.16	-0.16	13.20	0.00	0.00	0.14	0.00	80	13.05	13.05	2021.6	0.00	0.000	4.538	100.0	2	108	5437	########	########	########	########	########	1649.3	126.35
0.100	24.40	0.11	-0.05	0.33	-0.33	24.40	0.11	0.45	-0.05	0.00	127	33.94	33.94	1436.9	0.45	0.000	0.929	0.0	7	3	82	97.4	1.62	2.34	52.43	42.60	########	########
0.150	29.00	0.16	0.14	0.49	-0.49	29.00	0.16	0.55	0.14	0.00	127	54.82	54.82	1057.0	0.55	0.000	1.060	0.0	7	4	70	93.9	2.62	2.78	51.32	42.28	########	########
0.200	30.80	0.23	0.14	0.66	-0.66	30.80	0.23	0.75	0.14	0.00	127	75.71	75.71	812.7	0.75	0.000	1.229	0.0	7	5	61	89.4	3.62	2.95	50.33	41.79	########	########
0.250	30.20	0.27	0.14	0.82	-0.82	30.20	0.27	0.89	0.14	0.00	121	95.55	95.55	631.1	0.90	0.000	1.350	2.4	6	5	52	83.8	4.57	2.89	49.34	41.14	########	########
0.300	30.70	0.27	0.09	0.98	-0.98	30.70	0.27	0.88	0.09	0.00	121	115.39	115.39	531.1	0.88	0.000	1.383	3.8	6	5	46	80.4	5.52	2.94	48.64	40.77	########	########
0.350	33.90	0.24	0.14	1.15	-1.15	33.90	0.24	0.71	0.14	0.00	121	135.23	135.23	500.4	0.71	0.000	1.319	1.1	6	5	44	80.9	6.47	3.25	48.39	40.87	########	########
0.400	41.00	0.24	0.14	1.31	-1.31	41.00	0.24	0.59	0.14	0.00	127	156.12	156.12	524.3	0.59	0.000	1.241	0.0	7	6	46	85.1	7.47	3.93	48.59	41.43	########	########
0.450	51.90	0.28	0.14	1.48	-1.48	51.90	0.28	0.54	0.14	0.00	127	177.00	177.00	585.4	0.54	0.000	1.184	0.0	7	8	53	91.5	8.47	4.97	49.04	42.26	########	########
0.500	61.40	0.32	0.14	1.64	-1.64	61.40	0.32	0.52	0.14	0.00	127	197.89	197.89	619.6	0.52	0.000	1.157	0.0	7	9	57	95.6	9.47	5.88	49.27	42.80	########	########
0.550	66.60	0.38	0.14	1.80	-1.80	66.60	0.38	0.57	0.14	0.00	127	218.77	218.77	607.9	0.57	0.000	1.194	0.0	7	10	57	96.6	10.47	6.38	49.19	42.94	########	########
0.600	66.40	0.40	0.14	1.97	-1.97	66.40	0.40	0.60	0.14	0.00	127	239.66	239.66	553.1	0.60	0.000	1.237	0.0	7	10	54	94.6	11.47	6.36	48.81	42.71	########	########
0.650	63.40	0.40	0.00	2.13	-2.13	63.40	0.40	0.63	0.00	0.00	127	260.54	260.54	485.7	0.63	0.000	1.287	0.0	7	10	49	91.0	12.47	6.07	48.27	42.29	########	########
0.700	58.00	0.38	0.02	2.30	-2.30	58.00	0.38	0.66	0.02	0.00	121	280.39	280.39	412.7	0.66	0.000	1.344	2.1	6	9	43	86.1	13.42	5.55	47.58	41.69	########	########
0.750	53.00	0.37	0.02	2.46	-2.46	53.00	0.37	0.70	0.02	0.00	121	300.23	300.23	352.1	0.70	0.000	1.410	4.9	6	8	38	81.2	14.37	5.08	46.89	41.10	########	########
0.800	52.40	0.36	0.09	2.62	-2.62	52.40	0.36	0.69	0.09	0.00	121	320.07	320.07	326.4	0.69	0.000	1.426	5.6	6	8	36	79.4	15.32	5.02	46.55	40.89	########	########
0.850	51.80	0.32	0.14	2.79	-2.79	51.80	0.32	0.62	0.14	0.00	121	339.91	339.91	303.8	0.62	0.000	1.414	5.1	6	8	34	77.7	16.27	4.96	46.23	40.69	########	########
0.900	52.80	0.31	0.05	2.95	-2.95	52.80	0.31	0.59	0.05	0.00	121	359.75	359.75	292.5	0.59	0.000	1.410	5.0	6	8	33	77.2	17.22	5.06	46.06	40.65	########	########
0.950	51.50	0.30	0.00	3.12	-3.12	51.50	0.30	0.58	0.00	0.00	121	379.59	379.59	270.3	0.58	0.000	1.432	5.9	6	8	31	75.1	18.17	4.93	45.70	40.40	########	########
1.000	51.40	0.29	-0.02	3.28	-3.28	51.40	0.29	0.56	-0.02	0.00	121	399.43	399.43	256.4	0.57	0.000	1.440	6.2	6	8	30	74.0	19.12	4.92	45.45	40.27	########	########
1.050	51.50	0.30	-0.02	3.44	-3.44	51.50	0.30	0.58	-0.02	0.00	121	419.27	419.27	244.7	0.58	0.000	1.464	7.3	6	8	29	73.0	20.07	4.93	45.24	40.16	########	########
1.100	51.60	0.30	-0.05	3.61	-3.61	51.60	0.30	0.58	-0.05	0.00	121	439.11	439.11	234.0	0.58	0.000	1.478	7.8	6	8	28	72.1	21.02	4.94	45.03	40.06	########	########
1.150	53.40	0.30	-0.05	3.77	-3.77	53.40	0.30	0.56	-0.05	0.00	121	458.96	458.96	231.7	0.56	0.000	1.471	7.6	6	9	28	72.5	21.97	5.11	44.98	40.12	########	########
1.200	55.90	0.32	-0.05	3.94	-3.94	55.90	0.32	0.57	-0.05	0.00	121	478.80	478.80	232.5	0.57	0.000	1.476	7.7	6	9	29	73.4	22.92	5.35	45.00	40.24	########	########
1.250	57.70	0.34	-0.05	4.10	-4.10	57.70	0.34	0.59	-0.05	0.00	121	498.64	498.64	230.4	0.59	0.000	1.487	8.2	6	9	29	73.7	23.87	5.53	44.96	40.29	########	########
1.300	60.50	0.39	-0.05	4.27	-4.27	60.50	0.39	0.64	-0.05	0.00	121	518.48	518.48	232.4	0.65	0.000	1.511	9.2	6	10	30	74.7	24.82	5.79	45.00	40.42	########	########
1.350	66.80	0.55	-0.05	4.43	-4.43	66.80	0.55	0.82	-0.05	0.00	121	538.32	538.32	247.2	0.83	0.000	1.566	11.6	6	11	32	77.7	25.77	6.40	45.29	40.81	########	########
1.400	66.80	0.55	-0.05	4.59	-4.59	66.80	0.55	0.82	-0.05	0.00	121	558.16	558.16	238.4	0.83	0.000	1.577	12.0	6	11	32	77.0	26.72	6.40	45.12	40.72	########	########
1.450	42.30	0.50	-0.05	4.76	-4.76	42.30	0.50	1.18	-0.05	0.00	121	578.00	578.00	145.4	1.19	0.000	1.841	23.2	6	8	21	58.7	27.67	4.05	42.70	38.45	########	########
1.500	41.80	0.42	-0.05	4.92	-4.92	41.80	0.42	1.00	-0.05	0.00	121	597.84	597.84	138.8	1.01	0.000	1.806	21.8	6	8	20	57.6	28.62	4.00	42.47	38.32	########	########
1.550	49.20	0.41	-0.14	5.09	-5.09	49.20	0.41	0.83	-0.14	0.00	121	617.68	617.68	158.3	0.84	0.000	1.709	17.7	6	9	22	63.1	29.57	4.71	43.13	39.02	########	########
1.600	56.60	0.44	-0.16	5.25	-5.25	56.60	0.44	0.78	-0.16	0.00	121	637.53	637.53	176.6	0.78	0.000	1.654	15.3	6	10	25	67.8	30.52	5.42	43.67	39.61	########	########
1.650	79.10	0.47	-0.12	5.41	-5.41	79.10	0.47	0.59	-0.12	0.00	121	657.37	657.37	239.7	0.60	0.000	1.477	7.8	6	13	32	80.0	31.47	7.57	45.14	41.14	########	########
1.700	98.90	0.53	-0.05	5.58	-5.58	98.90	0.53	0.54	-0.05	0.00	121	677.21	677.21	291.1	0.54	0.000	1.384	3.9	6	16	38	87.9	32.42	9.47	46.04	42.13	########	########
1.750	109.10	0.64	-0.05	5.74	-5.74	109.10	0.64	0.59	-0.05	0.00	121	697.05	697.05	312.0	0.59	0.000	1.390	4.1	6	17	41	91.1	33.37	10.45	46.35	42.53	########	########
1.800	118.00	0.73	-0.05	5.91	-5.91	118.00	0.73	0.62	-0.05	0.00	121	716.89	716.89	328.2	0.62	0.000	1.391	4.2	6	19	43	93.5	34.32	11.30	46.58	42.84	########	########
1.850	129.40	0.83	-0.05	6.07	-6.07	129.40	0.83	0.64	-0.05	0.00	121	736.73	736.73	350.3	0.64	0.000	1.384	3.8	6	21	46	96.5	35.27	12.39	46.87	43.22	########	########
1.900	139.50	0.94	-0.05	6.23	-6.23	139.50	0.94	0.67	-0.05	0.00	121	756.57	756.57	367.8	0.68	0.000	1.386	3.9	6	22	49	98.8	36.22	13.36	47.08	43.51	########	########
1.950	143.40	1.10	-0.05	6.40	-6.40	143.40	1.10	0.77	-0.05	0.00	121	776.41	776.41	368.4	0.77	0.000	1.428	5.7	6	23	50	99.3	37.17	13.73	47.09	43.58	########	########
2.000	140.20	1.20	-0.05	6.56	-6.56	140.20	1.20	0.86	-0.05	0.00	121	796.25	796.25	351.1	0.86	0.000	1.478	7.9	6	23	49	97.9	38.12	13.43	46.88	43.41	########	########
2.050	140.15	1.30	-0.05	6.73	-6.73	140.15	1.30	0.93	-0.05	0.00	121	816.10	816.10	342.5	0.93	0.000	1.513	9.3	6	23	48	97.4	39.07	13.42	46.77	43.35	########	########
2.100	140.10	1.31	-0.05	6.89	-6.89	140.10	1.31	0.94	-0.05	0.00	121	835.94	835.94	334.2	0.94	0.000	1.522	9.7	6	23	48	96.8	40.02	13.42	46.66	43.29	########	########
2.150	142.70	1.39	-0.05	7.05	-7.05	142.70	1.39	0.97	-0.05	0.00	121	855.78	855.78	332.5	0.98	0.000	1.537	10.3	6	24	48	97.1	40.97	13.67	46.64	43.33	########	########
2.200	141.20	1.45	-0.14	7.22	-7.22	141.20	1.45	1.03	-0.14	0.00	121	875.62	875.62	321.5	1.03	0.000	1.564	11.5	6	24	47	96.2	41.92	13.52	46.49	43.22	########	########
2.250	142.75	1.32	-0.16	7.38	-7.38	142.75	1.32	0.92	-0.16	0.00	121	895.46	895.46	317.8	0.93	0.000	1.532	10.1	6	24	46	96.1	42.87	13.67	46.43	43.22	########	########
2.300	144.30	1.18	-0.12	7.55	-7.55	144.30	1.18	0.82	-0.12	0.00	121	915.30	915.30	314.3	0.82	0.000	1.494	8.5	6	24	45	96.1	43.82	13.82	46.38	43.22	########	########
2.350	147.50	0.99	-0.05	7.71	-7.71	147.50	0.99	0.67	-0.05	0.00	121	935.14	935.14	314.5	0.67	0.000	1.430	5.8	6	24	45	96.5	44.77	14.12	46.39	43.27	########	########
2.400	145.10	0.92	-0.05	7.87	-7.87	145.10	0.92	0.63	-0.05	0.00	121	954.98	954.98	302.9	0.64	0.000	1.423	5.5	6	23	43	95.4	45.72	13.89	46.22	43.14	########	########
2.450	140.70	0.89	-0.05	8.04	-8.04	140.70	0.89	0.63	-0.05	0.00	121	974.82	974.82	287.7	0.63	0.000	1.438	6.1	6	23	41	93.8	46.67	13.47	45.98	42.95	########	########
2.500	136.50	0.85	-0.05	8.20	-8.20	136.50	0.85	0.62	-0.05	0.00	121	994.67	994.67	273.5	0.62	0.000	1.449	6.6	6	22	40	92.2	47.62	13.07	45.75	42.75	########	########
2.550	131.90	0.81	-0.05	8.37	-8.37	131.90	0.81	0.61	-0.05	0.00	121	1014.51	1014.51	259.0	0.62	0.000	1.462	7.1	6	21	38	90.5	48.57	12.63	45.50	42.54	########	########
2.600	131.40	0.72	-0.05	8.53	-8.53	131.40	0.72	0.55	-0.05	0.00	121	1034.35	1034.35	253.1	0.55	0.000	1.435	6.0	6	21	37	89.9	49.52	12.58	45.40	42.48	########	########
2.650	131.40	0.73	0.05	8.69	-8.69	131.40	0.73	0.56	0.05	0.00	121	1054.19	1054.19	248.3	0.56	0.000	1.446	6.5	6	21	36	89.5	50.47	12.58	45.31	42.43	########	########
2.700	133.05	0.75	0.14	8.86	-8.86	133.05	0.75	0.56	0.14	0.00	121	1074.03	1074.03	246.8	0.57	0.000	1.452	6.7	6	22	36	89.6	51.42	12.74	45.28	42.45	########	########
2.750	134.70	0.84	0.14	9.02	-9.02	134.70	0.84	0.62	0.14	0.00	121	1093.87	1093.87	245.3	0.63	0.000	1.483	8.1	6	22	37	89.7	52.37	12.90	45.25	42.46	########	########
2.800	138.90	0.84	0.14	9.19	-9.19	138.90	0.84	0.60	0.14	0.00	121	1113.71	1113.71	248.4	0.61	0.000	1.470	7.5	6	23	37	90.5	53.32	13.30	45.31	42.57	########	########
2.850	147.60	0.93	0.23	9.35	-9.35	147.60	0.93	0.63	0.23	0.00	121	1133.55	1133.55	259.4	0.63	0.000	1.469	7.5	6	24	39	92.4	54.27	14.13	45.51	42.82	########	########
2.900	158.40	1.21	0.32	9.51	-9.51	158.40	1.21	0.76	0.32	0.00	121	1153.39	1153.39	273.7	0.77	0.000	1.512	9.3	6	26	42	94.8	55.22	15.17	45.76	43.11	########	########
2.950	182.80	1.17	0.32	9.68	-9.68	182.80	1.17	0.64	0.32	0.00	121	1173.24	1173.24	310.6	0.64	0.000	1.418	5.3	6	29	46	99.9	56.17	17.51	46.33	43.76	########	########
3.000	187.10	1.64	0.39	9.84	-9.84	187.10	1.64	0.88	0.39	0.00	121	1193.08	1193.08	312.6	0.88	0.000	1.518	9.6	6	31	48	100.0	57.12	17.92	46.36	43.83	########	########
3.050	149.20	2.11	0.46	10.01	-10.01	149.20	2.11	1.41	0.46	0.00	121	1212.92	1212.92	245.0	1.42	0.000	1.747	19.2	6	27	41	91.4	58.07	14.29	45.24	42.71	########	########
3.100	144.00	1.80	0.37	10.17	-10.17	144.00	1.80	1.25	0.37	0.00	121	1232.76	1232.76	232.6	1.26	0.000	1.719	18.1	6	26	39	89.7	59.02	13.79	45.00	42.50	########	########
3.150	143.60	1.89	0.32	10.33	-10.33	143.60	1.89	1.32	0.32	0.00	121	1252.60	1252.60	228.3	1.32	0.000	1.742	19.0	6	26	38	89.3	59.97	13.75	44.91	42.45	########	########
3.200	142.80	1.78	0.23	10.50	-10.50	142.80	1.78	1.25	0.23	0.00	121	1272.44	1272.44	223.5	1.25	0.000	1.730	18.5	6	25	38	88.7	60.92	13.67	44.81	42.38	########	########
3.250	144.90	1.33	0.28	10.66	-10.66	144.90	1.33	0.92	0.28	0.00	121	1292.28	1292.28	223.3	0.92	0.000	1.631	14.3	6	25	36	89.0	61.87	13.88	44.81	42.41	########	########
3.300	141.60	1.03	0.32	10.83	-10.83	141.60	1.03	0.73	0.32	0.00	121	1312.12	1312.12	214.8	0.73	0.000	1.571	11.8	6	24	35	87.8	62.82	13.56	44.62	42.27	########	########
3.350	132.80	0.92	0.32	10.99	-10.99	132.80	0.92	0.69	0.32	0.00	121	1331.96	1331.96	198.4	0.70	0.000	1.582	12.3	6	23	32	85.0	63.77	12.72	44.24	41.93	########	########
3.400	133.55	0.86	0.32	11.15	-11.15	133.55	0.86	0.64	0.32	0.00	121	1351.81	1351.81	196.6	0.65	0.000	1.564	11.5	6	23	32	84.9	64.72	12.79	44.20	41.92	########	########
3.450	134.30	0.84	0.32	11.32	-11.32	134.30	0.84	0.63	0.32	0.00	121	1371.65	1371.65	194.8	0.63	0.000	1.559	11.3	6	23	32	84.8	65.67	12.86	44.15	41.91	########	########
3.500	140.40	0.86	0.32	11.48	-11.48	140.40	0.86	0.61	0.32	0.00	121	1391.49	1391.49	200.8	0.62	0.000	1.543	10.6	6	23	32	86.2	66.62	13.44	44.30	42.09	########	########
3.550	147.40	0.87	0.32	11.65	-11.65	147.40	0.87	0.59	0.32	0.00	121	1411.33	1411.33	207.9	0.59	0.000	1.521	9.7	6	24	33	87.8	67.57	14.12	44.47	42.29	########	########
3.600	155.80	0.93	0.32	11.81	-11.81	155.80	0.93	0.60	0.32	0.00	121	1431.17	1431.17	216.7	0.60	0.000	1.511	9.2	6	26	35	89.6	68.52	14.92	44.67	42.52	########	########
3.650	162.00	1.01	0.32	11.98	-11.98	162.00	1.01	0.62	0.32	0.00	121	1451.01	1451.01	222.3	0.63	0.000	1.515	9.4	6	27	36	90.8	69.47	15.51	44.79	42.67	########	########
3.700	166.20	0.95	0.32	12.14	-12.14	166.20	0.95	0.57	0.32	0.00	121	1470.85	1470.85	225.0	0.57	0.000	1.486	8.2	6	27	36	91.5	70.42	15.92	44.84	42.76	########	########
3.750	173.30	1.07	0.32	12.30	-12.30	173.30	1.07	0.62	0.32	0.00	121	1490.69	1490.69	231.5	0.62	0.000	1.499	8.7	6	29	37	92.8	71.37	16.60	44.98	42.93	########	########
3.800	187.30	1.19	0.32	12.47	-12.47	187.30	1.19	0.64	0.32	0.00	121	1510.53	1510.53	247.0	0.64	0.000	1.487	8.2	6	31	40	95.5	72.32	17.94	45.28	43.27	########	########
3.850	185.40	1.25	0.32	12.63	-12.63	185.40	1.25	0.67	0.32	0.00	121	1530.38	1530.38	241.3	0.68	0.000	1.512	9.3	6	31	39	94.8	73.27	17.75	45.17	43.19	########	########
3.900	183.70	1.25	0.32	12.80	-12.80	183.70	1.25	0.68	0.32	0.00	121	1550.22	1550.22	236.0	0.68	0.000	1.522	9.7	6	31	39	94.2	74.22	17.59	45.07	43.11	########	########
3.950	182.00	1.24	0.32	12.96	-12.96	182.00	1.24	0.68	0.32	0.00	121	1570.06	1570.06	230.8	0.68	0.000	1.529	10.0	6	30	38	93.6	75.17	17.43	44.96	43.04	########	########
4.000	188.10	1.26	0.32	13.12	-13.12	188.10	1.26	0.67	0.32	0.00	121	1589.90	1589.90	235.6	0.67	0.000	1.518	9.5	6	31	39	94.6	76.12	18.01	45.06	43.17	########	########
4.050	180.80	1.03	0.32	13.29	-13.29	180.80	1.03	0.57	0.32	0.00	121	1609.74	1609.74	223.6	0.57	0.000	1.487	8.2	6	30	37	92.8	77.07	17.31	44.81	42.95	########	########
4.100	161.30	1.07	0.32	13.45	-13.45	161.30	1.07	0.66	0.32	0.00	121	1629.58	1629.58	197.0	0.67	0.000	1.572	11.8	6	27	33	88.2	78.02	15.45	44.21	42.37	########	########
4.150	165.95	1.12	0.32	13.62	-13.62	165.95	1.12	0.67	0.32	0.00	121	1649.42	1649.42	200.2	0.68	0.000	1.572	11.8	6	28	34	89.0	78.97	15.89	44.29	42.48	########	########
4.200	170.60	1.33	0.35	13.78	-13.78	170.60	1.33	0.78	0.35	0.00	121	1669.26	1669.26	203.4	0.78	0.000	1.609	13.4	6	29	35	89.8	79.92	16.34	44.36	42.58	########	########
4.250	192.40	1.45	0.39	13.94	-13.94	192.40	1.45	0.75	0.39	0.00	121	1689.10	1689.10	226.8	0.76	0.000	1.565	11.5	6	32	39	94.2	80.87	18.42	44.88	43.13	########	########
4.300	213.80	1.46	0.35	14.11	-14.11	213.80	1.46	0.68	0.35	0.00	121	1708.95	1708.95	249.2	0.69	0.000	1.506	9.0	6	35	42	98.0	81.82	20.47	45.32	43.61	########	########
4.350	232.80	1.49	0.35	14.27	-14.27	232.80	1.49	0.64	0.35	0.00	121	1728.79	1728.79	268.3	0.64	0.000	1.463	7.2	6	38	44	100.0	82.77	22.29	45.67	43.98	########	########
4.400	236.40	1.51	0.32	14.44	-14.44	236.40	1.51	0.64	0.32	0.00	121	1748.63	1748.63	269.4	0.64	0.000	1.461	7.1	6	39	45	100.0	83.72	22.64	45.68	44.03	########	########
4.450	234.20	1.63	0.32	14.60	-14.60	234.20	1.63	0.70	0.32	0.00	121	1768.47	1768.47	263.9	0.70	0.000	1.494	8.5	6	39	44	100.0	84.67	22.43	45.59	43.96	########	########
4.500	236.90	1.69	0.32	14.76	-14.76	236.90	1.69	0.71	0.32	0.00	121	1788.31	1788.31	263.9	0.72	0.000	1.502	8.8	6	39	45	100.0	85.62	22.69	45.59	43.99	########	########
4.550	239.60	1.64	0.32	14.93	-14.93	239.60	1.64	0.68	0.32	0.00	121	1808.15	1808.15	264.0	0.69	0.000	1.489	8.3	6	39	44	100.0	86.57	22.94	45.59	44.02	########	########
4.600	241.00	1.68	0.42	15.09	-15.09	241.00	1.68	0.70	0.42	0.00	121	1827.99	1827.99	262.7	0.70	0.000	1.496	8.6	6	40	44	100.0	87.52	23.08	45.57	44.02	########	########
4.650	236.50	1.64	0.48	15.26	-15.26	236.50	1.64	0.69	0.48	0.00	121	1847.83	1847.83	255.0	0.70	0.000	1.503	8.9	6	39	43	100.0	88.47	22.65	45.43	43.90	########	########
4.700	236.90	1.62	0.48	15.42	-15.42	236.90	1.62	0.68	0.48	0.00	121	1867.67	1867.67	252.7	0.69	0.000	1.502	8.9	6	39	43	100.0	89.42	22.69	45.39	43.88	########	########
4.750	236.00	1.50	0.39	15.58	-15.58	236.00	1.50	0.64	0.39	0.00	121	1887.51	1887.51	249.1	0.64	0.000	1.484	8.1	6	39	42	99.7	90.37	22.60	45.32	43.84	########	########
4.800	234.30	1.48	0.37	15.75	-15.75	234.30	1.48	0.63	0.37	0.00	121	1907.36	1907.36	244.7	0.63	0.000	1.488	8.3	6	39	42	99.2	91.32	22.44	45.24	43.78	########	########
4.850	236.75	1.48	0.35	15.91	-15.91	236.75	1.48	0.63	0.35	0.00	121	1927.20	1927.20	244.7	0.63	0.000	1.485	8.1	6	39	42	99.3	92.27	22.67	45.24	43.81	########	########
4.900	239.20	1.48	0.32	16.08	-16.08	239.20	1.48	0.62	0.32	0.00	121	1947.04	1947.04	244.7	0.62	0.000	1.482	8.0	6	39	42	99.5	93.22	22.91	45.24	43.83	########	########
4.950	249.80	1.50	0.32	16.24	-16.24	249.80	1.50	0.60	0.32	0.00	121	1966.88	1966.88	253.0	0.60	0.000	1.462	7.2	6	41	43	100.0	94.17	23.92	45.39	44.01	########	########
5.000	261.30	1.53	0.32	16.40	-16.40	261.30	1.53	0.59	0.32	0.00	121	1986.72	1986.72	262.0	0.59	0.000	1.444	6.4	6	42	44	100.0	95.12	25.02	45.56	44.20	########	########
5.050	270.40	1.55	0.32	16.57	-16.57	270.40	1.55	0.57	0.32	0.00	121	2006.56	2006.56	268.5	0.58	0.000	1.430	5.8	6	44	45	100.0	96.07	25.89	45.67	44.34	########	########
5.100	279.30	2.40	0.32	16.73	-16.73	279.30	2.40	0.86	0.32	0.00	121	2026.40	2026.40	274.7	0.86	0.000	1.549	10.8	6	47	48	100.0	97.02	26.75	45.77	44.48	########	########
5.150	298.00	3.05	0.32	16.90	-16.90	298.00	3.05	1.02	0.32	0.00	121	2046.24	2046.24	290.3	1.03	0.000	1.591	12.6	6	51	52	100.0	97.97	28.54	46.02	44.76	########	########
5.200	331.50	3.31	0.32	17.06	-17.06	331.50	3.31	1.00	0.32	0.00	121	2066.08	2066.08	319.9	1.00	0.000	1.556	11.1	6	56	57	100.0	98.92	31.74	46.46	45.25	########	########
5.250	307.10	3.36	0.32	17.22	-17.22	307.10	3.36	1.09	0.32	0.00	121	2085.93	2085.93	293.5	1.10	0.000	1.611	13.5	6	53	53	100.0	99.87	29.41	46.07	44.86	########	########
5.300	282.70	2.71	0.32	17.39	-17.39	282.70	2.71	0.96	0.32	0.00	121	2105.77	2105.77	267.5	0.96	0.000	1.592	12.7	6	48	48	100.0	100.82	27.07	45.65	44.44	########	########
5.350	281.70	2.51	0.35	17.55	-17.55	281.70	2.51	0.89	0.35	0.00	121	2125.61	2125.61	264.1	0.89	0.000	1.572	11.8	6	48	47	100.0	101.77	26.98	45.59	44.40	########	########
5.400	282.90	2.56	0.35	17.72	-17.72	282.90	2.56	0.90	0.35	0.00	121	2145.45	2145.45	262.7	0.91	0.000	1.579	12.1	6	48	47	100.0	102.72	27.09	45.57	44.40	########	########
5.450	284.10	2.61	0.48	17.88	-17.88	284.10	2.61	0.92	0.48	0.00	121	2165.29	2165.29	261.4	0.92	0.000	1.585	12.4	6	48	47	100.0	103.67	27.21	45.55	44.40	########	########
5.500	279.00	2.61	0.48	18.04	-18.04	279.00	2.61	0.94	0.48	0.00	121	2185.13	2185.13	254.4	0.94	0.000	1.599	13.0	6	48	46	100.0	104.62	26.72	45.42	44.29	########	########
5.550	267.80	1.94	0.48	18.21	-18.21	267.80	1.94	0.72	0.48	0.00	121	2204.97	2204.97	241.9	0.73	0.000	1.533	10.2	6	45	43	100.0	105.57	25.64	45.18	44.07	########	########
5.600	240.50	1.57	0.48	18.37	-18.37	240.50	1.57	0.65	0.48	0.00	121	2224.81	2224.81	215.2	0.66	0.000	1.539	10.4	6	40	39	96.9	106.52	23.03	44.63	43.54	########	########
5.650	216.10	1.44	0.48	18.54	-18.54	216.10	1.44	0.67	0.48	0.00	121	2244.65	2244.65	191.5	0.67	0.000	1.583	12.3	6	37	35	92.6	107.47	20.69	44.07	43.01	########	########
5.700	176.60	1.53	0.48	18.70	-18.70	176.60	1.53	0.87	0.48	0.00	121	2264.50	2264.50	155.0	0.87	0.000	1.728	18.4	6	31	30	84.7	108.42	16.91	43.03	42.02	########	########
5.750	88.40	1.62	0.39	18.86	-18.86	88.40	1.62	1.83	0.39	0.00	118	2283.81	2283.81	76.4	1.86	0.000	2.176	37.4	5	19	18	58.0	109.35	8.47	39.27	38.69	########	########
5.800	46.70	1.97	0.42	19.03	-19.03	46.70	1.97	4.22	0.42	0.00	115	2302.61	2302.61	39.6	4.32	0.000	2.637	57.0	4	12	11	########	########	########	########	########	5693.9	2.47
5.850	63.05	1.65	0.42	19.19	-19.19	63.05	1.65	2.62	0.42	0.00	118	2321.93	2321.93	53.3	2.67	0.000	2.397	46.8	5	15	14	44.7	111.17	6.04	37.21	37.04	########	########
5.900	79.40	1.69	0.69	19.36	-19.36	79.40	1.69	2.13	0.69	0.00	118	2341.25	2341.25	66.8	2.16	0.000	2.263	41.1	5	17	16	53.4	112.10	7.60	38.52	38.12	########	########
5.950	206.00	2.45	0.25	19.52	-19.52	206.00	2.45	1.19	0.25	0.00	121	2361.09	2361.09	173.5	1.20	0.000	1.789	21.0	6	37	34	89.7	113.05	19.73	43.59	42.66	########	########
6.000	279.80	2.42	0.23	19.68	-19.68	279.80	2.42	0.86	0.23	0.00	121	2380.93	2380.93	234.0	0.87	0.000	1.598	12.9	6	48	44	100.0	114.00	26.79	45.03	44.10	########	########
6.050	305.60	1.86	0.23	19.85	-19.85	305.60	1.86	0.61	0.23	0.00	121	2400.77	2400.77	253.6	0.61	0.000	1.466	7.3	6	50	45	100.0	114.95	29.26	45.40	44.50	########	########
6.100	324.50	2.04	0.25	20.01	-20.01	324.50	2.04	0.63	0.25	0.00	121	2420.61	2420.61	267.1	0.63	0.000	1.459	7.0	6	53	48	100.0	115.90	31.07	45.64	44.77	########	########
6.150	334.60	2.22	0.05	20.18	-20.18	334.60	2.22	0.66	0.05	0.00	121	2440.45	2440.45	273.2	0.67	0.000	1.469	7.4	6	55	49	100.0	116.85	32.04	45.75	44.89	########	########
6.200	344.70	3.01	-0.05	20.34	-20.34	344.70	3.01	0.87	-0.05	0.00	121	2460.30	2460.30	279.2	0.88	0.000	1.549	10.9	6	58	51	100.0	117.80	33.01	45.85	45.02	########	########
6.250	334.80	3.41	-0.05	20.51	-20.51	334.80	3.41	1.02	-0.05	0.00	121	2480.14	2480.14	269.0	1.02	0.000	1.611	13.5	6	57	51	100.0	118.75	32.06	45.68	44.86	########	########
6.300	321.20	3.01	-0.05	20.67	-20.67	321.20	3.01	0.94	-0.05	0.00	121	2499.98	2499.98	256.0	0.94	0.000	1.597	12.9	6	55	48	100.0	119.70	30.76	45.45	44.64	########	########
6.350	338.20	2.77	-0.05	20.83	-20.83	338.20	2.77	0.82	-0.05	0.00	121	2519.82	2519.82	267.4	0.82	0.000	1.541	10.5	6	57	49	100.0	120.65	32.39	45.65	44.87	########	########
6.400	355.20	2.65	-0.05	21.00	-21.00	355.20	2.65	0.75	-0.05	0.00	121	2539.66	2539.66	278.7	0.75	0.000	1.499	8.7	6	59	51	100.0	121.60	34.01	45.84	45.08	########	########
6.450	376.50	4.27	-0.05	21.16	-21.16	376.50	4.27	1.13	-0.05	0.00	121	2559.50	2559.50	293.2	1.14	0.000	1.623	14.0	6	65	56	100.0	122.55	36.05	46.07	45.34	########	########
6.500	403.50	5.90	-0.05	21.33	-21.33	403.50	5.90	1.46	-0.05	0.00	121	2579.34	2579.34	311.9	1.47	0.000	1.696	17.1	6	71	61	100.0	123.50	38.64	46.35	45.66	########	########
6.550	433.30	5.59	0.05	21.49	-21.49	433.30	5.59	1.29	0.05	0.00	121	2599.18	2599.18	332.4	1.29	0.000	1.635	14.5	6	75	64	100.0	124.45	41.49	46.63	45.98	########	########
6.600	495.60	4.78	0.14	21.65	-21.65	495.60	4.78	0.96	0.14	0.00	121	2619.02	2619.02	377.5	0.97	0.000	1.500	8.8	6	82	69	100.0	125.40	47.46	47.19	46.60	########	########
6.650	426.60	4.81	0.14	21.82	-21.82	426.60	4.81	1.13	0.14	0.00	121	2638.87	2638.87	322.3	1.13	0.000	1.596	12.8	6	73	61	100.0	126.35	40.85	46.50	45.87	########	########
6.700	393.00	2.52	0.42	21.98	-21.98	393.00	2.52	0.64	0.42	0.00	121	2658.71	2658.71	294.6	0.64	0.000	1.435	6.0	6	64	53	100.0	127.30	37.63	46.09	45.46	########	########
6.750	383.60	2.50	0.14	22.15	-22.15	383.60	2.50	0.65	0.14	0.00	121	2678.55	2678.55	285.4	0.65	0.000	1.450	6.6	6	62	52	100.0	128.25	36.73	45.95	45.32	########	########
6.800	378.90	2.99	0.14	22.31	-22.31	378.90	2.99	0.79	0.14	0.00	121	2698.39	2698.39	279.8	0.79	0.000	1.516	9.4	6	63	52	100.0	129.20	36.28	45.86	45.25	########	########
6.850	395.70	3.48	-0.02	22.47	-22.47	395.70	3.48	0.88	-0.02	0.00	121	2718.23	2718.23	290.1	0.88	0.000	1.541	10.5	6	66	55	100.0	130.15	37.89	46.02	45.44	########	########
6.900	412.50	3.38	-0.21	22.64	-22.64	412.50	3.38	0.82	-0.21	0.00	121	2738.07	2738.07	300.3	0.82	0.000	1.508	9.1	6	68	56	100.0	131.10	39.50	46.18	45.62	########	########
6.950	465.00	3.87	-0.21	22.80	-22.80	465.00	3.87	0.83	-0.21	0.00	121	2757.91	2757.91	336.2	0.83	0.000	1.481	8.0	6	76	62	100.0	132.05	44.53	46.68	46.17	########	########
7.000	421.65	3.70	-0.35	22.97	-22.97	421.65	3.70	0.88	-0.35	0.00	121	2777.75	2777.75	302.6	0.88	0.000	1.528	10.0	6	70	57	100.0	133.00	40.38	46.21	45.69	########	########
7.050	426.93	4.36	-0.21	23.13	-23.13	426.93	4.36	1.02	-0.21	0.00	121	2797.59	2797.59	304.2	1.02	0.000	1.577	12.1	6	72	58	100.0	133.95	40.88	46.24	45.73	########	########
7.100	432.20	3.53	-0.37	23.29	-23.29	432.20	3.53	0.82	-0.37	0.00	121	2817.44	2817.44	305.8	0.82	0.000	1.501	8.8	6	71	57	100.0	134.90	41.39	46.26	45.77	########	########
7.150	463.20	2.78	-0.39	23.46	-23.46	463.20	2.78	0.60	-0.39	0.00	121	2837.28	2837.28	325.5	0.60	0.000	1.384	3.9	6	74	59	100.0	135.85	44.36	46.54	46.09	########	########
7.200	499.60	3.27	-0.30	23.62	-23.62	499.60	3.27	0.65	-0.30	0.00	121	2857.12	2857.12	348.7	0.66	0.000	1.391	4.2	6	80	63	100.0	136.80	47.84	46.85	46.43	########	########
7.250	468.20	1.70	-0.23	23.79	-23.79	468.20	1.70	0.36	-0.23	0.00	127	2878.00	2878.00	324.4	0.36	0.000	1.237	0.0	7	71	56	100.0	137.80	44.84	46.52	46.11	########	########
7.300	485.00	0.00	-0.35	23.95	-23.95	485.00	0.00	0.00	-0.35	0.00	80	2891.06	2891.06	334.5	0.00	0.000	4.538	100.0	2	3972	3123	########	########	########	########	########	60444.1	20.91
7.350	600.50	0.00	-0.21	24.11	-24.11	600.50	0.00	0.00	-0.21	0.00	80	2904.11	2904.11	412.6	0.00	0.000	4.538	100.0	2	4917	3854	########	########	########	########	########	74880.9	25.78
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Average 3.70	194.42	1.51	0.15	12.14	-12.14	194.42	1.51	0.79	0.15	0.00	120.43	1469.73	1469.73	308.02	0.79	0.00	1.58	11.73	5.95	92.33	126.31	91.42	69.62	18.37	45.69	43.01	35667.02	43.88

Depth [m]	Q	I_c<2.6?	Q	I_c	I_c<2.6?	Q	I_c	n	q_c [kPa]	σ'_{vo} [kPa]	C_q	q_{c1N}	K_c	$(q_{c1N})_{cs}$	r_d	CSR	C_q	q_c [MPa]	q_{c1} [MPa]	q_{c1} [MPa]	Contractive?
0.050	2021.5	No	2021.5	Non-liq.	No	2021.5	Non-liq.	Non-liq.	1264.04	0.62	Non-liq.	Non-liq.	Non-liq.	9000000000.00	1.000	0.3619	2.23	1.26	2.82	2.32	No
0.100	1436.9	Yes	182.0	1.493	Yes	182.0	1.493	0.5	2336.56	1.62	1.70	182.09	1.00	182.09	0.999	0.3618	2.21	2.34	5.15	2.84	No
0.150	1056.9	Yes	170.1	1.569	Yes	170.1	1.569	0.5	2777.06	2.62	1.70	170.28	1.00	170.28	0.999	0.3616	2.18	2.78	6.05	3.14	No
0.200	812.6	Yes	153.7	1.686	Yes	153.7	1.686	0.5	2949.42	3.62	1.70	153.90	1.03	158.27	0.998	0.3615	2.15	2.95	6.35	3.35	No
0.250	631.1	Yes	134.1	1.782	Yes	134.1	1.782	0.5	2891.97	4.57	1.70	134.32	1.09	146.93	0.998	0.3614	2.13	2.89	6.16	3.52	No
0.300	531.1	Yes	124.0	1.803	Yes	124.0	1.803	0.5	2939.85	5.52	1.70	124.25	1.11	137.81	0.998	0.3612	2.11	2.94	6.19	3.66	No
0.350	500.4	Yes	126.5	1.737	Yes	126.5	1.737	0.5	3246.28	6.47	1.70	126.74	1.06	134.72	0.997	0.3611	2.08	3.25	6.76	3.79	No
0.400	524.2	Yes	142.4	1.646	Yes	142.4	1.646	0.5	3926.18	7.47	1.70	142.66	1.00	142.75	0.997	0.3609	2.06	3.93	8.09	3.90	No
0.450	585.4	Yes	169.3	1.565	Yes	169.3	1.565	0.5	4969.97	8.47	1.70	169.60	1.00	169.60	0.997	0.3608	2.04	4.97	10.12	4.01	No
0.500	619.6	Yes	189.5	1.517	Yes	189.5	1.517	0.5	5879.70	9.47	1.70	189.76	1.00	189.76	0.996	0.3607	2.01	5.88	11.84	4.10	No
0.550	607.8	Yes	195.4	1.531	Yes	195.4	1.531	0.5	6377.65	10.47	1.70	195.76	1.00	195.76	0.996	0.3605	1.99	6.38	12.71	4.19	No
0.600	553.1	Yes	186.1	1.563	Yes	186.1	1.563	0.5	6358.50	11.47	1.70	186.48	1.00	186.48	0.995	0.3604	1.97	6.36	12.53	4.27	No
0.650	485.7	Yes	170.4	1.605	Yes	170.4	1.605	0.5	6071.22	12.47	1.70	170.76	1.00	170.76	0.995	0.3602	1.95	6.07	11.84	4.34	No
0.700	412.7	Yes	150.2	1.658	Yes	150.2	1.658	0.5	5554.11	13.42	1.70	150.59	1.01	151.94	0.995	0.3601	1.93	5.55	10.72	4.41	No
0.750	352.1	Yes	132.6	1.718	Yes	132.6	1.718	0.5	5075.31	14.37	1.70	132.98	1.05	139.59	0.994	0.3600	1.91	5.08	9.70	4.47	No
0.800	326.4	Yes	126.9	1.728	Yes	126.9	1.728	0.5	5017.85	15.32	1.70	127.34	1.06	134.58	0.994	0.3598	1.89	5.02	9.50	4.53	No
0.850	303.8	Yes	121.8	1.715	Yes	121.8	1.715	0.5	4960.39	16.27	1.70	122.15	1.05	128.02	0.993	0.3597	1.87	4.96	9.29	4.59	No
0.900	292.5	Yes	120.6	1.705	Yes	120.6	1.705	0.5	5056.16	17.22	1.70	121.03	1.04	126.06	0.993	0.3596	1.86	5.06	9.38	4.64	No
0.950	270.3	Yes	114.5	1.722	Yes	114.5	1.722	0.5	4931.67	18.17	1.70	114.92	1.05	120.98	0.993	0.3594	1.84	4.93	9.06	4.70	No
1.000	256.4	Yes	111.4	1.724	Yes	111.4	1.724	0.5	4922.09	19.12	1.70	111.81	1.05	117.86	0.992	0.3593	1.82	4.92	8.96	4.75	No
1.050	244.7	Yes	108.9	1.740	Yes	108.9	1.740	0.5	4931.67	20.07	1.70	109.35	1.06	116.44	0.992	0.3591	1.80	4.93	8.89	4.80	No
1.100	234.0	Yes	106.6	1.747	Yes	106.6	1.747	0.5	4941.24	21.02	1.70	107.06	1.07	114.52	0.992	0.3590	1.79	4.94	8.83	4.84	No
1.150	231.7	Yes	107.9	1.735	Yes	107.9	1.735	0.5	5113.61	21.97	1.70	108.37	1.06	114.99	0.991	0.3589	1.77	5.11	9.05	4.89	No
1.200	232.5	Yes	110.6	1.730	Yes	110.6	1.730	0.5	5353.01	22.92	1.70	111.07	1.06	117.54	0.991	0.3587	1.75	5.35	9.39	4.93	No
1.250	230.4	Yes	111.9	1.733	Yes	111.9	1.733	0.5	5525.38	23.87	1.70	112.34	1.06	119.12	0.990	0.3586	1.74	5.53	9.60	4.97	No
1.300	232.4	Yes	115.0	1.746	Yes	115.0	1.746	0.5	5793.51	24.82	1.70	115.52	1.07	123.49	0.990	0.3584	1.72	5.79	9.98	5.01	No
1.350	247.2	Yes	124.7	1.784	Yes	124.7	1.784	0.5	6396.80	25.77	1.70	125.17	1.10	137.07	0.990	0.3583	1.71	6.40	10.92	5.05	No
1.400	238.4	Yes	122.4	1.790	Yes	122.4	1.790	0.5	6396.80	26.72	1.70	122.93	1.10	135.15	0.989	0.3582	1.69	6.40	10.82	5.09	No
1.450	145.4	Yes	76.0	2.051	Yes	76.0	2.051	0.5	4050.67	27.67	1.70	76.49	1.37	104.94	0.989	0.3580	1.68	4.05	6.79	5.13	No
1.500	138.8	Yes	73.8	2.017	Yes	73.8	2.017	0.5	4002.79	28.62	1.70	74.32	1.32	98.30	0.989	0.3579	1.66	4.00	6.66	5.16	No
1.550	158.3	Yes	85.5	1.916	Yes	85.5	1.916	0.5	4711.42	29.57	1.70	86.07	1.20	103.69	0.988	0.3578	1.65	4.71	7.77	5.20	No
1.600	176.6	Yes	96.9	1.855	Yes	96.9	1.855	0.5	5420.05	30.52	1.70	97.46	1.15	111.98	0.988	0.3576	1.63	5.42	8.86	5.23	No
1.650	239.7	Yes	133.6	1.673	Yes	133.6	1.673	0.5	7574.66	31.47	1.70	134.13	1.02	136.73	0.987	0.3575	1.62	7.57	12.28	5.27	No
1.700	291.1	Yes	164.7	1.573	Yes	164.7	1.573	0.5	9470.72	32.42	1.70	165.23	1.00	165.23	0.987	0.3573	1.61	9.47	15.22	5.30	No
1.750	312.0	Yes	179.1	1.569	Yes	179.1	1.569	0.5	10447.47	33.37	1.70	179.66	1.00	179.66	0.987	0.3572	1.59	10.45	16.65	5.33	No
1.800	328.2	Yes	191.0	1.562	Yes	191.0	1.562	0.5	11299.74	34.32	1.70	191.60	1.00	191.60	0.986	0.3571	1.58	11.30	17.86	5.36	No
1.850	350.3	Yes	206.7	1.546	Yes	206.7	1.546	0.5	12391.41	35.27	1.69	207.27	1.00	207.27	0.986	0.3569	1.57	12.39	19.43	5.39	No
1.900	367.8	Yes	219.9	1.541	Yes	219.9	1.541	0.5	13358.59	36.22	1.67	220.50	1.00	220.50	0.985	0.3568	1.56	13.36	20.77	5.42	No
1.950	368.4	Yes	223.1	1.575	Yes	223.1	1.575	0.5	13732.06	37.17	1.65	223.74	1.00	223.74	0.985	0.3566	1.54	13.73	21.18	5.45	No
2.000	351.1	Yes	215.4	1.620	Yes	215.4	1.620	0.5	13425.62	38.12	1.63	216.01	1.00	216.01	0.985	0.3565	1.53	13.43	20.54	5.48	No
2.050	342.5	Yes	212.7	1.649	Yes	212.7	1.649	0.5	13420.84	39.07	1.61	213.29	1.00	213.78	0.984	0.3564	1.52	13.42	20.38	5.51	No
2.100	334.2	Yes	210.0	1.655	Yes	210.0	1.655	0.5	13416.05	40.02	1.59	210.67	1.01	212.09	0.984	0.3562	1.51	13.42	20.21	5.54	No
2.150	332.5	Yes	211.4	1.666	Yes	211.4	1.666	0.5	13665.03	40.97	1.57	212.08	1.01	215.12	0.984	0.3561	1.49	13.67	20.42	5.57	No
2.200	321.5	Yes	206.8	1.689	Yes	206.8	1.689	0.5	13521.39	41.92	1.55	207.46	1.03	213.76	0.983	0.3560	1.48	13.52	20.05	5.59	No
2.250	317.8	Yes	206.7	1.656	Yes	206.7	1.656	0.5	13669.81	42.87	1.54	207.40	1.01	208.99	0.983	0.3558	1.47	13.67	20.12	5.62	No
2.300	314.3	Yes	206.7	1.618	Yes	206.7	1.618	0.5	13818.24	43.82	1.52	207.36	1.00	207.36	0.982	0.3557	1.46	13.82	20.18	5.64	No
2.350	314.5	Yes	209.0	1.556	Yes	209.0	1.556	0.5	14124.68	44.77	1.50	209.70	1.00	209.70	0.982	0.3555	1.45	14.12	20.47	5.67	No
2.400	302.9	Yes	203.5	1.548	Yes	203.5	1.548	0.5	13894.85	45.72	1.49	204.14	1.00	204.14	0.982	0.3554	1.44	13.89	19.99	5.69	No
2.450	287.7	Yes	195.2	1.561	Yes	195.2	1.561	0.5	13473.51	46.67	1.47	195.92	1.00	195.92	0.981	0.3553	1.43	13.47	19.24	5.72	No
2.500	273.5	Yes	187.5	1.570	Yes	187.5	1.570	0.5	13071.31	47.62	1.46	188.17	1.00	188.17	0.981	0.3551	1.42	13.07	18.53	5.74	No
2.550	259.0	Yes	179.3	1.581	Yes	179.3	1.581	0.5	12630.81	48.57	1.44	180.04	1.00	180.04	0.980	0.3550	1.41	12.63	17.77	5.77	No
2.600	253.1	Yes	176.9	1.554	Yes	176.9	1.554	0.5	12582.93	49.52	1.43	177.63	1.00	177.63	0.980	0.3548	1.40	12.58	17.57	5.79	No
2.650	248.3	Yes	175.2	1.561	Yes	175.2	1.561	0.5	12582.93	50.47	1.42	175.95	1.00	175.95	0.980	0.3547	1.39	12.58	17.45	5.81	No
2.700	246.8	Yes	175.8	1.564	Yes	175.8	1.564	0.5	12740.94	51.42	1.40	176.50	1.00	176.50	0.979	0.3546	1.38	12.74	17.54	5.84	No
2.750	245.3	Yes	176.3	1.591	Yes	176.3	1.591	0.5	12898.94	52.37	1.39	177.07	1.00	177.07	0.979	0.3544	1.37	12.90	17.63	5.86	No
2.800	248.4	Yes	180.2	1.575	Yes	180.2	1.575	0.5	13301.14	53.32	1.38	180.95	1.00	180.95	0.979	0.3543	1.36	13.30	18.05	5.88	No
2.850	259.4	Yes	189.9	1.569	Yes	189.9	1.569	0.5	14134.25	54.27	1.37	190.60	1.00	190.60	0.978	0.3542	1.35	14.13	19.05	5.90	No
2.900	273.7	Yes	202.0	1.605	Yes	202.0	1.605	0.5	15168.47	55.22	1.35	202.78	1.00	202.78	0.978	0.3540	1.34	15.17	20.30	5.92	No
2.950	310.6	Yes	231.3	1.510	Yes	231.3	1.510	0.5	17505.02	56.17	1.34	232.02	1.00	232.02	0.977	0.3539	1.33	17.51	23.26	5.94	No
3.000	312.6	Yes	234.7	1.601	Yes	234.7	1.601	0.5	17916.79	57.12	1.33	235.50	1.00	235.50	0.977	0.3537	1.32	17.92	23.65	5.97	No
3.050	245.0	Yes	185.5	1.824	Yes	185.5	1.824	0.5	14287.47	58.07	1.32	186.25	1.12	209.46	0.977	0.3536	1.31	14.29	18.73	5.99	No
3.100	232.6	Yes	177.5	1.797	Yes	177.5	1.797	0.5	13789.51	59.02	1.31	178.31	1.10	196.94	0.976	0.3535	1.30	13.79	17.95	6.01	No
3.150	228.3	Yes	175.6	1.817	Yes	175.6	1.817	0.5	13751.21	59.97	1.30	176.40	1.12	197.40	0.976	0.3533	1.29	13.75	17.78	6.03	No
3.200	223.5	Yes	173.3	1.803	Yes	173.3	1.803	0.5	13674.60	60.92	1.29	174.04	1.11	193.04	0.976	0.3532	1.28	13.67	17.57	6.05	No
3.250	223.3	Yes	174.5	1.707	Yes	174.5	1.707	0.5	13875.70	61.87	1.28	175.24	1.04	182.65	0.975	0.3530	1.28	13.88	17.71	6.07	No
3.300	214.8	Yes	169.2	1.648	Yes	169.2	1.648	0.5	13559.69	62.82	1.27	169.95	1.00	170.29	0.975	0.3529	1.27	13.56	17.19	6.09	No
3.350	198.4	Yes	157.4	1.658	Yes	157.4	1.658	0.5	12717.00	63.77	1.26	158.20	1.01	159.66	0.974	0.3528	1.26	12.72	16.01	6.10	No
3.400	196.6	Yes	157.1	1.639	Yes	157.1	1.639	0.5	12788.82	64.72	1.25	157.92	1.00	157.92	0.974	0.3526	1.25	12.79	16.00	6.12	No
3.450	194.8	Yes	156.8	1.631	Yes	156.8	1.631	0.5	12860.64	65.67	1.24	157.65	1.00	157.65	0.974	0.3525	1.24	12.86	15.99	6.14	No
3.500	200.8	Yes	162.8	1.613	Yes	162.8	1.613	0.5	13444.78	66.62	1.23	163.64	1.00	163.64	0.973	0.3524	1.23	13.44	16.60	6.16	No
3.550	207.9	Yes	169.8	1.589	Yes	169.8	1.589	0.5	14115.10	67.57	1.22	170.58	1.00	170.58	0.973	0.3522	1.23	14.12	17.32	6.18	No
3.600	216.7	Yes	178.2	1.575	Yes	178.2	1.575	0.5	14919.49	68.52	1.22	179.05	1.00	179.05	0.972	0.3521	1.22	14.92	18.19	6.20	No
3.650	222.3	Yes	184.1	1.577	Yes	184.1	1.577	0.5	15513.20	69.47	1.21	184.90	1.00	184.90	0.972	0.3519	1.21	15.51	18.80	6.21	No
3.700	225.0	Yes	187.6	1.546	Yes	187.6	1.546	0.5	15915.40	70.42	1.20	188.41	1.00	188.41	0.972	0.3518	1.20	15.92	19.16	6.23	No
3.750	231.5	Yes	194.3	1.556	Yes	194.3	1.556	0.5	16595.30	71.37	1.19	195.14	1.00	195.14	0.971	0.3517	1.20	16.60	19.86	6.25	No
3.800	247.0	Yes	208.7	1.541	Yes	208.7	1.541	0.5	17935.95	72.32	1.18	209.52	1.00	209.52	0.971	0.3515	1.19	17.94	21.33	6.27	No
3.850	241.3	Yes	205.2	1.563	Yes	205.2	1.563	0.5	17754.00	73.27	1.18	206.04	1.00	206.04	0.971	0.3514	1.18	17.75	20.98	6.28	No
3.900	236.0	Yes	202.0	1.571	Yes	202.0	1.571	0.5	17591.21	74.22	1.17	202.84	1.00	202.84	0.970	0.3512	1.17	17.59	20.66	6.30	No
3.950	230.8	Yes	198.8	1.577	Yes	198.8	1.577	0.5	17428.41	75.17	1.16	199.69	1.00	199.69	0.970	0.3511	1.17	17.43	20.35	6.32	No
4.000	235.6	Yes	204.2	1.563	Yes	204.2	1.563	0.5	18012.55	76.12	1.15	205.09	1.00	205.09	0.969	0.3510	1.16	18.01	20.90	6.33	No
4.050	223.6	Yes	195.0	1.532	Yes	195.0	1.532	0.5	17313.50	77.07	1.15	195.92	1.00	195.92	0.969	0.3508	1.15	17.31	19.97	6.35	No
4.100	197.0	Yes	172.8	1.615	Yes	172.8	1.615	0.5	15446.17	78.02	1.14	173.72	1.00	173.72	0.969	0.3507	1.15	15.45	17.71	6.37	No
4.150	200.2	Yes	176.8	1.613	Yes	176.8	1.613	0.5	15891.46	78.97	1.13	177.65	1.00	177.65	0.968	0.3506	1.14	15.89	18.11	6.38	No
4.200	203.4	Yes	180.6	1.647	Yes	180.6	1.647	0.5	16336.74	79.92	1.13	181.54	1.00	181.76	0.968	0.3504	1.13	16.34	18.51	6.40	No
4.250	226.8	Yes	202.6	1.600	Yes	202.6	1.600	0.5	18424.32	80.87	1.12	203.53	1.00	203.53	0.967	0.3503	1.13	18.42	20.75	6.41	No
4.300	249.2	Yes	224.0	1.539	Yes	224.0	1.539	0.5	20473.60	81.82	1.11	224.85	1.00	224.85	0.967	0.3501	1.12	20.47	22.92	6.43	No
4.350	268.3	Yes	242.5	1.495	Yes	242.5	1.495	0.5	22293.05	82.77	1.11	243.42	1.00	243.42	0.967	0.3500	1.11	22.29	24.82	6.45	No
4.400	269.4	Yes	244.9	1.491	Yes	244.9	1.491	0.5	22637.79	83.72	1.10	245.78	1.00	245.78	0.966	0.3499	1.11	22.64	25.06	6.46	No
4.450	263.9	Yes	241.2	1.522	Yes	241.2	1.522	0.5	22427.11	84.67	1.09	242.12	1.00	242.12	0.966	0.3497	1.10	22.43	24.68	6.48	No
4.500	263.9	Yes	242.6	1.527	Yes	242.6	1.527	0.5	22685.67	85.62	1.09	243.55	1.00	243.55	0.966	0.3496	1.09	22.69	24.82	6.49	No
4.550	264.0	Yes	244.0	1.513	Yes	244.0	1.513	0.5	22944.22	86.57	1.08	244.97	1.00	244.97	0.965	0.3494	1.09	22.94	24.96	6.51	No
4.600	262.7	Yes	244.1	1.518	Yes	244.1	1.518	0.5	23078.29	87.52	1.08	245.06	1.00	245.06	0.965	0.3493	1.08	23.08	24.97	6.52	No
4.650	255.0	Yes	238.3	1.524	Yes	238.3	1.524	0.5	22647.36	88.47	1.07	239.19	1.00	239.19	0.964	0.3492	1.08	22.65	24.36	6.54	No
4.700	252.7	Yes	237.4	1.521	Yes	237.4	1.521	0.5	22685.67	89.42	1.06	238.32	1.00	238.32	0.964	0.3490	1.07	22.69	24.27	6.55	No
4.750	249.1	Yes	235.2	1.502	Yes	235.2	1.502	0.5	22599.48	90.37	1.06	236.17	1.00	236.17	0.964	0.3489	1.06	22.60	24.04	6.57	No
4.800	244.7	Yes	232.3	1.505	Yes	232.3	1.505	0.5	22436.69	91.32	1.05	233.24	1.00	233.24	0.963	0.3488	1.06	22.44	23.74	6.58	No
4.850	244.7	Yes	233.5	1.500	Yes	233.5	1.500	0.5	22671.30	92.27	1.05	234.46	1.00	234.46	0.963	0.3486	1.05	22.67	23.86	6.59	No
4.900	244.7	Yes	234.7	1.495	Yes	234.7	1.495	0.5	22905.92	93.22	1.04	235.68	1.00	235.68	0.963	0.3485	1.05	22.91	23.97	6.61	No
4.950	253.0	Yes	243.9	1.474	Yes	243.9	1.474	0.5	23920.98	94.17	1.04	244.88	1.00	244.88	0.962	0.3483	1.04	23.92	24.90	6.62	No
5.000	262.0	Yes	253.9	1.454	Yes	253.9	1.454	0.5	25022.22	95.12	1.03	254.87	1.00	254.87	0.962	0.3482	1.04	25.02	25.90	6.64	No
5.050	268.5	Yes	261.5	1.438	Yes	261.5	1.438	0.5	25893.64	96.07	1.03	262.44	1.00	262.44	0.961	0.3481	1.03	25.89	26.66	6.65	No
5.100	274.7	Yes	268.8	1.555	Yes	268.8	1.555	0.5	26745.91	97.02	1.02	269.75	1.00	269.75	0.961	0.3479	1.02	26.75	27.39	6.66	No
5.150	290.3	Yes	285.4	1.596	Yes	285.4	1.596	0.5	28536.63	97.97	1.02	286.41	1.00	286.41	0.961	0.3478	1.02	28.54	29.07	6.68	No
5.200	319.9	Yes	316.1	1.559	Yes	316.1	1.559	0.5	31744.61	98.92	1.01	317.07	1.00	317.07	0.960	0.3476	1.01	31.74	32.17	6.69	No
5.250	293.4	Yes	291.3	1.613	Yes	291.3	1.613	0.5	29408.06	99.87	1.01	292.33	1.00	292.33	0.960	0.3475	1.01	29.41	29.64	6.70	No
5.300	267.5	Yes	266.8	1.593	Yes	266.8	1.593	0.5	27071.50	100.82	1.00	267.84	1.00	267.84	0.959	0.3474	1.00	27.07	27.15	6.72	No
5.350	264.1	Yes	264.6	1.571	Yes	264.6	1.571	0.5	26975.74	101.77	1.00	265.64	1.00	265.64	0.959	0.3472	1.00	26.98	26.91	6.73	No
5.400	262.7	Yes	264.5	1.577	Yes	264.5	1.577	0.5	27090.65	102.72	0.99	265.54	1.00	265.54	0.959	0.3471	0.99	27.09	26.88	6.74	No
5.450	261.4	Yes	264.4	1.582	Yes	264.4	1.582	0.5	27205.56	103.67	0.99	265.44	1.00	265.44	0.958	0.3470	0.99	27.21	26.86	6.76	No
5.500	254.4	Yes	258.5	1.594	Yes	258.5	1.594	0.5	26717.19	104.62	0.98	259.49	1.00	259.49	0.958	0.3468	0.98	26.72	26.24	6.77	No
5.550	241.9	Yes	246.9	1.527	Yes	246.9	1.527	0.5	25644.67	105.57	0.98	247.95	1.00	247.95	0.958	0.3467	0.98	25.64	25.06	6.78	No
5.600	215.2	Yes	220.7	1.531	Yes	220.7	1.531	0.5	23030.41	106.52	0.98	221.68	1.00	221.68	0.957	0.3465	0.97	23.03	22.39	6.79	No
5.650	191.5	Yes	197.3	1.573	Yes	197.3	1.573	0.5	20693.85	107.47	0.97	198.30	1.00	198.30	0.957	0.3464	0.97	20.69	20.02	6.81	No
5.700	155.0	Yes	160.3	1.717	Yes	160.3	1.717	0.5	16911.31	108.42	0.97	161.34	1.05	169.27	0.956	0.3463	0.96	16.91	16.28	6.82	No
5.750	76.4	Yes	79.4	2.164	Yes	79.4	2.164	0.5	8465.23	109.35	0.96	80.42	1.58	127.27	0.956	0.3461	0.96	8.47	8.11	6.83	No
5.800	39.6	No	39.6	Non-liq.	No	39.6	Non-liq.	Non-liq.	4472.02	110.25	Non-liq.	Non-liq.	Non-liq.	9000000000.00	0.956	0.3460	0.95	4.47	4.26	6.84	Yes
5.850	53.3	Yes	55.8	2.383	Yes	55.8	2.383	0.5	6037.70	111.17	0.95	56.89	2.24	127.63	0.955	0.3458	0.95	6.04	5.73	6.86	Yes
5.900	66.8	Yes	70.3	2.247	Yes	70.3	2.247	0.5	7603.39	112.10	0.95	71.34	1.79	127.78	0.955	0.3457	0.94	7.60	7.18	6.87	No
5.950	173.5	Yes	183.3	1.772	Yes	183.3	1.772	0.5	19726.67	113.05	0.95	184.32	1.09	200.34	0.954	0.3456	0.94	19.73	18.54	6.88	No
6.000	234.0	Yes	248.2	1.581	Yes	248.2	1.581	0.5	26793.79	114.00	0.94	249.30	1.00	249.30	0.954	0.3454	0.94	26.79	25.05	6.89	No
6.050	253.6	Yes	270.1	1.446	Yes	270.1	1.446	0.5	29264.41	114.95	0.94	271.16	1.00	271.16	0.954	0.3453	0.93	29.26	27.23	6.90	No
6.100	267.1	Yes	285.7	1.438	Yes	285.7	1.438	0.5	31074.29	115.90	0.94	286.75	1.00	286.75	0.953	0.3452	0.93	31.07	28.77	6.92	No
6.150	273.2	Yes	293.4	1.447	Yes	293.4	1.447	0.5	32041.47	116.85	0.93	294.47	1.00	294.47	0.953	0.3450	0.92	32.04	29.53	6.93	No
6.200	279.2	Yes	301.1	1.528	Yes	301.1	1.528	0.5	33008.65	117.80	0.93	302.13	1.00	302.13	0.953	0.3449	0.92	33.01	30.27	6.94	No
6.250	269.0	Yes	291.2	1.589	Yes	291.2	1.589	0.5	32060.62	118.75	0.92	292.28	1.00	292.28	0.952	0.3447	0.91	32.06	29.26	6.95	No
6.300	256.0	Yes	278.2	1.574	Yes	278.2	1.574	0.5	30758.28	119.70	0.92	279.29	1.00	279.29	0.952	0.3446	0.91	30.76	27.94	6.96	No
6.350	267.4	Yes	291.8	1.516	Yes	291.8	1.516	0.5	32386.21	120.65	0.92	292.91	1.00	292.91	0.951	0.3445	0.90	32.39	29.28	6.97	No
6.400	278.7	Yes	305.3	1.472	Yes	305.3	1.472	0.5	34014.14	121.60	0.91	306.43	1.00	306.43	0.951	0.3443	0.90	34.01	30.61	6.98	No
6.450	293.2	Yes	322.4	1.598	Yes	322.4	1.598	0.5	36053.84	122.55	0.91	323.55	1.00	323.55	0.951	0.3442	0.90	36.05	32.30	7.00	No
6.500	311.9	Yes	344.3	1.671	Yes	344.3	1.671	0.5	38639.37	123.50	0.91	345.41	1.02	351.69	0.950	0.3440	0.89	38.64	34.45	7.01	No
6.550	332.4	Yes	368.4	1.610	Yes	368.4	1.610	0.5	41493.03	124.45	0.90	369.50	1.00	369.50	0.950	0.3439	0.89	41.49	36.82	7.02	No
6.600	377.5	Yes	419.9	1.473	Yes	419.9	1.473	0.5	47458.91	125.40	0.90	421.03	1.00	421.03	0.950	0.3438	0.88	47.46	41.92	7.03	No
6.650	322.3	Yes	359.9	1.567	Yes	359.9	1.567	0.5	40851.44	126.35	0.90	361.05	1.00	361.05	0.949	0.3436	0.88	40.85	35.92	7.04	No
6.700	294.6	Yes	330.2	1.401	Yes	330.2	1.401	0.5	37633.88	127.30	0.89	331.37	1.00	331.37	0.949	0.3435	0.88	37.63	32.94	7.05	No
6.750	285.4	Yes	321.1	1.414	Yes	321.1	1.414	0.5	36733.74	128.25	0.89	322.24	1.00	322.24	0.948	0.3434	0.87	36.73	32.01	7.06	No
6.800	279.8	Yes	316.0	1.481	Yes	316.0	1.481	0.5	36283.66	129.20	0.89	317.12	1.00	317.12	0.948	0.3432	0.87	36.28	31.47	7.07	No
6.850	290.1	Yes	328.8	1.506	Yes	328.8	1.506	0.5	37892.44	130.15	0.88	329.97	1.00	329.97	0.948	0.3431	0.86	37.89	32.72	7.08	No
6.900	300.3	Yes	341.6	1.471	Yes	341.6	1.471	0.5	39501.21	131.10	0.88	342.73	1.00	342.73	0.947	0.3429	0.86	39.50	33.96	7.10	No
6.950	336.2	Yes	383.8	1.445	Yes	383.8	1.445	0.5	44528.64	132.05	0.88	384.96	1.00	384.96	0.947	0.3428	0.86	44.53	38.11	7.11	No
7.000	302.6	Yes	346.7	1.490	Yes	346.7	1.490	0.5	40377.42	133.00	0.87	347.82	1.00	347.82	0.946	0.3427	0.85	40.38	34.40	7.12	No
7.050	304.2	Yes	349.8	1.540	Yes	349.8	1.540	0.5	40883.04	133.95	0.87	350.92	1.00	350.92	0.946	0.3425	0.85	40.88	34.68	7.13	No
7.100	305.8	Yes	352.8	1.461	Yes	352.8	1.461	0.5	41387.70	134.90	0.87	354.00	1.00	354.00	0.946	0.3424	0.84	41.39	34.95	7.14	No
7.150	325.5	Yes	376.9	1.341	Yes	376.9	1.341	0.5	44356.27	135.85	0.86	378.07	1.00	378.07	0.945	0.3422	0.84	44.36	37.30	7.15	No
7.200	348.7	Yes	405.2	1.349	Yes	405.2	1.349	0.5	47841.96	136.80	0.86	406.36	1.00	406.36	0.945	0.3421	0.84	47.84	40.05	7.16	No
7.250	324.4	Yes	378.3	1.186	Yes	378.3	1.186	0.5	44835.08	137.80	0.86	379.43	1.00	379.43	0.945	0.3420	0.83	44.84	37.36	7.17	No
7.300	334.5	No	334.5	Non-liq.	No	334.5	Non-liq.	Non-liq.	46443.85	138.42	Non-liq.	Non-liq.	Non-liq.	9000000000.00	0.944	0.3418	0.83	46.44	38.59	7.18	No
7.350	412.6	No	412.6	Non-liq.	No	412.6	Non-liq.	Non-liq.	57504.19	139.05	Non-liq.	Non-liq.	Non-liq.	9000000000.00	0.944	0.3417	0.83	57.50	47.65	7.18	No
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Average	308.02		225.07	1.61		225.07	1.61	0.50	18617.88	70.37	1.28	212.51	1.04	216.28	0.99	0.35					

Sounding Name	Water Bottom Date	Depth (m)	Pressure (dbar)	Temperature (deg C)	Salinity (PSU)	Sigma-Theta (kg/m³)	Density (kg/m³)	Sound Velocity (m/s)	Conductivity (S/m)	Oxygen (ml/l)	Oxygen Saturation (%)	Fluorescence (mg/m³)	Transmissivity (%)	Beam Attenuation (1/m)	Beam Transmission (%)	Light (Lux)	Nitrate (µM)	Nitrite (µM)	Ammonia (µM)	Phosphate (µM)	Silicate (µM)	Chlorophyll a (µg/l)	Phaeopigment (µg/l)	Phaeophytin (µg/l)	Salinity (PSU)	Oxygen (ml/l)	Nitrate (µM)	Nitrite (µM)	Ammonia (µM)	Phosphate (µM)	Silicate (µM)	Chlorophyll a (µg/l)	Phaeopigment (µg/l)	Phaeophytin (µg/l)
CP02		Sal. Lab			Dissolved Oxygen Winkler Titration	Sulfide (µM) Hydrogen Sulfide Titration	Ehrlich-Acid Equivalent	Ehrlich-Base Equivalent	Weight Fraction																									
1	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sounding Name

CPT-03

Insert Raw Data

Surface Elevation [ft] 0.0 | Unequal End Area Ratio, a 0.83 | Pre-drill Depth [ft] 0.0 | Sat. Unit Weight for Pre-drill [pcf] 110 | Depth to Water [ft] 100.0

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Elevation [ft]	q_t [tsf]	f_s [tsf]	R_f [%]	u_2 [ft]	u_0 [ft]	From SBT, Iterated γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	Davies 1999 FC [%]	Robertson 1990 Norm. F_r/Q_t Chart SBT	SPT N_{60} [blows/ft]	SPT $(N_1)_{60}$ [blows/ft]	Baldi, et al. 1986 K_o 0.45 D_r [%]	R&C (1983) For friction angle plot σ'_{vo} [kPa]	R&C (1983) For friction angle plot q_c [MPa]	R&C (1983) ϕ' [deg]	K&M (1990) ϕ' [deg]	N_{kt} 16 s_u [psf]	s_u/σ'_{vo}	Based on q_c, using n=1.0 for all Q	I_c<2.6?	Based on q_c, using n=0.5 for I_c<2.6 Q	Recalc. I_c	Recalc. I_c<2.6?	Based on q_c, using n=0.7 for I_c>2.6 Q	Recalc. I_c	n	q_c [kPa]	σ'_{vo} [kPa]	C_q	q_{c1N}	K_c	$(q_{c1N})_{cs}$	r_d	a_{max} (*g) 0.557 CSR	Contractive/ Dilative Plot C_q	q_c [MPa]	Stark and Olson (1995) q_{c1} [MPa]	Boundary q_{c1} [MPa]	Contractive?
0.05	27.80	0.00	0.00	0.16	-0.16	27.80	0.00	0.00	0.00	0.00	80	13.05	13.05	4258.4	0.00	0.000	4.538	100.0	2	228	11451	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	3474.2	266.15	4258.4	No	4258.4	Non-liq.	No	4258.4	Non-liq.	Non-liq.	2662.14	0.62	Non-liq.	Non-liq.	Non-liq.	########	1.000	0.3619	2.23	2.66	5.94	2.32	No
0.10	50.70	0.00	0.00	0.33	-0.33	50.70	0.00	0.00	0.00	0.00	80	26.11	26.11	3883.1	0.00	0.000	4.538	100.0	2	415	12247	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	6335.9	242.69	3883.1	No	3883.1	Non-liq.	No	3883.1	Non-liq.	Non-liq.	4855.06	1.25	Non-liq.	Non-liq.	Non-liq.	########	0.999	0.3618	2.22	4.86	10.76	2.69	No
0.15	61.20	0.00	-0.09	0.49	-0.49	61.20	0.00	0.00	-0.09	0.00	80	39.16	39.16	3124.6	0.00	0.000	4.538	100.0	2	501	10819	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	7647.5	195.29	3124.6	No	3124.6	Non-liq.	No	3124.6	Non-liq.	Non-liq.	5860.54	1.87	Non-liq.	Non-liq.	Non-liq.	########	0.999	0.3616	2.20	5.86	12.89	2.92	No
0.20	61.50	0.00	-0.14	0.66	-0.66	61.50	0.00	0.00	-0.14	0.00	80	52.21	52.21	2354.7	0.00	0.000	4.538	100.0	2	504	8712	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	7684.1	147.17	2354.7	No	2354.7	Non-liq.	No	2354.7	Non-liq.	Non-liq.	5889.27	2.50	Non-liq.	Non-liq.	Non-liq.	########	0.998	0.3615	2.18	5.89	12.85	3.10	No
0.25	56.80	0.01	-0.07	0.82	-0.82	56.80	0.01	0.02	-0.07	0.00	127	73.10	73.10	1553.1	0.02	0.000	0.602	0.0	7	7	97	100.0	3.50	5.44	52.70	44.80	9000000000.0	9000000000.00	1553.1	Yes	288.6	1.142	Yes	288.6	1.142	0.5	5439.20	3.50	1.70	288.83	1.00	288.83	0.998	0.3614	2.16	5.44	11.73	3.33	No
0.30	58.10	0.03	0.00	0.98	-0.98	58.10	0.03	0.05	0.00	0.00	127	93.98	93.98	1235.4	0.05	0.000	0.384	0.0	7	7	78	100.0	4.50	5.56	51.89	44.31	9000000000.0	9000000000.00	1235.4	Yes	260.3	1.057	Yes	260.3	1.057	0.5	5563.69	4.50	1.70	260.55	1.00	260.55	0.998	0.3612	2.13	5.56	11.86	3.51	No
0.35	59.40	0.05	0.00	1.15	-1.15	59.40	0.05	0.08	0.00	0.00	127	114.87	114.87	1033.2	0.08	0.000	0.478	0.0	7	7	69	100.0	5.50	5.69	51.24	43.94	9000000000.0	9000000000.00	1033.2	Yes	240.7	1.098	Yes	240.7	1.098	0.5	5688.17	5.50	1.70	240.95	1.00	240.95	0.997	0.3611	2.11	5.69	11.99	3.66	No
0.40	70.00	0.12	-0.07	1.31	-1.31	70.00	0.12	0.17	-0.07	0.00	127	135.75	135.75	1030.3	0.17	0.000	0.645	0.0	7	9	75	100.0	6.50	6.70	51.23	44.32	9000000000.0	9000000000.00	1030.3	Yes	260.9	1.147	Yes	260.9	1.147	0.5	6703.24	6.50	1.70	261.20	1.00	261.20	0.997	0.3609	2.08	6.70	13.96	3.79	No
0.45	76.10	0.19	-0.14	1.48	-1.48	76.10	0.19	0.25	-0.14	0.00	127	156.64	156.64	970.6	0.25	0.000	0.784	0.0	7	10	76	100.0	7.50	7.29	51.01	44.38	9000000000.0	9000000000.00	970.7	Yes	264.1	1.217	Yes	264.1	1.217	0.5	7287.38	7.50	1.70	264.35	1.00	264.35	0.997	0.3608	2.06	7.29	15.01	3.90	No
0.50	84.40	0.26	-0.16	1.64	-1.64	84.40	0.26	0.31	-0.16	0.00	127	177.53	177.53	949.8	0.31	0.000	0.863	0.0	7	12	78	100.0	8.50	8.08	50.93	44.57	9000000000.0	9000000000.00	949.8	Yes	275.1	1.251	Yes	275.1	1.251	0.5	8082.19	8.50	1.70	275.40	1.00	275.40	0.996	0.3607	2.04	8.08	16.46	4.01	No
0.55	95.30	0.41	-0.16	1.80	-1.80	95.30	0.41	0.43	-0.16	0.00	127	198.41	198.41	959.6	0.43	0.000	0.984	0.0	7	13	83	100.0	9.50	9.13	50.97	44.89	9000000000.0	9000000000.00	959.6	Yes	293.8	1.317	Yes	293.8	1.317	0.5	9125.98	9.50	1.70	294.14	1.00	294.14	0.996	0.3605	2.01	9.13	18.38	4.10	No
0.60	106.30	0.56	-0.18	1.97	-1.97	106.30	0.56	0.53	-0.18	0.00	127	219.30	219.30	968.5	0.53	0.000	1.059	0.0	7	15	88	100.0	10.50	10.18	51.00	45.17	9000000000.0	9000000000.00	968.5	Yes	311.8	1.357	Yes	311.8	1.357	0.5	10179.34	10.50	1.70	312.08	1.00	312.08	0.995	0.3604	1.99	10.18	20.28	4.19	No
0.65	115.50	0.73	-0.18	2.13	-2.13	115.50	0.73	0.63	-0.18	0.00	127	240.18	240.18	960.8	0.63	0.000	1.132	0.0	7	17	91	100.0	11.50	11.06	50.97	45.35	9000000000.0	9000000000.00	960.8	Yes	323.7	1.402	Yes	323.7	1.402	0.5	11060.34	11.50	1.70	324.01	1.00	324.01	0.995	0.3602	1.97	11.06	21.79	4.27	No
0.70	127.90	0.85	-0.18	2.30	-2.30	127.90	0.85	0.66	-0.18	0.00	127	261.07	261.07	978.8	0.67	0.000	1.148	0.0	7	19	95	100.0	12.50	12.25	51.04	45.64	9000000000.0	9000000000.00	978.8	Yes	343.8	1.400	Yes	343.8	1.400	0.5	12247.77	12.50	1.70	344.15	1.00	344.15	0.995	0.3601	1.95	12.25	23.88	4.34	No
0.75	146.00	0.95	-0.18	2.46	-2.46	146.00	0.95	0.65	-0.18	0.00	127	281.95	281.95	1034.6	0.65	0.000	1.130	0.0	7	22	102	100.0	13.50	13.98	51.25	46.09	9000000000.0	9000000000.00	1034.6	Yes	377.7	1.366	Yes	377.7	1.366	0.5	13981.04	13.50	1.70	378.02	1.00	378.02	0.994	0.3600	1.93	13.98	26.97	4.41	No
0.80	155.20	1.25	-0.18	2.62	-2.62	155.20	1.25	0.81	-0.18	0.00	127	302.84	302.84	1024.0	0.81	0.000	1.217	0.0	7	23	105	100.0	14.50	14.86	51.21	46.21	9000000000.0	9000000000.00	1024.0	Yes	387.4	1.431	Yes	387.4	1.431	0.5	14862.03	14.50	1.70	387.74	1.00	387.74	0.994	0.3598	1.91	14.86	28.37	4.48	No
0.85	153.70	1.04	-0.18	2.79	-2.79	153.70	1.04	0.68	-0.18	0.00	127	323.72	323.72	948.6	0.68	0.000	1.161	0.0	7	23	97	100.0	15.50	14.72	50.92	46.00	9000000000.0	9000000000.00	948.6	Yes	371.0	1.384	Yes	371.0	1.384	0.5	14718.39	15.50	1.70	371.40	1.00	371.40	0.993	0.3597	1.89	14.72	27.80	4.54	No
0.90	150.45	0.98	-0.18	2.95	-2.95	150.45	0.98	0.65	-0.18	0.00	127	344.61	344.61	872.2	0.65	0.000	1.162	0.0	7	22	91	100.0	16.50	14.41	50.60	45.75	9000000000.0	9000000000.00	872.2	Yes	352.0	1.387	Yes	352.0	1.387	0.5	14407.17	16.50	1.70	352.35	1.00	352.35	0.993	0.3596	1.87	14.41	26.93	4.60	No
0.95	147.20	1.01	-0.18	3.12	-3.12	147.20	1.01	0.69	-0.18	0.00	127	365.49	365.49	804.5	0.69	0.000	1.198	0.0	7	22	86	100.0	17.50	14.10	50.30	45.51	9000000000.0	9000000000.00	804.5	Yes	334.3	1.418	Yes	334.3	1.418	0.5	14095.95	17.50	1.70	334.75	1.00	334.75	0.993	0.3594	1.85	14.10	26.08	4.66	No
1.00	148.10	1.04	-0.18	3.28	-3.28	148.10	1.04	0.70	-0.18	0.00	127	386.38	386.38	765.6	0.70	0.000	1.217	0.0	7	22	83	100.0	18.50	14.18	50.10	45.40	9000000000.0	9000000000.00	765.6	Yes	327.1	1.432	Yes	327.1	1.432	0.5	14182.13	18.50	1.70	327.57	1.00	327.57	0.992	0.3593	1.83	14.18	25.98	4.71	No
1.05	144.00	1.15	-0.18	3.44	-3.44	144.00	1.15	0.80	-0.18	0.00	127	407.26	407.26	706.2	0.80	0.000	1.283	0.0	7	22	79	100.0	19.50	13.79	49.79	45.14	9000000000.0	9000000000.00	706.2	Yes	309.8	1.490	Yes	309.8	1.490	0.5	13789.51	19.50	1.70	310.22	1.00	310.22	0.992	0.3591	1.81	13.79	25.01	4.77	No
1.10	129.50	1.17	-0.18	3.61	-3.61	129.50	1.17	0.90	-0.18	0.00	121	427.11	427.11	605.4	0.90	0.000	1.363	3.0	6	20	70	100.0	20.45	12.40	49.17	44.52	9000000000.0	9000000000.00	605.4	Yes	272.0	1.567	Yes	272.0	1.567	0.5	12400.99	20.45	1.70	272.43	1.00	272.43	0.992	0.3590	1.80	12.40	22.28	4.81	No
1.15	105.70	1.07	-0.18	3.77	-3.77	105.70	1.07	1.01	-0.18	0.00	121	446.95	446.95	472.0	1.01	0.000	1.462	7.2	6	17	57	99.2	21.40	10.12	48.15	43.44	9000000000.0	9000000000.00	472.0	Yes	216.9	1.670	Yes	216.9	1.670	0.5	10121.89	21.40	1.70	217.37	1.02	221.15	0.991	0.3589	1.78	10.12	18.02	4.86	No
1.20	88.80	0.88	-0.18	3.94	-3.94	88.80	0.88	0.99	-0.18	0.00	121	466.79	466.79	379.5	0.99	0.000	1.508	9.1	6	15	47	91.7	22.35	8.50	47.22	42.51	9000000000.0	9000000000.00	379.5	Yes	178.2	1.723	Yes	178.2	1.723	0.5	8503.53	22.35	1.70	178.69	1.05	188.19	0.991	0.3587	1.76	8.50	15.00	4.90	No
1.25	76.40	0.71	-0.18	4.10	-4.10	76.40	0.71	0.93	-0.18	0.00	121	486.63	486.63	313.0	0.93	0.000	1.538	10.4	6	13	40	85.0	23.30	7.32	46.37	41.69	9000000000.0	9000000000.00	313.0	Yes	150.1	1.757	Yes	150.1	1.757	0.5	7316.10	23.30	1.70	150.57	1.08	162.12	0.990	0.3586	1.75	7.32	12.79	4.95	No
1.30	66.90	0.54	-0.18	4.27	-4.27	66.90	0.54	0.81	-0.18	0.00	121	506.47	506.47	263.2	0.81	0.000	1.541	10.5	6	11	34	79.1	24.25	6.41	45.58	40.96	9000000000.0	9000000000.00	263.2	Yes	128.8	1.768	Yes	128.8	1.768	0.5	6406.38	24.25	1.70	129.24	1.08	140.05	0.990	0.3584	1.73	6.41	11.10	4.99	No
1.35	61.80	0.41	-0.18	4.43	-4.43	61.80	0.41	0.66	-0.18	0.00	121	526.31	526.31	233.8	0.67	0.000	1.517	9.5	6	10	30	75.2	25.20	5.92	45.03	40.49	9000000000.0	9000000000.00	233.8	Yes	116.6	1.749	Yes	116.6	1.749	0.5	5918.00	25.20	1.70	117.12	1.07	125.41	0.990	0.3583	1.72	5.92	10.16	5.03	No
1.40	58.40	0.36	-0.18	4.59	-4.59	58.40	0.36	0.62	-0.18	0.00	121	546.15	546.15	212.9	0.62	0.000	1.526	9.9	6	10	28	72.3	26.15	5.59	44.62	40.13	9000000000.0	9000000000.00	212.9	Yes	108.1	1.757	Yes	108.1	1.757	0.5	5592.41	26.15	1.70	108.64	1.08	116.92	0.989	0.3582	1.70	5.59	9.51	5.07	No
1.45	58.35	0.35	-0.18	4.76	-4.76	58.35	0.35	0.60	-0.18	0.00	121	565.99	565.99	205.2	0.60	0.000	1.530	10.0	6	10	27	71.5	27.10	5.59	44.40	40.04	9000000000.0	9000000000.00	205.2	Yes	106.1	1.757	Yes	106.1	1.757	0.5	5587.63	27.10	1.70	106.63	1.08	114.76	0.989	0.3580	1.69	5.59	9.42	5.11	No
1.50	60.33	0.37	-0.18	4.92	-4.92	60.33	0.37	0.61	-0.18	0.00	121	585.83	585.83	205.0	0.62	0.000	1.537	10.3	6	10	27	72.1	28.05	5.78	44.40	40.12	9000000000.0	9000000000.00	205.0	Yes	107.8	1.756	Yes	107.8	1.756	0.5	5777.23	28.05	1.70	108.37	1.08	116.61	0.989	0.3579	1.67	5.78	9.66	5.14	No
1.55	62.30	0.38	-0.18	5.09	-5.09	62.30	0.38	0.61	-0.18	0.00	121	605.68	605.68	204.7	0.61	0.000	1.536	10.3	6	10	27	72.6	29.00	5.97	44.39	40.19	9000000000.0	9000000000.00	204.7	Yes	109.5	1.750	Yes	109.5	1.750	0.5	5965.88	29.00	1.70	110.06	1.07	117.91	0.989	0.3578	1.66	5.97	9.89	5.18	No
1.60	64.80	0.43	-0.18	5.25	-5.25	64.80	0.43	0.66	-0.18	0.00	121	625.52	625.52	206.2	0.67	0.000	1.557	11.2	6	11	28	73.4	29.95	6.21	44.43	40.30	9000000000.0	9000000000.00	206.2	Yes	112.1	1.763	Yes	112.1	1.763	0.5	6205.28	29.95	1.70	112.64	1.08	121.70	0.988	0.3576	1.64	6.21	10.20	5.21	No
1.65	70.60	0.51	-0.18	5.41	-5.41	70.60	0.51	0.72	-0.18	0.00	121	645.36	645.36	217.8	0.73	0.000	1.565	11.5	6	12	30	76.0	30.90	6.76	44.69	40.64	9000000000.0	9000000000.00	217.8	Yes	120.3	1.761	Yes	120.3	1.761	0.5	6760.69	30.90	1.70	120.82	1.08	130.35	0.987	0.3575	1.63	6.76	11.01	5.25	No
1.70	74.10	0.44	-0.18	5.58	-5.58	74.10	0.44	0.59	-0.18	0.00	121	665.20	665.20	221.8	0.60	0.000	1.502	8.8	6	12	30	77.3	31.85	7.10	44.78	40.80	9000000000.0	9000000000.00	221.8	Yes	124.3	1.698	Yes	124.3	1.698	0.5	7095.85	31.85	1.70	124.91	1.04	129.46	0.987	0.3573	1.62	7.10	11.46	5.28	No
1.75	78.60	0.47	-0.14	5.74	-5.74	78.60	0.47	0.60	-0.14	0.00	121	685.04	685.04	228.5	0.60	0.000	1.494	8.5	6	13	31	78.9	32.80	7.53	44.92	41.01	9000000000.0	9000000000.00	228.5	Yes	130.0	1.684	Yes	130.0	1.684	0.5	7526.78	32.80	1.70	130.56	1.03	134.09	0.987	0.3572	1.60	7.53	12.06	5.31	No
1.80	85.30	0.49	-0.07	5.91	-5.91	85.30	0.49	0.57	-0.07	0.00	121	704.88	704.88	241.0	0.58	0.000	1.465	7.3	6	14	32	81.4	33.75	8.17	45.17	41.33	9000000000.0	9000000000.00	241.0	Yes	139.1	1.650	Yes	139.1	1.650	0.5	8168.37	33.75	1.70	139.68	1.00	140.15	0.986	0.3571	1.59	8.17	12.98	5.35	No
1.85	89.50	0.58	-0.14	6.07	-6.07	89.50	0.58	0.65	-0.14	0.00	121	724.72	724.72	246.0	0.65	0.000	1.494	8.5	6	15	34	82.7	34.70	8.57	45.26	41.49	9000000000.0	9000000000.00	246.0	Yes	144.0	1.670	Yes	144.0	1.670	0.5	8570.57	34.70	1.70	144.54	1.02	147.04	0.986	0.3569	1.58	8.57	13.50	5.38	No
1.90	92.00	0.68	-0.07	6.23	-6.23	92.00	0.68	0.74	-0.07	0.00	121	744.56	744.56	246.1	0.74	0.000	1.534	10.2	6	15	34	83.2	35.65	8.81	45.27	41.56	9000000000.0	9000000000.00	246.1	Yes	146.0	1.701	Yes	146.0	1.701	0.5	8809.97	35.65	1.69	146.58	1.04	152.25	0.985	0.3568	1.56	8.81	13.77	5.41	No
1.95	96.30	0.71	-0.02	6.40	-6.40	96.30	0.71	0.74	-0.02	0.00	121	764.40	764.40	251.0	0.74	0.000	1.527	9.9	6	16	35	84.4	36.60	9.22	45.36	41.72	9000000000.0	9000000000.00	251.0	Yes	150.8	1.690	Yes	150.8	1.690	0.5	9221.74	36.60	1.66	151.43	1.03	156.10	0.985	0.3566	1.55	9.22	14.29	5.44	No
2.00	100.10	0.71	-0.09	6.56	-6.56	100.10	0.71	0.71	-0.09	0.00	121	784.25	784.25	254.3	0.71	0.000	1.511	9.2	6	17	36	85.3	37.55	9.59	45.42	41.84	9000000000.0	9000000000.00	254.3	Yes	154.8	1.670	Yes	154.8	1.670	0.5	9585.63	37.55	1.64	155.40	1.02	158.12	0.985	0.3565	1.54	9.59	14.74	5.47	No
2.05	109.60	0.73	-0.14	6.73	-6.73	109.60	0.73	0.67	-0.14	0.00	121	804.09	804.09	271.6	0.67	0.000	1.472	7.6	6	18	38	88.3	38.50	10.50	45.72	42.21	9000000000.0	9000000000.00	271.6	Yes	167.4	1.626	Yes	167.4	1.626	0.5	10495.35	38.50	1.62	168.04	1.00	168.04	0.984	0.3564	1.53	10.50	16.01	5.49	No
2.10	121.90	0.73	-0.16	6.89	-6.89	121.90	0.73	0.60	-0.16	0.00	121	823.93	823.93	294.9	0.60	0.000	1.414	5.4	6	20	40	91.8	39.45	11.67	46.10	42.66	9000000000.0	9000000000.00	294.9	Yes	184.0	1.565	Yes	184.0	1.565	0.5	11673.21	39.45	1.60	184.63	1.00	184.63	0.984	0.3562	1.51	11.67	17.67	5.52	No
2.15	129.30	0.69	-0.12	7.05	-7.05	129.30	0.69	0.53	-0.12	0.00	121	843.77	843.77	305.5	0.54	0.000	1.368	3.2	6	20	42	93.6	40.40	12.38	46.26	42.89	9000000000.0	9000000000.00	305.5	Yes	192.9	1.518	Yes	192.9	1.518	0.5	12381.84	40.40	1.58	193.52	1.00	193.52	0.984	0.3561	1.50	12.38	18.59	5.55	No
2.20	133.50	0.64	-0.05	7.22	-7.22	133.50	0.64	0.48	-0.05	0.00	121	863.61	863.61	308.2	0.48	0.000	1.333	1.7	6	21	42	94.3	41.35	12.78	46.30	42.99	9000000000.0	9000000000.00	308.2	Yes	196.9	1.482	Yes	196.9	1.482	0.5	12784.03	41.35	1.57	197.50	1.00	197.50	0.983	0.3560	1.49	12.78	19.05	5.58	No
2.25	137.70	0.60	-0.12	7.38	-7.38	137.70	0.60	0.44	-0.12	0.00	127	884.50	884.50	310.4	0.44	0.000	1.303	0.4	7	21	42	95.0	42.35	13.19	46.33	43.08	9000000000.0	9000000000.00	310.4	Yes	200.6	1.450	Yes	200.6	1.450	0.5	13186.22	42.35	1.55	201.30	1.00	201.30	0.983	0.3558	1.48	13.19	19.49	5.60	No
2.30	142.10	0.59	-0.16	7.55	-7.55	142.10	0.59	0.42	-0.16	0.00	127	905.38	905.38	312.9	0.42	0.000	1.286	0.0	7	22	42	95.7	43.35	13.61	46.36	43.17	9000000000.0	9000000000.00	312.9	Yes	204.7	1.431	Yes	204.7	1.431	0.5	13607.57	43.35	1.53	205.32	1.00	205.32	0.982	0.3557	1.47	13.61	19.95	5.63	No
2.35	145.80	0.60	-0.16	7.71	-7.71	145.80	0.60	0.41	-0.16	0.00	127	926.27	926.27	313.8	0.41	0.000	1.283	0.0	7	22	42	96.2	44.35	13.96	46.38	43.24	9000000000.0	9000000000.00	313.8	Yes	207.6	1.424	Yes	207.6	1.424	0.5	13961.88	44.35	1.51	208.28	1.00	208.28	0.982	0.3555	1.45	13.96	20.30	5.66	No
2.40	147.90	0.60	-0.18	7.87	-7.87	147.90	0.60	0.41	-0.18	0.00	127	947.15	947.15	311.3	0.41	0.000	1.282	0.0	7	23	42	96.3	45.35	14.16	46.34	43.26	9000000000.0	9000000000.00	311.3	Yes	208.3	1.419	Yes	208.3	1.419	0.5	14162.98	45.35	1.49	208.93	1.00	208.93	0.982	0.3554	1.44	14.16	20.43	5.69	No
2.45	148.90	0.60	-0.18	8.04	-8.04	148.90	0.60	0.40	-0.18	0.00	127	968.04	968.04	306.6	0.40	0.000	1.285	0.0	7	23	42	96.1	46.35	14.26	46.27	43.24	9000000000.0	9000000000.00	306.6	Yes	207.4	1.419	Yes	207.4	1.419	0.5	14258.74	46.35	1.48	208.06	1.00	208.06	0.981	0.3553	1.43	14.26	20.41	5.71	No
2.50	148.40	0.60	-0.18	8.20	-8.20	148.40	0.60	0.40	-0.18	0.00	127	988.92	988.92	299.1	0.41	0.000	1.295	0.0	7	23	41	95.5	47.35	14.21	46.16	43.17	9000000000.0	9000000000.00	299.1	Yes	204.5	1.425	Yes	204.5	1.425	0.5	14210.86	47.35	1.46	205.16	1.00	205.16	0.981	0.3551	1.42	14.21	20.18	5.74	No
2.55	148.00	0.64	-0.18	8.37	-8.37	148.00	0.64	0.43	-0.18	0.00	121	1008.76	1008.76	292.4	0.43	0.000	1.320	1.1	6	23	41	95.0	48.30	14.17	46.06	43.11	9000000000.0	9000000000.00	292.4	Yes	201.9	1.446	Yes	201.9	1.446	0.5	14172.56	48.30	1.45	202.59	1.00	202.59	0.980	0.3550	1.41	14.17	19.98	5.76	No
2.60	147.60	0.59	-0.18	8.53	-8.53	147.60	0.59	0.40	-0.18	0.00	127	1029.65	1029.65	285.7	0.40	0.000	1.306	0.5	7	23	40	94.5	49.30	14.13	45.95	43.05	9000000000.0	9000000000.00	285.7	Yes	199.3	1.431	Yes	199.3	1.431	0.5	14134.25	49.30	1.43	199.98	1.00	199.98	0.980	0.3548	1.40	14.13	19.78	5.79	No
2.65	146.10	0.53	-0.18	8.69	-8.69	146.10	0.53	0.36	-0.18	0.00	127	1050.53	1050.53	277.1	0.36	0.000	1.291	0.0	7	23	39	93.6	50.30	13.99	45.81	42.95	9000000000.0	9000000000.00	277.1	Yes	195.3	1.415	Yes	195.3	1.415	0.5	13990.61	50.30	1.42	195.97	1.00	195.97	0.980	0.3547	1.39	13.99	19.43	5.81	No
2.70	147.65	0.50	-0.18	8.86	-8.86	147.65	0.50	0.34	-0.18	0.00	127	1071.42	1071.42	274.6	0.34	0.000	1.276	0.0	7	23	38	93.6	51.30	14.14	45.77	42.95	9000000000.0	9000000000.00	274.6	Yes	195.4	1.398	Yes	195.4	1.398	0.5	14139.04	51.30	1.41	196.11	1.00	196.11	0.979	0.3546	1.38	14.14	19.48	5.83	No
2.75	149.20	0.52	-0.18	9.02	-9.02	149.20	0.52	0.35	-0.18	0.00	127	1092.30	1092.30	272.2	0.35	0.000	1.286	0.0	7	23	38	93.6	52.30	14.29	45.73	42.96	9000000000.0	9000000000.00	272.2	Yes	195.5	1.405	Yes	195.5	1.405	0.5	14287.47	52.30	1.39	196.27	1.00	196.27	0.979	0.3544	1.37	14.29	19.54	5.86	No
2.80	154.40	0.54	-0.09	9.19	-9.19	154.40	0.54	0.35	-0.09	0.00	127	1113.19	1113.19	276.4	0.35	0.000	1.282	0.0	7	24	39	94.5	53.30	14.79	45.80	43.07	9000000000.0	9000000000.00	276.4	Yes	200.5	1.396	Yes	200.5	1.396	0.5	14785.42	53.30	1.38	201.19	1.00	201.19	0.979	0.3543	1.36	14.79	20.07	5.88	No
2.85	153.20	0.54	-0.02	9.35	-9.35	153.20	0.54	0.35	-0.02	0.00	127	1134.08	1134.08	269.2	0.35	0.000	1.293	0.0	7	24	38	93.8	54.30	14.67	45.68	42.99	9000000000.0	9000000000.00	269.2	Yes	197.1	1.404	Yes	197.1	1.404	0.5	14670.51	54.30	1.37	197.78	1.00	197.78	0.978	0.3542	1.35	14.67	19.77	5.90	No
2.90	156.80	0.53	-0.02	9.51	-9.51	156.80	0.53	0.34	-0.02	0.00	127	1154.96	1154.96	270.5	0.34	0.000	1.281	0.0	7	24	39	94.3	55.30	15.02	45.70	43.06	9000000000.0	9000000000.00	270.5	Yes	199.9	1.389	Yes	199.9	1.389	0.5	15015.25	55.30	1.35	200.59	1.00	200.59	0.978	0.3540	1.34	15.02	20.08	5.93	No
2.95	153.60	0.53	-0.05	9.68	-9.68	153.60	0.53	0.35	-0.05	0.00	127	1175.85	1175.85	260.3	0.35	0.000	1.300	0.3	7	24	37	93.2	56.30	14.71	45.52	42.92	9000000000.0	9000000000.00	260.3	Yes	194.0	1.405	Yes	194.0	1.405	0.5	14708.82	56.30	1.34	194.74	1.00	194.74	0.977	0.3539	1.33	14.71	19.53	5.95	No
3.00	149.20	0.49	-0.02	9.84	-9.84	149.20	0.49	0.33	-0.02	0.00	127	1196.73	1196.73	248.3	0.33	0.000	1.304	0.5	7	23	36	91.7	57.30	14.29	45.31	42.74	9000000000.0	9000000000.00	248.3	Yes	186.8	1.408	Yes	186.8	1.408	0.5	14287.47	57.30	1.33	187.51	1.00	187.51	0.977	0.3537	1.32	14.29	18.83	5.97	No
3.05	146.40	0.51	0.00	10.01	-10.01	146.40	0.51	0.35	0.00	0.00	121	1216.57	1216.57	239.7	0.35	0.000	1.331	1.6	6	23	35	90.6	58.25	14.02	45.14	42.61	9000000000.0	9000000000.00	239.7	Yes	181.7	1.431	Yes	181.7	1.431	0.5	14019.34	58.25	1.32	182.48	1.00	182.48	0.977	0.3536	1.31	14.02	18.35	5.99	No
3.10	139.10	0.47	0.00	10.17	-10.17	139.10	0.47	0.34	0.00	0.00	121	1236.41	1236.41	224.0	0.34	0.000	1.348	2.3	6	22	33	88.3	59.20	13.32	44.82	42.33	9000000000.0	9000000000.00	224.0	Yes	171.2	1.446	Yes	171.2	1.446	0.5	13320.29	59.20	1.31	171.99	1.00	171.99	0.976	0.3535	1.30	13.32	17.32	6.01	No
3.15	134.80	0.47	0.00	10.33	-10.33	134.80	0.47	0.35	0.00	0.00	121	1256.25	1256.25	213.6	0.35	0.000	1.373	3.4	6	21	32	86.8	60.15	12.91	44.60	42.14	9000000000.0	9000000000.00	213.6	Yes	164.6	1.468	Yes	164.6	1.468	0.5	12908.52	60.15	1.30	165.35	1.00	165.35	0.976	0.3533	1.29	12.91	16.67	6.03	No
3.20	130.20	0.45	0.00	10.50	-10.50	130.20	0.45	0.35	0.00	0.00	121	1276.10	1276.10	203.1	0.35	0.000	1.389	4.1	6	21	31	85.1	61.10	12.47	44.35	41.93	9000000000.0	9000000000.00	203.1	Yes	157.7	1.482	Yes	157.7	1.482	0.5	12468.02	61.10	1.29	158.46	1.00	158.46	0.976	0.3532	1.28	12.47	16.00	6.05	No
3.25	125.20	0.42	0.00	10.66	-10.66	125.20	0.42	0.34	0.00	0.00	121	1295.94	1295.94	192.2	0.34	0.000	1.402	4.6	6	20	29	83.3	62.05	11.99	44.09	41.71	9000000000.0	9000000000.00	192.2	Yes	150.4	1.493	Yes	150.4	1.493	0.5	11989.22	62.05	1.28	151.20	1.00	151.20	0.975	0.3530	1.27	11.99	15.28	6.07	No
3.30	123.70	0.41	0.00	10.83	-10.83	123.70	0.41	0.33	0.00	0.00	121	1315.78	1315.78	187.0	0.33	0.000	1.410	4.9	6	20	29	82.5	63.00	11.85	43.96	41.62	9000000000.0	9000000000.00	187.0	Yes	147.5	1.498	Yes	147.5	1.498	0.5	11845.58	63.00	1.27	148.26	1.00	148.26	0.975	0.3529	1.27	11.85	15.00	6.09	No
3.35	121.30	0.40	0.00	10.99	-10.99	121.30	0.40	0.33	0.00	0.00	121	1335.62	1335.62	180.6	0.33	0.000	1.421	5.4	6	20	28	81.5	63.95	11.62	43.79	41.49	9000000000.0	9000000000.00	180.6	Yes	143.5	1.508	Yes	143.5	1.508	0.5	11615.75	63.95	1.26	144.30	1.00	144.30	0.974	0.3528	1.26	11.62	14.61	6.11	No
3.40	121.70	0.40	0.00	11.15	-11.15	121.70	0.40	0.33	0.00	0.00	121	1355.46	1355.46	178.6	0.33	0.000	1.425	5.6	6	20	28	81.3	64.90	11.65	43.73	41.47	9000000000.0	9000000000.00	178.6	Yes	142.9	1.508	Yes	142.9	1.508	0.5	11654.06	64.90	1.25	143.71	1.00	143.71	0.974	0.3526	1.25	11.65	14.56	6.13	No
3.45	122.10	0.41	0.00	11.32	-11.32	122.10	0.41	0.34	0.00	0.00	121	1375.30	1375.30	176.6	0.34	0.000	1.434	6.0	6	20	27	81.1	65.85	11.69	43.67	41.45	9000000000.0	9000000000.00	176.6	Yes	142.3	1.515	Yes	142.3	1.515	0.5	11692.36	65.85	1.24	143.14	1.00	143.14	0.974	0.3525	1.24	11.69	14.52	6.15	No
3.50	122.90	0.42	0.00	11.48	-11.48	122.90	0.42	0.34	0.00	0.00	121	1395.14	1395.14	175.2	0.34	0.000	1.441	6.3	6	20	27	81.0	66.80	11.77	43.64	41.45	9000000000.0	9000000000.00	175.2	Yes	142.2	1.519	Yes	142.2	1.519	0.5	11768.97	66.80	1.23	143.05	1.00	143.05	0.973	0.3524	1.23	11.77	14.52	6.16	No
3.55	125.20	0.43	0.00	11.65	-11.65	125.20	0.43	0.34	0.00	0.00	121	1414.98	1414.98	176.0	0.35	0.000	1.440	6.2	6	20	28	81.4	67.75	11.99	43.66	41.50	9000000000.0	9000000000.00	176.0	Yes	143.9	1.515	Yes	143.9	1.515	0.5	11989.22	67.75	1.22	144.70	1.00	144.70	0.973	0.3522	1.23	11.99	14.69	6.18	No
3.60	131.20	0.44	0.00	11.81	-11.81	131.20	0.44	0.34	0.00	0.00	121	1434.82	1434.82	181.9	0.34	0.000	1.423	5.5	6	21	28	82.8	68.70	12.56	43.82	41.69	9000000000.0	9000000000.00	181.9	Yes	149.8	1.495	Yes	149.8	1.495	0.5	12563.78	68.70	1.21	150.59	1.00	150.59	0.972	0.3521	1.22	12.56	15.30	6.20	No
3.65	137.50	0.52	0.00	11.98	-11.98	137.50	0.52	0.38	0.00	0.00	121	1454.67	1454.67	188.0	0.38	0.000	1.439	6.2	6	22	30	84.5	69.65	13.17	43.98	41.88	9000000000.0	9000000000.00	188.0	Yes	155.9	1.507	Yes	155.9	1.507	0.5	13167.07	69.65	1.21	156.74	1.00	156.74	0.972	0.3519	1.21	13.17	15.93	6.22	No
3.70	135.70	0.44	0.00	12.14	-12.14	135.70	0.44	0.32	0.00	0.00	121	1474.51	1474.51	183.1	0.33	0.000	1.413	5.1	6	22	29	83.7	70.60	12.99	43.85	41.79	9000000000.0	9000000000.00	183.1	Yes	152.8	1.480	Yes	152.8	1.480	0.5	12994.70	70.60	1.20	153.64	1.00	153.64	0.972	0.3518	1.20	12.99	15.63	6.24	No
3.75	125.20	0.40	0.00	12.30	-12.30	125.20	0.40	0.32	0.00	0.00	121	1494.35	1494.35	166.6	0.32	0.000	1.445	6.4	6	20	27	80.3	71.55	11.99	43.39	41.37	9000000000.0	9000000000.00	166.6	Yes	140.0	1.510	Yes	140.0	1.510	0.5	11989.22	71.55	1.19	140.81	1.00	140.81	0.971	0.3517	1.20	11.99	14.33	6.25	No
3.80	120.60	0.35	0.00	12.47	-12.47	120.60	0.35	0.29	0.00	0.00	121	1514.19	1514.19	158.3	0.29	0.000	1.444	6.4	6	19	25	78.6	72.50	11.55	43.13	41.16	9000000000.0	9000000000.00	158.3	Yes	133.9	1.508	Yes	133.9	1.508	0.5	11548.72	72.50	1.18	134.74	1.00	134.74	0.971	0.3515	1.19	11.55	13.72	6.27	No
3.85	110.20	0.32	0.00	12.63	-12.63	110.20	0.32	0.29	0.00	0.00	121	1534.03	1534.03	142.7	0.29	0.000	1.484	8.1	6	18	23	74.9	73.45	10.55	42.61	40.70	9000000000.0	9000000000.00	142.7	Yes	121.5	1.546	Yes	121.5	1.546	0.5	10552.81	73.45	1.17	122.32	1.00	122.32	0.971	0.3514	1.18	10.55	12.46	6.29	No
3.90	117.20	0.34	0.00	12.80	-12.80	117.20	0.34	0.29	0.00	0.00	121	1553.87	1553.87	149.8	0.29	0.000	1.465	7.3	6	19	24	76.9	74.40	11.22	42.86	40.96	9000000000.0	9000000000.00	149.8	Yes	128.4	1.524	Yes	128.4	1.524	0.5	11223.13	74.40	1.17	129.26	1.00	129.26	0.970	0.3512	1.17	11.22	13.17	6.30	No
3.95	124.20	0.36	0.00	12.96	-12.96	124.20	0.36	0.29	0.00	0.00	121	1573.71	1573.71	156.8	0.29	0.000	1.447	6.5	6	20	25	78.9	75.35	11.89	43.09	41.21	9000000000.0	9000000000.00	156.8	Yes	135.3	1.504	Yes	135.3	1.504	0.5	11893.46	75.35	1.16	136.12	1.00	136.12	0.970	0.3511	1.17	11.89	13.87	6.32	No
4.00	141.00	0.43	0.00	13.12	-13.12	141.00	0.43	0.30	0.00	0.00	121	1593.55	1593.55	176.0	0.31	0.000	1.414	5.1	6	23	28	83.5	76.30	13.50	43.66	41.78	9000000000.0	9000000000.00	176.0	Yes	152.7	1.468	Yes	152.7	1.468	0.5	13502.23	76.30	1.15	153.56	1.00	153.56	0.969	0.3510	1.16	13.50	15.65	6.34	No
4.05	148.30	0.47	0.00	13.29	-13.29	148.30	0.47	0.32	0.00	0.00	121	1613.39	1613.39	182.8	0.32	0.000	1.408	4.9	6	24	29	85.2	77.25	14.20	43.85	42.00	9000000000.0	9000000000.00	182.8	Yes	159.6	1.459	Yes	159.6	1.459	0.5	14201.29	77.25	1.15	160.52	1.00	160.52	0.969	0.3508	1.15	14.20	16.36	6.35	No
4.10	156.60	0.55	0.00	13.45	-13.45	156.60	0.55	0.35	0.00	0.00	121	1633.24	1633.24	190.8	0.35	0.000	1.416	5.2	6	25	31	87.0	78.20	15.00	44.05	42.23	9000000000.0	9000000000.00	190.8	Yes	167.6	1.463	Yes	167.6	1.463	0.5	14996.10	78.20	1.14	168.47	1.00	168.47	0.969	0.3507	1.15	15.00	17.17	6.37	No
4.15	163.50	0.58	0.00	13.62	-13.62	163.50	0.58	0.35	0.00	0.00	121	1653.08	1653.08	196.8	0.36	0.000	1.407	4.8	6	26	32	88.4	79.15	15.66	44.20	42.40	9000000000.0	9000000000.00	196.8	Yes	173.9	1.452	Yes	173.9	1.452	0.5	15656.85	79.15	1.13	174.83	1.00	174.83	0.968	0.3506	1.14	15.66	17.82	6.39	No
4.20	166.50	0.58	0.02	13.78	-13.78	166.50	0.58	0.35	0.02	0.00	121	1672.92	1672.92	198.1	0.35	0.000	1.400	4.5	6	27	32	88.8	80.10	15.94	44.23	42.46	9000000000.0	9000000000.00	198.1	Yes	176.1	1.443	Yes	176.1	1.443	0.5	15944.13	80.10	1.12	176.98	1.00	176.98	0.968	0.3504	1.13	15.94	18.04	6.40	No
4.25	168.90	0.77	0.07	13.94	-13.94	168.90	0.77	0.46	0.07	0.00	121	1692.76	1692.76	198.6	0.46	0.000	1.466	7.3	6	28	33	89.1	81.05	16.17	44.25	42.50	9000000000.0	9000000000.00	198.6	Yes	177.6	1.505	Yes	177.6	1.505	0.5	16173.95	81.05	1.12	178.48	1.00	178.48	0.967	0.3503	1.13	16.17	18.20	6.42	No
4.30	171.60	0.90	0.02	14.11	-14.11	171.60	0.90	0.52	0.02	0.00	121	1712.60	1712.60	199.4	0.53	0.000	1.502	8.9	6	28	33	89.5	82.00	16.43	44.27	42.55	9000000000.0	9000000000.00	199.4	Yes	179.4	1.538	Yes	179.4	1.538	0.5	16432.51	82.00	1.11	180.28	1.00	180.28	0.967	0.3501	1.13	16.43	18.38	6.43	No
4.35	183.70	0.96	0.02	14.27	-14.27	183.70	0.96	0.52	0.02	0.00	121	1732.44	1732.44	211.1	0.53	0.000	1.482	8.0	6	30	35	91.9	82.95	17.59	44.54	42.85	9000000000.0	9000000000.00	211.1	Yes	191.0	1.516	Yes	191.0	1.516	0.5	17591.21	82.95	1.11	191.88	1.00	191.88	0.967	0.3500	1.11	17.59	19.56	6.45	No
4.40	190.60	0.95	0.00	14.44	-14.44	190.60	0.95	0.50	0.00	0.00	121	1752.28	1752.28	216.5	0.50	0.000	1.460	7.1	6	31	36	93.0	83.90	18.25	44.66	43.00	9000000000.0	9000000000.00	216.5	Yes	197.0	1.492	Yes	197.0	1.492	0.5	18251.96	83.90	1.10	197.96	1.00	197.96	0.966	0.3499	1.11	18.25	20.18	6.46	No
4.45	208.20	0.99	0.00	14.60	-14.60	208.20	0.99	0.48	0.00	0.00	121	1772.12	1772.12	234.0	0.48	0.000	1.421	5.4	6	33	38	96.2	84.85	19.94	45.03	43.39	9000000000.0	9000000000.00	234.0	Yes	214.1	1.451	Yes	214.1	1.451	0.5	19937.34	84.85	1.09	215.02	1.00	215.02	0.966	0.3497	1.10	19.94	21.92	6.48	No
4.50	228.50	0.91	0.09	14.76	-14.76	228.50	0.91	0.40	0.09	0.00	121	1791.96	1791.96	254.0	0.40	0.000	1.345	2.2	6	36	41	99.5	85.80	21.88	45.41	43.81	9000000000.0	9000000000.00	254.0	Yes	233.8	1.374	Yes	233.8	1.374	0.5	21881.28	85.80	1.09	234.68	1.00	234.68	0.966	0.3496	1.09	21.88	23.92	6.49	No
4.55	243.10	0.97	0.16	14.93	-14.93	243.10	0.97	0.40	0.16	0.00	121	1811.81	1811.81	267.4	0.40	0.000	1.328	1.5	6	38	43	100.0	86.75	23.28	45.65	44.08	9000000000.0	9000000000.00	267.4	Yes	247.4	1.355	Yes	247.4	1.355	0.5	23279.38	86.75	1.08	248.30	1.00	248.30	0.965	0.3494	1.09	23.28	25.30	6.51	No
4.60	257.70	1.04	0.09	15.09	-15.09	257.70	1.04	0.40	0.09	0.00	121	1831.65	1831.65	280.4	0.41	0.000	1.315	0.9	6	40	45	100.0	87.70	24.68	45.87	44.33	9000000000.0	9000000000.00	280.4	Yes	260.9	1.340	Yes	260.9	1.340	0.5	24677.49	87.70	1.07	261.78	1.00	261.78	0.965	0.3493	1.08	24.68	26.67	6.52	No
4.65	264.10	1.08	0.05	15.26	-15.26	264.10	1.08	0.41	0.05	0.00	121	1851.49	1851.49	284.3	0.41	0.000	1.314	0.9	6	41	46	100.0	88.65	25.29	45.93	44.42	9000000000.0	9000000000.00	284.3	Yes	265.9	1.337	Yes	265.9	1.337	0.5	25290.35	88.65	1.07	266.84	1.00	266.84	0.964	0.3492	1.07	25.29	27.18	6.54	No
4.70	271.10	1.14	0.02	15.42	-15.42	271.10	1.14	0.42	0.02	0.00	121	1871.33	1871.33	288.7	0.42	0.000	1.317	1.0	6	42	46	100.0	89.60	25.96	46.00	44.52	9000000000.0	9000000000.00	288.7	Yes	271.5	1.337	Yes	271.5	1.337	0.5	25960.68	89.60	1.06	272.46	1.00	272.46	0.964	0.3490	1.07	25.96	27.74	6.55	No
4.75	279.30	1.30	0.09	15.58	-15.58	279.30	1.30	0.47	0.09	0.00	121	1891.17	1891.17	294.4	0.47	0.000	1.339	1.9	6	44	48	100.0	90.55	26.75	46.09	44.64	9000000000.0	9000000000.00	294.4	Yes	278.3	1.357	Yes	278.3	1.357	0.5	26745.91	90.55	1.06	279.23	1.00	279.23	0.964	0.3489	1.06	26.75	28.43	6.57	No
4.80	292.50	1.49	0.16	15.75	-15.75	292.50	1.49	0.51	0.16	0.00	121	1911.01	1911.01	305.1	0.51	0.000	1.354	2.6	6	46	50	100.0	91.50	28.01	46.25	44.84	9000000000.0	9000000000.00	305.1	Yes	290.0	1.370	Yes	290.0	1.370	0.5	28009.95	91.50	1.05	290.90	1.00	290.90	0.963	0.3488	1.06	28.01	29.60	6.58	No
4.85	305.10	1.36	0.12	15.91	-15.91	305.10	1.36	0.45	0.12	0.00	127	1931.90	1931.90	314.9	0.45	0.000	1.305	0.5	7	47	51	100.0	92.50	29.22	46.39	45.01	9000000000.0	9000000000.00	314.9	Yes	300.8	1.320	Yes	300.8	1.320	0.5	29216.53	92.50	1.05	301.79	1.00	301.79	0.963	0.3486	1.05	29.22	30.70	6.60	No
4.90	315.30	1.49	0.18	16.08	-16.08	315.30	1.49	0.47	0.18	0.00	121	1951.74	1951.74	322.1	0.47	0.000	1.315	0.9	6	49	52	100.0	93.45	30.19	46.49	45.14	9000000000.0	9000000000.00	322.1	Yes	309.3	1.327	Yes	309.3	1.327	0.5	30193.29	93.45	1.04	310.29	1.00	310.29	0.963	0.3485	1.05	30.19	31.56	6.61	No
4.95	337.60	1.46	0.18	16.24	-16.24	337.60	1.46	0.43	0.18	0.00	127	1972.62	1972.62	341.3	0.43	0.000	1.270	0.0	7	52	55	100.0	94.45	32.33	46.75	45.45	9000000000.0	9000000000.00	341.3	Yes	329.5	1.281	Yes	329.5	1.281	0.5	32328.75	94.45	1.04	330.47	1.00	330.47	0.962	0.3483	1.04	32.33	33.60	6.63	No
5.00	348.10	1.45	0.18	16.40	-16.40	348.10	1.45	0.42	0.18	0.00	127	1993.51	1993.51	348.2	0.42	0.000	1.252	0.0	7	53	56	100.0	95.45	33.33	46.84	45.57	9000000000.0	9000000000.00	348.2	Yes	338.0	1.262	Yes	338.0	1.262	0.5	33334.24	95.45	1.03	338.96	1.00	338.96	0.962	0.3482	1.03	33.33	34.44	6.64	No
5.05	355.80	1.54	0.18	16.57	-16.57	355.80	1.54	0.43	0.18	0.00	127	2014.39	2014.39	352.3	0.43	0.000	1.260	0.0	7	54	57	100.0	96.45	34.07	46.89	45.65	9000000000.0	9000000000.00	352.3	Yes	343.7	1.268	Yes	343.7	1.268	0.5	34071.59	96.45	1.02	344.65	1.00	344.65	0.961	0.3481	1.03	34.07	35.01	6.66	No
5.10	349.40	1.63	0.18	16.73	-16.73	349.40	1.63	0.47	0.18	0.00	127	2035.28	2035.28	342.3	0.47	0.000	1.291	0.0	7	54	56	100.0	97.45	33.46	46.76	45.53	9000000000.0	9000000000.00	342.3	Yes	335.7	1.297	Yes	335.7	1.297	0.5	33458.73	97.45	1.02	336.71	1.00	336.71	0.961	0.3479	1.02	33.46	34.19	6.67	No
5.15	344.90	1.83	0.18	16.90	-16.90	344.90	1.83	0.53	0.18	0.00	121	2055.12	2055.12	334.7	0.53	0.000	1.337	1.9	6	54	55	100.0	98.40	33.03	46.66	45.45	9000000000.0	9000000000.00	334.6	Yes	329.8	1.342	Yes	329.8	1.342	0.5	33027.80	98.40	1.01	330.77	1.00	330.77	0.961	0.3478	1.02	33.03	33.57	6.68	No
5.20	344.25	1.89	0.18	17.06	-17.06	344.25	1.89	0.55	0.18	0.00	121	2074.96	2074.96	330.8	0.55	0.000	1.352	2.5	6	54	55	100.0	99.35	32.97	46.61	45.42	9000000000.0	9000000000.00	330.8	Yes	327.6	1.355	Yes	327.6	1.355	0.5	32965.56	99.35	1.01	328.56	1.00	328.56	0.960	0.3476	1.01	32.97	33.33	6.70	No
5.25	352.93	1.95	0.18	17.22	-17.22	352.93	1.95	0.55	0.18	0.00	121	2094.80	2094.80	336.0	0.55	0.000	1.349	2.4	6	56	56	100.0	100.30	33.80	46.68	45.51	9000000000.0	9000000000.00	336.0	Yes	334.3	1.350	Yes	334.3	1.350	0.5	33796.76	100.30	1.01	335.25	1.00	335.25	0.960	0.3475	1.01	33.80	33.99	6.71	No
5.30	361.60	3.38	0.18	17.39	-17.39	361.60	3.38	0.93	0.18	0.00	121	2114.64	2114.64	341.0	0.94	0.000	1.516	9.5	6	60	60	100.0	101.25	34.63	46.75	45.61	9000000000.0	9000000000.00	341.0	Yes	340.9	1.516	Yes	340.9	1.516	0.5	34627.00	101.25	1.00	341.87	1.00	341.87	0.959	0.3474	1.00	34.63	34.64	6.72	No
5.35	382.50	2.61	0.05	17.55	-17.55	382.50	2.61	0.68	0.05	0.00	121	2134.48	2134.48	357.4	0.68	0.000	1.398	4.4	6	61	61	100.0	102.20	36.63	46.95	45.85	9000000000.0	9000000000.00	357.4	Yes	358.9	1.397	Yes	358.9	1.397	0.5	36628.40	102.20	1.00	359.94	1.00	359.94	0.959	0.3472	1.00	36.63	36.45	6.74	No
5.40	394.20	3.45	0.09	17.72	-17.72	394.20	3.45	0.88	0.09	0.00	121	2154.33	2154.33	365.0	0.88	0.000	1.476	7.7	6	65	64	100.0	103.15	37.75	47.05	45.98	9000000000.0	9000000000.00	365.0	Yes	368.2	1.473	Yes	368.2	1.473	0.5	37748.80	103.15	0.99	369.24	1.00	369.24	0.959	0.3471	0.99	37.75	37.37	6.75	No
5.45	383.00	3.65	0.12	17.88	-17.88	383.00	3.65	0.95	0.12	0.00	121	2174.17	2174.17	351.3	0.96	0.000	1.515	9.4	6	63	62	100.0	104.10	36.68	46.88	45.82	9000000000.0	9000000000.00	351.3	Yes	356.1	1.511	Yes	356.1	1.511	0.5	36676.28	104.10	0.99	357.11	1.00	357.11	0.958	0.3470	0.99	36.68	36.13	6.76	No
5.50	348.80	3.02	0.35	18.04	-18.04	348.80	3.02	0.87	0.35	0.00	121	2194.01	2194.01	317.0	0.87	0.000	1.511	9.2	6	58	56	100.0	105.05	33.40	46.42	45.35	9000000000.0	9000000000.00	317.0	Yes	322.7	1.506	Yes	322.7	1.506	0.5	33401.27	105.05	0.98	323.75	1.00	323.75	0.958	0.3468	0.98	33.40	32.73	6.77	No
5.55	330.50	2.32	0.35	18.21	-18.21	330.50	2.32	0.70	0.35	0.00	121	2213.85	2213.85	297.6	0.70	0.000	1.460	7.1	6	54	52	100.0	106.00	31.65	46.14	45.07	9000000000.0	9000000000.00	297.6	Yes	304.4	1.454	Yes	304.4	1.454	0.5	31648.85	106.00	0.98	305.38	1.00	305.38	0.958	0.3467	0.98	31.65	30.86	6.79	No
5.60	315.70	1.81	0.35	18.37	-18.37	315.70	1.81	0.57	0.35	0.00	121	2233.69	2233.69	281.7	0.58	0.000	1.415	5.1	6	51	49	100.0	106.95	30.23	45.89	44.83	9000000000.0	9000000000.00	281.7	Yes	289.4	1.406	Yes	289.4	1.406	0.5	30231.60	106.95	0.97	290.41	1.00	290.41	0.957	0.3465	0.97	30.23	29.33	6.80	No
5.65	297.50	1.56	0.35	18.54	-18.54	297.50	1.56	0.52	0.35	0.00	121	2253.53	2253.53	263.0	0.53	0.000	1.410	5.0	6	48	45	100.0	107.90	28.49	45.57	44.52	9000000000.0	9000000000.00	263.0	Yes	271.4	1.400	Yes	271.4	1.400	0.5	28488.75	107.90	0.97	272.46	1.00	272.46	0.957	0.3464	0.97	28.49	27.50	6.81	No
5.70	277.20	1.49	0.35	18.70	-18.70	277.20	1.49	0.54	0.35	0.00	121	2273.37	2273.37	242.9	0.54	0.000	1.443	6.4	6	45	43	100.0	108.85	26.54	45.20	44.16	9000000000.0	9000000000.00	242.9	Yes	251.7	1.432	Yes	251.7	1.432	0.5	26544.82	108.85	0.96	252.76	1.00	252.76	0.956	0.3463	0.96	26.54	25.49	6.83	No
5.75	256.40	1.65	0.35	18.86	-18.86	256.40	1.65	0.64	0.35	0.00	121	2293.21	2293.21	222.6	0.65	0.000	1.524	9.8	6	43	40	98.7	109.80	24.55	44.79	43.77	9000000000.0	9000000000.00	222.6	Yes	231.7	1.511	Yes	231.7	1.511	0.5	24553.00	109.80	0.96	232.78	1.00	232.78	0.956	0.3461	0.96	24.55	23.46	6.84	No
5.80	236.40	1.81	0.37	19.03	-19.03	236.40	1.81	0.77	0.37	0.00	121	2313.05	2313.05	203.4	0.77	0.000	1.604	13.2	6	40	38	95.4	110.75	22.64	44.36	43.36	9000000000.0	9000000000.00	203.4	Yes	212.7	1.590	Yes	212.7	1.590	0.5	22637.79	110.75	0.96	213.70	1.00	213.70	0.956	0.3460	0.95	22.64	21.53	6.85	No
5.85	223.70	1.98	0.53	19.19	-19.19	223.70	1.98	0.89	0.53	0.00	121	2332.90	2332.90	190.8	0.89	0.000	1.668	15.9	6	39	36	93.1	111.70	21.42	44.05	43.08	9000000000.0	9000000000.00	190.8	Yes	200.3	1.653	Yes	200.3	1.653	0.5	21421.63	111.70	0.95	201.36	1.01	202.45	0.955	0.3458	0.95	21.42	20.27	6.86	No
5.90	225.50	2.54	0.55	19.36	-19.36	225.50	2.54	1.13	0.55	0.00	121	2352.74	2352.74	190.7	1.13	0.000	1.743	19.1	6	40	37	93.3	112.65	21.59	44.05	43.10	9000000000.0	9000000000.00	190.7	Yes	201.1	1.727	Yes	201.1	1.727	0.5	21594.00	112.65	0.95	202.12	1.06	213.51	0.955	0.3457	0.94	21.59	20.33	6.87	No
5.95	227.30	3.40	0.69	19.52	-19.52	227.30	3.40	1.50	0.69	0.00	121	2372.58	2372.58	190.6	1.50	0.000	1.835	23.0	6	42	39	93.4	113.60	21.77	44.05	43.11	9000000000.0	9000000000.00	190.6	Yes	201.8	1.819	Yes	201.8	1.819	0.5	21766.37	113.60	0.94	202.88	1.12	227.40	0.954	0.3456	0.94	21.77	20.39	6.89	No
6.00	262.70	3.01	0.88	19.68	-19.68	262.70	3.01	1.15	0.88	0.00	121	2392.42	2392.42	218.6	1.15	0.000	1.708	17.6	6	46	42	98.8	114.55	25.16	44.71	43.79	9000000000.0	9000000000.00	218.6	Yes	232.4	1.691	Yes	232.4	1.691	0.5	25156.29	114.55	0.94	233.50	1.03	240.91	0.954	0.3454	0.93	25.16	23.46	6.90	No
6.05	281.80	2.66	0.69	19.85	-19.85	281.80	2.66	0.94	0.69	0.00	121	2412.26	2412.26	232.6	0.95	0.000	1.628	14.2	6	48	44	100.0	115.50	26.99	45.00	44.10	9000000000.0	9000000000.00	232.6	Yes	248.4	1.609	Yes	248.4	1.609	0.5	26985.31	115.50	0.94	249.45	1.00	249.45	0.954	0.3453	0.93	26.99	25.04	6.91	No
6.10	301.20	2.49	0.62	20.01	-20.01	301.20	2.49	0.83	0.62	0.00	121	2432.10	2432.10	246.7	0.83	0.000	1.568	11.7	6	51	46	100.0	116.45	28.84	45.28	44.40	9000000000.0	9000000000.00	246.7	Yes	264.5	1.548	Yes	264.5	1.548	0.5	28843.07	116.45	0.93	265.53	1.00	265.53	0.953	0.3452	0.92	28.84	26.63	6.92	No
6.15	304.20	2.46	0.58	20.18	-20.18	304.20	2.46	0.81	0.58	0.00	121	2451.94	2451.94	247.1	0.81	0.000	1.561	11.3	6	51	46	100.0	117.40	29.13	45.28	44.43	9000000000.0	9000000000.00	247.1	Yes	266.0	1.539	Yes	266.0	1.539	0.5	29130.35	117.40	0.93	267.09	1.00	267.09	0.953	0.3450	0.92	29.13	26.77	6.93	No
6.20	298.80	2.44	0.53	20.34	-20.34	298.80	2.44	0.82	0.53	0.00	121	2471.78	2471.78	240.8	0.82	0.000	1.572	11.8	6	50	45	100.0	118.35	28.61	45.16	44.32	9000000000.0	9000000000.00	240.8	Yes	260.2	1.549	Yes	260.2	1.549	0.5	28613.24	118.35	0.93	261.29	1.00	261.29	0.953	0.3449	0.91	28.61	26.17	6.95	No
6.25	313.15	2.34	0.62	20.51	-20.51	313.15	2.34	0.75	0.62	0.00	121	2491.62	2491.62	250.4	0.75	0.000	1.532	10.1	6	52	46	100.0	119.30	29.99	45.34	44.53	9000000000.0	9000000000.00	250.4	Yes	271.7	1.508	Yes	271.7	1.508	0.5	29987.41	119.30	0.92	272.75	1.00	272.75	0.952	0.3447	0.91	29.99	27.30	6.96	No
6.30	327.50	2.06	0.58	20.67	-20.67	327.50	2.06	0.63	0.58	0.00	121	2511.47	2511.47	259.8	0.63	0.000	1.468	7.4	6	53	47	100.0	120.25	31.36	45.52	44.72	9000000000.0	9000000000.00	259.8	Yes	283.0	1.441	Yes	283.0	1.441	0.5	31361.57	120.25	0.92	284.12	1.00	284.12	0.952	0.3446	0.91	31.36	28.41	6.97	No
6.35	315.40	1.99	0.65	20.83	-20.83	315.40	1.99	0.63	0.65	0.00	121	2531.31	2531.31	248.2	0.63	0.000	1.483	8.1	6	52	45	100.0	121.20	30.20	45.30	44.52	9000000000.0	9000000000.00	248.2	Yes	271.5	1.455	Yes	271.5	1.455	0.5	30202.87	121.20	0.91	272.55	1.00	272.55	0.951	0.3445	0.90	30.20	27.24	6.98	No
6.40	323.60	2.08	0.69	21.00	-21.00	323.60	2.08	0.64	0.69	0.00	121	2551.15	2551.15	252.7	0.65	0.000	1.483	8.1	6	53	46	100.0	122.15	30.99	45.39	44.63	9000000000.0	9000000000.00	252.7	Yes	277.4	1.454	Yes	277.4	1.454	0.5	30988.10	122.15	0.91	278.54	1.00	278.54	0.951	0.3443	0.90	30.99	27.81	6.99	No
6.45	325.90	1.99	0.65	21.16	-21.16	325.90	1.99	0.61	0.65	0.00	121	2570.99	2570.99	252.5	0.61	0.000	1.468	7.4	6	53	46	100.0	123.10	31.21	45.38	44.64	9000000000.0	9000000000.00	252.5	Yes	278.3	1.438	Yes	278.3	1.438	0.5	31208.35	123.10	0.91	279.44	1.00	279.44	0.951	0.3442	0.89	31.21	27.88	7.00	No
6.50	329.65	2.02	0.69	21.33	-21.33	329.65	2.02	0.61	0.69	0.00	121	2590.83	2590.83	253.5	0.62	0.000	1.468	7.4	6	54	46	100.0	124.05	31.57	45.40	44.68	9000000000.0	9000000000.00	253.5	Yes	280.5	1.436	Yes	280.5	1.436	0.5	31567.46	124.05	0.90	281.57	1.00	281.57	0.950	0.3440	0.89	31.57	28.07	7.01	No
6.55	333.40	2.05	0.62	21.49	-21.49	333.40	2.05	0.61	0.62	0.00	121	2610.67	2610.67	254.4	0.62	0.000	1.468	7.4	6	54	46	100.0	125.00	31.93	45.42	44.72	9000000000.0	9000000000.00	254.4	Yes	282.6	1.435	Yes	282.6	1.435	0.5	31926.56	125.00	0.90	283.69	1.00	283.69	0.950	0.3439	0.89	31.93	28.26	7.03	No
6.60	346.10	2.04	0.53	21.65	-21.65	346.10	2.04	0.59	0.53	0.00	121	2630.51	2630.51	262.1	0.59	0.000	1.446	6.5	6	56	47	100.0	125.95	33.14	45.56	44.88	9000000000.0	9000000000.00	262.1	Yes	292.3	1.412	Yes	292.3	1.412	0.5	33142.72	125.95	0.90	293.38	1.00	293.38	0.950	0.3438	0.88	33.14	29.20	7.04	No
6.65	349.50	1.97	0.53	21.82	-21.82	349.50	1.97	0.56	0.53	0.00	121	2650.35	2650.35	262.7	0.57	0.000	1.432	5.9	6	56	47	100.0	126.90	33.47	45.57	44.91	9000000000.0	9000000000.00	262.7	Yes	294.0	1.396	Yes	294.0	1.396	0.5	33468.30	126.90	0.89	295.15	1.00	295.15	0.949	0.3436	0.88	33.47	29.35	7.05	No
6.70	358.70	1.90	0.48	21.98	-21.98	358.70	1.90	0.53	0.48	0.00	121	2670.19	2670.19	267.7	0.53	0.000	1.407	4.8	6	57	48	100.0	127.85	34.35	45.65	45.01	9000000000.0	9000000000.00	267.7	Yes	300.7	1.370	Yes	300.7	1.370	0.5	34349.30	127.85	0.89	301.79	1.00	301.79	0.949	0.3435	0.87	34.35	29.99	7.06	No
6.75	361.80	1.89	0.46	22.15	-22.15	361.80	1.89	0.52	0.46	0.00	121	2690.04	2690.04	268.0	0.52	0.000	1.403	4.7	6	58	48	100.0	128.80	34.65	45.66	45.04	9000000000.0	9000000000.00	268.0	Yes	302.1	1.365	Yes	302.1	1.365	0.5	34646.16	128.80	0.88	303.28	1.00	303.28	0.948	0.3434	0.87	34.65	30.11	7.07	No
6.80	382.90	1.88	0.53	22.31	-22.31	382.90	1.88	0.49	0.53	0.00	121	2709.88	2709.88	281.6	0.49	0.000	1.369	3.2	6	61	50	100.0	129.75	36.67	45.89	45.29	9000000000.0	9000000000.00	281.6	Yes	318.7	1.329	Yes	318.7	1.329	0.5	36666.70	129.75	0.88	319.79	1.00	319.79	0.948	0.3432	0.87	36.67	31.72	7.08	No
6.85	404.00	1.95	0.39	22.47	-22.47	404.00	1.95	0.48	0.39	0.00	121	2729.72	2729.72	295.0	0.48	0.000	1.349	2.4	6	64	52	100.0	130.70	38.69	46.10	45.53	9000000000.0	9000000000.00	295.0	Yes	335.0	1.308	Yes	335.0	1.308	0.5	38687.25	130.70	0.88	336.18	1.00	336.18	0.948	0.3431	0.86	38.69	33.32	7.09	No
6.90	422.30	2.02	0.37	22.64	-22.64	422.30	2.02	0.48	0.37	0.00	121	2749.56	2749.56	306.2	0.48	0.000	1.334	1.7	6	66	54	100.0	131.65	40.44	46.27	45.72	9000000000.0	9000000000.00	306.2	Yes	349.0	1.293	Yes	349.0	1.293	0.5	40439.67	131.65	0.88	350.14	1.00	350.14	0.947	0.3429	0.86	40.44	34.67	7.10	No
6.95	396.80	2.31	0.46	22.80	-22.80	396.80	2.31	0.58	0.46	0.00	121	2769.40	2769.40	285.6	0.58	0.000	1.415	5.2	6	64	52	100.0	132.60	38.00	45.95	45.41	9000000000.0	9000000000.00	285.6	Yes	326.7	1.374	Yes	326.7	1.374	0.5	37997.77	132.60	0.87	327.81	1.00	327.81	0.947	0.3428	0.85	38.00	32.44	7.11	No
7.00	396.75	3.50	0.53	22.97	-22.97	396.75	3.50	0.88	0.53	0.00	121	2789.24	2789.24	283.5	0.89	0.000	1.548	10.8	6	66	54	100.0	133.55	37.99	45.92	45.39	9000000000.0	9000000000.00	283.5	Yes	325.5	1.510	Yes	325.5	1.510	0.5	37992.99	133.55	0.87	326.61	1.00	326.61	0.946	0.3427	0.85	37.99	32.29	7.12	No
7.05	421.38	2.96	0.55	23.13	-23.13	421.38	2.96	0.70	0.55	0.00	121	2809.08	2809.08	299.0	0.70	0.000	1.459	7.0	6	69	55	100.0	134.50	40.35	46.16	45.66	9000000000.0	9000000000.00	299.0	Yes	344.5	1.418	Yes	344.5	1.418	0.5	40351.57	134.50	0.87	345.65	1.00	345.65	0.946	0.3425	0.85	40.35	34.14	7.13	No
7.10	446.00	3.00	0.51	23.29	-23.29	446.00	3.00	0.67	0.51	0.00	121	2828.92	2828.92	314.3	0.67	0.000	1.431	5.8	6	72	58	100.0	135.45	42.71	46.38	45.91	9000000000.0	9000000000.00	314.3	Yes	363.4	1.389	Yes	363.4	1.389	0.5	42709.19	135.45	0.86	364.56	1.00	364.56	0.946	0.3424	0.84	42.71	35.98	7.14	No
7.15	448.20	3.22	0.53	23.46	-23.46	448.20	3.22	0.72	0.53	0.00	121	2848.76	2848.76	313.7	0.72	0.000	1.452	6.7	6	73	58	100.0	136.40	42.92	46.37	45.92	9000000000.0	9000000000.00	313.7	Yes	363.9	1.410	Yes	363.9	1.410	0.5	42919.87	136.40	0.86	365.08	1.00	365.08	0.945	0.3422	0.84	42.92	36.00	7.15	No
7.20	450.15	3.13	0.58	23.62	-23.62	450.15	3.13	0.70	0.58	0.00	121	2868.60	2868.60	312.8	0.70	0.000	1.443	6.3	6	73	58	100.0	137.35	43.11	46.36	45.93	9000000000.0	9000000000.00	312.8	Yes	364.2	1.399	Yes	364.2	1.399	0.5	43106.60	137.35	0.86	365.40	1.00	365.40	0.945	0.3421	0.84	43.11	36.00	7.16	No
7.25	452.10	3.78	0.53	23.79	-23.79	452.10	3.78	0.84	0.53	0.00	121	2888.45	2888.45	312.0	0.84	0.000	1.503	8.9	6	75	59	100.0	138.30	43.29	46.35	45.93	9000000000.0	9000000000.00	312.0	Yes	364.6	1.460	Yes	364.6	1.460	0.5	43293.33	138.30	0.86	365.72	1.00	365.72	0.945	0.3420	0.83	43.29	36.00	7.18	No
7.30	474.00	4.43	0.46	23.95	-23.95	474.00	4.43	0.93	0.46	0.00	121	2908.29	2908.29	325.0	0.94	0.000	1.529	10.0	6	79	62	100.0	139.25	45.39	46.53	46.14	9000000000.0	9000000000.00	325.0	Yes	381.0	1.487	Yes	381.0	1.487	0.5	45390.49	139.25	0.85	382.13	1.00	382.13	0.944	0.3418	0.83	45.39	37.58	7.19	No
7.35	478.30	4.69	0.53	24.11	-24.11	478.30	4.69	0.98	0.53	0.00	121	2928.13	2928.13	325.7	0.98	0.000	1.545	10.7	6	80	62	100.0	140.20	45.80	46.54	46.17	9000000000.0	9000000000.00	325.7	Yes	383.1	1.502	Yes	383.1	1.502	0.5	45802.26	140.20	0.85	384.29	1.00	384.29	0.944	0.3417	0.82	45.80	37.75	7.20	No
7.40	491.60	4.95	0.35	24.28	-24.28	491.60	4.95	1.01	0.35	0.00	121	2947.97	2947.97	332.5	1.01	0.000	1.549	10.8	6	82	64	100.0	141.15	47.08	46.64	46.28	9000000000.0	9000000000.00	332.5	Yes	392.5	1.506	Yes	392.5	1.506	0.5	47075.87	141.15	0.85	393.64	1.00	393.64	0.943	0.3416	0.82	47.08	38.64	7.21	No
7.45	442.30	5.74	0.30	24.44	-24.44	442.30	5.74	1.30	0.30	0.00	121	2967.81	2967.81	297.1	1.30	0.000	1.666	15.8	6	77	59	100.0	142.10	42.35	46.13	45.76	9000000000.0	9000000000.00	297.1	Yes	351.8	1.623	Yes	351.8	1.623	0.5	42354.88	142.10	0.84	352.98	1.00	352.98	0.943	0.3414	0.82	42.35	34.62	7.22	No
7.50	459.60	4.91	0.37	24.61	-24.61	459.60	4.91	1.07	0.37	0.00	121	2987.65	2987.65	306.7	1.07	0.000	1.591	12.6	6	78	60	100.0	143.05	44.01	46.27	45.93	9000000000.0	9000000000.00	306.7	Yes	364.4	1.545	Yes	364.4	1.545	0.5	44011.53	143.05	0.84	365.57	1.00	365.57	0.943	0.3413	0.81	44.01	35.82	7.23	No
7.55	433.50	4.10	0.28	24.77	-24.77	433.50	4.10	0.95	0.28	0.00	121	3007.49	3007.49	287.3	0.95	0.000	1.567	11.6	6	73	56	100.0	144.00	41.51	45.98	45.63	9000000000.0	9000000000.00	287.3	Yes	342.5	1.519	Yes	342.5	1.519	0.5	41512.19	144.00	0.84	343.67	1.00	343.67	0.942	0.3411	0.81	41.51	33.64	7.24	No
7.60	407.40	2.82	0.23	24.93	-24.93	407.40	2.82	0.69	0.23	0.00	121	3027.33	3027.33	268.1	0.69	0.000	1.487	8.2	6	67	51	100.0	144.95	39.01	45.66	45.32	9000000000.0	9000000000.00	268.1	Yes	320.7	1.434	Yes	320.7	1.434	0.5	39012.84	144.95	0.84	321.91	1.00	321.91	0.942	0.3410	0.81	39.01	31.48	7.25	No
7.65	409.00	2.96	0.18	25.10	-25.10	409.00	2.96	0.72	0.18	0.00	121	3047.17	3047.17	267.4	0.73	0.000	1.502	8.9	6	68	51	100.0	145.90	39.17	45.65	45.32	9000000000.0	9000000000.00	267.4	Yes	320.9	1.448	Yes	320.9	1.448	0.5	39166.05	145.90	0.83	322.13	1.00	322.13	0.941	0.3409	0.80	39.17	31.47	7.26	No
7.70	410.60	3.10	0.35	25.26	-25.26	410.60	3.10	0.75	0.35	0.00	121	3067.02	3067.02	266.8	0.76	0.000	1.516	9.5	6	68	51	100.0	146.85	39.32	45.64	45.33	9000000000.0	9000000000.00	266.8	Yes	321.1	1.462	Yes	321.1	1.462	0.5	39319.27	146.85	0.83	322.34	1.00	322.34	0.941	0.3407	0.80	39.32	31.47	7.27	No
7.75	419.00	2.76	0.28	25.43	-25.43	419.00	2.76	0.66	0.28	0.00	121	3086.86	3086.86	270.5	0.66	0.000	1.469	7.5	6	68	51	100.0	147.80	40.12	45.70	45.41	9000000000.0	9000000000.00	270.5	Yes	326.7	1.413	Yes	326.7	1.413	0.5	40123.66	147.80	0.83	327.87	1.00	327.87	0.941	0.3406	0.80	40.12	31.98	7.28	No
7.80	422.40	2.92	0.18	25.59	-25.59	422.40	2.92	0.69	0.18	0.00	121	3106.70	3106.70	270.9	0.69	0.000	1.484	8.1	6	69	52	100.0	148.75	40.45	45.71	45.43	9000000000.0	9000000000.00	270.9	Yes	328.3	1.427	Yes	328.3	1.427	0.5	40449.24	148.75	0.83	329.48	1.00	329.48	0.940	0.3404	0.79	40.45	32.10	7.29	No
7.85	429.85	2.50	0.30	25.75	-25.75	429.85	2.50	0.58	0.30	0.00	121	3126.54	3126.54	274.0	0.58	0.000	1.428	5.7	6	69	51	100.0	149.70	41.16	45.76	45.50	9000000000.0	9000000000.00	274.0	Yes	333.0	1.368	Yes	333.0	1.368	0.5	41162.66	149.70	0.82	334.22	1.00	334.22	0.940	0.3403	0.79	41.16	32.53	7.29	No
7.90	437.30	2.34	0.09	25.92	-25.92	437.30	2.34	0.54	0.09	0.00	121	3146.38	3146.38	277.0	0.54	0.000	1.399	4.5	6	70	51	100.0	150.65	41.88	45.81	45.57	9000000000.0	9000000000.00	277.0	Yes	337.7	1.337	Yes	337.7	1.337	0.5	41876.08	150.65	0.82	338.94	1.00	338.94	0.940	0.3402	0.79	41.88	32.96	7.30	No
7.95	465.20	2.27	0.09	26.08	-26.08	465.20	2.27	0.49	0.09	0.00	121	3166.22	3166.22	292.9	0.49	0.000	1.354	2.6	6	73	54	100.0	151.60	44.55	46.07	45.85	9000000000.0	9000000000.00	292.9	Yes	358.2	1.291	Yes	358.2	1.291	0.5	44547.79	151.60	0.82	359.43	1.00	359.43	0.939	0.3400	0.78	44.55	34.92	7.31	No
8.00	455.40	2.23	0.09	26.25	-26.25	455.40	2.23	0.49	0.09	0.00	121	3186.06	3186.06	284.9	0.49	0.000	1.364	3.0	6	72	53	100.0	152.55	43.61	45.94	45.73	9000000000.0	9000000000.00	284.9	Yes	349.5	1.300	Yes	349.5	1.300	0.5	43609.34	152.55	0.81	350.76	1.00	350.76	0.939	0.3399	0.78	43.61	34.05	7.32	No
8.05	457.80	2.38	0.09	26.41	-26.41	457.80	2.38	0.52	0.09	0.00	121	3205.90	3205.90	284.6	0.52	0.000	1.382	3.8	6	73	53	100.0	153.50	43.84	45.94	45.74	9000000000.0	9000000000.00	284.6	Yes	350.3	1.317	Yes	350.3	1.317	0.5	43839.17	153.50	0.81	351.52	1.00	351.52	0.938	0.3398	0.78	43.84	34.09	7.33	No
8.10	479.50	2.53	-0.18	26.57	-26.57	479.50	2.53	0.53	-0.18	0.00	121	3225.74	3225.74	296.3	0.53	0.000	1.374	3.4	6	76	55	100.0	154.45	45.92	46.12	45.95	9000000000.0	9000000000.00	296.3	Yes	365.8	1.309	Yes	365.8	1.309	0.5	45917.17	154.45	0.81	367.05	1.00	367.05	0.938	0.3396	0.77	45.92	35.56	7.34	No
8.15	545.10	3.57	-0.12	26.74	-26.74	545.10	3.57	0.65	-0.12	0.00	121	3245.59	3245.59	334.9	0.66	0.000	1.403	4.7	6	87	63	100.0	155.40	52.20	46.54	46.54	9000000000.0	9000000000.00	334.9	Yes	414.7	1.343	Yes	414.7	1.343	0.5	52199.06	155.40	0.81	415.99	1.00	415.99	0.938	0.3395	0.77	52.20	40.26	7.35	No
8.20	569.30	4.75	0.02	26.90	-26.90	569.30	4.75	0.83	0.02	0.00	121	3265.43	3265.43	347.7	0.84	0.000	1.472	7.6	6	93	67	100.0	156.35	54.52	46.83	46.74	9000000000.0	9000000000.00	347.7	Yes	431.9	1.415	Yes	431.9	1.415	0.5	54516.46	156.35	0.81	433.13	1.00	433.13	0.937	0.3393	0.77	54.52	41.88	7.36	No
8.25	556.15	4.85	0.16	27.07	-27.07	556.15	4.85	0.87	0.16	0.00	121	3285.27	3285.27	337.6	0.87	0.000	1.496	8.6	6	92	65	100.0	157.30	53.26	46.70	46.61	9000000000.0	9000000000.00	337.6	Yes	420.6	1.437	Yes	420.6	1.437	0.5	53257.21	157.30	0.80	421.85	1.00	421.85	0.937	0.3392	0.77	53.26	40.75	7.37	No
8.30	543.00	4.82	0.09	27.23	-27.23	543.00	4.82	0.89	0.09	0.00	121	3305.11	3305.11	327.6	0.89	0.000	1.510	9.2	6	90	64	100.0	158.25	52.00	46.57	46.48	9000000000.0	9000000000.00	327.6	Yes	409.4	1.450	Yes	409.4	1.450	0.5	51997.96	158.25	0.80	410.64	1.00	410.64	0.937	0.3391	0.76	52.00	39.63	7.38	No
8.35	535.10	5.62	0.00	27.39	-27.39	535.10	5.62	1.05	0.00	0.00	121	3324.95	3324.95	320.9	1.05	0.000	1.573	11.8	6	90	64	100.0	159.20	51.24	46.48	46.40	9000000000.0	9000000000.00	320.9	Yes	402.2	1.514	Yes	402.2	1.514	0.5	51241.45	159.20	0.80	403.45	1.00	403.45	0.936	0.3389	0.76	51.24	38.90	7.39	No
8.40	452.80	4.57	-0.02	27.56	-27.56	452.80	4.57	1.01	-0.02	0.00	121	3344.79	3344.79	269.7	1.01	0.000	1.607	13.3	6	77	54	100.0	160.15	43.36	45.69	45.59	9000000000.0	9000000000.00	269.7	Yes	339.1	1.544	Yes	339.1	1.544	0.5	43360.36	160.15	0.80	340.39	1.00	340.39	0.936	0.3388	0.76	43.36	32.79	7.40	No
8.45	429.30	3.98	-0.23	27.72	-27.72	429.30	3.98	0.93	-0.23	0.00	121	3364.63	3364.63	254.2	0.93	0.000	1.596	12.8	6	73	51	100.0	161.10	41.11	45.42	45.32	9000000000.0	9000000000.00	254.2	Yes	320.5	1.531	Yes	320.5	1.531	0.5	41109.99	161.10	0.79	321.77	1.00	321.77	0.935	0.3386	0.75	41.11	30.96	7.41	No
8.5	438.8	2.51	-0.461332	27.89	-27.89	438.80	2.51	0.57	-0.46	0.00	121	3384.47	3384.47	258.3	0.57	0.000	1.441	6.3	6	71	49	100.0	162.05	42.02	45.49	45.41	9000000000.0	9000000000.00	258.3	Yes	326.7	1.368	Yes	326.7	1.368	0.5	42019.72	162.05	0.79	327.92	1.00	327.92	0.935	0.3385	0.75	42.02	31.52	7.42	No
8.55	419.1	2.52	-0.461332	28.05	-28.05	419.10	2.52	0.60	-0.46	0.00	121	3404.31	3404.31	245.2	0.60	0.000	1.473	7.6	6	69	48	100.0	163.00	40.13	45.25	45.17	9000000000.0	9000000000.00	245.2	Yes	311.0	1.399	Yes	311.0	1.399	0.5	40133.23	163.00	0.79	312.29	1.00	312.29	0.935	0.3384	0.75	40.13	29.99	7.43	No
8.6	411.2	2.52	-0.438265	28.22	-28.22	411.20	2.52	0.61	-0.44	0.00	121	3424.16	3424.16	239.2	0.62	0.000	1.486	8.2	6	68	47	100.0	163.95	39.38	45.13	45.07	9000000000.0	9000000000.00	239.2	Yes	304.2	1.411	Yes	304.2	1.411	0.5	39376.73	163.95	0.79	305.51	1.00	305.51	0.934	0.3382	0.74	39.38	29.31	7.43	No
8.65	391.1	2.51	-0.530532	28.38	-28.38	391.10	2.51	0.64	-0.53	0.00	121	3444.00	3444.00	226.1	0.64	0.000	1.518	9.5	6	65	45	100.0	164.90	37.45	44.87	44.82	9000000000.0	9000000000.00	226.1	Yes	288.5	1.442	Yes	288.5	1.442	0.5	37451.94	164.90	0.78	289.74	1.00	289.74	0.934	0.3381	0.74	37.45	27.77	7.44	No
8.7	324.1	2.46	-0.830397	28.54	-28.54	324.10	2.46	0.76	-0.83	0.00	121	3463.84	3463.84	186.1	0.76	0.000	1.630	14.3	6	56	38	99.0	165.85	31.04	43.93	43.91	9000000000.0	9000000000.00	186.1	Yes	238.1	1.553	Yes	238.1	1.553	0.5	31035.98	165.85	0.78	239.41	1.00	239.41	0.933	0.3380	0.74	31.04	22.93	7.45	No
8.75	324.85	2.3	-0.991863	28.71	-28.71	324.84	2.30	0.71	-0.99	0.00	121	3483.68	3483.68	185.5	0.71	0.000	1.611	13.5	6	56	38	99.0	166.80	31.11	43.92	43.90	9000000000.0	9000000000.00	185.5	Yes	238.0	1.532	Yes	238.0	1.532	0.5	31107.80	166.80	0.78	239.28	1.00	239.28	0.933	0.3378	0.74	31.11	22.89	7.46	No
8.8	325.6	2.25	-0.94573	28.87	-28.87	325.59	2.25	0.69	-0.95	0.00	121	3503.52	3503.52	184.9	0.69	0.000	1.605	13.2	6	56	38	99.0	167.75	31.18	43.90	43.90	9000000000.0	9000000000.00	184.9	Yes	237.9	1.524	Yes	237.9	1.524	0.5	31179.63	167.75	0.78	239.16	1.00	239.16	0.933	0.3377	0.73	31.18	22.86	7.47	No
8.850	340.10	2.20	-0.90	29.04	-29.04	340.10	2.20	0.65	-0.90	0.00	121	3523.36	3523.36	192.1	0.65	0.000	1.573	11.9	6	57	39	100.0	168.70	32.57	44.08	44.10	9000000000.0	9000000000.00	192.1	Yes	247.8	1.492	Yes	247.8	1.492	0.5	32568.15	168.70	0.77	249.10	1.00	249.10	0.932	0.3375	0.73	32.57	23.78	7.48	No
8.900	342.40	2.65	-0.72	29.20	-29.20	342.40	2.65	0.77	-0.72	0.00	121	3543.20	3543.20	192.3	0.78	0.000	1.625	14.1	6	59	40	100.0	169.65	32.79	44.09	44.11	9000000000.0	9000000000.00	192.3	Yes	248.8	1.545	Yes	248.8	1.545	0.5	32788.40	169.65	0.77	250.08	1.00	250.08	0.932	0.3374	0.73	32.79	23.85	7.49	No
8.950	343.30	3.10	-0.53	29.36	-29.36	343.30	3.10	0.90	-0.53	0.00	121	3563.04	3563.04	191.7	0.91	0.000	1.673	16.1	6	60	40	100.0	170.60	32.87	44.08	44.11	9000000000.0	9000000000.00	191.7	Yes	248.7	1.594	Yes	248.7	1.594	0.5	32874.59	170.60	0.77	250.04	1.00	250.04	0.932	0.3373	0.72	32.87	23.83	7.50	No
9.000	362.50	3.41	-0.53	29.53	-29.53	362.50	3.41	0.94	-0.53	0.00	121	3582.88	3582.88	201.3	0.95	0.000	1.670	16.0	6	63	42	100.0	171.55	34.71	44.31	44.36	9000000000.0	9000000000.00	201.4	Yes	262.0	1.592	Yes	262.0	1.592	0.5	34713.19	171.55	0.77	263.29	1.00	263.29	0.931	0.3371	0.72	34.71	25.06	7.51	No
9.050	318.60	2.94	-0.46	29.69	-29.69	318.60	2.94	0.92	-0.46	0.00	121	3602.73	3602.73	175.9	0.93	0.000	1.706	17.5	6	56	37	97.5	172.50	30.51	43.65	43.73	9000000000.0	9000000000.00	175.9	Yes	229.5	1.625	Yes	229.5	1.625	0.5	30509.30	172.50	0.77	230.77	1.00	230.77	0.931	0.3370	0.72	30.51	21.95	7.51	No
9.100	303.10	0.00	-0.37	29.86	-29.86	303.10	0.00	0.00	-0.37	0.00	80	3615.78	3615.78	166.7	0.00	0.000	4.538	100.0	2	2482	1643	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	37661.3	10.42	166.7	No	166.7	Non-liq.	No	166.7	Non-liq.	Non-liq.	29025.01	173.12	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3368	0.72	29.03	20.83	7.52	No
9.150	302.70	0.00	-0.39	30.02	-30.02	302.70	0.00	0.00	-0.39	0.00	80	3628.83	3628.83	165.8	0.00	0.000	4.538	100.0	2	2479	1636	########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	37610.4	10.36	165.8	No	165.8	Non-liq.	No	165.8	Non-liq.	Non-liq.	28986.71	173.75	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3367	0.72	28.99	20.75	7.53	No
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				########	##########	########	########	########	########	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	1.000	#NUM!	#NUM!	0.00	#NUM!	#NUM!	#NUM!
Average																																																	
4.60	247.29	1.59	0.05	15.09	-15.09	247.29	1.59	0.57	0.05	0.00	120.88	1828.58	1828.58	396.87	0.58	0.00	1.51	9.17	6.07	75.53	300.32	94.60	88.53	24.05	45.94	43.92	16735.57	145.35	396.87		322.08	1.47		322.08	1.47	0.50	23680.84	87.55	1.17	255.06	1.01	255.98	0.98	0.35					

DRAFT

Sounding Name

CPT-04

Insert Raw Data

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Surface Elevation [ft] 0.0	Unequal End Area Ratio, a 0.83	Pre-drill Depth [ft] 0.0	Sat. Unit Weight for Pre-drill [pcf] 110	Depth to Water [ft] 100.0	From SBT, Iterated	γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	FC [%]	SBT	SPT N_{60} [blows/ft]	SPT $(N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{vo} [kPa]	q_c [kPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}
0.05	17.1	0	0.00	0.16	-0.16	17.10	0.00	0.00	0.00	80	13.05	13.05	2619.0	0.00	0.00	4.538	100.2	140	7.044	########	########	########	########	2136.7	163.69	2619.0	No	2619.0
0.1	22.4	0	0.00	0.33	-0.33	22.40	0.00	0.00	0.00	80	26.11	26.11	1715.0	0.00	0.00	4.538	100.2	183	5411	########	########	########	########	2798.4	107.19	1715.0	No	1715.0
0.15	23.2	0	0.00	0.49	-0.49	23.20	0.00	0.00	0.00	80	39.16	39.16	1183.9	0.00	0.00	4.538	100.2	190	4101	########	########	########	########	2897.6	73.99	1183.9	No	1183.9
0.2	27	0	0.00	0.66	-0.66	27.00	0.00	0.00	0.00	80	52.21	52.21	1033.2	0.00	0.00	4.538	100.2	221	3925	########	########	########	########	3371.7	64.58	1033.2	No	1033.2
0.25	35.8	0	0.00	0.82	-0.82	35.80	0.00	0.00	0.00	80	65.27	65.27	1096.0	0.00	0.00	4.538	100.2	293	4271	########	########	########	########	4470.9	68.50	1096.0	No	1096.0
0.3	43.6	0	0.00	0.98	-0.98	43.60	0.00	0.00	0.00	80	78.32	78.32	1112.4	0.00	0.00	4.538	100.2	357	4520	########	########	########	########	5445.1	69.52	1112.4	No	1112.4
0.35	53.9	0	0.00	1.15	-1.15	53.90	0.00	0.00	0.00	80	91.37	91.37	1178.8	0.00	0.00	4.538	100.2	441	4962	########	########	########	########	6731.8	73.67	1178.8	No	1178.8
0.4	63.7	0	0.00	1.31	-1.31	63.70	0.00	0.00	0.00	80	104.43	104.43	1219.0	0.00	0.00	4.538	100.2	522	5291	########	########	########	########	7956.0	76.19	1219.0	No	1219.0
0.45	76.9	0.03	0.00	1.48	-1.48	76.90	0.03	0.04	0.00	80	125.31	125.31	1228.3	0.04	0.00	4.538	100.2	9	83	100.0	6.0	7.36	51.87	44.96	########	########	########	1228.3
0.5	91	0.06	0.00	1.64	-1.64	91.00	0.06	0.07	0.00	80	146.20	146.20	1243.9	0.07	0.00	4.538	100.2	11	86	100.0	7.00	8.71	51.92	45.40	########	########	########	1243.9
0.55	99.4	0.29	0.00	1.80	-1.80	99.40	0.29	0.29	0.00	80	167.08	167.08	1188.8	0.29	0.00	0.791	0.00	7	13	94	100.0	8.00	9.52	51.75	45.50	########	########	########	1188.8
0.6	101.5	0.46	-0.05	1.97	-1.97	101.50	0.46	0.45	-0.05	80	187.97	187.97	1079.0	0.45	0.00	0.880	0.00	7	14	93	100.0	9.00	9.72	51.40	45.32	########	########	########	1079.0
0.65	105.4	0.59	-0.07	2.13	-2.13	105.40	0.59	0.58	-0.07	80	208.85	208.85	1008.3	0.56	0.00	1.075	0.00	7	15	91	100.0	10.00	10.09	51.15	45.25	########	########	########	1008.3
0.7	120.3	0.71	0.00	2.30	-2.30	120.30	0.71	0.59	0.00	80	229.74	229.74	1046.3	0.59	0.00	1.089	0.0	7	18	97	100.0	11.00	11.52	51.29	45.65	########	########	########	1046.3
0.75	129.1	0.87	-0.09	2.46	-2.46	129.10	0.87	0.67	-0.09	80	250.62	250.62	1029.2	0.67	0.00	1.144	0.0	7	19	99	100.0	12.00	12.36	51.23	45.78	########	########	########	1029.2
0.8	119.3	0.96	-0.14	2.62	-2.62	119.30	0.96	0.80	-0.14	80	271.51	271.51	877.8	0.81	0.00	1.243	0.0	7	18	88	100.0	13.00	11.42	50.63	45.21	########	########	########	877.8
0.85	104.7	0.84	-0.18	2.79	-2.79	104.70	0.84	0.80	-0.18	80	292.40	292.40	715.1	0.80	0.00	1.282	0.0	7	16	74	100.0	14.00	10.03	49.84	44.41	########	########	########	715.2
0.9	104.9	0.79	-0.18	2.95	-2.95	104.90	0.79	0.75	-0.18	80	313.28	313.28	668.7	0.75	0.00	1.273	0.0	7	16	70	100.0	15.00	10.05	49.57	44.26	########	########	########	668.7
0.95	105.1	0.75	-0.32	3.12	-3.12	105.10	0.75	0.71	-0.32	80	334.17	334.17	628.0	0.71	0.00	1.267	0.0	7	16	67	100.0	16.00	10.06	49.32	44.11	########	########	########	628.0
1	109.9	0.68	-0.25	3.28	-3.28	109.90	0.68	0.62	-0.25	80	355.05	355.05	618.1	0.62	0.00	1.219	0.0	7	17	66	100.0	17.00	10.52	49.26	44.18	########	########	########	618.1
1.05	114.7	0.67	-0.18	3.44	-3.44	114.70	0.67	0.58	-0.18	80	375.94	375.94	609.2	0.59	0.00	1.202	0.0	7	17	65	100.0	18.00	10.98	49.20	44.25	########	########	########	609.2
1.1	118.6	0.68	-0.18	3.61	-3.61	118.60	0.68	0.57	-0.18	80	396.82	396.82	596.7	0.57	0.00	1.200	0.0	7	18	65	100.0	19.00	11.36	49.12	44.28	########	########	########	596.7
1.15	121	0.69	-0.18	3.77	-3.77	121.00	0.69	0.57	-0.18	80	417.71	417.71	578.3	0.57	0.00	1.206	0.0	7	18	64	100.0	20.00	11.59	48.99	44.25	########	########	########	578.4
1.2	123.6	0.72	-0.18	3.94	-3.94	123.60	0.72	0.58	-0.18	80	438.59	438.59	562.6	0.58	0.00	1.221	0.0	7	19	63	100.0	21.00	11.94	48.88	44.24	########	########	########	562.6
1.25	127.5	0.74	-0.18	4.10	-4.10	127.50	0.74	0.58	-0.18	80	459.48	459.48	554.0	0.58	0.00	1.224	0.0	7	19	63	100.0	22.00	12.21	48.81	44.27	########	########	########	554.0
1.3	135.1	0.76	-0.18	4.27	-4.27	135.10	0.76	0.58	-0.18	80	480.36	480.36	581.5	0.58	0.00	1.209	0.0	7	20	64	100.0	23.00	12.94	48.87	44.44	########	########	########	581.5
1.35	139.4	0.81	-0.18	4.43	-4.43	139.40	0.81	0.58	-0.18	80	501.25	501.25	555.2	0.59	0.00	1.282	0.0	7	21	64	100.0	24.00	13.35	48.82	44.49	########	########	########	555.2
1.4	138.8	0.86	-0.18	4.59	-4.59	138.80	0.86	0.62	-0.18	80	522.13	522.13	530.7	0.62	0.00	1.258	0.0	7	21	62	100.0	25.00	13.29	48.64	44.37	########	########	########	530.7
1.45	130.8	0.82	-0.18	4.76	-4.76	130.80	0.82	0.63	-0.18	80	543.02	543.02	480.7	0.63	0.00	1.287	0.0	7	20	58	100.0	26.00	12.53	48.23	44.00	########	########	########	480.8
1.5	114.9	0.73	-0.18	4.92	-4.92	114.90	0.73	0.64	-0.18	80	562.86	562.86	407.3	0.64	0.00	1.337	1.9	6	18	50	97.6	26.95	11.00	47.52	43.29	########	########	########	407.3
1.55	100.8	0.76	-0.18	5.09	-5.09	100.80	0.76	0.75	-0.18	80	582.70	582.70	345.0	0.76	0.00	1.441	6.3	6	16	44	91.8	27.90	9.65	46.58	42.58	########	########	########	345.0
1.6	86.6	0.78	-0.18	5.25	-5.25	86.60	0.78	0.90	-0.18	80	602.54	602.54	286.4	0.90	0.00	1.533	11.0	5	15	38	85.3	28.85	8.29	45.96	41.78	########	########	########	286.4
1.65	73.9	1.03	-0.30	5.41	-5.41	73.90	1.03	1.39	-0.30	80	622.38	622.38	236.5	1.40	0.00	1.752	19.4	6	13	34	78.6	29.80	7.08	45.08	40.94	########	########	########	236.5
1.7	62.5	1.18	-0.42	5.58	-5.58	62.50	1.18	1.89	-0.42	80	642.22	642.22	193.6	1.90	0.00	2.009	26.7	5	12	30	71.5	30.75	5.99	44.12	40.07	########	########	########	193.6
1.75	52.8	1.42	-0.72	5.74	-5.74	52.80	1.42	2.69	-0.72	80	662.07	662.07	158.5	2.71	0.00	2.084	33.5	8	11	26	64.8	31.70	5.06	43.14	39.15	########	########	########	158.5
1.8	52.95	1.64	-0.46	5.91	-5.91	52.95	1.64	3.15	-0.46	80	681.91	681.91	151.7	3.17	0.00	2.151	36.4	8	11	26	63.2	32.65	4.98	42.92	39.05	########	########	########	151.7
1.85	54.17	1.86	-0.23	6.07	-6.07	54.17	1.86	3.43	-0.23	80	701.75	701.75	153.4	3.46	0.00	2.178	37.5	7	11	27	64.1	33.60	5.03	42.97	39.21	########	########	########	153.4
1.9	56.3	1.84	-0.35	6.23	-6.23	56.30	1.84	3.27	-0.35	80	721.59	721.59	155.0	3.29	0.00	2.158	36.7	8	12	27	65.0	34.55	5.39	43.03	39.29	########	########	########	155.0
1.95	56.6	1.89	-0.37	6.40	-6.40	56.60	1.89	3.34	-0.37	80	741.43	741.43	151.7	3.37	0.00	2.171	37.2	8	12	27	64.6	35.50	5.42	42.92	39.25	########	########	########	151.7
2	58.4	1.93	-0.69	6.56	-6.56	58.40	1.93	3.30	-0.69	80	761.27	761.27	152.4	3.33	0.00	2.166	37.0	8	12	27	65.3	36.45	5.59	42.94	39.34	########	########	########	152.4
2.05	57.2	1.82	-0.69	6.73	-6.73	57.20	1.82	3.18	-0.69	80	781.11	781.11	145.4	3.20	0.00	2.165	37.0	8	12	26	64.0	37.40	5.48	42.71	39.18	########	########	########	145.5
2.1	52.9	1.81	-1.08	6.89	-6.89	52.90	1.81	3.40	-1.08	80	800.95	800.95	134.7	3.50	0.00	-0.227	37.3	8	11	24	59.2	38.27	5.08	42.38	38.90	########	########	########	134.8
2.15	55.75	1.96	-1.06	7.05	-7.05	55.74	1.96	3.52	-1.06	80	820.79	820.79	134.8	3.54	-0.001	2.220	39.3	8	12	25	61.9	39.30	5.34	42.32	38.94	########	########	########	134.8
2.2	59.4	2.1	-1.04	7.22	-7.22	59.38	2.10	3.54	-1.04	80	840.64	840.64	140.3	3.57	-0.001	2.211	39.9	8	13	26	63.9	40.25	5.69	42.52	39.18	########	########	########	140.3
2.25	74.8	2.22	-0.18	7.38	-7.38	74.80	2.22	2.97	-0.18	80	860.48	860.48	172.9	2.99	0.000	2.098	34.0	8	15	31	72.2	41.20	7.16	43.57	40.23	########	########	########	172.9
2.3	77.5	2.35	-0.18	7.55	-7.55	85.55	2.39	2.92	-0.18	80	880.32	880.32	193.2	2.95	0.000	2.081	33.4	8	15	34	79.8	42.15	8.19	44.12	40.88	########	########	########	193.2
2.35	97.4	2.67	-0.32	7.71	-7.71	97.40	2.67	2.74	-0.32	80	900.16	900.16	215.4	2.75	0.000	2.012	30.5	8	19	37	81.4	43.10	9.33	44.64	41.38	########	########	########	215.4
2.4	104.6	2.85	-1.87	7.87	-7.87	104.59	2.85	2.72	-1.87	80	920.00	920.00	226.4	2.74	-0.001	1.998	29.9	8	21	39	83.6	44.05	10.02	44.87	41.67	########	########	########	226.4
2.45	107.1	2.75	-2.54	8.04	-8.04	107.10	2.75	2.57	-2.54	80	939.84	939.84	233.5	2.58	-0.001	1.976	28.9	8	21	39	84.1	45.00	10.26	44.97	41.73	########	########	########	233.5
2.5	110	2.58	-2.49	8.20	-8.20	109.99	2.58	2.35	-2.49	80	959.68	959.68	223.6	2.36	-0.001	1.942	27.5	8	21	39	84.7	45.95	10.53	44.91	41.67	########	########	########	223.6
2.55	113.4	2.11	-2.45	8.37	-8.37	113.39	2.11	1.86	-2.45	80	979.52	979.52	230.5	1.87	-0.001	1.858	23.9	8	21	38	85.4	46.90	10.86	44.98	41.81	########	########	########	230.5
2.6	111.4	1.92	-1.91	8.53	-8.53	111.39	1.92	1.72	-1.91	80	999.36	999.36	221.9	1.73	0.001	1.841	23.2	8	21	37	84.3	47.85	10.67	44.78	41.77	########	########	########	221.9
2.65	112.1	1.74	-1.61	8.69	-8.69	112.09	1.74	1.55	-1.61	80	1019.21	1019.21	219.0	1.56	0.000	1.809	21.9	6	21	34	84.1	48.80	10.73	44.72	41.51	########	########	########	219.0
2.7	107.5	1.65	-1.75	8.86	-8.86	107.49	1.65	1.53	-1.75	80	1039.05	1039.05	205.9	1.54	-0.001	1.832	22.4	6	20	34	82.1	49.75	10.29	44.42	41.51	########	########	########	205.9
2.75	102.3	1.61	-1.22	9.02	-9.02	102.29	1.61	1.57	-1.22	80	1058.89	1058.89	192.2	1.58	-0.000	1.850	23.6	6	19	32	79.8	50.70	9.80	44.09	41.23	########	########	########	192.2
2.8	102.45	1.74	-1.08	9.19	-9.19	102.44	1.74	1.70	-1.08	80	1078.73	1078.73	188.9	1.71	0.000	1.886	24.9	6	19	32	79.5	51.65	9.81	44.01	41.19	########	########	########	188.9
2.85	102.6	1.87	-1.55	9.35	-9.35	102.59	1.87	1.82	-1.55	80	1098.57	1098.57	185.8	1.83	0.000	1.908	26.1	6	19	32	79.2	52.60	9.83	43.93	41.08	########	########	########	185.8
2.9	104.5	2.1	-1.50	9.51	-9.51	104.49	2.10	2.01	-1.50	80	1118.41	1118.41	185.9	2.02	0.000	1.941	27.5	6	20	33	79.5	53.55	10.01	43.93	41.20	########	########	########	185.9
2.95	108.4	2.09	-1.45	9.68	-9.68	108.39	2.09	2.19	-1.45	80	1138.25	1138.25	195.5	2.21	0.000	1.952	28.7	6	20	33	80.5	54.50	10.38	44.02	41.33	########	########	########	195.5
3	116.8	1.89	-1.38	9.84	-9.84	116.79	1.89	1.62	-1.38	80	1158.09	1158.09	200.7	1.63	0.000	1.847	23.5	6	22	35	83.0	55.45	11.18	44.30	41.65	########	########	########	200.7
3.05	121.7	1.56	-0.99	10.01	-10.01	121.69	1.56	1.29	-0.99	80	1177.93	1177.93	205.6	1.30	0.000	1.379	3.6	6	22	34	84.2	56.40	11.65	44.41	41.93	########	########	########	205.6
3.1	117.9	1.42	-0.85	10.17	-10.17	117.90	1.42	1.20	-0.85	80	1197.78	1197.78	195.9	1.21	0.000	1.757	19.7	6	21	33	82.7	57.35	11.29	44.18	41.61	########	########	########	195.9
3.15	117.8	1.31	-0.69	10.33	-10.33	117.80	1.31	1.11	-0.69	80	1217.62	1217.62	192.5	1.12	0.000	1.736	18.8	6	21	32	82.3	58.30	11.28	44.10	41.57	########	########	########	192.5
3.2	117.7	1.3	-0.62	10.50	-10.50	117.70	1.30	1.10	-0.62	80	1237.46	1237.46	189.2	1.11	0.000	1.729	18.8	6	21	32	81.8	59.25	11.27	44.01	41.53	########	########	########	189.2
3.25	117	1.29	-0.57	10.66	-10.66	116.99	1.29	1.10	-0.57	80	1257.30	1257.30	185.1	1.11	0.000	1.745	19.2	6	21	31	81.3	60.20	11.20	43.91	41.46	########	########	########	185.1
3.3	109	1.31	-0.63	10.83	-10.83	109.00	1.31	1.20	-0.63	80	1277.14	1277.14	189.7	1.21	0.000	1.798	21.4	6	20	29	78.3	61.15	10.44	43.81	41.08	########	########	########	189.7
3.35	106.9	1.26	-0.69	10.99	-10.99	106.90	1.26	1.18	-0.69	80	1296.98	1296.98	163.8	1.19	0.000	1.803	21.6	6	20	28	77.2	62.10	10.24	43.30	40.95	########	########	########	163.8
3.4	103.6	1.25	-0.65	11.15	-11.15	103.60	1.25	1.21	-0.65	80	1316.82	1316.82	152.8	1.22	0.000	1.825	22.5	6	19	28	75.7	63.05	9.92	43.07	40.77	########	########	########	152.8
3.45	102.4	1.32	-0.62	11.32	-11.32	102.40	1.29	1.26	-0.60	80	1336.66	1336.66	142.2	1.27	0.000	1.846	23.5	6	19	27	74.9	64.00	9.63	42.84	40.59	########	########	########	142.2
3.5	100.8	1.32	-0.60	11.48	-11.48	100.80	1.32	1.31	-0.60	80	1356.50	1356.50	147.6	1.32	0.000	1.866	24.4	6	19	27	74.0	64.95	9.65	42.78	40.57	########	########	########	147.6
3.55	97.6	1.38	-0.55	11.65	-11.65	97.60	1.38	1.41	-0.55	80	1376.35	1376.35	140.8	1.42	0.000	1.906	26.0	6	19	26	72.5	65.90	9.55	42.54	40.39	########	########	########	140.8
3.6	92.9	1.34	-0.53	11.81	-11.81	92.90	1.34	1.44	-0.53	80	1396.19	1396.19	132.1	1.45	0.000	1.932	27.1	6	18	25	70.3	66.85	8.90	42.21	40.11	########	########	########	132.1
3.65	87.8	1.31	-0.44	11.98	-11.98	87.60	1.31	1.52	-0.44	80	1416.03	1416.03	122.7	1.53	0.000	1.965	28.5	6	17	23	67.7	67.80	8.39	41.83	39.76	########	########	########	122.7
3.7	85	1.29	-0.62	12.14	-12.14	85.00	1.29	1.52	-0.62	80	1435.87	1435.87	117.4	1.53	-0.000	1.984	29.3	6	17	22	66.3	68.75	8.14	41.60	39.62	########	########	########	117.4
3.75	80.4	1.29	-0.69	12.30	-12.30	80.40	1.29	1.60	-0.69	80	1455.71	1455.71	109.5	1.60	0.000	2.022	30.9	6	16	21	63.9	69.70	7.70	41.23	39.32	########	########	########	109.5
3.8	71.8	1.28	-0.69	12.47	-12.47	71.80	1.28	1.79	-0.69	80	1475.05	1475.05	96.4	1.80	0.000	2.094	34.0	6	15	19	59.3	70.62	6.88	40.55	38.74	########	########	########	96.4
3.85	60	1.26	-0.88	12.63	-12.63	60.00	1.26	2.07	-0.88	80	1494.35	1494.35	79.3	2.30	0.000	2.229	39.7	5	13	17	52.1	71.55	5.75	39.48	37.86	########	########	########	79.3
3.9	49.9	1.43	-0.95	12.80	-12.80	49.90	1.43	2.87	-0.95	80	1513.67	1513.67	66.2	3.19	0.000	2.446	45.4	5	15	14	47.8	72.48	4.78	38.35	36.94	########	########	########	66.2
3.95	45.5	1.58	-0.95	12.96	-12.96	45.49	1.58	3.47	-0.95	80	1532.99	1532.99	58.4	3.53	0.001	2.455	49.3	5	11	14	41.3	73.40	4.36	37.74	36.47	########	########	########	58.4
4	46.25	1.61	-0.97	13.12	-13.12	46.24	1.61	3.48	-0.97	80	1552.30	1552.30	58.6	3.54	-0.001	2.455	49.3	5	11	14	41.3	74.32	4.43	37.76	36.52	########	########	########	58.6
4.05	47	1.59	-1.01	13.29	-13.29	46.99	1.59	3.38	-1.01	80	1571.62	1571.62	59.5	3.39	-0.001	2.446	49.4	5	11	14	41.7	75.25	4.50	37.78	36.57	########	########	########	59.5
4.1	51.3	1.62	-1.34	13.45	-13.45	51.29	1.62	3.16	-1.34	80	1590.94	1590.94	63.5	3.21	-0.001	2.400	46.9	5	12	15	44.8	76.17	4.91	38.22	36.96	########	########	########	63.5
4.15	55.2	1.65	-1.59	13.62	-13.62	55.20	1.65	2.99	-1.59	80	1610.26	1610.26	68.2	3.03	-0.001	2.353	44.2	5	13	16	47.3	77.10	5.29	38.58	37.37	########	########	########	68.2
4.2	61.2	1.83	-1.85	13.78	-13.78	61.19	1.83	2.99	-1.85	80	1629.58	1629.58	74.1	3.03	0.001	2.336	44.2	5	14	17	51.0	78.02	5.86	39.10	37.74	########	########	########	74.1
4.25	65.6	1.87	-2.17	13.94	-13.94	65.59	1.87	2.85	-2.17	80	1648.90	1648.90	78.6	2.89	-0.001	2.303	42.8	5	15	18	53.5	78.95	6.28	39.43	38.05	########	########	########	78.6
4.3	67.2	1.44	-2.28	14.11	-14.11	67.19	1.44	2.14	-2.28	80	1668.22	1668.22	83.0	2.17	-0.001	2.188	38.9	5	17	17	54.1	79.87	6.44	39.50	38.13	########	########	########	83.0
4.35	70.9	1.42	-2.10	14.27	-14.27	70.89	1.42	2.00	-2.10	80	1687.54	1687.54	83.0	2.03	-0.001	2.176	37.5	5	15	18	55.9	80.80	6.79	39.74	38.36	########	########	########	83.0
4.4	55.8	1.44	-1.87	14.43	-14.43	55.79	1.44	2.33	-1.87	80	1706.86	1706.86	95.6	2.35	-0.001	2.172	37.5	5	14	15	61.5	81.72	7.89	40.50	38.65	########	########	########	95.6
4.45	85.2	1.62	-1.53	14.60	-14.60	85.18	1.62	1.90	-1.53	80	1726.18	1726.18	97.7	1.92	-0.001	2.110	34.6	5	17	20	62.5	82.65	8.16	40.63	39.19	########	########	########	97.7
4.5	84.4	2.01	-3.48	14.76	-14.76	84.38	2.01	2.38	-3.48	80	1745.49	1745.49	95.7	2.41	-0.001	2.187	37.9	5	18	21	61.9	83.57	8.08	40.51	39.11	########	########	########	95.7
4.55	82.6	2.38	-4.03	14.93	-14.93	82.58	2.38	2.93	-4.03	80	1764.81	1764.81	92.6	2.94	-0.001	2.262	41.5	5	18	21	60.9	84.50	7.91	40.93	39.60	########	########	########	92.6
4.6	87	2.31	-3.00	15.09	-15.09	86.98	2.31	2.66	-3.00	80	1784.13	1784.13	96.5	2.68	-0.001	2.219	39.3	5	19	21	62.6	85.42	8.33	40.56	39.21	########	########	########	96.5
4.65	91.4	1.67	-1.51	15.26	-15.26	91.38	1.67	1.83	-1.51	80	1803.

Sounding Name

CPT-05

Insert Raw Data

Surface Elevation [ft]: 0.0 | Unequal End Area Ratio, a: 0.83 | Pre-drill Depth [ft]: 0.0 | Sat. Unit Weight for Pre-drill [pcf]: 110 | Depth to Water [ft]: 100.0 | From SBT, Iterated

Davies 1999 | Robertson 1990 Norm. F_r/Q_t Chart | Baldi, et al. 1986 K_o 0.45 | R&C (1983) For friction angle plot | For friction angle plot | R&C (1983) | K&M (1990) | N_{kt} 16 | Based on q_c, using n=1.0 for all | Based on q_c, using n=0.5 for I_c<2.6 | Recalc. | Recalc. | Based on q_c, using n=0.7 for I_c>2.6 | Recalc. | a_{max} (*g) 0.557 | Contractive/Dilative Plot | Stark and Olson (1995) | Boundary

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Elevation [ft]	q_t [tsf]	f_s [tsf]	R_f [%]	u_2 [ft]	u_0 [ft]	γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	FC [%]	SBT	SPT N_{60} [blows/ft]	SPT $(N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{vo} [kPa]	q_c [MPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}	Q	I_c<2.6?	Q	I_c	I_c<2.6?	Q	I_c	n	q_c [kPa]	σ'_{vo} [kPa]	C_q	q_{c1N}	K_c	$(q_{c1N})_{cs}$	r_d	CSR	C_q	q_c [MPa]	q_{c1} [MPa]	q_{c1} [MPa]	Contractive?
0.050	35.90	0.00	0.02	0.16	-0.16	35.90	0.00	0.00	0.02	0.00	80	13.05	13.05	5499.5	0.00	0.000	4.538	100.0	2	294	14788	########	########	########	########	########	4486.7	343.72	5499.5	No	5499.5	Non-liq.	No	5499.5	Non-liq.	Non-liq.	3437.80	0.62	Non-liq.	Non-liq.	Non-liq.	########	1.000	0.3619	2.23	3.44	7.68	2.32	No
0.100	52.70	0.16	0.02	0.33	-0.33	52.70	0.16	0.30	0.02	0.00	127	33.94	33.94	3104.6	0.30	0.000	0.703	0.0	7	7	167	100.0	1.62	5.05	54.98	46.28	########	########	3104.6	Yes	393.2	1.122	Yes	393.2	1.122	0.5	5046.58	1.62	1.70	393.29	1.00	393.29	0.999	0.3618	2.21	5.05	11.13	2.84	No
0.150	52.50	0.20	0.02	0.49	-0.49	52.50	0.20	0.38	0.02	0.00	127	54.82	54.82	1914.2	0.38	0.000	0.823	0.0	7	7	118	100.0	2.62	5.03	53.42	45.11	########	########	1914.2	Yes	308.1	1.267	Yes	308.1	1.267	0.5	5027.43	2.62	1.70	308.26	1.00	308.26	0.999	0.3616	2.18	5.03	10.96	3.14	No
0.200	52.00	0.24	0.02	0.66	-0.66	52.00	0.24	0.46	0.02	0.00	127	75.71	75.71	1372.7	0.46	0.000	0.945	0.0	7	7	95	100.0	3.62	4.98	52.27	44.30	########	########	1372.7	Yes	259.6	1.377	Yes	259.6	1.377	0.5	4979.55	3.62	1.70	259.82	1.00	259.82	0.998	0.3615	2.15	4.98	10.72	3.35	No
0.250	52.50	0.25	0.02	0.82	-0.82	52.50	0.25	0.48	0.02	0.00	127	96.59	96.59	1086.0	0.48	0.000	0.998	0.0	7	7	80	100.0	4.62	5.03	51.42	43.76	########	########	1086.0	Yes	232.0	1.424	Yes	232.0	1.424	0.5	5027.43	4.62	1.70	232.24	1.00	232.24	0.998	0.3614	2.13	5.03	10.70	3.53	No
0.300	53.00	0.25	0.02	0.98	-0.98	53.00	0.25	0.47	0.02	0.00	127	117.48	117.48	901.3	0.47	0.000	1.032	0.0	7	8	70	100.0	5.62	5.08	50.73	43.34	########	########	901.3	Yes	212.4	1.451	Yes	212.4	1.451	0.5	5075.31	5.62	1.70	212.59	1.00	212.59	0.998	0.3612	2.10	5.08	10.68	3.68	No
0.350	53.60	0.26	0.02	1.15	-1.15	53.60	0.26	0.49	0.02	0.00	127	138.37	138.37	773.8	0.49	0.000	1.077	0.0	7	8	64	97.9	6.62	5.13	50.14	43.00	########	########	773.8	Yes	197.9	1.483	Yes	197.9	1.483	0.5	5132.76	6.62	1.70	198.11	1.00	198.11	0.997	0.3611	2.08	5.13	10.68	3.80	No
0.400	67.80	0.26	0.02	1.31	-1.31	67.80	0.26	0.38	0.02	0.00	127	159.25	159.25	850.5	0.38	0.000	0.969	0.0	7	10	70	100.0	7.62	6.49	50.51	43.79	########	########	850.5	Yes	233.3	1.364	Yes	233.3	1.364	0.5	6492.56	7.62	1.70	233.58	1.00	233.58	0.997	0.3609	2.06	6.49	13.35	3.92	No
0.450	76.30	0.29	0.02	1.48	-1.48	76.30	0.29	0.38	0.02	0.00	127	180.14	180.14	846.1	0.38	0.000	0.967	0.0	7	11	72	100.0	8.62	7.31	50.49	44.06	########	########	846.1	Yes	246.9	1.342	Yes	246.9	1.342	0.5	7306.53	8.62	1.70	247.16	1.00	247.16	0.997	0.3608	2.03	7.31	14.86	4.02	No
0.500	81.00	0.30	0.02	1.64	-1.64	81.00	0.30	0.37	0.02	0.00	127	201.02	201.02	804.9	0.37	0.000	0.970	0.0	7	11	70	100.0	9.62	7.76	50.30	44.08	########	########	804.9	Yes	248.1	1.334	Yes	248.1	1.334	0.5	7756.60	9.62	1.70	248.38	1.00	248.38	0.996	0.3607	2.01	7.76	15.60	4.11	No
0.550	82.80	0.30	0.02	1.80	-1.80	82.80	0.30	0.36	0.02	0.00	127	221.91	221.91	745.3	0.36	0.000	0.982	0.0	7	12	66	100.0	10.62	7.93	50.00	43.95	########	########	745.3	Yes	241.3	1.338	Yes	241.3	1.338	0.5	7928.97	10.62	1.70	241.65	1.00	241.65	0.996	0.3605	1.99	7.93	15.77	4.20	No
0.600	83.90	0.30	0.02	1.97	-1.97	83.90	0.30	0.36	0.02	0.00	127	242.79	242.79	690.1	0.36	0.000	0.999	0.0	7	12	63	100.0	11.62	8.03	49.70	43.80	########	########	690.1	Yes	233.8	1.346	Yes	233.8	1.346	0.5	8034.31	11.62	1.70	234.10	1.00	234.10	0.995	0.3604	1.97	8.03	15.81	4.28	No
0.650	83.60	0.30	0.02	2.13	-2.13	83.60	0.30	0.36	0.02	0.00	127	263.68	263.68	633.1	0.36	0.000	1.024	0.0	7	12	59	100.0	12.62	8.01	49.35	43.58	########	########	633.1	Yes	223.5	1.363	Yes	223.5	1.363	0.5	8005.58	12.62	1.70	223.83	1.00	223.83	0.995	0.3602	1.95	8.01	15.59	4.35	No
0.700	84.30	0.30	0.02	2.30	-2.30	84.30	0.30	0.36	0.02	0.00	127	284.56	284.56	591.5	0.36	0.000	1.041	0.0	7	12	57	100.0	13.62	8.07	49.08	43.44	########	########	591.5	Yes	216.9	1.372	Yes	216.9	1.372	0.5	8072.61	13.62	1.70	217.26	1.00	217.26	0.995	0.3601	1.93	8.07	15.55	4.42	No
0.750	88.40	0.26	0.02	2.46	-2.46	88.40	0.26	0.29	0.02	0.00	127	305.45	305.45	577.8	0.29	0.000	0.988	0.0	7	13	56	100.0	14.62	8.47	48.99	43.50	########	########	577.8	Yes	219.5	1.322	Yes	219.5	1.322	0.5	8465.23	14.62	1.70	219.90	1.00	219.90	0.994	0.3600	1.91	8.47	16.14	4.49	No
0.800	93.70	0.23	0.05	2.62	-2.62	93.70	0.23	0.25	0.05	0.00	127	326.33	326.33	573.3	0.25	0.000	0.938	0.0	7	13	55	100.0	15.62	8.97	48.95	43.62	########	########	573.3	Yes	225.1	1.274	Yes	225.1	1.274	0.5	8972.76	15.62	1.70	225.51	1.00	225.51	0.994	0.3598	1.89	8.97	16.93	4.55	No
0.850	86.50	0.22	0.07	2.79	-2.79	86.50	0.22	0.25	0.07	0.00	127	347.22	347.22	497.2	0.25	0.000	0.995	0.0	7	12	49	96.9	16.62	8.28	48.37	43.09	########	########	497.2	Yes	201.4	1.323	Yes	201.4	1.323	0.5	8283.28	16.62	1.70	201.82	1.00	201.82	0.993	0.3597	1.87	8.28	15.47	4.61	No
0.900	77.20	0.21	0.18	2.95	-2.95	77.20	0.21	0.27	0.18	0.00	127	368.10	368.10	418.5	0.27	0.000	1.072	0.0	7	11	43	91.3	17.62	7.39	47.64	42.41	########	########	418.4	Yes	174.5	1.392	Yes	174.5	1.392	0.5	7392.71	17.62	1.70	174.94	1.00	174.94	0.993	0.3596	1.85	7.39	13.66	4.67	No
0.950	71.20	0.24	0.18	3.12	-3.12	71.20	0.24	0.34	0.18	0.00	127	388.99	388.99	365.1	0.34	0.000	1.177	0.0	7	11	39	87.0	18.62	6.82	47.05	41.89	########	########	365.1	Yes	156.5	1.479	Yes	156.5	1.479	0.5	6818.15	18.62	1.70	156.95	1.00	156.95	0.993	0.3594	1.83	6.82	12.47	4.72	No
1.000	71.45	0.26	0.16	3.28	-3.28	71.45	0.26	0.36	0.16	0.00	127	409.88	409.88	347.6	0.36	0.000	1.214	0.0	7	11	38	86.1	19.62	6.84	46.83	41.78	########	########	347.6	Yes	153.0	1.505	Yes	153.0	1.505	0.5	6842.09	19.62	1.70	153.44	1.00	153.44	0.992	0.3593	1.81	6.84	12.39	4.77	No
1.050	71.70	0.33	0.16	3.44	-3.44	71.70	0.33	0.46	0.16	0.00	127	430.76	430.76	331.9	0.46	0.000	1.297	0.2	7	11	38	85.2	20.62	6.87	46.63	41.68	########	########	331.9	Yes	149.7	1.568	Yes	149.7	1.568	0.5	6866.03	20.62	1.70	150.19	1.00	150.19	0.992	0.3591	1.79	6.87	12.32	4.82	No
1.100	72.80	0.35	0.18	3.61	-3.61	72.80	0.35	0.48	0.18	0.00	121	450.60	450.60	322.1	0.48	0.000	1.320	1.1	6	11	37	84.8	21.57	6.97	46.49	41.64	########	########	322.1	Yes	148.6	1.581	Yes	148.6	1.581	0.5	6971.37	21.57	1.70	149.10	1.00	149.10	0.992	0.3590	1.78	6.97	12.39	4.87	No
1.150	72.55	0.31	0.18	3.77	-3.77	72.55	0.31	0.43	0.18	0.00	127	471.49	471.49	306.8	0.43	0.000	1.301	0.3	7	11	36	83.7	22.57	6.95	46.27	41.52	########	########	306.7	Yes	144.8	1.562	Yes	144.8	1.562	0.5	6947.43	22.57	1.70	145.26	1.00	145.26	0.991	0.3589	1.76	6.95	12.23	4.91	No
1.200	72.30	0.23	0.37	3.94	-3.94	72.30	0.23	0.32	0.37	0.00	127	492.37	492.37	292.7	0.32	0.000	1.238	0.0	7	11	34	82.7	23.57	6.92	46.06	41.40	########	########	292.7	Yes	141.2	1.506	Yes	141.2	1.506	0.5	6923.49	23.57	1.70	141.66	1.00	141.66	0.991	0.3587	1.74	6.92	12.07	4.96	No
1.250	73.90	0.24	0.18	4.10	-4.10	73.90	0.24	0.32	0.18	0.00	127	513.26	513.26	287.0	0.33	0.000	1.250	0.0	7	11	34	82.6	24.57	7.08	45.97	41.40	########	########	287.0	Yes	141.3	1.510	Yes	141.3	1.510	0.5	7076.70	24.57	1.70	141.82	1.00	141.82	0.990	0.3586	1.73	7.08	12.22	5.00	No
1.300	72.10	0.26	0.18	4.27	-4.27	72.10	0.26	0.36	0.18	0.00	127	534.14	534.14	269.0	0.36	0.000	1.299	0.3	7	11	32	80.8	25.57	6.90	45.68	41.19	########	########	269.0	Yes	135.1	1.549	Yes	135.1	1.549	0.5	6904.33	25.57	1.70	135.63	1.00	135.63	0.990	0.3584	1.71	6.90	11.81	5.04	No
1.350	67.30	0.35	-0.16	4.43	-4.43	67.30	0.35	0.52	-0.16	0.00	121	553.98	553.98	242.0	0.52	0.000	1.435	6.0	6	11	31	77.4	26.52	6.44	45.19	40.77	########	########	242.0	Yes	123.8	1.666	Yes	123.8	1.666	0.5	6444.68	26.52	1.70	124.31	1.01	126.15	0.990	0.3583	1.70	6.44	10.93	5.08	No
1.400	68.35	0.44	0.02	4.59	-4.59	68.35	0.44	0.64	0.02	0.00	121	573.83	573.83	237.2	0.65	0.000	1.504	8.9	6	11	31	77.3	27.47	6.55	45.09	40.76	########	########	237.2	Yes	123.5	1.721	Yes	123.5	1.721	0.5	6545.23	27.47	1.70	124.05	1.05	130.49	0.989	0.3582	1.68	6.55	11.00	5.12	No
1.450	69.40	0.48	0.18	4.76	-4.76	69.40	0.48	0.69	0.18	0.00	121	593.67	593.67	232.8	0.69	0.000	1.531	10.1	6	12	31	77.1	28.42	6.65	45.00	40.76	########	########	232.8	Yes	123.3	1.740	Yes	123.3	1.740	0.5	6645.78	28.42	1.70	123.83	1.07	131.89	0.989	0.3580	1.67	6.65	11.07	5.16	No
1.500	75.20	0.48	0.37	4.92	-4.92	75.20	0.48	0.64	0.37	0.00	121	613.51	613.51	244.2	0.64	0.000	1.492	8.4	6	12	32	79.5	29.37	7.20	45.23	41.06	########	########	244.1	Yes	131.5	1.697	Yes	131.5	1.697	0.5	7201.19	29.37	1.70	132.00	1.04	136.73	0.989	0.3579	1.65	7.20	11.89	5.19	No
1.550	90.30	0.44	0.37	5.09	-5.09	90.30	0.44	0.49	0.37	0.00	121	633.35	633.35	284.2	0.49	0.000	1.364	3.0	6	14	36	85.9	30.32	8.65	45.93	41.86	########	########	284.2	Yes	155.4	1.569	Yes	155.4	1.569	0.5	8647.17	30.32	1.70	156.00	1.00	156.00	0.988	0.3578	1.64	8.65	14.16	5.23	No
1.600	107.80	0.39	0.37	5.25	-5.25	107.80	0.39	0.36	0.37	0.00	127	654.23	654.23	328.6	0.36	0.000	1.232	0.0	7	16	40	92.0	31.32	10.32	46.58	42.63	########	########	328.5	Yes	182.7	1.438	Yes	182.7	1.438	0.5	10322.98	31.32	1.70	183.23	1.00	183.23	0.988	0.3576	1.62	10.32	16.75	5.26	No
1.650	112.30	0.36	0.37	5.41	-5.41	112.30	0.36	0.32	0.37	0.00	127	675.12	675.12	331.7	0.32	0.000	1.196	0.0	7	17	41	92.9	32.32	10.75	46.62	42.75	########	########	331.7	Yes	187.3	1.401	Yes	187.3	1.401	0.5	10753.91	32.32	1.70	187.91	1.00	187.91	0.987	0.3575	1.61	10.75	17.30	5.30	No
1.700	113.60	0.38	0.39	5.58	-5.58	113.60	0.38	0.33	0.39	0.00	127	696.00	696.00	325.4	0.34	0.000	1.214	0.0	7	17	40	92.7	33.32	10.88	46.54	42.73	########	########	325.4	Yes	186.6	1.412	Yes	186.6	1.412	0.5	10878.40	33.32	1.70	187.21	1.00	187.21	0.987	0.3573	1.59	10.88	17.35	5.33	No
1.750	119.30	0.40	0.39	5.74	-5.74	119.30	0.40	0.34	0.39	0.00	127	716.89	716.89	331.8	0.34	0.000	1.208	0.0	7	18	41	93.9	34.32	11.42	46.63	42.89	########	########	331.8	Yes	193.1	1.400	Yes	193.1	1.400	0.5	11424.23	34.32	1.70	193.72	1.00	193.72	0.987	0.3572	1.58	11.42	18.06	5.36	No
1.800	125.00	0.50	0.55	5.91	-5.91	125.00	0.50	0.40	0.55	0.00	127	737.78	737.78	337.9	0.40	0.000	1.251	0.0	7	19	43	95.1	35.32	11.97	46.71	43.05	########	########	337.9	Yes	199.5	1.431	Yes	199.5	1.431	0.5	11970.07	35.32	1.69	200.08	1.00	200.08	0.986	0.3571	1.57	11.97	18.76	5.40	No
1.850	139.80	0.56	0.55	6.07	-6.07	139.80	0.56	0.40	0.55	0.00	127	758.66	758.66	367.6	0.40	0.000	1.224	0.0	7	21	47	98.8	36.32	13.39	47.08	43.52	########	########	367.5	Yes	220.1	1.396	Yes	220.1	1.396	0.5	13387.32	36.32	1.67	220.66	1.00	220.66	0.986	0.3569	1.55	13.39	20.80	5.43	No
1.900	140.30	0.51	0.55	6.23	-6.23	140.30	0.51	0.36	0.55	0.00	127	779.55	779.55	359.0	0.36	0.000	1.203	0.0	7	21	46	98.4	37.32	13.44	46.97	43.47	########	########	359.0	Yes	217.9	1.376	Yes	217.9	1.376	0.5	13435.20	37.32	1.65	218.47	1.00	218.47	0.985	0.3568	1.54	13.44	20.70	5.46	No
1.950	127.10	0.47	0.55	6.40	-6.40	127.10	0.47	0.37	0.55	0.00	127	800.43	800.43	316.6	0.37	0.000	1.250	0.0	7	19	41	94.0	38.32	12.17	46.42	42.93	########	########	316.6	Yes	194.7	1.420	Yes	194.7	1.420	0.5	12171.16	38.32	1.63	195.31	1.00	195.31	0.985	0.3566	1.53	12.17	18.59	5.49	No
2.000	119.80	0.47	0.55	6.56	-6.56	119.80	0.47	0.39	0.55	0.00	127	821.32	821.32	290.7	0.39	0.000	1.295	0.1	7	19	38	91.2	39.32	11.47	46.03	42.59	########	########	290.7	Yes	181.1	1.461	Yes	181.1	1.461	0.5	11472.11	39.32	1.61	181.74	1.00	181.74	0.985	0.3565	1.52	11.47	17.38	5.52	No
2.050	115.50	0.48	0.55	6.73	-6.73	115.50	0.48	0.42	0.55	0.00	121	841.16	841.16	273.6	0.42	0.000	1.331	1.6	6	18	37	89.3	40.27	11.06	45.76	42.36	########	########	273.6	Yes	172.5	1.492	Yes	172.5	1.492	0.5	11060.34	40.27	1.59	173.14	1.00	173.14	0.984	0.3564	1.50	11.06	16.63	5.55	No
2.100	105.00	0.52	0.55	6.89	-6.89	105.00	0.52	0.50	0.55	0.00	121	861.00	861.00	242.9	0.50	0.000	1.420	5.4	6	17	34	85.2	41.22	10.05	45.20	41.85	########	########	242.9	Yes	154.9	1.574	Yes	154.9	1.574	0.5	10054.85	41.22	1.57	155.57	1.00	155.57	0.984	0.3562	1.49	10.05	15.00	5.57	No
2.150	97.30	0.57	0.55	7.05	-7.05	97.30	0.57	0.59	0.55	0.00	121	880.84	880.84	219.9	0.59	0.000	1.500	8.8	6	16	32	81.8	42.17	9.32	44.74	41.43	########	########	219.9	Yes	141.9	1.648	Yes	141.9	1.648	0.5	9317.50	42.17	1.55	142.53	1.00	142.83	0.984	0.3561	1.48	9.32	13.79	5.60	No
2.200	94.40	0.64	0.46	7.22	-7.22	94.40	0.64	0.68	0.46	0.00	121	900.68	900.68	208.6	0.68	0.000	1.560	11.3	6	16	31	80.1	43.12	9.04	44.48	41.23	########	########	208.6	Yes	136.1	1.701	Yes	136.1	1.701	0.5	9039.79	43.12	1.53	136.75	1.04	142.06	0.983	0.3560	1.47	9.04	13.28	5.63	No
2.250	90.80	0.74	0.42	7.38	-7.38	90.80	0.74	0.81	0.42	0.00	121	920.52	920.52	196.3	0.82	0.000	1.634	14.5	6	16	30	78.2	44.07	8.70	44.19	40.99	########	########	196.3	Yes	129.5	1.769	Yes	129.5	1.769	0.5	8695.06	44.07	1.52	130.11	1.08	141.10	0.983	0.3558	1.46	8.70	12.67	5.65	No
2.300	86.90	0.83	0.37	7.55	-7.55	86.90	0.83	0.96	0.37	0.00	121	940.36	940.36	183.8	0.96	0.000	1.703	17.4	6	15	29	76.1	45.02	8.32	43.87	40.73	########	########	183.8	Yes	122.5	1.832	Yes	122.5	1.832	0.5	8321.59	45.02	1.50	123.20	1.13	139.28	0.982	0.3557	1.45	8.32	12.04	5.68	No
2.350	78.90	0.89	0.37	7.71	-7.71	78.90	0.89	1.13	0.37	0.00	121	960.20	960.20	163.3	1.13	0.000	1.790	21.1	6	14	26	71.9	45.97	7.56	43.29	40.22	########	########	163.3	Yes	110.0	1.915	Yes	110.0	1.915	0.5	7555.51	45.97	1.48	110.70	1.20	133.17	0.982	0.3555	1.44	7.56	10.85	5.70	No
2.400	72.70	0.88	0.32	7.87	-7.87	72.70	0.88	1.21	0.32	0.00	121	980.05	980.05	147.4	1.22	0.000	1.844	23.4	6	13	24	68.4	46.92	6.96	42.77	39.78	########	########	147.4	Yes	100.3	1.965	Yes	100.3	1.965	0.5	6961.79	46.92	1.47	100.96	1.26	126.94	0.982	0.3554	1.43	6.96	9.92	5.73	No
2.450	74.85	0.90	0.35	8.04	-8.04	74.85	0.90	1.20	0.35	0.00	121	999.89	999.89	148.7	1.21	0.000	1.839	23.1	6	14	25	69.1	47.87	7.17	42.82	39.87	########	########	148.7	Yes	102.2	1.957	Yes	102.2	1.957	0.5	7167.67	47.87	1.45	102.91	1.25	128.42	0.981	0.3553	1.41	7.17	10.14	5.75	No
2.500	77.00	1.03	0.37	8.20	-8.20	77.00	1.03	1.34	0.37	0.00	121	1019.73	1019.73	150.0	1.35	0.000	1.869	24.4	6	14	25	69.7	48.82	7.37	42.86	39.96	########	########	150.0	Yes	104.1	1.982	Yes	104.1	1.982	0.5	7373.56	48.82	1.44	104.83	1.28	133.94	0.981	0.3551	1.40	7.37	10.35	5.77	No
2.550	90.40	1.10	0.37	8.37	-8.37	90.40	1.10	1.22	0.37	0.00	121	1039.57	1039.57	172.9	1.22	0.000	1.797	21.4	6	16	29	75.5	49.77	8.66	43.57	40.68	########	########	172.9	Yes	121.2	1.906	Yes	121.2	1.906	0.5	8656.75	49.77	1.43	121.90	1.19	145.60	0.980	0.3550	1.39	8.66	12.07	5.80	No
2.600	102.90	1.10	0.48	8.53	-8.53	102.90	1.10	1.07	0.48	0.00	121	1059.41	1059.41	193.3	1.07	0.000	1.723	18.2	6	18	31	80.0	50.72	9.85	44.12	41.25	########	########	193.3	Yes	136.7	1.829	Yes	136.7	1.829	0.5	9853.76	50.72	1.41	137.45	1.13	155.10	0.980	0.3548	1.38	9.85	13.64	5.82	No
2.650	111.60	0.96	0.37	8.69	-8.69	111.60	0.96	0.86	0.37	0.00	121	1079.25	1079.25	205.8	0.86	0.000	1.636	14.5	6	19	32	82.7	51.67	10.69	44.42	41.60	########	########	205.8	Yes	147.0	1.742	Yes	147.0	1.742	0.5	10686.87	51.67	1.40	147.69	1.07	157.48	0.980	0.3547	1.37	10.69	14.68	5.84	No
2.700	109.10	0.98	0.21	8.86	-8.86	109.10	0.98	0.90	0.21	0.00	121	1099.09	1099.09	197.5	0.90	0.000	1.662	15.6	6	19	31	81.5	52.62	10.45	44.22	41.45	########	########	197.5	Yes	142.4	1.765	Yes	142.4	1.765	0.5	10447.47	52.62	1.39	143.07	1.08	154.80	0.979	0.3546	1.36	10.45	14.25	5.86	No
2.750	123.40	1.01	0.07	9.02	-9.02	123.40	1.01	0.82	0.07	0.00	121	1118.93	1118.93	219.6	0.82	0.000	1.600	13.0	6	21	34	85.8	53.57	11.82	44.73	41.99	########	########	219.6	Yes	159.7	1.701	Yes	159.7	1.701	0.5	11816.85	53.57	1.38	160.38	1.04	166.55	0.979	0.3544	1.35	11.82	16.01	5.89	No
2.800	128.70	1.04	-0.09	9.19	-9.19	128.70	1.04	0.81	-0.09	0.00	121	1138.77	1138.77	225.0	0.81	0.000	1.589	12.5	6	22	35	87.1	54.52	12.32	44.84	42.15	########	########	225.0	Yes	165.1	1.686	Yes	165.1	1.686	0.5	12324.38	54.52	1.36	165.81	1.03	170.55	0.979	0.3543	1.35	12.32	16.58	5.91	No
2.850	121.60	0.96	-0.02	9.35	-9.35	121.60	0.96	0.79	-0.02	0.00	121	1158.62	1158.62	208.9	0.79	0.000	1.605	13.2	6	21	33	84.5	55.47	11.64	44.49	41.84	########	########	208.9	Yes	154.6	1.701	Yes	154.6	1.701	0.5	11644.48	55.47	1.35	155.32	1.04	161.31	0.978	0.3542	1.34	11.64	15.55	5.93	No
2.900	111.20	0.85	0.02	9.51	-9.51	111.20	0.85	0.76	0.02	0.00	121	1178.46	1178.46	187.7	0.77	0.000	1.629	14.2	6	19	30	80.8	56.42	10.65	43.97	41.37	########	########	187.7	Yes	140.1	1.725	Yes	140.1	1.725	0.5	10648.57	56.42	1.34	140.83	1.05	148.50	0.978	0.3540	1.33	10.65	14.13	5.95	No
2.950	109.80	0.81	-0.02	9.68	-9.68	109.80	0.81	0.74	-0.02	0.00	121	1198.30	1198.30	182.3	0.74	0.000	1.628	14.2	6	19	29	79.9	57.37	10.51	43.83	41.27	########	########	182.3	Yes	137.1	1.722	Yes	137.1	1.722	0.5	10514.51	57.37	1.33	137.90	1.05	145.16	0.977	0.3539	1.32	10.51	13.85	5.97	No
3.000	108.80	0.81	0.02	9.84	-9.84	108.80	0.81	0.74	0.02	0.00	121	1218.14	1218.14	177.6	0.75	0.000	1.639	14.7	6	19	29	79.2	58.32	10.42	43.70	41.19	########	########	177.6	Yes	134.8	1.730	Yes	134.8	1.730	0.5	10418.74	58.32	1.32	135.53	1.06	143.43	0.977	0.3537	1.31	10.42	13.63	5.99	No
3.050	106.80	0.84	0.18	10.01	-10.01	106.80	0.84	0.79	0.18	0.00	121	1237.98	1237.98	171.5	0.79	0.000	1.667	15.8	6	19	28	78.2	59.27	10.23	43.53	41.06	########	########	171.5	Yes	131.2	1.755	Yes	131.2	1.755	0.5	10227.22	59.27	1.31	131.97	1.07	141.83	0.977	0.3536	1.30	10.23	13.29	6.01	No
3.100	102.20	0.86	0.02	10.17	-10.17	102.20	0.86	0.84	0.02	0.00	121	1257.82	1257.82	161.5	0.85	0.000	1.706	17.5	6	18	27	76.2	60.22	9.79	43.23	40.81	########	########	161.5	Yes	124.5	1.791	Yes	124.5	1.791	0.5	9786.73	60.22	1.30	125.28	1.10	137.82	0.976	0.3535	1.29	9.79	12.63	6.03	No
3.150	97.90	0.86	-0.16	10.33	-10.33	97.90	0.86	0.88	-0.16	0.00	121	1277.66	1277.66	152.2	0.88	0.000	1.737	18.8	6	17	26	74.2	61.17	9.37	42.94	40.57	########	########	152.2	Yes	118.3	1.820	Yes	118.3	1.820	0.5	9374.95	61.17	1.29	119.08	1.12	133.55	0.976	0.3533	1.28	9.37	12.02	6.05	No
3.200	99.05	0.87	-0.23	10.50	-10.50	99.05	0.87	0.88	-0.23	0.00	121	1297.50	1297.50	151.7	0.88	0.000	1.739	18.9	6	18	26	74.3	62.12	9.49	42.92	40.59	########	########	151.7	Yes	118.8	1.819	Yes	118.8	1.819	0.5	9485.08	62.12	1.28	119.55	1.12	133.96	0.976	0.3532	1.27	9.49	12.08	6.07	No
3.250	100.20	0.92	-0.14	10.66	-10.66	100.20	0.92	0.92	-0.14	0.00	121	1317.34	1317.34	151.1	0.92	0.000	1.753	19.5	6	18	26	74.4	63.07	9.60	42.90	40.61	########	########	151.1	Yes	119.2	1.830	Yes	119.2	1.830	0.5	9595.20	63.07	1.27	120.02	1.13	135.51	0.975	0.3530	1.27	9.60	12.14	6.09	No
3.300	105.80	0.99	-0.05	10.83	-10.83	105.80	0.99	0.94	-0.05	0.00	121	1337.19	1337.19	157.2	0.94	0.000	1.746	19.2	6	19	27	76.2	64.02	10.13	43.10	40.83	########	########	157.2	Yes	125.0	1.820	Yes	125.0	1.820	0.5	10131.46	64.02	1.26	125.79	1.12	141.03	0.975	0.3529	1.26	10.13	12.74	6.11	No
3.350	113.00	1.04	0.32	10.99	-10.99	113.00	1.04	0.92	0.32	0.00	121	1357.03	1357.03	165.5	0.93	0.000	1.724	18.3	6	20	28	78.4	64.97	10.82	43.36	41.11	########	########	165.5	Yes	132.6	1.796	Yes	132.6	1.796	0.5	10820.94	64.97	1.25	133.36	1.10	147.15	0.974	0.3528	1.25	10.82	13.51	6.13	No
3.400	119.80	1.00	0.48	11.15	-11.15	119.80	1.00	0.83	0.48	0.00	121	1376.87	1376.87	173.0	0.84	0.000	1.681	16.5	6	21	29	80.3	65.92	11.47	43.57	41.35	########	########	173.0	Yes	139.6	1.751	Yes	139.6	1.751	0.5	11472.11	65.92	1.24	140.37	1.07	150.49	0.974	0.3526	1.24	11.47	14.24	6.15	No
3.450	125.10	0.92	0.55	11.32	-11.32	125.10	0.92	0.74	0.55	0.00	121	1396.71	1396.71	178.1	0.74	0.000	1.635	14.5	6	22	30	81.7	66.87	11.98	43.72	41.53	########	########	178.1	Yes	144.7	1.703	Yes	144.7	1.703	0.5	11979.64	66.87	1.23	145.53	1.04	151.34	0.974	0.3525	1.23	11.98	14.77	6.17	No
3.500	130.40	0.79	0.55	11.48	-11.48	130.40	0.79	0.61	0.55	0.00	121	1416.55	1416.55	183.1	0.61	0.000	1.571	11.8	6	22	30	83.0	67.82	12.49	43.85	41.69	########	########	183.1	Yes	149.8	1.639	Yes	149.8	1.639	0.5	12487.17	67.82	1.22	150.63	1.00	150.63	0.973	0.3524	1.23	12.49	15.30	6.18	No
3.550	133.90	0.78	0.55	11.65	-11.65	133.90	0.78	0.58	0.55	0.00	121	1436.39	1436.39	185.4	0.59	0.000	1.556	11.1	6	22	30	83.7	68.77	12.82	43.91	41.79	########	########	185.4	Yes	152.8	1.621	Yes	152.8	1.621	0.5	12822.33	68.77	1.21	153.60	1.00	153.60	0.973	0.3522	1.22	12.82	15.61	6.20	No
3.600	122.70	0.73	0.55	11.81	-11.81	122.70	0.73	0.59	0.55	0.00	121	1456.23	1456.23	167.5	0.60	0.000	1.596	12.8	6	21	28	80.1	69.72	11.75	43.41	41.34	########	########	167.5	Yes	139.0	1.660	Yes	139.0	1.660	0.5	11749.82	69.72	1.21	139.79	1.01	141.24	0.972	0.3521	1.21	11.75	14.21	6.22	No
3.650	125.20	0.70	0.55	11.98	-11.98	125.20	0.70	0.56	0.55	0.00	121	1476.07	1476.07	168.6	0.56	0.000	1.577	12.0	6	21	28	80.6	70.67	11.99	43.45	41.40	########	########	168.6	Yes	140.8	1.639	Yes	140.8	1.639	0.5	11989.22	70.67	1.20	141.68	1.00	141.68	0.972	0.3519	1.20	11.99	14.41	6.23	No
3.700	127.70	0.74	0.55	12.14	-12.14	127.70	0.74	0.58	0.55	0.00	121	1495.91	1495.91	169.7	0.58	0.000	1.584	12.3	6	22	28	81.0	71.62	12.23	43.48	41.46	########	########	169.7	Yes	142.7	1.644	Yes	142.7	1.644	0.5	12228.62	71.62	1.19	143.54	1.00	143.39	0.972	0.3518	1.19	12.23	14.61	6.25	No
3.750	128.30	0.77	0.55	12.30	-12.30	128.30	0.77	0.60	0.55	0.00	121	1515.76	1515.76	168.3	0.60	0.000	1.597	12.9	6	22	28	80.9	72.57	12.29	43.44	41.45	########	########	168.3	Yes	142.4	1.654	Yes	142.4	1.654	0.5	12286.07	72.57	1.18	143.27	1.01	144.12	0.971	0.3517	1.19	12.29	14.59	6.27	No
3.800	121.20	0.86	0.55	12.47	-12.47	121.20	0.86	0.71	0.55	0.00	121	1535.60	1535.60	156.9	0.71	0.000	1.667	15.8	6	21	27	78.5	73.52	11.61	43.09	41.15	########	########	156.9	Yes	133.6	1.720	Yes	133.6	1.720	0.5	11606.18	73.52	1.17	134.47	1.05	141.40	0.971	0.3515	1.18	11.61	13.69	6.29	No
3.850	108.70	0.93	0.55	12.63	-12.63	108.70	0.93	0.86	0.55	0.00	121	1555.44	1555.44	138.8	0.86	0.000	1.760	19.8	6	20	25	74.0	74.47	10.41	42.47	40.60	########	########	138.8	Yes	119.0	1.811	Yes	119.0	1.811	0.5	10409.17	74.47	1.17	119.83	1.11	133.58	0.971	0.3514	1.17	10.41	12.21	6.31	No
3.900	98.90	0.94	0.55	12.80	-12.80	98.90	0.94	0.95	0.55	0.00	121	1575.28	1575.28	124.6	0.96	0.000	1.826	22.6	6	18	23	70.2	75.42	9.47	41.91	40.12	########	########	124.6	Yes	107.5	1.874	Yes	107.5	1.874	0.5	9470.72	75.42	1.16	108.33	1.17	126.28	0.970	0.3512	1.17	9.47	11.04	6.32	No
3.950	85.10	0.88	0.55	12.96	-12.96	85.10	0.88	1.03	0.55	0.00	121	1595.12	1595.12	105.7	1.04	0.000	1.904	25.9	6	16	20	64.1	76.37	8.15	41.05	39.37	########	########	105.7	Yes	91.8	1.951	Yes	91.8	1.951	0.5	8149.22	76.37	1.15	92.64	1.24	114.95	0.970	0.3511	1.16	8.15	9.44	6.34	No
4.000	73.80	0.79	0.53	13.12	-13.12	73.80	0.79	1.07	0.53	0.00	121	1614.96	1614.96	90.4	1.08	0.000	1.966	28.5	6	14	18	58.4	77.32	7.07	40.20	38.66	########	########	90.4	Yes	79.0	2.012	Yes	79.0	2.012	0.5	7067.13	77.32	1.14	79.84	1.32	105.02	0.969	0.3510	1.15	7.07	8.14	6.36	No
4.050	73.00	0.82	0.37	13.29	-13.29	73.00	0.82	1.12	0.37	0.00	121	1634.80	1634.80	88.3	1.14	0.000	1.987	29.4	6	14	17	57.7	78.27	6.99	40.08	38.58	########	########	88.3	Yes	77.6	2.031	Yes	77.6	2.031	0.5	6990.52	78.27	1.14	78.49	1.34	105.34	0.969	0.3508	1.14	6.99	8.00	6.37	No
4.100	74.80	0.86	0.28	13.45	-13.45	74.80	0.86	1.15	0.28	0.00	121	1654.64	1654.64	89.4	1.16	0.000	1.990	29.5	6	15	18	58.4	79.22	7.16	40.14	38.67	########	########	89.4	Yes	79.1	2.031	Yes	79.1	2.031	0.5	7162.89	79.22	1.13	79.95	1.34	107.30	0.969	0.3507	1.14	7.16	8.15	6.39	No
4.150	76.60	0.91	0.23	13.62	-13.62	76.60	0.91	1.19	0.23	0.00	121	1674.48	1674.48	90.5	1.20	0.000	1.995	29.8	6	15	18	59.1	80.17	7.34	40.21	38.75	########	########	90.5	Yes	80.5	2.034	Yes	80.5	2.034	0.5	7335.26	80.17	1.12	81.38	1.35	109.58	0.968	0.3506	1.13	7.34	8.30	6.40	No
4.200	79.40	0.89	0.30	13.78	-13.78	79.40	0.89	1.12	0.30	0.00	121	1694.33	1694.33	92.7	1.13	0.000	1.970	28.7	6	15	18	60.2	81.12	7.60	40.34	38.89	########	########	92.7	Yes	83.0	2.007	Yes	83.0	2.007	0.5	7603.39	81.12	1.12	83.86	1.31	109.84	0.968	0.3504	1.12	7.60	8.55	6.42	No
4.250	77.00	0.84	0.37	13.94	-13.94	77.00	0.84	1.09	0.37	0.00	121	1714.17	1714.17	88.8	1.10	0.000	1.977	29.0	6	15	18	58.8	82.07	7.37	40.11	38.72	########	########	88.8	Yes	80.0	2.013	Yes	80.0	2.013	0.5	7373.56	82.07	1.11	80.86	1.32	106.46	0.967	0.3503	1.12	7.37	8.24	6.43	No
4.300	79.60	0.89	0.35	14.11	-14.11	79.60	0.89	1.12	0.35	0.00	121	1734.01	1734.01	90.8	1.13	0.000	1.977	29.0	6	16	18	59.8	83.02	7.62	40.23	38.85	########	########	90.8	Yes	82.2	2.010	Yes	82.2	2.010	0.5	7622.54	83.02	1.10	83.11	1.31	109.13	0.967	0.3501	1.11	7.62	8.47	6.45	No
4.350	88.20	0.93	0.18	14.27	-14.27	88.20	0.93	1.05	0.18	0.00	121	1753.85	1753.85	99.6	1.06	0.000	1.929	27.0	6	17	20	63.5	83.97	8.45	40.73	39.31	########	########	99.6	Yes	90.7	1.961	Yes	90.7	1.961	0.5	8446.08	83.97	1.10	91.56	1.25	114.62	0.967	0.3500	1.11	8.45	9.33	6.47	No
4.400	98.70	1.08	0.18	14.44	-14.44	98.70	1.08	1.09	0.18	0.00	121	1773.69	1773.69	110.3	1.10	0.000	1.906	26.0	6	19	21	67.6	84.92	9.45	41.27	39.82	########	########	110.3	Yes	101.0	1.935	Yes	101.0	1.935	0.5	9451.56	84.92	1.09	101.89	1.22	124.67	0.966	0.3499	1.10	9.45	10.39	6.48	No
4.450	112.80	1.08	0.18	14.60	-14.60	112.80	1.08	0.96	0.18	0.00	121	1793.53	1793.53	124.8	0.97	0.000	1.827	22.6	6	21	24	72.5	85.87	10.80	41.92	40.44	########	########	124.8	Yes	114.9	1.854	Yes	114.9	1.854	0.5	10801.79	85.87	1.09	115.80	1.15	133.01	0.966	0.3497	1.09	10.80	11.80	6.50	No
4.500	118.90	1.09	0.18	14.76	-14.76	118.90	1.09	0.92	0.18	0.00	121	1813.37	1813.37	130.1	0.92	0.000	1.801	21.5	6	22	24	74.2	86.82	11.39	42.14	40.66	########	########	130.1	Yes	120.5	1.826	Yes	120.5	1.826	0.5	11385.93	86.82	1.08	121.39	1.13	136.72	0.966	0.3496	1.09	11.39	12.37	6.51	No
4.550	136.70	1.05	0.18	14.93	-14.93	136.70	1.05	0.77	0.18	0.00	121	1833.21	1833.21	148.1	0.77	0.000	1.708	17.6	6	24	27	79.4	87.77	13.09	42.80	41.30	########	########	148.1	Yes	137.9	1.732	Yes	137.9	1.732	0.5	13090.46	87.77	1.07	138.81	1.06	147.02	0.965	0.3494	1.08	13.09	14.14	6.53	No
4.600	132.20	0.89	0.18	15.09	-15.09	132.20	0.89	0.67	0.18	0.00	121	1853.05	1853.05	141.7	0.68	0.000	1.686	16.7	6	23	26	77.8	88.72	12.66	42.57	41.12	########	########	141.7	Yes	132.6	1.709	Yes	132.6	1.709	0.5	12659.54	88.72	1.07	133.52	1.04	139.39	0.965	0.3493	1.07	12.66	13.60	6.54	No
4.650	116.60	0.68	0.05	15.26	-15.26	116.60	0.68	0.58	0.05	0.00	121	1872.90	1872.90	123.5	0.59	0.000	1.697	17.1	6	21	23	72.8	89.67	11.17	41.87	40.49	########	########	123.5	Yes	116.2	1.718	Yes	116.2	1.718	0.5	11165.68	89.67	1.06	117.14	1.05	123.01	0.964	0.3492	1.07	11.17	11.93	6.55	No
4.700	94.60	0.64	0.02	15.42	-15.42	94.60	0.64	0.68	0.02	0.00	121	1892.74	1892.74	99.0	0.68	0.000	1.813	22.0	6	17	19	64.6	90.62	9.06	40.69	39.47	########	########	99.0	Yes	93.6	1.833	Yes	93.6	1.833	0.5	9058.95	90.62	1.06	94.54	1.13	106.94	0.964	0.3490	1.06	9.06	9.62	6.57	No
4.750	71.80	0.70	0.18	15.58	-15.58	71.80	0.70	0.97	0.18	0.00	121	1912.58	1912.58	74.1	0.99	0.000	2.009	30.4	6	14	15	53.8	91.57	6.88	39.10	38.12	########	########	74.1	Yes	70.4	2.027	Yes	70.4	2.027	0.5	6875.61	91.57	1.05	71.38	1.34	95.39	0.964	0.3489	1.06	6.88	7.26	6.58	No
4.800	48.00	0.77	0.02	15.75	-15.75	48.00	0.77	1.60	0.02	0.00	118	1931.90	1931.90	48.7	1.64	0.000	2.288	42.2	5	11	11	38.2	92.50	4.60	36.67	36.18	########	########	48.7	Yes	46.5	2.303	Yes	46.5	2.303	0.5	4596.50	92.50	1.05	47.48	1.96	93.02	0.963	0.3488	1.05	4.60	4.83	6.60	Yes
4.850	29.00	0.96	-0.07	15.91	-15.91	29.00	0.96	3.31	-0.07	0.00	115	1950.69	1950.69	28.7	3.43	0.000	2.669	58.4	4	8	8	########	########	########	########	########	3503.0	1.80	28.7	No	28.7	Non-liq.	No	28.7	Non-liq.	Non-liq.	2777.06	93.40	Non-liq.	Non-liq.	Non-liq.	########	0.963	0.3486	1.05	2.78	2.90	6.61	Yes
4.900	20.70	0.83	0.07	16.08	-16.08	20.70	0.83	4.01	0.07	0.00	115	1969.49	1969.49	20.0	4.21	0.000	2.847	65.9	4	6	6	########	########	########	########	########	2464.5	1.25	20.0	No	20.0	Non-liq.	No	20.0	Non-liq.	Non-liq.	1982.24	94.30	Non-liq.	Non-liq.	Non-liq.	########	0.963	0.3485	1.04	1.98	2.06	6.62	Yes
4.950	27.65	0.87	0.21	16.24	-16.24	27.65	0.87	3.15	0.21	0.00	115	1988.29	1988.29	26.8	3.26	0.000	2.678	58.8	4	7	8	########	########	########	########	########	3332.1	1.68	26.8	No	26.8	Non-liq.	No	26.8	Non-liq.	Non-liq.	2647.78	95.20	Non-liq.	Non-liq.	Non-liq.	########	0.962	0.3483	1.03	2.65	2.74	6.64	Yes
5.000	34.60	0.91	3.21	16.40	-16.40	34.62	0.91	2.63	3.21	0.00	118	2007.61	2007.61	33.5	2.71	0.003	2.552	53.4	5	9	9	24.8	96.12	3.31	34.38	34.52	########	########	33.5	Yes	32.6	2.561	Yes	32.6	2.561	0.5	3313.31	96.12	1.03	33.57	3.10	103.99	0.962	0.3482	1.03	3.31	3.41	6.65	Yes
5.050	42.50	1.00	3.09	16.57	-16.57	42.52	1.00	2.35	3.09	0.00	118	2026.92	2026.92	41.0	2.41	0.002	2.453	49.2	5	10	10	32.5	97.05	4.07	35.62	35.48	########	########	40.9	Yes	40.1	2.460	Yes	40.1	2.460	0.5	4069.82	97.05	1.02	41.04	2.58	105.70	0.961	0.3481	1.02	4.07	4.17	6.66	Yes
5.100	49.30	0.94	-0.05	16.73	-16.73	49.30	0.94	1.91	-0.05	0.00	118	2046.24	2046.24	47.2	1.95	0.000	2.346	44.7	5	11	11	38.0	97.97	4.72	36.48	36.17	########	########	47.2	Yes	46.4	2.352	Yes	46.4	2.352	0.5	4720.99	97.97	1.02	47.38	2.13	100.74	0.961	0.3479	1.02	4.72	4.81	6.68	Yes
5.150	54.90	0.80	-0.51	16.90	-16.90	54.90	0.80	1.46	-0.51	0.00	118	2065.56	2065.56	52.2	1.49	0.000	2.238	40.1	5	12	12	41.9	98.90	5.26	37.08	36.66	########	########	52.2	Yes	51.5	2.242	Yes	51.5	2.242	0.5	5257.25	98.90	1.01	52.52	1.78	93.30	0.961	0.3478	1.01	5.26	5.33	6.69	Yes
5.200	57.20	0.79	-0.58	17.06	-17.06	57.20	0.79	1.38	-0.58	0.00	118	2084.88	2084.88	53.9	1.41	0.000	2.212	39.0	5	12	12	43.3	99.82	5.48	37.27	36.83	########	########	53.9	Yes	53.5	2.215	Yes	53.5	2.215	0.5	5477.50	99.82	1.01	54.46	1.70	92.82	0.960	0.3476	1.01	5.48	5.52	6.70	Yes
5.250	57.50	0.78	-0.53	17.22	-17.22	57.50	0.78	1.36	-0.53	0.00	118	2104.20	2104.20	53.6	1.38	0.000	2.209	38.8	5	12	12	43.3	100.75	5.51	37.25	36.84	########	########	53.7	Yes	53.5	2.210	Yes	53.5	2.210	0.5	5506.23	100.75	1.00	54.50	1.69	92.19	0.960	0.3475	1.00	5.51	5.52	6.72	Yes
5.300	56.30	0.77	-0.51	17.39	-17.39	56.30	0.77	1.37	-0.51	0.00	118	2123.52	2123.52	52.0	1.39	0.000	2.222	39.4	5	12	12	42.3	101.67	5.39	37.06	36.71	########	########	52.0	Yes	52.1	2.221	Yes	52.1	2.221	0.5	5391.32	101.67	1.00	53.12	1.72	91.40	0.959	0.3474	1.00	5.39	5.38	6.73	Yes
5.350	54.90	0.73	-0.51	17.55	-17.55	54.90	0.73	1.33	-0.51	0.00	118	2142.84	2142.84	50.2	1.36	0.000	2.227	39.6	5	12	12	41.1	102.60	5.26	36.86	36.57	########	########	50.2	Yes	50.6	2.224	Yes	50.6	2.224	0.5	5257.25	102.60	0.99	51.56	1.73	89.15	0.959	0.3472	0.99	5.26	5.22	6.74	Yes
5.400	52.10	0.71	-0.99	17.72	-17.72	52.09	0.71	1.36	-0.99	0.00	118	2162.16	2162.16	47.2	1.39	-0.001	2.255	40.8	5	11	11	38.9	103.52	4.99	36.48	36.30	########	########	47.2	Yes	47.7	2.251	Yes	47.7	2.251	0.5	4989.12	103.52	0.99	48.71	1.80	87.79	0.959	0.3471	0.99	4.99	4.93	6.75	Yes
5.450	48.80	0.70	-1.04	17.88	-17.88	48.79	0.70	1.43	-1.04	0.00	118	2181.48	2181.48	43.7	1.47	-0.001	2.295	42.5	5	11	11	36.2	104.45	4.67	36.03	35.97	########	########	43.7	Yes	44.4	2.290	Yes	44.4	2.290	0.5	4673.11	104.45	0.98	45.42	1.92	87.08	0.958	0.3470	0.98	4.67	4.59	6.77	Yes
5.500	49.10	0.74	-1.34	18.04	-18.04	49.09	0.74	1.51	-1.34	0.00	118	2200.80	2200.80	43.6	1.54	-0.001	2.309	43.1	5	11	11	36.3	105.37	4.70	36.01	35.97	########	########	43.6	Yes	44.5	2.303	Yes	44.5	2.303	0.5	4701.84	105.37	0.98	45.50	1.96	89.04	0.958	0.3468	0.98	4.70	4.60	6.78	Yes
5.550	49.40	0.79	-2.40	18.21	-18.21	49.39	0.79	1.60	-2.40	0.00	118	2220.11	2220.11	43.5	1.64	-0.002	2.326	43.8	5	11	11	36.3	106.30	4.73	35.99	35.98	########	########	43.5	Yes	44.6	2.318	Yes	44.6	2.318	0.5	4730.57	106.30	0.98	45.58	2.01	91.50	0.958	0.3467	0.97	4.73	4.60	6.79	Yes
5.600	49.40	0.90	-2.77	18.37	-18.37	49.39	0.90	1.82	-2.77	0.00	118	2239.43	2239.43	43.1	1.86	-0.002	2.364	45.4	5	11	11	36.1	107.22	4.73	35.94	35.96	########	########	43.1	Yes	44.4	2.355	Yes	44.4	2.355	0.5	4730.57	107.22	0.97	45.38	2.14	97.01	0.957	0.3465	0.97	4.73	4.58	6.80	Yes
5.650	45.00	0.90	-2.81	18.54	-18.54	44.99	0.90	2.00	-2.81	0.00	118	2258.75	2258.75	38.8	2.05	-0.002	2.426	48.0	5	11	10	32.4	108.15	4.31	35.30	35.49	########	########	38.8	Yes	40.1	2.415	Yes	40.1	2.415	0.5	4309.22	108.15	0.97	41.17	2.37	97.73	0.957	0.3464	0.96	4.31	4.15	6.82	Yes
5.700	30.60	0.91	-2.81	18.70	-18.70	30.59	0.91	2.97	-2.81	0.00	115	2277.55	2277.55	25.9	3.09	-0.003	2.675	58.6	4	8	8	########	########	########	########	########	3680.8	1.62	25.9	No	25.9	Non-liq.	No	25.9	Non-liq.	Non-liq.	2930.27	109.05	Non-liq.	Non-liq.	Non-liq.	########	0.956	0.3463	0.96	2.93	2.81	6.83	Yes
5.750	27.80	0.91	-2.84	18.86	-18.86	27.78	0.91	3.27	-2.84	0.00	115	2296.35	2296.35	23.2	3.42	-0.003	2.739	61.3	4	8	7	########	########	########	########	########	3329.6	1.45	23.2	No	23.2	Non-liq.	No	23.2	Non-liq.	Non-liq.	2662.14	109.95	Non-liq.	Non-liq.	Non-liq.	########	0.956	0.3461	0.95	2.66	2.54	6.84	Yes
5.800	29.75	0.86	-2.86	19.03	-19.03	29.73	0.86	2.89	-2.86	0.00	115	2315.14	2315.14	24.7	3.01	-0.003	2.683	59.0	4	8	7	########	########	########	########	########	3572.2	1.54	24.7	No	24.7	Non-liq.	No	24.7	Non-liq.	Non-liq.	2848.88	110.85	Non-liq.	Non-liq.	Non-liq.	########	0.956	0.3460	0.95	2.85	2.71	6.85	Yes
5.850	31.70	0.86	-2.24	19.19	-19.19	31.69	0.86	2.71	-2.24	0.00	115	2333.94	2333.94	26.2	2.82	-0.002	2.646	57.4	4	8	8	########	########	########	########	########	3815.1	1.63	26.2	No	26.2	Non-liq.	No	26.2	Non-liq.	Non-liq.	3035.61	111.75	Non-liq.	Non-liq.	Non-liq.	########	0.955	0.3458	0.95	3.04	2.87	6.86	Yes
5.900	27.50	0.70	-4.29	19.36	-19.36	27.48	0.70	2.55	-4.29	0.00	115	2352.74	2352.74	22.4	2.66	-0.005	2.684	59.0	4	7	7	########	########	########	########	########	3287.6	1.40	22.4	No	22.4	Non-liq.	No	22.4	Non-liq.	Non-liq.	2633.41	112.65	Non-liq.	Non-liq.	Non-liq.	########	0.955	0.3457	0.94	2.63	2.48	6.87	Yes
5.950	24.90	0.65	-5.24	19.52	-19.52	24.87	0.65	2.61	-5.24	0.00	115	2371.53	2371.53	20.0	2.74	-0.007	2.731	61.0	4	7	6	########	########	########	########	########	2960.8	1.25	20.0	No	20.0	Non-liq.	No	20.0	Non-liq.	Non-liq.	2384.44	113.55	Non-liq.	Non-liq.	Non-liq.	########	0.954	0.3456	0.94	2.38	2.23	6.89	Yes
6.000	41.70	0.66	-6.16	19.68	-19.68	41.67	0.66	1.58	-6.16	0.00	118	2390.85	2390.85	33.9	1.63	-0.005	2.412	47.4	5	10	9	28.3	114.47	3.99	34.46	35.00	########	########	33.9	Yes	36.0	2.390	Yes	36.0	2.390	0.5	3993.21	114.47	0.94	37.08	2.27	84.28	0.954	0.3454	0.93	3.99	3.72	6.90	Yes
6.050	58.50	0.66	-5.77	19.85	-19.85	58.47	0.66	1.13	-5.77	0.00	118	2410.17	2410.17	47.5	1.15	-0.003	2.204	38.6	5	12	11	41.1	115.40	5.60	36.53	36.59	########	########	47.5	Yes	50.7	2.181	Yes	50.7	2.181	0.5	5601.99	115.40	0.94	51.81	1.62	84.00	0.954	0.3453	0.93	5.60	5.20	6.91	Yes
6.100	97.50	0.84	-7.31	20.01	-20.01	97.46	0.84	0.86	-7.31	0.00	121	2430.01	2430.01	79.2	0.87	-0.002	1.954	28.0	6	19	17	60.5	116.35	9.34	39.48	39.01	########	########	79.2	Yes	84.9	1.929	Yes	84.9	1.929	0.5	9336.65	116.35	0.93	85.99	1.22	104.72	0.953	0.3452	0.92	9.34	8.63	6.92	No
6.150	128.20	1.09	-4.29	20.18	-20.18	128.18	1.09	0.85	-4.29	0.00	121	2449.85	2449.85	103.6	0.86	-0.001	1.857	23.9	6	24	21	70.8	117.30	12.28	40.94	40.30	########	########	103.7	Yes	111.5	1.832	Yes	111.5	1.832	0.5	12276.50	117.30	0.93	112.61	1.13	127.30	0.953	0.3450	0.92	12.28	11.29	6.93	No
6.200	167.00	1.05	-1.25	20.34	-20.34	166.99	1.05	0.63	-1.25	0.00	121	2469.69	2469.69	134.2	0.63	0.000	1.687	16.7	6	29	26	80.7	118.25	15.99	42.30	41.55	########	########	134.2	Yes	145.0	1.660	Yes	145.0	1.660	0.5	15992.01	118.25	0.93	146.10	1.01	147.64	0.953	0.3449	0.92	15.99	14.63	6.94	No
6.250	232.60	1.28	-0.81	20.51	-20.51	232.60	1.28	0.55	-0.81	0.00	121	2489.54	2489.54	185.9	0.55	0.000	1.539	10.4	6	39	34	93.3	119.20	22.27	43.93	43.11	########	########	185.9	Yes	201.6	1.512	Yes	201.6	1.512	0.5	22273.90	119.20	0.92	202.68	1.00	202.68	0.952	0.3447	0.91	22.27	20.29	6.96	No
6.300	239.60	1.50	-0.51	20.67	-20.67	239.60	1.50	0.63	-0.51	0.00	121	2509.38	2509.38	190.0	0.63	0.000	1.568	11.6	6	40	35	94.2	120.15	22.94	44.03	43.23	########	########	190.0	Yes	206.9	1.540	Yes	206.9	1.540	0.5	22944.22	120.15	0.92	207.95	1.00	207.95	0.952	0.3446	0.91	22.94	20.80	6.97	No
6.350	313.60	2.77	-0.51	20.83	-20.83	313.60	2.77	0.88	-0.51	0.00	121	2529.22	2529.22	247.0	0.89	0.000	1.589	12.5	6	53	46	100.0	121.10	30.03	45.28	44.50	########	########	247.0	Yes	270.0	1.563	Yes	270.0	1.563	0.5	30030.50	121.10	0.91	271.10	1.00	271.10	0.951	0.3445	0.90	30.03	27.09	6.98	No
6.400	316.40	3.79	-0.42	21.00	-21.00	316.40	3.79	1.20	-0.42	0.00	121	2549.06	2549.06	247.2	1.20	0.000	1.688	16.8	6	56	48	100.0	122.05	30.30	45.29	44.52	########	########	247.2	Yes	271.4	1.663	Yes	271.4	1.663	0.5	30298.63	122.05	0.91	272.46	1.01	275.81	0.951	0.3443	0.90	30.30	27.21	6.99	No
6.450	350.90	4.26	-0.35	21.16	-21.16	350.90	4.26	1.21	-0.35	0.00	121	2568.90	2568.90	272.2	1.22	0.000	1.666	15.8	6	61	53	100.0	123.00	33.60	45.73	45.00	########	########	272.2	Yes	299.9	1.641	Yes	299.9	1.641	0.5	33602.37	123.00	0.91	301.00	1.00	299.95	0.951	0.3442	0.89	33.60	30.03	7.00	No
6.500	362.60	2.34	-0.35	21.33	-21.33	362.60	2.34	0.65	-0.35	0.00	121	2588.74	2588.74	279.1	0.65	0.000	1.453	6.8	6	59	50	100.0	123.95	34.72	45.85	45.14	########	########	279.1	Yes	308.7	1.423	Yes	308.7	1.423	0.5	34722.76	123.95	0.90	309.84	1.00	309.84	0.950	0.3440	0.89	34.72	30.89	7.01	No
6.550	373.10	2.42	-0.16	21.49	-21.49	373.10	2.42	0.65	-0.16	0.00	121	2608.58	2608.58	285.1	0.65	0.000	1.449	6.6	6	61	52	100.0	124.90	35.73	45.94	45.26	########	########	285.1	Yes	316.5	1.417	Yes	316.5	1.417	0.5	35728.25	124.90	0.90	317.59	1.00	317.59	0.950	0.3439	0.89	35.73	31.64	7.02	No
6.600	370.60	2.50	0.07	21.65	-21.65	370.60	2.50	0.67	0.07	0.00	121	2628.42	2628.42	281.0	0.68	0.000	1.465	7.3	6	60	51	100.0	125.85	35.49	45.88	45.21	########	########	281.0	Yes	313.2	1.433	Yes	313.2	1.433	0.5	35488.85	125.85	0.90	314.27	1.00	314.27	0.950	0.3438	0.88	35.49	31.28	7.04	No
6.650	366.10	2.36	0.42	21.82	-21.82	366.10	2.36	0.64	0.42	0.00	121	2648.26	2648.26	275.5	0.65	0.000	1.457	7.0	6	60	50	100.0	126.80	35.06	45.79	45.13	########	########	275.5	Yes	308.2	1.423	Yes	308.2	1.423	0.5	35057.93	126.80	0.89	309.29	1.00	309.29	0.949	0.3436	0.88	35.06	30.76	7.05	No
6.700	363.90	2.15	0.21	21.98	-21.98	363.90	2.15	0.59	0.21	0.00	121	2668.11	2668.11	271.8	0.59	0.000	1.435	6.0	6	59	49	100.0	127.75	34.85	45.72	45.08	########	########	271.8	Yes	305.2	1.399	Yes	305.2	1.399	0.5	34847.25	127.75	0.89	306.29	1.00	306.29	0.949	0.3435	0.87	34.85	30.44	7.06	No
6.750	326.60	2.09	1.25	22.15	-22.15	326.61	2.09	0.64	1.25	0.00	121	2687.95	2687.95	242.0	0.64	0.000	1.495	8.6	6	54	45	100.0	128.70	31.28	45.19	44.55	########	########	242.0	Yes	272.8	1.458	Yes	272.8	1.458	0.5	31275.39	128.70	0.89	273.88	1.00	273.88	0.948	0.3434	0.87	31.28	27.19	7.07	No
6.800	325.25	2.03	0.55	22.31	-22.31	325.25	2.03	0.62	0.55	0.00	121	2707.79	2707.79	239.2	0.63	0.000	1.492	8.4	6	54	44	100.0	129.65	31.15	45.13	44.51	########	########	239.2	Yes	270.6	1.453	Yes	270.6	1.453	0.5	31146.11	129.65	0.88	271.74	1.00	271.74	0.948	0.3432	0.87	31.15	26.96	7.08	No
6.850	328.07	2.06	0.78	22.47	-22.47	328.07	2.06	0.63	0.78	0.00	121	2727.63	2727.63	239.6	0.63	0.000	1.493	8.5	6	54	44	100.0	130.60	31.42	45.14	44.53	########	########	239.6	Yes	272.0	1.453	Yes	272.0	1.453	0.5	31416.15	130.60	0.88	273.10	1.00	273.10	0.948	0.3431	0.86	31.42	27.07	7.09	No
6.900	330.90	2.08	1.04	22.64	-22.64	330.91	2.08	0.63	1.04	0.00	121	2747.47	2747.47	239.9	0.63	0.000	1.493	8.5	6	54	45	100.0	131.55	31.69	45.15	44.56	########	########	239.9	Yes	273.3	1.452	Yes	273.3	1.452	0.5	31687.16	131.55	0.88	274.46	1.00	274.46	0.947	0.3429	0.86	31.69	27.18	7.10	No
6.950	347.40	2.06	2.38	22.80	-22.80	347.41	2.06	0.59	2.38	0.00	121	2767.31	2767.31	250.1	0.60	0.000	1.462	7.2	6	57	46	100.0	132.50	33.27	45.34	44.77	########	########	250.1	Yes	286.0	1.420	Yes	286.0	1.420	0.5	33267.20	132.50	0.87	287.11	1.00	287.11	0.947	0.3428	0.85	33.27	28.41	7.11	No
7.000	328.60	1.80	2.26	22.97	-22.97	328.61	1.80	0.55	2.26	0.00	121	2787.15	2787.15	234.8	0.55	0.000	1.460	7.1	6	54	43	100.0	133.45	31.47	45.04	44.49	########	########	234.8	Yes	269.5	1.415	Yes	269.5	1.415	0.5	31466.91	133.45	0.87	270.61	1.00	270.61	0.946	0.3427	0.85	31.47	26.75	7.12	No
7.050	323.40	2.12	2.63	23.13	-23.13	323.41	2.12	0.66	2.63	0.00	121	2806.99	2806.99	229.4	0.66	0.000	1.520	9.6	6	54	43	100.0	134.40	30.97	44.94	44.40	########	########	229.4	Yes	264.2	1.475	Yes	264.2	1.475	0.5	30968.95	134.40	0.87	265.38	1.00	265.38	0.946	0.3425	0.85	30.97	26.22	7.13	No
7.100	325.55	2.44	2.49	23.29	-23.29	325.56	2.44	0.75	2.49	0.00	121	2826.83	2826.83	229.3	0.75	0.000	1.560	11.3	6	55	44	100.0	135.35	31.17	44.93	44.41	########	########	229.3	Yes	265.0	1.516	Yes	265.0	1.516	0.5	31174.84	135.35	0.87	266.21	1.00	266.21	0.946	0.3424	0.84	31.17	26.27	7.14	No
7.150	327.70	2.91	2.54	23.46	-23.46	327.71	2.91	0.89	2.54	0.00	121	2846.68	2846.68	229.2	0.89	0.000	1.613	13.6	6	56	45	100.0	136.30	31.38	44.93	44.43	########	########	229.2	Yes	265.9	1.569	Yes	265.9	1.569	0.5	31380.72	136.30	0.86	267.03	1.00	267.03	0.945	0.3422	0.84	31.38	26.33	7.15	No
7.200	342.60	2.67	2.61	23.62	-23.62	342.61	2.67	0.78	2.61	0.00	121	2866.52	2866.52	238.0	0.78	0.000	1.561	11.3	6	58	46	100.0	137.25	32.81	45.11	44.62	########	########	238.0	Yes	277.0	1.515	Yes	277.0	1.515	0.5	32807.55	137.25	0.86	278.20	1.00	278.20	0.945	0.3421	0.84	32.81	27.41	7.16	No
7.250	365.70	2.43	3.02	23.79	-23.79	365.72	2.43	0.66	3.02	0.00	121	2886.36	2886.36	252.4	0.67	0.000	1.494	8.5	6	60	47	100.0	138.20	35.02	45.38	44.92	########	########	252.4	Yes	294.8	1.446	Yes	294.8	1.446	0.5	35019.62	138.20	0.86	295.94	1.00	295.94	0.945	0.3420	0.83	35.02	29.13	7.17	No
7.300	381.50	2.33	2.95	23.95	-23.95	381.52	2.33	0.61	2.95	0.00	121	2906.20	2906.20	261.6	0.61	0.000	1.457	6.9	6	62	49	100.0	139.15	36.53	45.55	45.10	########	########	261.5	Yes	306.5	1.408	Yes	306.5	1.408	0.5	36532.64	139.15	0.85	307.67	1.00	307.67	0.944	0.3418	0.83	36.53	30.26	7.18	No
7.350	398.80	2.48	3.14	24.11	-24.11	398.82	2.48	0.62	3.14	0.00	121	2926.04	2926.04	271.6	0.62	0.000	1.451	6.7	6	65	50	100.0	140.10	38.19	45.72	45.30	########	########	271.6	Yes	319.4	1.401	Yes	319.4	1.401	0.5	38189.30	140.10	0.85	320.53	1.00	320.53	0.944	0.3417	0.82	38.19	31.49	7.19	No
7.400	391.20	2.63	3.32	24.28	-24.28	391.22	2.63	0.67	3.32	0.00	121	2945.88	2945.88	264.6	0.67	0.000	1.483	8.0	6	64	50	100.0	141.05	37.46	45.60	45.19	########	########	264.6	Yes	312.2	1.433	Yes	312.2	1.433	0.5	37461.52	141.05	0.85	313.36	1.00	313.36	0.943	0.3416	0.82	37.46	30.76	7.20	No
7.450	402.20	2.57	3.83	24.44	-24.44	402.22	2.57	0.64	3.83	0.00	121	2965.72	2965.72	270.2	0.64	0.000	1.460	7.1	6	66	51	100.0	142.00	38.51	45.70	45.31	########	########	270.2	Yes	319.9	1.409	Yes	319.9	1.409	0.5	38514.88	142.00	0.84	321.09	1.00	321.09	0.943	0.3414	0.82	38.51	31.49	7.21	No
7.500	381.40	2.55	4.34	24.61	-24.61	381.42	2.55	0.67	4.34	0.00	121	2985.56	2985.56	254.5	0.67	0.000	1.493	8.5	6	63	48	100.0	142.95	36.52	45.42	45.04	########	########	254.5	Yes	302.3	1.441	Yes	302.3	1.441	0.5	36523.06	142.95	0.84	303.47	1.00	303.47	0.943	0.3413	0.81	36.52	29.74	7.22	No
7.550	382.05	2.53	4.29	24.77	-24.77	382.07	2.53	0.66	4.29	0.00	121	3005.40	3005.40	253.3	0.66	0.000	1.491	8.4	6	63	48	100.0	143.90	36.59	45.40	45.03	########	########	253.2	Yes	301.8	1.438	Yes	301.8	1.438	0.5	36585.31	143.90	0.84	302.98	1.00	302.98	0.942	0.3411	0.81	36.59	29.66	7.23	No
7.600	382.70	2.40	4.11	24.93	-24.93	382.72	2.40	0.63	4.11	0.00	121	3025.25	3025.25	252.0	0.63	0.000	1.477	7.8	6	63	48	100.0	144.85	36.65	45.38	45.02	########	########	252.0	Yes	301.3	1.421	Yes	301.3	1.421	0.5	36647.55	144.85	0.84	302.50	1.00	302.50	0.942	0.3410	0.81	36.65	29.59	7.24	No
7.650	396.40	2.13	4.11	25.10	-25.10	396.42	2.13	0.54	4.11	0.00	121	3045.09	3045.09	259.4	0.54	0.000	1.422	5.5	6	64	48	100.0	145.80	37.96	45.51	45.18	########	########	259.4	Yes	311.1	1.364	Yes	311.1	1.364	0.5	37959.47	145.80	0.83	312.31	1.00	312.31	0.941	0.3409	0.80	37.96	30.52	7.25	No
7.700	411.60	2.13	4.13	25.26	-25.26	411.62	2.13	0.52	4.13	0.00	121	3064.93	3064.93	267.6	0.52	0.000	1.401	4.6	6	66	49	100.0	146.75	39.42	45.65	45.34	########	########	267.6	Yes	322.0	1.342	Yes	322.0	1.342	0.5	39415.03	146.75	0.83	323.23	1.00	323.23	0.941	0.3407	0.80	39.42	31.56	7.26	No
7.750	402.85	2.13	4.54	25.43	-25.43	402.87	2.13	0.53	4.54	0.00	121	3084.77	3084.77	260.2	0.53	0.000	1.416	5.2	6	65	48	100.0	147.70	38.58	45.52	45.22	########	########	260.2	Yes	314.1	1.356	Yes	314.1	1.356	0.5	38577.13	147.70	0.83	315.34	1.00	315.34	0.941	0.3406	0.80	38.58	30.76	7.27	No
7.800	404.43	2.11	4.57	25.59	-25.59	404.45	2.11	0.52	4.57	0.00	121	3104.61	3104.61	259.6	0.52	0.000	1.413	5.1	6	65	48	100.0	148.65	38.73	45.51	45.22	########	########	259.5	Yes	314.4	1.352	Yes	314.4	1.352	0.5	38728.43	148.65	0.83	315.57	1.00	315.57	0.940	0.3404	0.79	38.73	30.75	7.28	No
7.850	406.00	2.12	5.24	25.75	-25.75	406.03	2.12	0.52	5.24	0.00	121	3124.45	3124.45	258.9	0.52	0.000	1.414	5.1	6	65	48	100.0	149.60	38.88	45.50	45.23	########	########	258.9	Yes	314.6	1.352	Yes	314.6	1.352	0.5	38878.77	149.60	0.82	315.78	1.00	315.78	0.940	0.3403	0.79	38.88	30.74	7.29	No
7.900	416.40	2.12	4.82	25.92	-25.92	416.43	2.12	0.51	4.82	0.00	121	3144.29	3144.29	263.9	0.51	0.000	1.401	4.6	6	67	49	100.0	150.55	39.87	45.59	45.33	########	########	263.9	Yes	321.6	1.337	Yes	321.6	1.337	0.5	39874.68	150.55	0.82	322.85	1.00	322.85	0.940	0.3402	0.79	39.87	31.40	7.30	No
7.950	423.30	2.18	5.97	26.08	-26.08	423.33	2.18	0.52	5.97	0.00	121	3164.13	3164.13	266.6	0.52	0.000	1.401	4.6	6	68	50	100.0	151.50	40.54	45.64	45.40	########	########	266.6	Yes	325.9	1.337	Yes	325.9	1.337	0.5	40535.43	151.50	0.82	327.17	1.00	327.17	0.939	0.3400	0.78	40.54	31.79	7.31	No
8.000	427.10	2.74	7.13	26.25	-26.25	427.14	2.74	0.64	7.13	0.00	121	3183.97	3183.97	267.3	0.64	0.001	1.465	7.3	6	70	51	100.0	152.45	40.90	45.65	45.43	########	########	267.3	Yes	327.8	1.403	Yes	327.8	1.403	0.5	40899.32	152.45	0.82	329.07	1.00	329.07	0.939	0.3399	0.78	40.90	31.94	7.32	No
8.050	418.80	2.85	6.14	26.41	-26.41	418.83	2.85	0.68	6.14	0.00	121	3203.82	3203.82	260.5	0.68	0.000	1.491	8.4	6	69	50	100.0	153.40	40.10	45.53	45.32	########	########	260.4	Yes	320.4	1.429	Yes	320.4	1.429	0.5	40104.51	153.40	0.81	321.68	1.00	321.68	0.938	0.3398	0.78	40.10	31.20	7.33	No
8.100	424.35	3.29	6.18	26.57	-26.57	424.38	3.29	0.78	6.18	0.00	121	3223.66	3223.66	262.3	0.78	0.000	1.530	10.0	6	71	51	100.0	154.35	40.64	45.56	45.36	########	########	262.3	Yes	323.7	1.468	Yes	323.7	1.468	0.5	40635.98	154.35	0.81	324.94	1.00	324.94	0.938	0.3396	0.77	40.64	31.48	7.34	No
8.150	429.90	3.29	6.78	26.74	-26.74	429.94	3.29	0.77	6.78	0.00	121	3243.50	3243.50	264.1	0.77	0.000	1.523	9.8	6	71	51	100.0	155.30	41.17	45.59	45.41	########	########	264.1	Yes	326.9	1.461	Yes	326.9	1.461	0.5	41167.45	155.30	0.81	328.18	1.00	328.18	0.938	0.3395	0.77	41.17	31.77	7.35	No
8.200	424.70	3.08	6.44	26.90	-26.90	424.73	3.08	0.73	6.44	0.00	121	3263.34	3263.34	259.3	0.73	0.000	1.512	9.3	6	70	50	100.0	156.25	40.67	45.51	45.34	########	########	259.3	Yes	322.0	1.448	Yes	322.0	1.448	0.5	40669.49	156.25	0.80	323.22	1.00	323.22	0.937	0.3393	0.77	40.67	31.26	7.36	No
8.250	415.75	2.92	6.48	27.07	-27.07	415.78	2.92	0.70	6.48	0.00	121	3283.18	3283.18	252.3	0.71	0.000	1.511	9.2	6	69	49	100.0	157.20	39.81	45.38	45.22	########	########	252.3	Yes	314.2	1.445	Yes	314.2	1.445	0.5	39812.44	157.20	0.80	315.45	1.00	315.45	0.937	0.3392	0.77	39.81	30.48	7.37	No
8.300	406.80	2.93	6.55	27.23	-27.23	406.83	2.93	0.72	6.55	0.00	121	3303.02	3303.02	245.3	0.72	0.001	1.527	9.9	6	68	48	100.0	158.15	38.96	45.25	45.10	########	########	245.3	Yes	306.5	1.460	Yes	306.5	1.460	0.5	38955.38	158.15	0.80	307.73	1.00	307.73	0.937	0.3391	0.76	38.96	29.70	7.38	No
8.350	412.30	2.94	6.41	27.39	-27.39	412.33	2.94	0.71	6.41	0.00	121	3322.86	3322.86	247.2	0.72	0.000	1.522	9.7	6	69	48	100.0	159.10	39.48	45.28	45.15	########	########	247.2	Yes	309.7	1.454	Yes	309.7	1.454	0.5	39482.06	159.10	0.80	310.96	1.00	310.96	0.936	0.3389	0.76	39.48	29.98	7.39	No
8.400	403.70	2.92	6.90	27.56	-27.56	403.74	2.92	0.72	6.90	0.00	121	3342.70	3342.70	240.6	0.73	0.001	1.534	10.2	6	67	47	100.0	160.05	38.66	45.16	45.04	########	########	240.5	Yes	302.3	1.466	Yes	302.3	1.466	0.5	38658.52	160.05	0.80	303.57	1.00	303.57	0.936	0.3388	0.76	38.66	29.24	7.40	No
8.450	383.90	3.02	6.20	27.72	-27.72	383.93	3.02	0.79	6.20	0.00	121	3362.54	3362.54	227.4	0.79	0.001	1.578	12.1	6	65	45	100.0	161.00	36.76	44.89	44.79	########	########	227.3	Yes	286.6	1.508	Yes	286.6	1.508	0.5	36762.46	161.00	0.79	287.83	1.00	287.83	0.935	0.3386	0.75	36.76	27.70	7.41	No
8.500	353.60	3.12	6.80	27.89	-27.89	353.64	3.12	0.88	6.80	0.00	121	3382.38	3382.38	208.1	0.89	0.001	1.640	14.7	6	61	43	100.0	161.95	33.86	44.47	44.38	########	########	208.1	Yes	263.1	1.570	Yes	263.1	1.570	0.5	33860.92	161.95	0.79	264.33	1.00	264.33	0.935	0.3385	0.75	33.86	25.41	7.42	No
8.550	331.60	3.23	6.87	28.05	-28.05	331.64	3.23	0.97	6.87	0.00	121	3402.23	3402.23	194.0	0.98	0.001	1.692	16.9	6	58	40	100.0	162.90	31.75	44.13	44.06	########	########	193.9	Yes	245.9	1.622	Yes	245.9	1.622	0.5	31754.19	162.90	0.79	247.16	1.00	247.16	0.935	0.3384	0.75	31.75	23.74	7.42	No
8.600	374.95	3.33	6.97	28.22	-28.22	374.99	3.33	0.89	6.97	0.00	121	3422.07	3422.07	218.2	0.89	0.001	1.628	14.2	6	65	45	100.0	163.85	35.91	44.70	44.63	########	########	218.1	Yes	277.4	1.557	Yes	277.4	1.557	0.5	35905.41	163.85	0.78	278.66	1.00	278.66	0.934	0.3382	0.74	35.91	26.74	7.43	No
8.650	418.30	5.81	7.10	28.38	-28.38	418.34	5.81	1.39	7.10	0.00	121	3441.91	3441.91	242.1	1.39	0.001	1.744	19.1	6	75	52	100.0	164.80	40.06	45.19	45.14	########	########	242.1	Yes	308.7	1.680	Yes	308.7	1.680	0.5	40056.63	164.80	0.78	309.98	1.02	317.54	0.934	0.3381	0.74	40.06	29.72	7.44	No
8.700	514.90	4.14	7.27	28.54	-28.54	514.94	4.14	0.80	7.27	0.00	121	3461.75	3461.75	296.5	0.81	0.001	1.505	9.0	6	85	58	100.0	165.75	49.31	46.12	46.12	########	########	296.5	Yes	379.2	1.437	Yes	379.2	1.437	0.5	49307.09	165.75	0.78	380.47	1.00	380.47	0.934	0.3380	0.74	49.31	36.44	7.45	No
8.750	447.10	3.95	8.28	28.71	-28.71	447.14	3.95	0.88	8.28	0.00	121	3481.59	3481.59	255.9	0.89	0.001	1.579	12.1	6	76	52	100.0	166.70	42.81	45.45	45.43	########	########	255.8	Yes	328.1	1.508	Yes	328.1	1.508	0.5	42814.53	166.70	0.78	329.43	1.00	329.43	0.933	0.3378	0.74	42.81	31.52	7.46	No
8.800	467.80	3.76	9.13	28.87	-28.87	467.85	3.76	0.80	9.13	0.00	121	3501.43	3501.43	266.2	0.81	0.001	1.537	10.3	6	78	53	100.0	167.65	44.80	45.63	45.63	########	########	266.2	Yes	342.4	1.464	Yes	342.4	1.464	0.5	44796.77	167.65	0.78	343.71	1.00	343.71	0.933	0.3377	0.73	44.80	32.85	7.47	No
8.850	488.50	3.71	10.01	29.04	-29.04	488.55	3.71	0.76	10.01	0.00	121	3521.27	3521.27	276.5	0.76	0.001	1.507	9.1	6	81	55	100.0	168.60	46.78	45.80	45.83	########	########	276.5	Yes	356.6	1.434	Yes	356.6	1.434	0.5	46779.01	168.60	0.78	357.90	1.00	357.90	0.932	0.3375	0.73	46.78	34.17	7.48	No
8.900	498.10	3.75	8.49	29.20	-29.20	498.15	3.75	0.75	8.49	0.00	121	3541.11	3541.11	280.3	0.76	0.001	1.500	8.8	6	82	55	100.0	169.55	47.70	45.87	45.91	########	########	280.3	Yes	362.6	1.427	Yes	362.6	1.427	0.5	47698.32	169.55	0.77	363.91	1.00	363.91	0.932	0.3374	0.73	47.70	34.71	7.49	No
8.950	531.90	3.80	7.98	29.36	-29.36	531.94	3.80	0.71	7.98	0.00	121	3560.95	3560.95	297.8	0.72	0.001	1.466	7.3	6	87	58	100.0	170.50	50.94	46.14	46.21	########	########	297.7	Yes	386.2	1.392	Yes	386.2	1.392	0.5	50935.02	170.50	0.77	387.52	1.00	387.52	0.932	0.3373	0.73	50.94	36.93	7.50	No
9.000	561.80	4.59	5.86	29.53	-29.53	561.83	4.59	0.82	5.86	0.00	121	3580.80	3580.80	312.9	0.82	0.000	1.495	8.6	6	93	62	100.0	171.45	53.80	46.36	46.45	########	########	312.8	Yes	406.9	1.423	Yes	406.9	1.423	0.5	53798.26	171.45	0.77	408.17	1.00	408.17	0.931	0.3371	0.72	53.80	38.86	7.50	No
9.050	571.30	3.48	5.05	29.69	-29.69	571.33	3.48	0.61	5.05	0.00	121	3600.64	3600.64	316.3	0.61	0.000	1.397	4.4	6	91	61	100.0	172.40	54.71	46.41	46.52	########	########	316.3	Yes	412.6	1.320	Yes	412.6	1.320	0.5	54707.99	172.40	0.77	413.93	1.00	413.93	0.931	0.3370	0.72	54.71	39.37	7.51	No
9.100	511.40	0.00	4.24	29.86	-29.86	511.42	0.00	0.00	4.24	0.00	80	3613.69	3613.69	282.0	0.00	0.000	4.538	100.0	2	4188	2774	########	########	########	########	########	63702.0	17.63	282.0	No	282.0	Non-liq.	No	282.0	Non-liq.	Non-liq.	48971.93	173.02	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3368	0.72	48.97	35.15	7.52	No
9.150	499.60	0.00	4.15	30.02	-30.02	499.62	0.00	0.00	4.15	0.00	80	3626.74	3626.74	274.5	0.00	0.000	4.538	100.0	2	4091	2702	########	########	########	########	########	62226.1	17.16	274.5	No	274.5	Non-liq.	No	274.5	Non-liq.	Non-liq.	47841.96	173.65	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3367	0.72	47.84	34.26	7.52	No
				########	########	########	########	########	########	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	1.000	#NUM!	#NUM!	0.00	#NUM!	#NUM!	#NUM!
Average																																																	
4.60	184.32	1.33	1.16	15.09	-15.09	184.33	1.33	0.88	1.16	0.00	120.81	1841.92	1841.92	293.05	0.90	0.00	1.69	17.64	5.92	76.92	146.86	83.22	86.79	18.16	44.18	42.13	13363.37	32.68	293.05		214.14	1.66		214.14	1.66	0.50	17650.50	88.19	1.19	193.35	1.15	202.61	0.98	0.35					

Sounding Name

CPT-06

DRAFT

Insert Raw Data					Surface Elevation [ft] 0.0	Unequal End Area Ratio, a 0.83	Pre-drill Depth [ft] 0.0	Sat. Unit Weight for Pre-drill [pcf] 110		Depth to Water [ft] 100.0	From SBT, Iterated							Davies 1999	Robertson 1990 Norm. F_r/Q_t Chart			Baldi et al. 1986 K_o 0.45	R&C (1983) For friction angle plot	For friction angle plot	R&C (1983)	K&M (1990)	N_{kt} 16		Based on q_c, using n=1.0 for all		Based on q_c, using n=0.5 for I_c<2.6	Recalc.	Recalc.	Based on q_c, using n=0.7 for I_c>2.6	Recalc.									a_{max} (*g) 0.557	Contractive/ Dilative Plot		Stark and Olson (1995)	Boundary	
Depth [m]	**q_c [tsf]**	**f_s [tsf]**	**u_2 [ft]**	**Depth [ft]**	**Elevation [ft]**	**q_t [tsf]**	**f_s [tsf]**	**R_f [%]**	**u_2 [ft]**	**u_0 [ft]**	**γ_{sat} [pcf]**	**σ_{vo} [psf]**	**σ'_{vo} [psf]**	**Q_t**	**F_r [%]**	**B_q**	**I_c**	**FC [%]**	**SBT**	**SPT N_{60} [blows/ft]**	**SPT $(N_1)_{60}$ [blows/ft]**	**D_r [%]**	**σ'_{vo} [kPa]**	**q_c [MPa]**	**ϕ' [deg]**	**ϕ' [deg]**	**s_u [psf]**	**s_u/σ'_{vo}**	**Q**	**I_c<2.6?**	**Q**	**I_c**	**I_c<2.6?**	**Q**	**I_c**	**n**	**q_c [kPa]**	**σ'_{vo} [kPa]**	**C_q**	**q_{c1N}**	**K_c**	**$(q_{c1N})_{cs}$**	**r_d**	**CSR**	**C_q**	**q_c [MPa]**	**q_{c1} [MPa]**	**q_{c1} [MPa]**	**Contractive?**
0.05	28.3	0	0.02	0.16	-0.16	28.30	0.00	0.00	0.02	0.00	80	13.05	13.05	4335.1	0.00	0.000	4.538	100.0	2	232	11657	#########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	3536.7	270.94	4335.1	No	4335.1	Non-liq.	No	4335.1	Non-liq.	Non-liq.	2710.02	0.62	Non-liq.	Non-liq.	Non-liq.	########	1.000	0.3619	2.23	2.71	6.05	2.32	No
0.1	51.1	0.16	0.05	0.33	-0.33	51.10	0.16	0.31	0.05	0.00	127	33.94	33.94	3010.3	0.31	0.000	0.716	0.0	7	7	162	100.0	1.62	4.89	54.88	46.13	########	########	3010.3	Yes	381.2	1.141	Yes	381.2	1.141	0.5	4893.36	1.62	1.70	381.35	1.00	381.35	0.999	0.3618	2.21	4.89	10.79	2.84	No
0.15	63.3	0.25	0.05	0.49	-0.49	63.30	0.25	0.39	0.05	0.00	127	54.82	54.82	2308.2	0.40	0.000	0.824	0.0	7	9	143	100.0	2.62	6.06	54.03	46.01	########	########	2308.2	Yes	371.5	1.215	Yes	371.5	1.215	0.5	6061.64	2.62	1.70	371.68	1.00	371.68	0.999	0.3616	2.18	6.06	13.21	3.14	No
0.2	71.1	0.35	0.21	0.66	-0.66	71.10	0.35	0.49	0.21	0.00	127	75.71	75.71	1877.3	0.49	0.000	0.933	0.0	7	10	129	100.0	3.62	6.81	53.35	45.79	########	########	1877.2	Yes	355.1	1.296	Yes	355.1	1.296	0.5	6808.57	3.62	1.70	355.26	1.00	355.26	0.998	0.3615	2.15	6.81	14.66	3.35	No
0.25	70.4	0.43	0.39	0.82	-0.82	70.40	0.43	0.61	0.39	0.00	127	96.59	96.59	1456.7	0.61	0.000	1.052	0.0	7	10	109	100.0	4.62	6.74	52.48	45.16	########	########	1456.6	Yes	311.2	1.402	Yes	311.2	1.402	0.5	6741.54	4.62	1.70	311.42	1.00	311.42	0.998	0.3614	2.13	6.74	14.35	3.53	No
0.3	66.4	0.49	0.39	0.98	-0.98	66.40	0.49	0.74	0.39	0.00	127	117.48	117.48	1129.4	0.74	0.000	1.166	0.0	7	10	92	100.0	5.62	6.36	51.57	44.41	########	########	1129.4	Yes	266.1	1.509	Yes	266.1	1.509	0.5	6358.50	5.62	1.70	266.34	1.00	266.34	0.998	0.3612	2.10	6.36	13.38	3.68	No
0.35	62.3	0.47	0.39	1.15	-1.15	62.30	0.47	0.75	0.39	0.00	127	138.37	138.37	899.5	0.76	0.000	1.213	0.0	7	9	77	100.0	6.62	5.97	50.72	43.72	########	########	899.5	Yes	230.0	1.560	Yes	230.0	1.560	0.5	5965.88	6.62	1.70	230.26	1.00	230.26	0.997	0.3611	2.08	5.97	12.41	3.80	No
0.4	58.2	0.44	0.30	1.31	-1.31	58.20	0.44	0.76	0.30	0.00	127	159.25	159.25	729.9	0.76	0.000	1.255	0.0	7	9	65	98.1	7.62	5.57	49.92	43.06	########	########	729.9	Yes	200.2	1.604	Yes	200.2	1.604	0.5	5573.26	7.62	1.70	200.51	1.00	200.51	0.997	0.3609	2.06	5.57	11.46	3.92	No
0.45	56.8	0.42	0.25	1.48	-1.48	56.80	0.42	0.74	0.25	0.00	127	180.14	180.14	629.6	0.74	0.000	1.280	0.0	7	9	58	94.6	8.62	5.44	49.33	42.65	########	########	629.6	Yes	183.7	1.625	Yes	183.7	1.625	0.5	5439.20	8.62	1.70	183.99	1.00	183.99	0.997	0.3608	2.03	5.44	11.06	4.02	No
0.5	54.8	0.4	0.21	1.64	-1.64	54.80	0.40	0.73	0.21	0.00	127	201.02	201.02	544.2	0.73	0.000	1.309	0.7	7	9	52	90.9	9.62	5.25	48.74	42.21	########	########	544.2	Yes	167.7	1.651	Yes	167.7	1.651	0.5	5247.68	9.62	1.70	168.04	1.00	168.73	0.996	0.3607	2.01	5.25	10.55	4.11	No
0.55	54.45	0.4	0.21	1.80	-1.80	54.45	0.40	0.73	0.21	0.00	121	220.86	220.86	492.1	0.74	0.000	1.337	1.8	6	9	49	88.7	10.57	5.21	48.32	41.96	########	########	492.1	Yes	159.0	1.671	Yes	159.0	1.671	0.5	5214.16	10.57	1.70	159.29	1.02	162.13	0.996	0.3605	1.99	5.21	10.38	4.20	No
0.6	54.1	0.4	0.21	1.97	-1.97	54.10	0.40	0.74	0.21	0.00	121	240.70	240.70	448.5	0.74	0.000	1.363	2.9	6	9	46	86.6	11.52	5.18	47.93	41.72	########	########	448.5	Yes	151.3	1.689	Yes	151.3	1.689	0.5	5180.64	11.52	1.70	151.60	1.03	156.20	0.995	0.3604	1.97	5.18	10.21	4.27	No
0.65	54.4	0.4	0.21	2.13	-2.13	54.40	0.40	0.74	0.21	0.00	121	260.54	260.54	416.6	0.74	0.000	1.380	3.7	6	9	43	85.2	12.47	5.21	47.62	41.56	########	########	416.6	Yes	146.2	1.699	Yes	146.2	1.699	0.5	5209.37	12.47	1.70	146.52	1.04	151.95	0.995	0.3602	1.95	5.21	10.16	4.34	No
0.7	53.1	0.4	0.21	2.30	-2.30	53.10	0.40	0.75	0.21	0.00	121	280.39	280.39	377.8	0.76	0.000	1.415	5.2	6	9	40	82.9	13.42	5.08	47.20	41.27	########	########	377.8	Yes	137.5	1.726	Yes	137.5	1.726	0.5	5084.88	13.42	1.70	137.87	1.06	145.51	0.995	0.3601	1.93	5.08	9.82	4.41	No
0.75	53.05	0.43	0.21	2.46	-2.46	53.05	0.43	0.81	0.21	0.00	121	300.23	300.23	352.4	0.81	0.000	1.459	7.0	6	9	39	81.2	14.37	5.08	46.89	41.10	########	########	352.4	Yes	132.7	1.758	Yes	132.7	1.758	0.5	5080.10	14.37	1.70	133.11	1.08	143.39	0.994	0.3600	1.91	5.08	9.71	4.47	No
0.8	53	0.47	0.21	2.62	-2.62	53.00	0.47	0.89	0.21	0.00	121	320.07	320.07	330.2	0.89	0.000	1.507	9.1	6	9	38	79.8	15.32	5.08	46.60	40.94	########	########	330.2	Yes	128.4	1.795	Yes	128.4	1.795	0.5	5075.31	15.32	1.70	128.80	1.10	142.02	0.994	0.3598	1.89	5.08	9.60	4.53	No
0.85	54.2	0.45	0.21	2.79	-2.79	54.20	0.45	0.83	0.21	0.00	121	339.91	339.91	317.9	0.83	0.000	1.496	8.6	6	9	37	79.4	16.27	5.19	46.44	40.91	########	########	317.9	Yes	127.4	1.779	Yes	127.4	1.779	0.5	5190.22	16.27	1.70	127.81	1.09	139.49	0.993	0.3597	1.87	5.19	9.73	4.59	No
0.9	55.15	0.44	0.21	2.95	-2.95	55.15	0.44	0.80	0.21	0.00	121	359.75	359.75	305.6	0.80	0.000	1.494	8.5	6	9	36	78.9	17.22	5.28	46.26	40.85	########	########	305.6	Yes	126.0	1.771	Yes	126.0	1.771	0.5	5281.19	17.22	1.70	126.41	1.09	137.32	0.993	0.3596	1.86	5.28	9.80	4.64	No
0.95	56.1	0.45	0.21	3.12	-3.12	56.10	0.45	0.80	0.21	0.00	121	379.59	379.59	294.6	0.80	0.000	1.506	9.0	6	9	35	78.4	18.17	5.37	46.09	40.81	########	########	294.6	Yes	124.8	1.776	Yes	124.8	1.776	0.5	5372.17	18.17	1.70	125.19	1.09	136.41	0.993	0.3594	1.84	5.37	9.87	4.70	No
1	58.7	0.45	0.21	3.28	-3.28	58.70	0.45	0.77	0.21	0.00	121	399.43	399.43	292.9	0.77	0.000	1.493	8.5	6	10	35	79.1	19.12	5.62	46.07	40.90	########	########	292.9	Yes	127.3	1.757	Yes	127.3	1.757	0.5	5621.14	19.12	1.70	127.69	1.08	137.46	0.992	0.3593	1.82	5.62	10.23	4.75	No
1.05	60.7	0.44	0.21	3.44	-3.44	60.70	0.44	0.72	0.21	0.00	121	419.27	419.27	288.6	0.73	0.000	1.480	7.9	6	10	35	79.3	20.07	5.81	46.00	40.95	########	########	288.5	Yes	128.4	1.739	Yes	128.4	1.739	0.5	5812.66	20.07	1.70	128.88	1.06	137.13	0.992	0.3591	1.80	5.81	10.48	4.80	No
1.1	62.2	0.43	0.21	3.61	-3.61	62.20	0.43	0.69	0.21	0.00	121	439.11	439.11	282.3	0.69	0.000	1.471	7.6	6	10	34	79.3	21.02	5.96	45.90	40.95	########	########	282.3	Yes	128.6	1.726	Yes	128.6	1.726	0.5	5956.30	21.02	1.70	129.05	1.05	136.16	0.992	0.3590	1.79	5.96	10.64	4.84	No
1.15	62.9	0.4	0.21	3.77	-3.77	62.90	0.40	0.64	0.21	0.00	121	458.96	458.96	273.1	0.64	0.000	1.456	6.9	6	10	33	78.8	21.97	6.02	45.75	40.90	########	########	273.1	Yes	127.2	1.707	Yes	127.2	1.707	0.5	6023.34	21.97	1.70	127.65	1.04	133.12	0.991	0.3589	1.77	6.02	10.66	4.89	No
1.2	64.3	0.4	0.21	3.94	-3.94	64.30	0.40	0.62	0.21	0.00	121	478.80	478.80	267.6	0.62	0.000	1.455	6.9	6	10	33	78.8	22.92	6.16	45.65	40.91	########	########	267.6	Yes	127.3	1.701	Yes	127.3	1.701	0.5	6157.40	22.92	1.70	127.76	1.04	132.72	0.991	0.3587	1.75	6.16	10.80	4.93	No
1.25	73.3	0.43	0.21	4.10	-4.10	73.30	0.43	0.59	0.21	0.00	121	498.64	498.64	293.0	0.59	0.000	1.409	4.9	6	12	36	82.9	23.87	7.02	46.07	41.43	########	########	293.0	Yes	142.2	1.648	Yes	142.2	1.648	0.5	7019.25	23.87	1.70	142.71	1.00	142.94	0.990	0.3586	1.74	7.02	12.20	4.97	No
1.3	87.8	0.46	0.30	4.27	-4.27	87.80	0.46	0.52	0.30	0.00	121	518.48	518.48	337.7	0.53	0.000	1.331	1.6	6	14	41	89.0	24.82	8.41	46.70	42.20	########	########	337.7	Yes	167.1	1.562	Yes	167.1	1.562	0.5	8407.77	24.82	1.70	167.64	1.00	167.64	0.990	0.3584	1.72	8.41	14.48	5.01	No
1.35	104.2	0.51	0.39	4.43	-4.43	104.20	0.51	0.49	0.39	0.00	127	539.36	539.36	385.4	0.49	0.000	1.269	0.0	7	16	46	94.7	25.82	9.98	47.28	42.93	########	########	385.4	Yes	194.6	1.491	Yes	194.6	1.491	0.5	9978.25	25.82	1.70	195.06	1.00	195.06	0.990	0.3583	1.71	9.98	17.03	5.05	No
1.4	105.7	0.5	0.39	4.59	-4.59	105.70	0.50	0.47	0.39	0.00	127	560.25	560.25	376.3	0.47	0.000	1.266	0.0	7	16	45	94.5	26.82	10.12	47.18	42.90	########	########	376.3	Yes	193.6	1.484	Yes	193.6	1.484	0.5	10121.89	26.82	1.70	194.15	1.00	194.15	0.989	0.3582	1.69	10.12	17.11	5.09	No
1.45	89.6	0.38	0.23	4.76	-4.76	89.60	0.38	0.42	0.23	0.00	127	581.14	581.14	307.4	0.43	0.000	1.298	0.2	7	14	38	87.4	27.82	8.58	46.28	42.03	########	########	307.4	Yes	161.1	1.522	Yes	161.1	1.522	0.5	8580.14	27.82	1.70	161.59	1.00	161.59	0.989	0.3580	1.68	8.58	14.37	5.13	No
1.5	71.3	0.42	0.21	4.92	-4.92	71.30	0.42	0.59	0.21	0.00	121	600.98	600.98	236.3	0.59	0.000	1.479	7.9	6	12	31	77.9	28.77	6.83	45.07	40.86	########	########	236.3	Yes	125.9	1.691	Yes	125.9	1.691	0.5	6827.73	28.77	1.70	126.45	1.03	130.50	0.989	0.3579	1.66	6.83	11.34	5.17	No
1.55	63.3	0.46	0.23	5.09	-5.09	63.30	0.46	0.73	0.23	0.00	121	620.82	620.82	202.9	0.73	0.000	1.589	12.6	6	11	28	72.7	29.72	6.06	44.35	40.21	########	########	202.9	Yes	109.9	1.793	Yes	109.9	1.793	0.5	6061.64	29.72	1.70	110.45	1.10	121.70	0.988	0.3578	1.65	6.06	9.98	5.21	No
1.6	66.85	0.57	0.23	5.25	-5.25	66.85	0.57	0.85	0.23	0.00	121	640.66	640.66	207.7	0.86	0.000	1.630	14.3	6	12	29	74.1	30.67	6.40	44.46	40.40	########	########	207.7	Yes	114.3	1.823	Yes	114.3	1.823	0.5	6401.59	30.67	1.70	114.83	1.12	129.03	0.988	0.3576	1.63	6.40	10.45	5.24	No
1.65	70.4	0.7	0.39	5.41	-5.41	70.40	0.70	0.99	0.39	0.00	121	660.50	660.50	212.2	1.00	0.000	1.672	16.1	6	12	30	75.4	31.62	6.74	44.56	40.57	########	########	212.2	Yes	118.5	1.854	Yes	118.5	1.854	0.5	6741.59	31.62	1.70	119.09	1.15	136.74	0.987	0.3575	1.62	6.74	10.91	5.27	No
1.7	80.3	0.79	0.30	5.58	-5.58	80.30	0.79	0.98	0.30	0.00	121	680.34	680.34	235.1	0.99	0.000	1.638	14.6	6	14	33	79.9	32.57	7.69	45.05	41.13	########	########	235.1	Yes	133.3	1.813	Yes	133.3	1.813	0.5	7689.57	32.57	1.70	133.85	1.12	149.36	0.987	0.3573	1.61	7.69	12.34	5.31	No
1.75	85.9	0.78	0.25	5.74	-5.74	85.90	0.78	0.91	0.25	0.00	121	700.18	700.18	244.4	0.91	0.000	1.601	13.0	6	15	34	81.8	33.52	8.23	45.23	41.38	########	########	244.4	Yes	140.6	1.772	Yes	140.6	1.772	0.5	8225.83	33.52	1.70	141.14	1.09	153.38	0.987	0.3572	1.59	8.23	13.09	5.34	No
1.8	92.3	0.6	0.21	5.91	-5.91	92.30	0.60	0.65	0.21	0.00	121	720.02	720.02	255.4	0.65	0.000	1.483	8.1	6	15	35	84.0	34.47	8.84	45.44	41.66	########	########	255.4	Yes	149.0	1.659	Yes	149.0	1.659	0.5	8838.70	34.47	1.70	149.55	1.01	151.00	0.986	0.3571	1.58	8.84	13.95	5.37	No
1.85	89.9	0.59	0.21	6.07	-6.07	89.90	0.59	0.66	0.21	0.00	121	739.86	739.86	242.0	0.66	0.000	1.503	8.9	6	15	33	82.4	35.42	8.61	45.19	41.47	########	########	242.0	Yes	143.1	1.675	Yes	143.1	1.675	0.5	8608.87	35.42	1.69	143.69	1.02	146.72	0.986	0.3569	1.57	8.61	13.48	5.40	No
1.9	91.5	0.61	0.05	6.23	-6.23	91.50	0.61	0.67	0.05	0.00	121	759.71	759.71	239.9	0.67	0.000	1.511	9.2	6	15	33	82.5	36.37	8.76	45.15	41.49	########	########	239.9	Yes	143.7	1.678	Yes	143.7	1.678	0.5	8762.09	36.37	1.67	144.33	1.02	147.64	0.985	0.3568	1.55	8.76	13.61	5.43	No
1.95	90.85	0.64	0.05	6.40	-6.40	90.85	0.64	0.70	0.05	0.00	121	779.55	779.55	232.1	0.71	0.000	1.537	10.4	6	15	33	81.7	37.32	8.70	44.99	41.39	########	########	232.1	Yes	140.9	1.700	Yes	140.9	1.700	0.5	8699.84	37.32	1.65	141.47	1.04	146.82	0.985	0.3566	1.54	8.70	13.40	5.46	No
2	91.42	0.68	0.05	6.56	-6.56	91.42	0.68	0.74	0.05	0.00	121	799.39	799.39	227.7	0.75	0.000	1.560	11.3	6	15	33	81.4	38.27	8.75	44.90	41.36	########	########	227.7	Yes	140.0	1.717	Yes	140.0	1.717	0.5	8754.43	38.27	1.63	140.58	1.05	147.52	0.985	0.3565	1.53	8.75	13.38	5.49	No
2.05	92	0.77	0.09	6.73	-6.73	92.00	0.77	0.84	0.09	0.00	121	819.23	819.23	223.6	0.84	0.000	1.602	13.1	6	16	33	81.2	39.22	8.81	44.81	41.33	########	########	223.6	Yes	139.1	1.752	Yes	139.1	1.752	0.5	8809.97	39.22	1.61	139.74	1.07	149.96	0.984	0.3564	1.52	8.81	13.36	5.52	No
2.1	94.6	0.85	0.16	6.89	-6.89	94.60	0.85	0.90	0.16	0.00	121	839.07	839.07	224.5	0.90	0.000	1.623	14.0	6	16	33	81.7	40.17	9.06	44.83	41.41	########	########	224.5	Yes	141.4	1.767	Yes	141.4	1.767	0.5	9058.95	40.17	1.59	141.98	1.08	153.83	0.984	0.3562	1.50	9.06	13.63	5.54	No
2.15	98.7	0.95	0.09	7.05	-7.05	98.70	0.95	0.96	0.09	0.00	121	858.91	858.91	228.8	0.97	0.000	1.639	14.7	6	17	34	82.9	41.12	9.45	44.92	41.56	########	########	228.8	Yes	145.8	1.777	Yes	145.8	1.777	0.5	9451.56	41.12	1.57	146.42	1.09	159.67	0.984	0.3561	1.49	9.45	14.11	5.57	No
2.2	106.9	1.05	0.12	7.22	-7.22	106.90	1.05	0.98	0.12	0.00	121	878.75	878.75	242.3	0.99	0.000	1.629	14.2	6	18	36	85.4	42.07	10.24	45.19	41.88	########	########	242.3	Yes	156.1	1.762	Yes	156.1	1.762	0.5	10236.80	42.07	1.55	156.78	1.08	169.25	0.983	0.3560	1.48	10.24	15.16	5.60	No
2.25	119.4	1.17	0.12	7.38	-7.38	119.40	1.17	0.98	0.12	0.00	121	898.59	898.59	264.8	0.98	0.000	1.602	13.1	6	20	39	89.2	43.02	11.43	45.60	42.36	########	########	264.7	Yes	172.5	1.730	Yes	172.5	1.730	0.5	11433.81	43.02	1.53	173.17	1.06	183.18	0.983	0.3558	1.47	11.43	16.81	5.62	No
2.3	134.3	1.32	0.21	7.55	-7.55	134.30	1.32	0.98	0.21	0.00	121	918.43	918.43	291.5	0.99	0.000	1.576	12.0	6	23	43	93.2	43.97	12.86	46.04	42.87	########	########	291.5	Yes	192.0	1.698	Yes	192.0	1.698	0.5	12860.64	43.97	1.52	192.66	1.04	199.65	0.982	0.3557	1.46	12.86	18.76	5.65	No
2.35	144.5	1.43	0.21	7.71	-7.71	144.50	1.43	0.99	0.21	0.00	121	938.28	938.28	307.0	0.99	0.000	1.564	11.5	6	24	46	95.6	44.92	13.84	46.28	43.17	########	########	307.0	Yes	204.4	1.681	Yes	204.4	1.681	0.5	13837.40	44.92	1.50	205.09	1.02	210.18	0.982	0.3555	1.45	13.84	20.03	5.67	No
2.4	145.4	1.41	0.21	7.87	-7.87	145.40	1.41	0.97	0.21	0.00	121	958.12	958.12	302.5	0.97	0.000	1.561	11.4	6	24	45	95.4	45.87	13.92	46.21	43.15	########	########	302.5	Yes	203.6	1.676	Yes	203.6	1.676	0.5	13923.58	45.87	1.49	204.22	1.02	208.58	0.982	0.3554	1.44	13.92	20.01	5.70	No
2.45	143.4	1.3	0.21	8.04	-8.04	143.40	1.30	0.91	0.21	0.00	121	977.96	977.96	292.3	0.91	0.000	1.549	10.8	6	24	44	94.4	46.82	13.73	46.06	43.03	########	########	292.3	Yes	198.7	1.662	Yes	198.7	1.662	0.5	13732.06	46.82	1.47	199.36	1.01	201.74	0.981	0.3553	1.43	13.73	19.58	5.72	No
2.5	143.7	1.14	0.21	8.20	-8.20	143.70	1.14	0.79	0.21	0.00	121	997.80	997.80	287.0	0.80	0.000	1.510	9.2	6	24	42	94.1	47.77	13.76	45.97	42.99	########	########	287.0	Yes	197.1	1.624	Yes	197.1	1.624	0.5	13760.79	47.77	1.46	197.78	1.00	197.78	0.981	0.3551	1.42	13.76	19.48	5.75	No
2.55	144	0.8	0.21	8.37	-8.37	144.00	0.80	0.56	0.21	0.00	121	1017.64	1017.64	282.0	0.56	0.000	1.405	4.7	6	23	41	93.8	48.72	13.79	45.89	42.96	########	########	282.0	Yes	195.6	1.524	Yes	195.6	1.524	0.5	13789.51	48.72	1.44	196.25	1.00	196.25	0.980	0.3550	1.41	13.79	19.38	5.77	No
2.6	149.7	0.77	0.25	8.53	-8.53	149.70	0.77	0.51	0.25	0.00	121	1037.48	1037.48	287.6	0.52	0.000	1.376	3.5	6	24	41	94.8	49.67	14.34	45.98	43.10	########	########	287.6	Yes	201.4	1.493	Yes	201.4	1.493	0.5	14335.35	49.67	1.43	202.06	1.00	202.06	0.980	0.3548	1.40	14.34	20.00	5.79	No
2.65	148	0.77	0.30	8.69	-8.69	148.00	0.77	0.52	0.30	0.00	121	1057.32	1057.32	279.0	0.52	0.000	1.389	4.1	6	24	40	94.0	50.62	14.17	45.84	43.00	########	########	279.0	Yes	197.2	1.503	Yes	197.2	1.503	0.5	14172.56	50.62	1.41	197.88	1.00	197.88	0.980	0.3547	1.39	14.17	19.63	5.82	No
2.7	144.6	0.77	0.39	8.86	-8.86	144.60	0.77	0.53	0.39	0.00	121	1077.16	1077.16	267.5	0.53	0.000	1.409	4.9	6	23	39	92.7	51.57	13.85	45.65	42.84	########	########	267.5	Yes	190.8	1.521	Yes	190.8	1.521	0.5	13846.97	51.57	1.40	191.55	1.00	191.55	0.979	0.3546	1.38	13.85	19.04	5.84	No
2.75	139.7	0.78	0.39	9.02	-9.02	139.70	0.78	0.56	0.39	0.00	121	1097.00	1097.00	253.7	0.56	0.000	1.440	6.2	6	23	38	91.0	52.52	13.38	45.41	42.63	########	########	253.7	Yes	182.7	1.549	Yes	182.7	1.549	0.5	13377.74	52.52	1.39	183.38	1.00	183.38	0.979	0.3544	1.37	13.38	18.26	5.86	No
2.8	128.8	0.68	0.55	9.19	-9.19	128.80	0.68	0.53	0.55	0.00	121	1116.84	1116.84	229.7	0.53	0.000	1.457	6.9	6	21	34	87.5	53.47	12.33	44.94	42.20	########	########	229.6	Yes	166.8	1.565	Yes	166.8	1.565	0.5	12333.95	53.47	1.38	167.56	1.00	167.56	0.979	0.3543	1.36	12.33	16.72	5.88	No
2.85	117.2	0.69	0.46	9.35	-9.35	117.20	0.69	0.59	0.46	0.00	121	1136.69	1136.69	205.2	0.59	0.000	1.525	9.8	6	19	31	83.5	54.42	11.22	44.40	41.71	########	########	205.2	Yes	150.4	1.630	Yes	150.4	1.630	0.5	11223.13	54.42	1.36	151.13	1.00	151.13	0.978	0.3542	1.35	11.22	15.11	5.91	No
2.9	106.6	0.67	0.44	9.51	-9.51	106.60	0.67	0.63	0.44	0.00	121	1156.53	1156.53	183.3	0.63	0.000	1.580	12.2	6	18	29	79.5	55.37	10.21	43.86	41.21	########	########	183.3	Yes	135.5	1.683	Yes	135.5	1.683	0.5	10208.07	55.37	1.35	136.28	1.03	139.85	0.978	0.3540	1.34	10.21	13.65	5.93	No
2.95	108.25	0.66	0.42	9.68	-9.68	108.25	0.66	0.61	0.42	0.00	121	1176.37	1176.37	183.0	0.61	0.000	1.573	11.8	6	18	29	79.8	56.32	10.37	43.85	41.25	########	########	183.0	Yes	136.5	1.672	Yes	136.5	1.672	0.5	10366.08	56.32	1.34	137.22	1.02	139.83	0.977	0.3539	1.33	10.37	13.76	5.95	No
3	109.9	0.68	0.39	9.84	-9.84	109.90	0.68	0.62	0.39	0.00	121	1196.21	1196.21	182.8	0.62	0.000	1.577	12.0	6	19	29	80.0	57.27	10.52	43.84	41.28	########	########	182.7	Yes	137.4	1.674	Yes	137.4	1.674	0.5	10524.08	57.27	1.33	138.15	1.02	140.93	0.977	0.3537	1.32	10.52	13.88	5.97	No
3.05	112.1	0.69	0.39	10.01	-10.01	112.10	0.69	0.62	0.39	0.00	121	1216.05	1216.05	183.4	0.62	0.000	1.575	11.9	6	19	29	80.4	58.22	10.73	43.86	41.33	########	########	183.4	Yes	139.0	1.669	Yes	139.0	1.669	0.5	10734.75	58.22	1.32	139.76	1.02	142.05	0.977	0.3536	1.31	10.73	14.06	5.99	No
3.1	105.7	0.69	0.25	10.17	-10.17	105.70	0.69	0.65	0.25	0.00	121	1235.89	1235.89	170.1	0.66	0.000	1.616	13.7	6	18	27	77.8	59.17	10.12	43.49	41.01	########	########	170.1	Yes	130.0	1.707	Yes	130.0	1.707	0.5	10121.89	59.17	1.31	130.72	1.04	136.32	0.976	0.3535	1.30	10.12	13.16	6.01	No
3.15	104.8	0.67	0.21	10.33	-10.33	104.80	0.67	0.64	0.21	0.00	121	1255.73	1255.73	165.9	0.64	0.000	1.619	13.8	6	18	27	77.1	60.12	10.04	43.37	40.94	########	########	165.9	Yes	127.8	1.708	Yes	127.8	1.708	0.5	10035.70	60.12	1.30	128.58	1.04	134.12	0.976	0.3533	1.29	10.04	12.96	6.03	No
3.2	104.95	0.65	0.14	10.50	-10.50	104.95	0.65	0.62	0.14	0.00	121	1275.57	1275.57	163.6	0.62	0.000	1.613	13.6	6	18	27	76.9	61.07	10.05	43.30	40.91	########	########	163.6	Yes	127.0	1.702	Yes	127.0	1.702	0.5	10050.07	61.07	1.29	127.76	1.04	132.75	0.976	0.3532	1.28	10.05	12.90	6.05	No
3.25	105.1	0.61	0.09	10.66	-10.66	105.10	0.61	0.58	0.09	0.00	121	1295.41	1295.41	161.3	0.58	0.000	1.602	13.1	6	18	26	76.6	62.02	10.06	43.23	40.88	########	########	161.3	Yes	126.2	1.687	Yes	126.2	1.687	0.5	10064.43	62.02	1.28	126.95	1.03	130.67	0.975	0.3530	1.27	10.06	12.83	6.07	No
3.3	110.8	0.59	0.07	10.83	-10.83	110.80	0.59	0.53	0.07	0.00	121	1315.26	1315.26	167.5	0.54	0.000	1.566	11.6	6	19	27	78.3	62.97	10.61	43.41	41.09	########	########	167.5	Yes	132.0	1.650	Yes	132.0	1.650	0.5	10610.27	62.97	1.27	132.83	1.00	133.23	0.975	0.3529	1.27	10.61	13.44	6.09	No
3.35	114.7	0.55	0.05	10.99	-10.99	114.70	0.55	0.48	0.05	0.00	121	1335.10	1335.10	170.8	0.48	0.000	1.532	10.1	6	19	27	79.3	63.92	10.98	43.51	41.22	########	########	170.8	Yes	135.7	1.614	Yes	135.7	1.614	0.5	10983.73	63.92	1.26	136.48	1.00	136.48	0.974	0.3528	1.26	10.98	13.82	6.11	No
3.4	114.2	0.52	0.05	11.15	-11.15	114.20	0.52	0.46	0.05	0.00	121	1354.94	1354.94	167.6	0.46	0.000	1.526	9.9	6	19	27	78.8	64.87	10.94	43.42	41.16	########	########	167.6	Yes	134.1	1.606	Yes	134.1	1.606	0.5	10935.85	64.87	1.25	134.88	1.00	134.88	0.974	0.3526	1.25	10.94	13.67	6.13	No
3.45	122.8	0.55	0.14	11.32	-11.32	122.80	0.55	0.45	0.14	0.00	121	1374.78	1374.78	177.6	0.45	0.000	1.501	8.8	6	20	28	81.3	65.82	11.76	43.70	41.48	########	########	177.6	Yes	143.2	1.578	Yes	143.2	1.578	0.5	11759.39	65.82	1.24	143.99	1.00	143.99	0.974	0.3525	1.24	11.76	14.60	6.14	No
3.5	157.7	0.58	0.21	11.48	-11.48	157.70	0.58	0.37	0.21	0.00	121	1394.62	1394.62	225.2	0.37	0.000	1.367	3.1	6	25	34	90.6	66.77	15.10	44.85	42.64	########	########	225.2	Yes	182.8	1.442	Yes	182.8	1.442	0.5	15101.43	66.77	1.23	183.59	1.00	183.59	0.973	0.3524	1.23	15.10	18.63	6.16	No
3.55	187.2	0.74	0.39	11.65	-11.65	187.21	0.74	0.40	0.39	0.00	121	1414.46	1414.46	263.7	0.40	0.000	1.330	1.6	6	29	40	96.9	67.72	17.93	45.59	43.42	########	########	263.7	Yes	215.6	1.401	Yes	215.6	1.401	0.5	17926.37	67.72	1.22	216.40	1.00	216.40	0.973	0.3522	1.23	17.93	21.97	6.18	No
3.6	209.2	0.85	0.55	11.81	-11.81	209.20	0.85	0.41	0.55	0.00	127	1435.35	1435.35	290.5	0.41	0.000	1.305	0.5	7	32	44	100.0	68.72	20.03	46.03	43.92	########	########	290.5	Yes	239.2	1.371	Yes	239.2	1.371	0.5	20033.10	68.72	1.21	240.07	1.00	240.07	0.972	0.3521	1.22	20.03	24.39	6.20	No
3.65	226.1	0.88	0.58	11.98	-11.98	226.10	0.88	0.39	0.58	0.00	127	1456.23	1456.23	309.5	0.39	0.000	1.272	0.0	7	35	46	100.0	69.72	21.65	46.32	44.26	########	########	309.5	Yes	256.8	1.335	Yes	256.8	1.335	0.5	21651.45	69.72	1.21	257.59	1.00	257.59	0.972	0.3519	1.21	21.65	26.19	6.22	No
3.7	250.2	1.07	0.74	12.14	-12.14	250.20	1.07	0.43	0.74	0.00	127	1477.12	1477.12	337.8	0.43	0.000	1.270	0.0	7	38	51	100.0	70.72	23.96	46.71	44.71	########	########	337.8	Yes	282.2	1.329	Yes	282.2	1.329	0.5	23959.28	70.72	1.20	283.03	1.00	283.03	0.972	0.3518	1.20	23.96	28.79	6.24	No
3.75	263.1	1.27	0.92	12.30	-12.30	263.10	1.27	0.48	0.92	0.00	127	1498.00	1498.00	350.3	0.48	0.000	1.294	0.1	7	41	53	100.0	71.72	25.19	46.87	44.91	########	########	350.3	Yes	294.7	1.349	Yes	294.7	1.349	0.5	25194.59	71.72	1.19	295.54	1.00	295.54	0.971	0.3517	1.19	25.19	30.08	6.26	No
3.8	262.6	2.4	0.67	12.47	-12.47	262.60	2.40	0.91	0.67	0.00	121	1517.84	1517.84	345.0	0.92	0.000	1.505	9.0	6	44	56	100.0	72.67	25.15	46.80	44.87	########	########	345.0	Yes	292.2	1.551	Yes	292.2	1.551	0.5	25146.71	72.67	1.18	293.04	1.00	293.04	0.971	0.3515	1.19	25.15	29.83	6.27	No
3.85	282.5	2.23	0.92	12.63	-12.63	282.50	2.23	0.79	0.92	0.00	121	1537.69	1537.69	366.4	0.79	0.000	1.439	6.2	6	46	58	100.0	73.62	27.05	47.06	45.19	########	########	366.4	Yes	312.4	1.484	Yes	312.4	1.484	0.5	27052.35	73.62	1.17	313.21	1.00	313.21	0.971	0.3514	1.18	27.05	31.90	6.29	No
3.9	267.3	2.22	1.18	12.80	-12.80	267.31	2.22	0.83	1.18	0.00	121	1557.53	1557.53	342.2	0.83	0.000	1.475	7.7	6	44	55	100.0	74.57	25.60	46.76	44.89	########	########	342.2	Yes	293.6	1.518	Yes	293.6	1.518	0.5	25596.79	74.57	1.17	294.46	1.00	294.46	0.970	0.3512	1.17	25.60	30.00	6.31	No
3.95	275.3	1.97	0.72	12.96	-12.96	275.30	1.97	0.72	0.72	0.00	121	1577.37	1577.37	348.1	0.72	0.000	1.421	5.4	6	44	56	100.0	75.52	26.36	46.84	45.00	########	########	348.1	Yes	300.5	1.464	Yes	300.5	1.464	0.5	26362.87	75.52	1.16	301.36	1.00	301.36	0.970	0.3511	1.16	26.36	30.71	6.32	No
4	277	2.12	1.08	13.12	-13.12	277.01	2.12	0.77	1.08	0.00	121	1597.21	1597.21	345.9	0.77	0.000	1.445	6.4	6	45	56	100.0	76.47	26.53	46.81	45.00	########	########	345.9	Yes	300.5	1.485	Yes	300.5	1.485	0.5	26525.66	76.47	1.15	301.33	1.00	301.33	0.969	0.3510	1.16	26.53	30.71	6.34	No
4.05	287	2.26	1.22	13.29	-13.29	287.01	2.26	0.79	1.22	0.00	121	1617.05	1617.05	354.0	0.79	0.000	1.448	6.6	6	47	57	100.0	77.42	27.48	46.91	45.14	########	########	354.0	Yes	309.4	1.486	Yes	309.4	1.486	0.5	27483.27	77.42	1.14	310.29	1.00	310.29	0.969	0.3508	1.15	27.48	31.63	6.36	No
4.1	297	3.12	1.43	13.45	-13.45	297.01	3.12	1.05	1.43	0.00	121	1636.89	1636.89	361.9	1.05	0.000	1.541	10.5	6	50	61	100.0	78.37	28.44	47.01	45.28	########	########	361.9	Yes	318.3	1.575	Yes	318.3	1.575	0.5	28440.87	78.37	1.14	319.15	1.00	319.15	0.969	0.3507	1.15	28.44	32.53	6.37	No
4.15	317.6	4.13	0.67	13.62	-13.62	317.60	4.13	1.30	0.67	0.00	121	1656.73	1656.73	382.4	1.30	0.000	1.603	13.1	6	54	65	100.0	79.32	30.41	47.25	45.57	########	########	382.4	Yes	338.4	1.633	Yes	338.4	1.633	0.5	30413.54	79.32	1.13	339.24	1.00	339.24	0.968	0.3506	1.14	30.41	34.59	6.39	No
4.2	304.9	4	1.25	13.78	-13.78	304.91	4.00	1.31	1.25	0.00	121	1676.57	1676.57	362.7	1.32	0.000	1.619	13.8	6	52	63	100.0	80.27	29.20	47.02	45.35	########	########	362.7	Yes	322.8	1.648	Yes	322.8	1.648	0.5	29197.38	80.27	1.12	323.74	1.00	324.41	0.968	0.3504	1.13	29.20	33.01	6.40	No
4.25	250.3	2.72	1.80	13.94	-13.94	250.31	2.72	1.09	1.80	0.00	121	1696.41	1696.41	294.1	1.09	0.000	1.608	13.3	6	43	51	100.0	81.22	23.97	46.08	44.38	########	########	294.1	Yes	263.3	1.638	Yes	263.3	1.638	0.5	23968.86	81.22	1.12	264.21	1.00	264.21	0.967	0.3503	1.12	23.97	26.94	6.42	No
4.3	249.5	1.9	2.19	14.11	-14.11	249.51	1.90	0.76	2.19	0.00	121	1716.25	1716.25	289.8	0.76	0.000	1.494	8.5	6	41	48	100.0	82.17	23.89	46.02	44.33	########	########	289.7	Yes	260.9	1.525	Yes	260.9	1.525	0.5	23892.25	82.17	1.11	261.84	1.00	261.84	0.967	0.3501	1.12	23.89	26.70	6.44	No
4.35	248.4	1.78	2.19	14.27	-14.27	248.41	1.78	0.72	2.19	0.00	121	1736.10	1736.10	285.2	0.72	0.000	1.480	7.9	6	41	47	100.0	83.12	23.79	45.94	44.28	########	########	285.2	Yes	258.3	1.510	Yes	258.3	1.510	0.5	23786.91	83.12	1.10	259.19	1.00	259.19	0.967	0.3500	1.11	23.79	26.42	6.45	No
4.4	247.3	1.54	1.78	14.44	-14.44	247.31	1.54	0.62	1.78	0.00	121	1755.94	1755.94	280.7	0.62	0.000	1.441	6.3	6	40	46	100.0	84.07	23.68	45.87	44.24	########	########	280.7	Yes	255.7	1.470	Yes	255.7	1.470	0.5	23681.58	84.07	1.10	256.58	1.00	256.58	0.966	0.3499	1.10	23.68	26.16	6.47	No
4.45	244	1.71	1.57	14.60	-14.60	244.01	1.71	0.70	1.57	0.00	121	1775.78	1775.78	273.8	0.70	0.000	1.485	8.1	6	40	46	100.0	85.02	23.37	45.76	44.15	########	########	273.8	Yes	250.8	1.512	Yes	250.8	1.512	0.5	23365.57	85.02	1.09	251.74	1.00	251.74	0.966	0.3497	1.10	23.37	25.66	6.48	No
4.5	240.7	1.4	2.21	14.76	-14.76	240.71	1.40	0.58	2.21	0.00	121	1795.62	1795.62	267.1	0.58	0.000	1.436	6.0	6	39	44	100.0	85.97	23.05	45.64	44.05	########	########	267.1	Yes	246.0	1.462	Yes	246.0	1.462	0.5	23049.56	85.97	1.09	246.96	1.00	246.96	0.966	0.3496	1.09	23.05	25.17	6.50	No
4.55	214.8	1.18	2.88	14.93	-14.93	214.82	1.18	0.55	2.88	0.00	121	1815.46	1815.46	235.7	0.55	0.000	1.459	7.0	6	35	39	96.9	86.92	20.57	45.06	43.48	########	########	235.6	Yes	218.2	1.485	Yes	218.2	1.485	0.5	20569.36	86.92	1.08	219.17	1.00	219.17	0.965	0.3494	1.09	20.57	22.33	6.51	No
4.6	190	1.06	1.41	15.09	-15.09	190.01	1.06	0.56	1.41	0.00	121	1835.30	1835.30	206.1	0.56	0.000	1.508	9.1	6	31	35	91.9	87.87	18.19	44.42	42.87	########	########	206.1	Yes	191.9	1.532	Yes	191.9	1.532	0.5	18194.50	87.87	1.07	192.82	1.00	192.82	0.965	0.3493	1.08	18.19	19.64	6.53	No
4.65	170.9	0.66	0.62	15.26	-15.26	170.90	0.66	0.39	0.62	0.00	121	1855.14	1855.14	183.2	0.39	0.000	1.453	6.8	6	28	31	87.7	88.82	16.37	43.86	42.34	########	########	183.2	Yes	171.6	1.477	Yes	171.6	1.477	0.5	16365.47	88.82	1.07	172.51	1.00	172.51	0.964	0.3492	1.07	16.37	17.57	6.54	No
4.7	145.4	0.63	0.55	15.42	-15.42	145.40	0.63	0.43	0.55	0.00	121	1874.98	1874.98	154.1	0.44	0.000	1.544	10.6	6	24	27	81.2	89.77	13.92	43.00	41.54	########	########	154.1	Yes	145.0	1.566	Yes	145.0	1.566	0.5	13923.58	89.77	1.06	145.99	1.00	145.99	0.964	0.3490	1.07	13.92	14.86	6.56	No
4.75	96.3	0.78	-0.30	15.58	-15.58	96.30	0.78	0.81	-0.30	0.00	121	1894.82	1894.82	100.6	0.82	0.000	1.854	23.8	6	18	20	65.2	90.72	9.22	40.78	39.55	########	########	100.6	Yes	95.2	1.873	Yes	95.2	1.873	0.5	9221.74	90.72	1.06	96.18	1.16	111.97	0.964	0.3489	1.06	9.22	9.79	6.57	No
4.8	62.8	0.94	-0.39	15.75	-15.75	62.80	0.94	1.50	-0.39	0.00	118	1914.14	1914.14	64.6	1.52	0.000	2.172	37.3	5	13	14	48.6	91.65	6.01	38.33	37.48	########	########	64.6	Yes	61.5	2.189	Yes	61.5	2.189	0.5	6013.76	91.65	1.05	62.41	1.64	102.39	0.963	0.3488	1.06	6.01	6.35	6.58	Yes
4.85	33.5	1.19	-0.16	15.91	-15.91	33.50	1.19	3.55	-0.16	0.00	115	1932.94	1932.94	33.7	3.66	0.000	2.637	57.0	4	9	9	#########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	4066.6	2.10	33.7	No	33.7	Non-liq.	No	33.7	Non-liq.	Non-liq.	3207.98	92.55	Non-liq.	Non-liq.	Non-liq.	########	0.963	0.3486	1.05	3.21	3.37	6.60	Yes
4.9	28.55	1.06	0.05	16.08	-16.08	28.55	1.06	3.71	0.05	0.00	115	1951.74	1951.74	28.3	3.84	0.000	2.708	60.0	4	8	8	#########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	3446.8	1.77	28.3	No	28.3	Non-liq.	No	28.3	Non-liq.	Non-liq.	2733.96	93.45	Non-liq.	Non-liq.	Non-liq.	########	0.963	0.3485	1.05	2.73	2.86	6.61	Yes
4.95	58.73	1.27	0.35	16.24	-16.24	58.73	1.27	2.16	0.35	0.00	118	1971.06	1971.06	58.6	2.20	0.000	2.310	43.1	5	13	14	45.5	94.37	5.62	37.76	37.09	########	########	58.6	Yes	56.5	2.322	Yes	56.5	2.322	0.5	5624.02	94.37	1.04	57.51	2.02	116.22	0.962	0.3483	1.04	5.62	5.85	6.62	Yes
5	88.9	1.15	0.90	16.40	-16.40	88.90	1.15	1.29	0.90	0.00	121	1990.90	1990.90	88.3	1.31	0.000	2.027	31.1	6	18	19	61.1	95.32	8.51	40.08	39.05	########	########	88.3	Yes	85.7	2.037	Yes	85.7	2.037	0.5	8513.11	95.32	1.03	86.62	1.35	117.08	0.962	0.3482	1.03	8.51	8.80	6.64	No
5.05	118	1.19	1.50	16.57	-16.57	118.01	1.19	1.01	1.50	0.00	121	2010.74	2010.74	116.4	1.02	0.000	1.865	24.2	6	22	23	71.8	96.27	11.30	41.55	40.38	########	########	116.4	Yes	113.4	1.873	Yes	113.4	1.873	0.5	11299.74	96.27	1.03	114.41	1.16	133.25	0.961	0.3481	1.03	11.30	11.62	6.65	No
5.1	127.3	0.93	0.92	16.73	-16.73	127.30	0.93	0.73	0.92	0.00	121	2030.58	2030.58	124.4	0.74	0.000	1.753	19.5	6	23	24	74.5	97.22	12.19	41.90	40.72	########	########	124.4	Yes	121.8	1.760	Yes	121.8	1.760	0.5	12190.31	97.22	1.02	122.82	1.08	132.46	0.961	0.3479	1.02	12.19	12.47	6.67	No
5.15	130.1	0.94	0.83	16.90	-16.90	130.10	0.94	0.72	0.83	0.00	121	2050.42	2050.42	125.9	0.73	0.000	1.746	19.2	6	23	24	75.1	98.17	12.46	41.97	40.80	########	########	125.9	Yes	123.9	1.751	Yes	123.9	1.751	0.5	12458.44	98.17	1.02	124.91	1.07	133.96	0.961	0.3478	1.02	12.46	12.68	6.68	No
5.2	135.6	0.94	0.78	17.06	-17.06	135.60	0.94	0.69	0.78	0.00	121	2070.26	2070.26	130.0	0.70	0.000	1.724	18.3	6	24	25	76.5	99.12	12.99	42.13	40.97	########	########	130.0	Yes	128.6	1.728	Yes	128.6	1.728	0.5	12985.13	99.12	1.01	129.57	1.06	136.87	0.960	0.3476	1.01	12.99	13.14	6.69	No
5.25	139.8	1.05	0.76	17.22	-17.22	139.80	1.05	0.75	0.76	0.00	121	2090.10	2090.10	132.8	0.76	0.000	1.738	18.9	6	25	25	77.5	100.07	13.39	42.24	41.10	########	########	132.8	Yes	132.0	1.740	Yes	132.0	1.740	0.5	13387.32	100.07	1.01	132.95	1.07	141.60	0.960	0.3475	1.01	13.39	13.48	6.71	No
5.3	151.3	1.42	0.76	17.39	-17.39	151.30	1.42	0.94	0.76	0.00	121	2109.94	2109.94	142.4	0.95	0.000	1.778	20.6	6	27	27	80.3	101.02	14.49	42.60	41.45	########	########	142.4	Yes	142.2	1.779	Yes	142.2	1.779	0.5	14488.57	101.02	1.00	143.20	1.09	156.30	0.959	0.3474	1.00	14.49	14.51	6.72	No
5.35	181.7	1.06	0.74	17.55	-17.55	181.70	1.06	0.58	0.74	0.00	121	2129.79	2129.79	169.6	0.59	0.000	1.586	12.4	6	31	31	87.1	101.97	17.40	43.48	42.30	########	########	169.6	Yes	170.2	1.585	Yes	170.2	1.585	0.5	17399.69	101.97	1.00	171.17	1.00	171.17	0.959	0.3472	1.00	17.40	17.34	6.73	No
5.4	210.9	1.17	0.74	17.72	-17.72	210.90	1.17	0.55	0.74	0.00	121	2149.63	2149.63	195.2	0.56	0.000	1.525	9.8	6	35	35	92.6	102.92	20.20	44.16	42.99	########	########	195.2	Yes	196.8	1.522	Yes	196.8	1.522	0.5	20195.89	102.92	0.99	197.76	1.00	197.76	0.959	0.3471	0.99	20.20	20.02	6.75	No
5.45	217.9	1.3	0.67	17.88	-17.88	217.90	1.30	0.60	0.67	0.00	121	2169.47	2169.47	199.9	0.60	0.000	1.537	10.3	6	36	36	93.7	103.87	20.87	44.28	43.13	########	########	199.9	Yes	202.4	1.533	Yes	202.4	1.533	0.5	20866.22	103.87	0.99	203.39	1.00	203.39	0.958	0.3470	0.99	20.87	20.58	6.76	No
5.5	230.9	1.55	0.76	18.04	-18.04	230.90	1.55	0.67	0.76	0.00	121	2189.31	2189.31	209.9	0.67	0.000	1.555	11.1	6	39	38	95.7	104.82	22.11	44.51	43.38	########	########	209.9	Yes	213.5	1.550	Yes	213.5	1.550	0.5	22111.10	104.82	0.98	214.55	1.00	214.55	0.958	0.3468	0.98	22.11	21.69	6.77	No
5.55	246.4	1.65	0.83	18.21	-18.21	246.40	1.65	0.67	0.83	0.00	121	2209.15	2209.15	222.1	0.67	0.000	1.536	10.3	6	41	40	98.0	105.77	23.60	44.78	43.67	########	########	222.1	Yes	226.9	1.529	Yes	226.9	1.529	0.5	23595.39	105.77	0.98	227.92	1.00	227.92	0.958	0.3467	0.98	23.60	23.03	6.78	No
5.6	263.6	2.29	0.92	18.37	-18.37	263.60	2.29	0.87	0.92	0.00	121	2228.99	2228.99	235.5	0.87	0.000	1.598	12.9	6	45	43	100.0	106.72	25.24	45.06	43.97	########	########	235.5	Yes	241.7	1.590	Yes	241.7	1.590	0.5	25242.47	106.72	0.97	242.74	1.00	242.74	0.957	0.3465	0.97	25.24	24.52	6.80	No
5.65	246.7	2.07	0.90	18.54	-18.54	246.70	2.07	0.84	0.90	0.00	121	2248.83	2248.83	218.4	0.84	0.000	1.610	13.4	6	42	40	97.7	107.67	23.62	44.70	43.63	########	########	218.4	Yes	225.1	1.601	Yes	225.1	1.601	0.5	23624.12	107.67	0.97	226.17	1.00	226.17	0.957	0.3464	0.97	23.62	22.83	6.81	No
5.7	243	1.97	0.85	18.70	-18.70	243.00	1.97	0.81	0.85	0.00	121	2268.67	2268.67	213.2	0.81	0.000	1.607	13.3	6	42	39	96.9	108.62	23.27	44.59	43.54	########	########	213.2	Yes	220.8	1.596	Yes	220.8	1.596	0.5	23269.81	108.62	0.97	221.80	1.00	221.80	0.956	0.3463	0.96	23.27	22.37	6.82	No
5.75	248.6	1.88	0.90	18.86	-18.86	248.60	1.88	0.76	0.90	0.00	121	2288.51	2288.51	216.3	0.76	0.000	1.581	12.2	6	42	40	97.6	109.57	23.81	44.66	43.63	########	########	216.3	Yes	224.9	1.569	Yes	224.9	1.569	0.5	23806.07	109.57	0.96	225.93	1.00	225.93	0.956	0.3461	0.96	23.81	22.78	6.83	No
5.8	254.2	1.74	1.29	19.03	-19.03	254.21	1.74	0.68	1.29	0.00	121	2308.35	2308.35	219.2	0.69	0.000	1.547	10.8	6	43	40	98.3	110.52	24.34	44.72	43.71	########	########	219.2	Yes	229.0	1.533	Yes	229.0	1.533	0.5	24342.32	110.52	0.96	230.02	1.00	230.02	0.956	0.3460	0.95	24.34	23.17	6.85	No
5.85	248.8	1.59	1.66	19.19	-19.19	248.81	1.59	0.64	1.66	0.00	121	2328.20	2328.20	212.7	0.64	0.000	1.536	10.3	6	42	39	97.3	111.47	23.83	44.58	43.59	########	########	212.7	Yes	223.1	1.521	Yes	223.1	1.521	0.5	23825.22	111.47	0.95	224.18	1.00	224.18	0.955	0.3458	0.95	23.83	22.57	6.86	No
5.9	250.2	1.47	1.61	19.36	-19.36	250.21	1.47	0.59	1.61	0.00	121	2348.04	2348.04	212.1	0.59	0.000	1.513	9.3	6	41	38	97.3	112.42	23.96	44.56	43.60	########	########	212.1	Yes	223.4	1.496	Yes	223.4	1.496	0.5	23959.28	112.42	0.95	224.48	1.00	224.48	0.955	0.3457	0.94	23.96	22.58	6.87	No
5.95	264.1	1.23	1.68	19.52	-19.52	264.11	1.23	0.47	1.68	0.00	121	2367.88	2367.88	222.1	0.47	0.000	1.433	5.9	6	43	39	99.2	113.37	25.29	44.78	43.84	########	########	222.1	Yes	234.9	1.414	Yes	234.9	1.414	0.5	25290.35	113.37	0.95	235.96	1.00	235.96	0.954	0.3456	0.94	25.29	23.72	6.88	No
6	259.5	1.17	1.75	19.68	-19.68	259.51	1.17	0.45	1.75	0.00	121	2387.72	2387.72	216.4	0.45	0.000	1.434	6.0	6	42	38	98.3	114.32	24.85	44.66	43.73	########	########	216.4	Yes	229.8	1.413	Yes	229.8	1.413	0.5	24849.85	114.32	0.94	230.88	1.00	230.88	0.954	0.3454	0.93	24.85	23.20	6.90	No
6.05	247	0.93	1.91	19.85	-19.85	247.01	0.93	0.38	1.91	0.00	121	2407.56	2407.56	204.2	0.38	0.000	1.408	4.9	6	40	36	96.3	115.27	23.65	44.38	43.48	########	########	204.2	Yes	217.8	1.385	Yes	217.8	1.385	0.5	23652.85	115.27	0.94	218.86	1.00	218.86	0.954	0.3453	0.93	23.65	21.97	6.91	No
6.1	246.05	0.94	1.96	20.01	-20.01	246.06	0.94	0.38	1.96	0.00	121	2427.40	2427.40	201.7	0.38	0.000	1.416	5.2	6	40	36	96.0	116.22	23.56	44.32	43.44	########	########	201.7	Yes	216.1	1.391	Yes	216.1	1.391	0.5	23561.88	116.22	0.93	217.12	1.00	217.12	0.953	0.3452	0.92	23.56	21.78	6.92	No
6.15	248.68	0.96	1.87	20.18	-20.18	248.69	0.96	0.39	1.87	0.00	121	2447.24	2447.24	202.2	0.39	0.000	1.417	5.3	6	40	36	96.2	117.17	23.81	44.33	43.47	########	########	202.2	Yes	217.5	1.392	Yes	217.5	1.392	0.5	23813.73	117.17	0.93	218.55	1.00	218.55	0.953	0.3450	0.92	23.81	21.91	6.93	No
6.2	251.3	1.11	1.85	20.34	-20.34	251.31	1.11	0.44	1.85	0.00	121	2467.08	2467.08	202.7	0.44	0.000	1.451	6.7	6	41	36	96.4	118.12	24.06	44.35	43.50	########	########	202.7	Yes	218.9	1.424	Yes	218.9	1.424	0.5	24064.62	118.12	0.93	219.96	1.00	219.96	0.953	0.3449	0.92	24.06	22.03	6.94	No
6.25	251.8	1.2	1.98	20.51	-20.51	251.81	1.20	0.48	1.98	0.00	121	2486.92	2486.92	201.5	0.48	0.000	1.473	7.6	6	41	36	96.3	119.07	24.11	44.32	43.49	########	########	201.5	Yes	218.4	1.445	Yes	218.4	1.445	0.5	24112.50	119.07	0.92	219.52	1.00	219.52	0.952	0.3447	0.91	24.11	21.97	6.95	No
6.3	247.3	1.27	2.12	20.67	-20.67	247.31	1.27	0.51	2.12	0.00	121	2506.77	2506.77	196.3	0.52	0.000	1.502	8.8	6	41	36	95.5	120.02	23.68	44.19	43.39	########	########	196.3	Yes	213.7	1.473	Yes	213.7	1.473	0.5	23681.58	120.02	0.92	214.74	1.00	214.74	0.952	0.3446	0.91	23.68	21.48	6.97	No
6.35	243.3	1.35	2.12	20.83	-20.83	243.31	1.35	0.55	2.12	0.00	121	2526.61	2526.61	191.6	0.56	0.000	1.531	10.1	6	41	35	94.7	120.97	23.30	44.07	43.29	########	########	191.6	Yes	209.3	1.502	Yes	209.3	1.502	0.5	23298.53	120.97	0.92	210.44	1.00	210.44	0.951	0.3445	0.90	23.30	21.03	6.98	No
6.4	234.9	1.34	2.05	21.00	-21.00	234.91	1.34	0.57	2.05	0.00	121	2546.45	2546.45	183.5	0.57	0.000	1.553	11.0	6	39	34	93.2	121.92	22.49	43.86	43.10	########	########	183.5	Yes	201.3	1.522	Yes	201.3	1.522	0.5	22494.15	121.92	0.91	202.38	1.00	202.38	0.951	0.3443	0.90	22.49	20.21	6.99	No
6.45	234.85	1.32	2.10	21.16	-21.16	234.86	1.32	0.56	2.10	0.00	121	2566.29	2566.29	182.0	0.57	0.000	1.552	11.0	6	39	34	93.0	122.87	22.49	43.82	43.08	########	########	182.0	Yes	200.5	1.520	Yes	200.5	1.520	0.5	22489.36	122.87	0.91	201.55	1.00	201.55	0.951	0.3442	0.89	22.49	20.11	7.00	No
6.5	234.8	1.31	2.15	21.33	-21.33	234.81	1.31	0.56	2.15	0.00	121	2586.13	2586.13	180.6	0.56	0.000	1.553	11.0	6	39	34	92.8	123.82	22.48	43.78	43.06	########	########	180.6	Yes	199.6	1.519	Yes	199.6	1.519	0.5	22484.57	123.82	0.90	200.73	1.00	200.73	0.950	0.3440	0.89	22.48	20.02	7.01	No
6.55	237.8	1.31	2.15	21.49	-21.49	237.81	1.31	0.55	2.15	0.00	121	2605.97	2605.97	181.5	0.55	0.000	1.548	10.8	6	40	34	93.2	124.77	22.77	43.81	43.11	########	########	181.5	Yes	201.4	1.512	Yes	201.4	1.512	0.5	22771.85	124.77	0.90	202.52	1.00	202.52	0.950	0.3439	0.89	22.77	20.18	7.02	No
6.6	230.2	1.28	2.15	21.65	-21.65	230.21	1.28	0.56	2.15	0.00	121	2625.81	2625.81	174.3	0.56	0.000	1.564	11.5	6	39	33	91.8	125.72	22.04	43.61	42.93	########	########	174.3	Yes	194.2	1.527	Yes	194.2	1.527	0.5	22044.07	125.72	0.90	195.31	1.00	195.31	0.950	0.3438	0.88	22.04	19.44	7.03	No
6.65	222.2	0.9	2.15	21.82	-21.82	222.21	0.90	0.41	2.15	0.00	121	2645.65	2645.65	167.0	0.41	0.000	1.498	8.7	6	37	31	90.2	126.67	21.28	43.40	42.75	########	########	167.0	Yes	186.7	1.458	Yes	186.7	1.458	0.5	21277.99	126.67	0.89	187.81	1.00	187.81	0.949	0.3436	0.88	21.28	18.68	7.04	No
6.7	207.7	0.82	2.05	21.98	-21.98	207.71	0.82	0.39	2.05	0.00	121	2665.49	2665.49	154.9	0.40	0.000	1.520	9.6	6	34	29	87.5	127.62	19.89	43.02	42.41	########	########	154.8	Yes	173.8	1.478	Yes	173.8	1.478	0.5	19889.46	127.62	0.89	174.90	1.00	174.90	0.949	0.3435	0.87	19.89	17.38	7.06	No
6.75	203.2	0.76	1.85	22.15	-22.15	203.21	0.76	0.37	1.85	0.00	121	2685.34	2685.34	150.3	0.38	0.000	1.518	9.5	6	34	28	86.5	128.57	19.46	42.87	42.28	########	########	150.3	Yes	169.4	1.474	Yes	169.4	1.474	0.5	19458.54	128.57	0.89	170.48	1.00	170.48	0.948	0.3434	0.87	19.46	16.93	7.07	No
6.8	197.6	0.78	1.73	22.31	-22.31	197.61	0.78	0.39	1.73	0.00	121	2705.18	2705.18	145.1	0.40	0.000	1.544	10.6	6	33	27	85.3	129.52	18.92	42.69	42.13	########	########	145.1	Yes	164.0	1.499	Yes	164.0	1.499	0.5	18922.28	129.52	0.88	165.17	1.00	165.17	0.948	0.3432	0.87	18.92	16.39	7.08	No
6.85	189.1	0.79	1.61	22.47	-22.47	189.11	0.79	0.42	1.61	0.00	121	2725.02	2725.02	137.8	0.42	0.000	1.576	12.0	6	32	26	83.4	130.47	18.11	42.43	41.90	########	########	137.8	Yes	156.4	1.530	Yes	156.4	1.530	0.5	18108.31	130.47	0.88	157.49	1.00	157.49	0.948	0.3431	0.86	18.11	15.61	7.09	No
6.9	182.3	0.8	1.61	22.64	-22.64	182.31	0.80	0.44	1.61	0.00	121	2744.86	2744.86	131.8	0.44	0.000	1.604	13.2	6	31	25	81.9	131.42	17.46	42.20	41.71	########	########	131.8	Yes	150.1	1.556	Yes	150.1	1.556	0.5	17457.14	131.42	0.88	151.28	1.00	151.28	0.947	0.3429	0.86	17.46	14.98	7.10	No
6.95	165.9	1.05	1.55	22.80	-22.80	165.91	1.05	0.63	1.55	0.00	121	2764.70	2764.70	119.0	0.64	0.000	1.731	18.5	6	30	24	78.1	132.37	15.89	41.67	41.24	########	########	119.0	Yes	136.0	1.684	Yes	136.0	1.684	0.5	15886.67	132.37	0.87	137.17	1.03	140.89	0.947	0.3428	0.86	15.89	13.58	7.11	No
7	149.5	1.13	1.66	22.97	-22.97	149.51	1.13	0.76	1.66	0.00	121	2784.54	2784.54	106.4	0.76	0.000	1.816	22.2	6	27	22	74.0	133.32	14.32	41.08	40.73	########	########	106.4	Yes	122.0	1.769	Yes	122.0	1.769	0.5	14316.20	133.32	0.87	123.17	1.08	133.61	0.946	0.3427	0.85	14.32	12.18	7.12	No
7.05	112.9	1.32	1.80	23.13	-23.13	112.91	1.32	1.17	1.80	0.00	118	2804.38	2804.38	79.5	1.18	0.001	2.034	31.4	6	23	18	63.1	134.27	10.81	39.50	39.37	########	########	79.5	Yes	91.5	1.987	Yes	91.5	1.987	0.5	10811.36	134.27	0.87	92.69	1.28	118.94	0.946	0.3425	0.85	10.81	9.16	7.13	No
7.1	101.7	1.41	1.80	23.29	-23.29	101.71	1.41	1.39	1.80	0.00	118	2823.70	2823.70	71.0	1.41	0.001	2.119	35.0	5	21	17	58.9	135.20	9.74	38.86	38.86	########	########	71.0	Yes	82.1	2.072	Yes	82.1	2.072	0.5	9738.84	135.20	0.87	83.21	1.41	116.97	0.946	0.3424	0.84	9.74	8.21	7.14	No
7.15	116.2	1.55	1.82	23.46	-23.46	116.21	1.55	1.33	1.82	0.00	118	2843.02	2843.02	80.8	1.35	0.001	2.065	32.8	5	23	19	63.9	136.12	11.13	39.58	39.48	########	########	80.7	Yes	93.6	2.017	Yes	93.6	2.017	0.5	11127.37	136.12	0.86	94.75	1.32	125.39	0.945	0.3422	0.84	11.13	9.34	7.15	No
7.2	98.7	1.61	1.82	23.62	-23.62	98.71	1.61	1.63	1.82	0.00	118	2862.34	2862.34	68.0	1.66	0.001	2.180	37.6	5	21	17	57.5	137.05	9.45	38.61	38.68	########	########	68.0	Yes	79.0	2.131	Yes	79.0	2.131	0.5	9451.56	137.05	0.86	80.21	1.51	121.43	0.945	0.3421	0.84	9.45	7.90	7.16	No
7.25	82.4	1.76	2.33	23.79	-23.79	82.41	1.76	2.14	2.33	0.00	118	2881.66	2881.66	56.2	2.17	0.001	2.320	43.6	5	18	15	50.4	137.97	7.89	37.52	37.80	########	########	56.2	Yes	65.6	2.271	Yes	65.6	2.271	0.5	7890.67	137.97	0.86	66.74	1.86	124.10	0.945	0.3420	0.83	7.89	6.57	7.17	Yes
7.3	64.8	1.98	2.01	23.95	-23.95	64.81	1.98	3.06	2.01	0.00	118	2900.98	2900.98	43.7	3.12	0.001	2.508	51.5	5	16	12	41.1	138.90	6.21	36.02	36.64	########	########	43.7	Yes	51.1	2.458	Yes	51.1	2.458	0.5	6205.28	138.90	0.85	52.31	2.57	134.22	0.944	0.3418	0.83	6.21	5.15	7.18	Yes
7.35	65.7	1.85	2.40	24.11	-24.11	65.71	1.85	2.82	2.40	0.00	118	2920.30	2920.30	44.0	2.88	0.001	2.481	50.4	5	16	12	41.5	139.82	6.29	36.06	36.69	########	########	44.0	Yes	51.7	2.430	Yes	51.7	2.430	0.5	6291.47	139.82	0.85	52.86	2.44	128.96	0.944	0.3417	0.83	6.29	5.19	7.19	Yes
7.4	74.9	1.65	2.26	24.28	-24.28	74.91	1.65	2.20	2.26	0.00	118	2939.62	2939.62	50.0	2.25	0.001	2.368	45.6	5	17	13	46.4	140.75	7.17	36.82	37.30	########	########	50.0	Yes	58.9	2.315	Yes	58.9	2.315	0.5	7172.46	140.75	0.85	60.06	2.00	120.01	0.943	0.3416	0.82	7.17	5.90	7.20	Yes
7.45	84.1	1.83	2.84	24.44	-24.44	84.12	1.83	2.18	2.84	0.00	118	2958.93	2958.93	55.9	2.21	0.001	2.328	43.9	5	19	15	50.7	141.67	8.05	37.48	37.84	########	########	55.8	Yes	66.0	2.275	Yes	66.0	2.275	0.5	8053.46	141.67	0.85	67.22	1.87	125.66	0.943	0.3414	0.82	8.05	6.59	7.21	Yes
7.5	84.9	2.01	2.33	24.61	-24.61	84.91	2.01	2.37	2.33	0.00	118	2978.25	2978.25	56.0	2.41	0.001	2.352	44.9	5	19	15	50.9	142.60	8.13	37.50	37.87	########	########	56.0	Yes	66.4	2.298	Yes	66.4	2.298	0.5	8130.07	142.60	0.84	67.64	1.94	131.35	0.943	0.3413	0.82	8.13	6.63	7.22	Yes
7.55	88.7	1.97	2.68	24.77	-24.77	88.71	1.97	2.22	2.68	0.00	118	2997.57	2997.57	58.2	2.26	0.001	2.320	43.6	5	20	15	52.4	143.52	8.49	37.72	38.06	########	########	58.2	Yes	69.2	2.266	Yes	69.2	2.266	0.5	8493.96	143.52	0.84	70.44	1.84	129.81	0.942	0.3411	0.81	8.49	6.90	7.23	Yes
7.6	94.6	1.36	3.02	24.93	-24.93	94.62	1.36	1.44	3.02	0.00	121	3016.89	3016.89	61.7	1.46	0.001	2.177	37.5	5	20	15	54.8	144.45	9.06	38.06	38.35	########	########	61.7	Yes	73.7	2.118	Yes	73.7	2.118	0.5	9058.95	144.45	0.84	74.88	1.49	111.43	0.942	0.3410	0.81	9.06	7.33	7.24	No
7.65	122.5	1.03	2.56	25.10	-25.10	122.51	1.03	0.84	2.56	0.00	121	3036.73	3036.73	79.7	0.85	0.001	1.945	27.6	6	24	18	64.5	145.40	11.73	39.51	39.57	########	########	79.7	Yes	95.4	1.882	Yes	95.4	1.882	0.5	11730.66	145.40	0.83	96.65	1.17	113.34	0.941	0.3409	0.81	11.73	9.45	7.25	No
7.7	135.6	0.95	-0.02	25.26	-25.26	135.60	0.95	0.70	-0.02	0.00	121	3056.57	3056.57	87.7	0.71	0.000	1.865	24.2	6	25	19	68.3	146.35	12.99	40.04	40.04	########	########	87.7	Yes	105.4	1.800	Yes	105.4	1.800	0.5	12985.13	146.35	0.83	106.63	1.11	118.00	0.941	0.3407	0.80	12.99	10.41	7.26	No
7.75	132.1	1.3	-0.28	25.43	-25.43	132.10	1.30	0.98	-0.28	0.00	121	3076.41	3076.41	84.9	1.00	0.000	1.964	28.5	6	26	19	67.1	147.30	12.65	39.86	39.90	########	########	84.9	Yes	102.3	1.901	Yes	102.3	1.901	0.5	12649.96	147.30	0.83	103.55	1.19	123.24	0.941	0.3406	0.80	12.65	10.10	7.27	No
7.8	91.1	1.65	-0.32	25.59	-25.59	91.10	1.65	1.81	-0.32	0.00	118	3095.73	3095.73	57.9	1.84	0.000	2.263	41.1	5	20	15	52.8	148.22	8.72	37.69	38.11	########	########	57.9	Yes	70.0	2.202	Yes	70.0	2.202	0.5	8723.78	148.22	0.83	71.18	1.67	118.94	0.940	0.3404	0.80	8.72	6.94	7.28	Yes
7.85	63.9	1.7	-0.02	25.75	-25.75	63.90	1.70	2.66	-0.02	0.00	118	3115.05	3115.05	40.0	2.73	0.000	2.496	51.0	5	16	12	39.0	149.15	6.12	35.49	36.40	########	########	40.0	Yes	48.6	2.434	Yes	48.6	2.434	0.5	6119.10	149.15	0.82	49.78	2.46	122.21	0.940	0.3403	0.79	6.12	4.85	7.29	Yes
7.9	94.7	2.16	0.30	25.92	-25.92	94.70	2.16	2.28	0.30	0.00	118	3134.37	3134.37	59.4	2.32	0.000	2.322	43.6	5	21	16	54.0	150.07	9.07	37.84	38.27	########	########	59.4	Yes	72.3	2.260	Yes	72.3	2.260	0.5	9068.52	150.07	0.82	73.54	1.83	134.35	0.940	0.3402	0.79	9.07	7.16	7.30	Yes
7.95	125.5	2.55	1.25	26.08	-26.08	125.51	2.55	2.03	1.25	0.00	118	3153.69	3153.69	78.6	2.06	0.000	2.198	38.4	5	27	20	64.7	151.00	12.02	39.43	39.60	########	########	78.6	Yes	95.9	2.137	Yes	95.9	2.137	0.5	12017.95	151.00	0.82	97.16	1.53	148.18	0.939	0.3400	0.79	12.02	9.45	7.31	No
8	278.1	2.61	1.01	26.25	-26.25	278.11	2.61	0.94	1.01	0.00	121	3173.53	3173.53	174.3	0.94	0.000	1.714	17.8	6	49	36	95.0	151.95	26.63	43.61	43.38	########	########	174.3	Yes	213.4	1.652	Yes	213.4	1.652	0.5	26631.00	151.95	0.82	214.62	1.00	215.65	0.939	0.3399	0.78	26.63	20.85	7.32	No
8.05	329	2.6	1.36	26.41	-26.41	329.01	2.60	0.79	1.36	0.00	121	3193.37	3193.37	205.1	0.79	0.000	1.611	13.5	6	56	41	100.0	152.90	31.51	44.40	44.17	########	########	205.1	Yes	251.9	1.548	Yes	251.9	1.548	0.5	31505.21	152.90	0.81	253.12	1.00	253.12	0.938	0.3398	0.78	31.51	24.56	7.33	No
8.1	331.9	2.14	1.27	26.57	-26.57	331.91	2.14	0.64	1.27	0.00	121	3213.21	3213.21	205.6	0.65	0.000	1.550	10.9	6	56	40	100.0	153.85	31.78	44.41	44.20	########	########	205.6	Yes	253.3	1.484	Yes	253.3	1.484	0.5	31782.92	153.85	0.81	254.56	1.00	254.56	0.938	0.3396	0.78	31.78	24.68	7.34	No
8.15	335.8	2.1	1.45	26.74	-26.74	335.81	2.10	0.63	1.45	0.00	121	3233.05	3233.05	206.7	0.63	0.000	1.539	10.4	6	56	40	100.0	154.80	32.16	44.44	44.24	########	########	206.7	Yes	255.5	1.472	Yes	255.5	1.472	0.5	32156.38	154.80	0.81	256.76	1.00	256.76	0.938	0.3395	0.77	32.16	24.87	7.35	No
8.2	340	2.17	1.61	26.90	-26.90	340.01	2.17	0.64	1.61	0.00	121	3252.90	3252.90	208.0	0.64	0.000	1.543	10.6	6	57	41	100.0	155.75	32.56	44.47	44.28	########	########	208.0	Yes	257.9	1.475	Yes	257.9	1.475	0.5	32558.58	155.75	0.80	259.18	1.00	259.18	0.937	0.3393	0.77	32.56	25.08	7.36	No
8.25	325.4	2.24	1.66	27.07	-27.07	325.41	2.24	0.69	1.66	0.00	121	3272.74	3272.74	197.9	0.69	0.000	1.581	12.2	6	55	39	100.0	156.70	31.16	44.23	44.06	########	########	197.9	Yes	246.0	1.513	Yes	246.0	1.513	0.5	31160.47	156.70	0.80	247.29	1.00	247.29	0.937	0.3392	0.77	31.16	23.90	7.36	No
8.3	338	2.24	1.73	27.23	-27.23	338.01	2.24	0.66	1.73	0.00	121	3292.58	3292.58	204.3	0.67	0.000	1.560	11.3	6	57	40	100.0	157.65	32.37	44.38	44.23	########	########	204.3	Yes	254.8	1.490	Yes	254.8	1.490	0.5	32367.06	157.65	0.80	256.09	1.00	256.09	0.937	0.3391	0.76	32.37	24.73	7.37	No
8.35	350.6	2.59	1.80	27.39	-27.39	350.61	2.59	0.74	1.80	0.00	121	3312.42	3312.42	210.7	0.74	0.000	1.582	12.3	6	59	42	100.0	158.60	33.57	44.53	44.39	########	########	210.7	Yes	263.6	1.513	Yes	263.6	1.513	0.5	33573.64	158.60	0.80	264.84	1.00	264.84	0.936	0.3389	0.76	33.57	25.55	7.38	No
8.4	367.2	3.63	1.96	27.56	-27.56	367.21	3.63	0.99	1.96	0.00	121	3332.26	3332.26	219.4	0.99	0.000	1.660	15.6	6	64	45	100.0	159.55	35.16	44.72	44.59	########	########	219.4	Yes	275.3	1.594	Yes	275.3	1.594	0.5	35163.26	159.55	0.80	276.56	1.00	276.56	0.936	0.3388	0.76	35.16	26.65	7.39	No
8.45	404.2	3.6	2.21	27.72	-27.72	404.21	3.60	0.89	2.21	0.00	121	3352.10	3352.10	240.2	0.89	0.000	1.600	13.0	6	69	48	100.0	160.50	38.71	45.15	45.04	########	########	240.2	Yes	302.3	1.534	Yes	302.3	1.534	0.5	38706.40	160.50	0.79	303.52	1.00	303.52	0.935	0.3386	0.76	38.71	29.22	7.40	No
8.5	414	3.68	5.47	27.89	-27.89	414.03	3.68	0.89	5.47	0.00	121	3371.94	3371.94	244.6	0.89	0.000	1.594	12.7	6	70	49	100.0	161.45	39.64	45.24	45.14	########	########	244.6	Yes	308.7	1.527	Yes	308.7	1.527	0.5	39644.86	161.45	0.79	309.96	1.00	309.96	0.935	0.3385	0.75	39.64	29.82	7.41	No
8.55	457	3.39	5.12	28.05	-28.05	457.03	3.39	0.74	5.12	0.00	121	3391.78	3391.78	268.5	0.74	0.000	1.509	9.1	6	76	53	100.0	162.40	43.76	45.67	45.60	########	########	268.5	Yes	339.9	1.440	Yes	339.9	1.440	0.5	43762.56	162.40	0.79	341.16	1.00	341.16	0.935	0.3384	0.75	43.76	32.78	7.42	No
8.6	464.4	2.4	4.96	28.22	-28.22	464.43	2.40	0.52	4.96	0.00	121	3411.62	3411.62	271.3	0.52	0.000	1.396	4.4	6	74	51	100.0	163.35	44.47	45.71	45.66	########	########	271.2	Yes	344.4	1.321	Yes	344.4	1.321	0.5	44471.19	163.35	0.79	345.67	1.00	345.67	0.934	0.3382	0.75	44.47	33.19	7.43	No
8.65	443.25	3.44	4.77	28.38	-28.38	443.28	3.44	0.78	4.77	0.00	121	3431.47	3431.47	257.4	0.78	0.000	1.536	10.3	6	74	51	100.0	164.30	42.45	45.47	45.42	########	########	257.3	Yes	327.7	1.465	Yes	327.7	1.465	0.5	42445.85	164.30	0.79	328.97	1.00	328.97	0.934	0.3381	0.74	42.45	31.55	7.44	No
8.7	422.1	3.08	4.75	28.54	-28.54	422.13	3.08	0.73	4.75	0.00	121	3451.31	3451.31	243.6	0.73	0.000	1.533	10.2	6	70	48	100.0	165.25	40.42	45.22	45.18	########	########	243.6	Yes	311.1	1.460	Yes	311.1	1.460	0.5	40420.52	165.25	0.78	312.37	1.00	312.37	0.934	0.3380	0.74	40.42	29.93	7.45	No
8.75	434.5	2.73	4.77	28.71	-28.71	434.53	2.73	0.63	4.77	0.00	121	3471.15	3471.15	249.4	0.63	0.000	1.480	7.9	6	71	49	100.0	166.20	41.61	45.33	45.30	########	########	249.3	Yes	319.3	1.405	Yes	319.3	1.405	0.5	41607.95	166.20	0.78	320.63	1.00	320.63	0.933	0.3378	0.74	41.61	30.69	7.46	No
8.8	440.1	2.58	4.36	28.87	-28.87	440.12	2.58	0.59	4.36	0.00	121	3490.99	3490.99	251.1	0.59	0.000	1.458	7.0	6	72	49	100.0	167.15	42.14	45.36	45.35	########	########	251.1	Yes	322.6	1.380	Yes	322.6	1.380	0.5	42144.20	167.15	0.78	323.84	1.00	323.84	0.933	0.3377	0.73	42.14	30.97	7.46	No
8.85	445.7	2.38	3.97	29.04	-29.04	445.72	2.38	0.53	3.97	0.00	121	3510.83	3510.83	252.9	0.54	0.000	1.428	5.7	6	72	49	100.0	168.10	42.68	45.39	45.40	########	########	252.9	Yes	325.7	1.348	Yes	325.7	1.348	0.5	42680.46	168.10	0.78	327.03	1.00	327.03	0.932	0.3375	0.73	42.68	31.24	7.47	No
8.9	431.5	2.31	3.58	29.20	-29.20	431.52	2.31	0.54	3.58	0.00	121	3530.67	3530.67	243.4	0.54	0.000	1.441	6.3	6	70	47	100.0	169.05	41.32	45.21	45.23	########	########	243.4	Yes	314.4	1.360	Yes	314.4	1.360	0.5	41320.66	169.05	0.77	315.72	1.00	315.72	0.932	0.3374	0.73	41.32	30.13	7.48	No
8.95	445.1	2.42	4.24	29.36	-29.36	445.12	2.42	0.54	4.24	0.00	121	3550.51	3550.51	249.7	0.55	0.000	1.437	6.1	6	72	48	100.0	170.00	42.62	45.33	45.36	########	########	249.7	Yes	323.5	1.356	Yes	323.5	1.356	0.5	42623.01	170.00	0.77	324.76	1.00	324.76	0.932	0.3373	0.73	42.62	30.96	7.49	No
9	468.25	2.54	4.27	29.53	-29.53	468.27	2.54	0.54	4.27	0.00	121	3570.35	3570.35	261.3	0.54	0.000	1.422	5.5	6	75	50	100.0	170.95	44.84	45.54	45.59	########	########	261.3	Yes	339.4	1.340	Yes	339.4	1.340	0.5	44839.86	170.95	0.77	340.70	1.00	340.70	0.931	0.3371	0.72	44.84	32.45	7.50	No
9.05	491.4	3.04	4.29	29.69	-29.69	491.42	3.04	0.62	4.29	0.00	121	3590.19	3590.19	272.8	0.62	0.000	1.448	6.6	6	80	53	100.0	171.90	47.06	45.74	45.81	########	########	272.7	Yes	355.3	1.368	Yes	355.3	1.368	0.5	47056.72	171.90	0.77	356.55	1.00	356.55	0.931	0.3370	0.72	47.06	33.93	7.51	No
9.1	498.3	0	4.84	29.86	-29.86	498.33	0.00	0.00	4.84	0.00	80	3603.25	3603.25	275.6	0.00	0.000	4.538	100.0	2	4081	2709	#########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	62065.5	17.22	275.6	No	275.6	Non-liq.	No	275.6	Non-liq.	Non-liq.	47717.47	172.52	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3368	0.72	47.72	34.32	7.51	No
9.15	462.2	0	5.14	30.02	-30.02	462.23	0.00	0.00	5.14	0.00	80	3616.30	3616.30	254.6	0.00	0.000	4.538	100.0	2	3785	2505	#########	9000000000.00	9000000000.00	9000000000.00	9000000000.00	57552.4	15.91	254.6	No	254.6	Non-liq.	No	254.6	Non-liq.	Non-liq.	44260.51	173.15	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3367	0.72	44.26	31.76	7.52	No
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Average																																																	
4.60	**179.40**	**1.28**	**1.18**	**15.09**	**-15.09**	**179.41**	**1.28**	**0.83**	**1.18**	**0.00**	**120.46**	**1829.87**	**1829.87**	**296.73**	**0.84**	**0.00**	**1.65**	**14.77**	**5.91**	**73.62**	**129.83**	**86.12**	**87.09**	**17.10**	**44.42**	**42.35**	**26133.60**	**61.59**	**296.72**		**210.82**	**1.65**		**210.82**	**1.65**	**0.50**	**17179.51**	**87.61**	**1.18**	**189.94**	**1.10**	**198.08**	**0.98**	**0.35**					

Sounding Name

CPT-07

Insert Raw Data

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Surface Elevation [ft]	Unequal End Area Ratio, a 0.83	Pre-drill Depth [ft] 0.0	Sat. Unit Weight for Pre-drill [pcf] 110	Depth to Water [ft] 100.0	From SBT, Iterated γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	FC [%]	SBT	$SPT\ N_{60}$ [blows/ft]	$SPT\ (N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{hc} [kPa]	q_c [MPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}
0.05	12.80	0.00	0.16	0.16	-0.16	12.80	0.00	0.00	0.16	80	13.05	13.05	1960.3	0.00	0.000	4.538	100.0	2	105	5272	########	########	########	########	########	1599.3	122.52
0.10	20.30	0.15	0.18	0.33	-0.33	20.30	0.15	0.74	0.18	0.00	127	33.94	33.94	1196.3	0.74	0.000	1.403	6.7	3	73	90.4	1.82	1.94	51.77	41.72	########	########
0.15	21.80	0.17	0.18	0.49	-0.49	21.80	0.17	0.78	0.18	0.00	127	54.82	54.82	794.0	0.78	0.000	1.250	0.0	7	3	75	83.0	2.62	2.09	50.25	40.91	########	########
0.20	21.10	0.18	0.18	0.66	-0.66	21.10	0.18	0.85	0.18	0.00	127	74.67	74.67	584.2	0.85	0.000	1.358	2.7	6	3	44	75.2	3.57	2.02	48.89	40.02	########	########
0.25	25.40	0.20	0.18	0.82	-0.82	25.40	0.20	0.79	0.18	0.00	127	94.51	94.51	536.6	0.79	0.000	1.340	2.0	6	4	44	77.4	4.52	2.43	48.68	40.34	########	########
0.30	32.70	0.22	0.28	0.98	-0.98	32.70	0.22	0.67	0.28	0.00	127	115.39	115.39	585.8	0.67	0.000	1.271	0.0	7	5	47	82.8	5.52	3.13	48.90	41.07	########	########
0.35	43.40	0.27	0.35	1.15	-1.15	43.40	0.27	0.62	0.35	0.00	127	136.28	136.28	636.2	0.62	0.000	1.214	0.0	7	7	54	90.2	6.52	4.16	49.37	42.03	########	########
0.40	52.80	0.31	0.35	1.31	-1.31	52.80	0.31	0.59	0.35	0.00	127	157.16	157.16	670.9	0.59	0.000	1.180	0.0	7	8	58	94.7	7.52	5.08	49.59	42.62	########	########
0.45	63.90	0.41	0.39	1.48	-1.48	63.90	0.41	0.64	0.39	0.00	127	178.05	178.05	716.8	0.64	0.000	1.198	0.0	7	10	65	99.4	8.62	6.12	49.85	43.24	########	########
0.50	83.40	0.51	0.42	1.64	-1.64	83.40	0.51	0.61	0.42	0.00	127	198.93	198.93	837.5	0.61	0.000	1.146	0.0	7	12	76	100.0	9.52	7.99	50.45	44.25	########	########
0.55	83.20	0.58	0.44	1.80	-1.80	83.20	0.58	0.70	0.44	0.00	127	219.82	219.82	756.0	0.70	0.000	1.217	0.0	7	13	72	100.0	10.52	7.97	50.05	44.00	########	########
0.60	83.00	0.58	0.48	1.97	-1.97	83.00	0.58	0.67	0.48	0.00	127	240.70	240.70	687.2	0.68	0.000	1.225	0.0	7	13	67	100.0	11.52	7.95	49.69	43.77	########	########
0.65	85.50	0.53	0.53	2.13	-2.13	85.50	0.53	0.62	0.53	0.00	127	261.59	261.59	652.7	0.62	0.000	1.206	0.0	7	13	64	100.0	12.52	8.19	49.48	43.71	########	########
0.70	88.00	0.50	0.53	2.30	-2.30	88.00	0.50	0.57	0.53	0.00	127	282.47	282.47	622.1	0.57	0.000	1.187	0.0	7	13	62	100.0	13.52	8.43	49.28	43.66	########	########
0.75	89.00	0.45	0.44	2.46	-2.46	89.00	0.45	0.51	0.44	0.00	127	303.36	303.36	585.8	0.51	0.000	1.161	0.0	7	13	59	100.0	14.52	8.92	49.04	43.55	########	########
0.80	89.20	0.46	0.44	2.62	-2.62	89.20	0.46	0.52	0.44	0.00	127	324.25	324.25	549.2	0.52	0.000	1.185	0.0	7	13	57	99.5	15.52	8.54	48.78	43.40	########	########
0.85	89.20	0.48	0.44	2.79	-2.79	89.20	0.48	0.54	0.44	0.00	127	345.13	345.13	561.9	0.54	0.000	1.216	0.0	7	13	54	98.3	16.52	8.54	48.52	43.25	########	########
0.90	92.05	0.63	0.37	2.95	-2.95	92.05	0.63	0.68	0.37	0.00	127	366.02	366.02	502.0	0.69	0.000	1.307	0.6	7	14	55	98.2	17.52	8.81	48.41	43.26	########	########
0.95	94.90	0.87	0.35	3.12	-3.12	94.90	0.87	0.92	0.35	0.00	127	385.86	385.86	490.9	0.92	0.000	1.417	5.2	6	15	57	98.2	18.47	9.09	48.31	43.28	########	########
1.00	103.60	0.78	0.44	3.28	-3.28	103.60	0.78	0.75	0.44	0.00	127	405.70	405.70	509.7	0.75	0.000	1.337	1.8	6	16	58	100.0	19.42	9.92	48.47	43.58	########	########
1.05	95.80	0.75	0.51	3.44	-3.44	95.80	0.75	0.78	0.51	0.00	127	425.54	425.54	449.3	0.78	0.000	1.382	3.8	6	15	52	96.5	20.37	9.17	47.94	43.09	########	########
1.10	98.70	0.61	0.53	3.61	-3.61	98.70	0.61	0.62	0.53	0.00	127	446.42	446.42	441.2	0.62	0.000	1.306	0.5	7	15	51	96.6	21.37	9.45	47.86	43.12	########	########
1.15	103.30	0.54	0.44	3.77	-3.77	103.30	0.54	0.52	0.44	0.00	127	467.31	467.31	441.1	0.52	0.000	1.250	0.0	7	16	50	97.4	22.37	9.89	47.86	43.23	########	########
1.20	105.80	0.53	0.44	3.94	-3.94	105.80	0.53	0.50	0.44	0.00	127	488.20	488.20	432.4	0.50	0.000	1.242	0.0	7	16	50	97.4	23.37	10.13	47.78	43.24	########	########
1.25	106.50	0.52	0.46	4.10	-4.10	106.50	0.52	0.49	0.46	0.00	127	509.08	509.08	417.4	0.49	0.000	1.245	0.0	7	16	49	96.8	24.37	10.20	47.63	43.17	########	########
1.30	105.70	0.52	0.42	4.27	-4.27	105.70	0.52	0.49	0.42	0.00	127	529.97	529.97	397.9	0.49	0.000	1.261	0.0	7	16	47	95.7	25.37	10.12	47.43	43.04	########	########
1.35	104.10	0.64	0.37	4.43	-4.43	104.10	0.64	0.61	0.37	0.00	127	549.85	549.85	377.7	0.62	0.000	1.348	2.3	6	16	46	94.3	26.32	9.97	47.22	42.88	########	########
1.40	103.10	0.50	0.48	4.59	-4.59	103.10	0.50	0.48	0.48	0.00	127	570.69	570.69	360.3	0.49	0.000	1.267	0.0	7	16	44	93.1	27.32	9.87	46.99	42.74	########	########
1.45	96.90	0.36	0.48	4.76	-4.76	96.90	0.36	0.37	0.48	0.00	127	591.58	591.58	328.6	0.37	0.000	1.241	2.0	7	15	39	90.0	28.32	9.28	46.58	42.38	########	########
1.50	86.00	0.36	0.46	4.92	-4.92	86.00	0.36	0.42	0.46	0.00	127	611.42	611.42	280.3	0.42	0.000	1.325	1.4	6	13	35	84.7	29.27	8.24	45.87	41.71	########	########
1.55	79.70	0.47	0.29	5.09	-5.09	79.70	0.47	0.59	0.29	0.00	127	631.26	631.26	251.5	0.59	0.000	1.459	7.0	6	13	33	81.2	30.22	7.63	45.37	41.27	########	########
1.60	73.40	0.58	0.29	5.25	-5.25	73.40	0.58	0.79	0.18	0.00	127	651.10	651.10	224.5	0.79	0.000	1.583	12.3	5	12	31	77.3	31.17	7.03	44.83	40.80	########	########
1.65	77.10	0.53	0.21	5.41	-5.41	77.10	0.53	0.69	0.21	0.00	127	670.94	670.94	228.8	0.69	0.000	1.535	10.2	6	13	31	78.6	32.12	7.38	44.92	40.97	########	########
1.70	71.40	0.40	0.29	5.58	-5.58	71.40	0.40	0.56	0.29	0.00	127	690.78	690.78	205.7	0.56	0.000	1.515	9.2	6	12	28	75.0	33.07	6.84	44.42	40.53	########	########
1.75	64.40	0.29	0.35	5.74	-5.74	64.40	0.29	0.45	0.35	0.00	127	710.62	710.62	180.3	0.45	0.000	1.497	8.6	6	11	25	70.5	34.02	6.17	43.78	39.97	########	########
1.80	56.60	0.28	0.41	5.91	-5.91	56.60	0.28	0.49	0.16	0.00	127	730.47	730.47	154.5	0.50	0.000	1.577	12.0	6	10	22	65.0	34.97	5.42	42.99	39.29	########	########
1.85	57.95	0.27	0.35	6.07	-6.07	57.95	0.27	0.47	0.09	0.00	127	750.31	750.31	153.5	0.47	0.000	1.583	11.4	6	10	22	65.3	35.92	5.55	42.98	39.34	########	########
1.90	59.30	0.27	0.05	6.23	-6.23	59.30	0.27	0.46	0.05	0.00	127	770.15	770.15	153.0	0.46	0.000	1.558	11.2	6	10	22	65.6	36.87	5.68	42.96	39.38	########	########
1.95	64.50	0.29	0.05	6.40	-6.40	64.50	0.29	0.45	0.05	0.00	127	789.99	789.99	162.3	0.45	0.000	1.534	10.2	6	11	23	68.3	37.82	6.18	43.26	39.72	########	########
2.00	66.80	0.32	0.00	6.56	-6.56	66.80	0.32	0.48	0.00	0.00	127	809.83	809.83	164.0	0.48	0.000	1.546	10.7	6	11	23	69.1	38.77	6.40	43.31	39.83	########	########
2.05	66.50	0.31	0.00	6.73	-6.73	66.50	0.31	0.47	0.00	0.00	127	829.67	829.67	159.3	0.47	0.000	1.550	10.9	6	11	23	68.5	39.72	6.37	43.16	39.75	########	########
2.10	69.60	0.29	0.00	6.89	-6.89	69.60	0.30	0.45	0.00	0.00	127	849.51	849.51	164.1	0.44	0.000	1.528	9.9	6	11	23	69.4	40.67	6.23	43.18	39.67	########	########
2.15	67.30	0.27	0.14	7.05	-7.05	67.30	0.27	0.40	0.14	0.00	127	869.35	869.35	153.8	0.40	0.000	1.526	9.9	6	11	22	67.9	41.62	6.44	42.99	39.70	########	########
2.20	67.30	0.26	0.27	7.22	-7.22	67.30	0.26	0.39	0.27	0.00	127	889.19	889.19	154.1	0.39	0.000	1.528	9.9	6	11	22	67.5	42.57	6.44	42.87	39.64	########	########
2.25	67.30	0.25	0.02	7.38	-7.38	67.30	0.25	0.37	0.02	0.00	127	909.04	909.04	147.1	0.37	0.000	1.525	9.8	6	11	21	67.0	43.52	6.44	42.76	39.59	########	########
2.30	67.80	0.24	0.02	7.55	-7.55	67.80	0.24	0.35	0.02	0.00	127	928.88	928.88	145.0	0.35	0.000	1.523	9.8	6	11	21	66.8	44.47	6.49	42.69	39.54	########	########
2.35	66.70	0.22	0.00	7.71	-7.71	66.70	0.22	0.33	0.00	0.00	127	948.72	948.72	139.6	0.33	0.000	1.518	9.5	6	11	21	65.7	45.42	6.39	42.50	39.45	########	########
2.40	63.00	0.21	-0.09	7.87	-7.87	63.00	0.21	0.33	-0.09	0.00	121	968.56	968.56	129.1	0.34	0.000	1.550	10.9	6	11	19	63.1	46.37	6.03	42.10	39.12	########	########
2.45	64.40	0.28	-0.18	8.04	-8.04	64.40	0.28	0.39	-0.18	0.00	121	988.40	988.40	134.1	0.39	0.000	1.560	11.4	6	11	19	64.1	47.32	6.04	42.37	39.22	########	########
2.50	35.00	0.34	-0.21	8.20	-8.20	35.00	0.34	0.97	-0.21	0.00	121	1008.24	1008.24	68.4	0.99	0.000	2.036	31.5	6	7	12	39.8	48.27	3.35	38.65	36.22	########	########
2.55	35.05	0.43	-0.09	8.37	-8.37	35.05	0.43	1.23	-0.09	0.00	118	1027.56	1027.56	67.2	1.25	0.000	2.104	34.4	6	7	13	39.4	49.20	3.36	38.55	36.18	########	########
2.60	35.10	0.51	0.00	8.53	-8.53	35.10	0.51	1.45	0.00	0.00	118	1046.88	1046.88	66.1	1.47	0.000	2.157	36.6	5	7	13	39.1	50.12	3.36	38.45	36.14	########	########
2.65	76.70	0.45	0.35	8.69	-8.69	76.70	0.45	0.59	0.35	0.00	121	1066.72	1066.72	142.8	0.59	0.000	1.647	15.0	6	13	23	68.6	51.07	7.34	42.61	39.83	########	########
2.70	106.70	0.38	0.35	8.86	-8.86	106.70	0.38	0.36	0.35	0.00	121	1086.56	1086.56	191.4	0.36	0.000	1.480	5.0	7	17	29	80.9	52.02	10.22	44.17	41.37	########	########
2.75	105.20	0.61	0.35	9.02	-9.02	105.20	0.61	0.58	0.35	0.00	121	1106.40	1106.40	189.2	0.58	0.000	1.548	10.8	6	18	29	80.0	52.97	10.07	44.01	41.26	########	########
2.80	104.60	0.85	0.35	9.19	-9.19	104.60	0.85	0.81	0.35	0.00	121	1126.24	1126.24	184.9	0.81	0.000	1.652	15.7	6	18	29	79.4	53.92	10.02	43.84	41.19	########	########
2.85	104.30	0.58	0.35	9.35	-9.35	104.30	0.58	0.56	0.35	0.00	121	1146.08	1146.08	181.0	0.56	0.000	1.551	10.9	6	17	28	78.9	54.87	9.99	43.80	41.13	########	########
2.90	109.05	0.56	0.35	9.51	-9.51	109.05	0.56	0.51	0.35	0.00	121	1165.93	1165.93	186.1	0.52	0.000	1.520	9.6	6	18	29	80.2	55.82	10.44	43.93	41.30	########	########
2.95	118.80	0.68	0.35	9.68	-9.68	118.80	0.68	0.57	0.35	0.00	121	1185.77	1185.77	200.7	0.57	0.000	1.505	9.0	6	19	29	81.5	56.77	10.90	44.06	41.47	########	########
3.00	125.90	0.50	0.35	9.84	-9.84	125.90	0.50	0.40	0.35	0.00	121	1205.61	1205.61	207.9	0.40	0.000	1.415	5.2	6	20	31	85.0	57.72	12.99	44.75	42.20	########	########
3.05	135.70	0.50	0.37	9.99	-9.99	135.70	0.50	0.37	0.37	0.00	121	1225.45	1225.45	220.6	0.37	0.000	1.371	3.5	6	22	33	87.6	58.67	12.99	44.75	42.21	########	########
3.10	141.30	0.51	0.35	10.17	-10.17	141.30	0.51	0.36	0.35	0.00	121	1245.29	1245.29	225.9	0.36	0.000	1.361	2.9	6	22	34	88.8	59.62	13.53	44.86	42.38	########	########
3.15	146.90	0.51	0.42	10.33	-10.33	146.90	0.51	0.35	0.42	0.00	121	1265.13	1265.13	231.2	0.35	0.000	1.343	2.1	6	23	34	89.9	60.57	14.07	44.97	42.53	########	########
3.20	159.80	0.62	0.39	10.50	-10.50	159.80	0.62	0.39	0.39	0.00	121	1284.97	1284.97	272.7	0.39	0.000	1.337	2.3	6	25	37	92.8	61.52	15.30	45.90	43.90	########	########
3.25	166.30	0.78	0.53	10.66	-10.66	166.30	0.78	0.47	0.53	0.00	121	1304.81	1304.81	253.9	0.47	0.000	1.399	4.1	6	26	38	94.0	62.47	15.92	45.41	43.05	########	########
3.30	162.40	0.72	0.69	10.83	-10.83	162.40	0.72	0.44	0.69	0.00	121	1324.65	1324.65	243.9	0.44	0.000	1.388	4.3	6	26	37	92.8	63.42	15.55	45.23	42.87	########	########
3.35	161.10	0.72	0.88	10.99	-10.99	161.10	0.72	0.45	0.88	0.00	121	1344.50	1344.50	238.7	0.45	0.000	1.398	4.4	6	26	36	92.2	64.37	15.43	45.12	42.83	########	########
3.40	161.00	0.73	0.78	11.15	-11.15	161.00	0.73	0.45	0.78	0.00	121	1364.34	1364.34	235.0	0.46	0.000	1.407	4.8	6	26	36	91.9	65.32	15.42	45.05	42.79	########	########
3.45	168.60	0.85	0.78	11.32	-11.32	168.60	0.85	0.50	0.78	0.00	121	1384.18	1384.18	247.6	0.50	0.000	1.426	5.0	6	27	38	93.3	66.15	16.15	45.20	42.98	########	########
3.50	176.30	1.90	0.92	11.48	-11.48	176.30	1.90	1.08	0.92	0.00	121	1404.02	1404.02	250.1	1.08	0.000	1.655	15.1	6	31	42	94.7	67.22	16.88	45.34	43.17	########	########
3.55	208.80	1.65	1.25	11.65	-11.65	208.80	1.65	0.79	1.25	0.00	121	1423.86	1423.86	302.2	0.79	0.000	1.504	8.9	6	34	47	100.0	68.17	19.99	46.68	43.93	########	########
3.60	195.80	2.06	1.13	11.81	-11.81	195.81	2.06	1.05	1.13	0.00	121	1443.70	1443.70	270.3	1.06	0.000	1.620	13.9	6	34	45	100.0	69.12	18.75	45.70	43.59	########	########
3.65	207.20	2.46	1.32	11.98	-11.98	207.20	2.46	1.20	0.92	0.00	121	1463.54	1463.54	282.2	1.20	0.000	1.652	15.2	6	36	48	100.0	70.07	19.84	45.90	43.83	########	########
3.70	222.60	4.16	0.72	12.14	-12.14	222.60	4.16	1.87	0.72	0.00	121	1483.38	1483.38	299.1	1.88	0.000	1.794	21.2	6	41	53	100.0	71.02	21.32	46.16	44.14	########	########
3.75	279.50	3.86	1.89	12.30	-12.30	279.51	3.86	1.38	1.89	0.00	121	1503.22	1503.22	370.9	1.38	0.000	1.633	14.4	6	48	63	100.0	71.97	26.77	47.12	45.19	########	########
3.80	259.90	3.27	1.42	12.47	-12.47	259.90	3.27	1.36	1.43	0.00	121	1523.07	1523.07	352.1	1.36	0.000	1.642	14.8	6	43	56	100.0	72.92	24.03	47.03	44.65	########	########
3.85	249.40	3.05	1.25	12.63	-12.63	249.41	3.05	1.22	1.25	0.00	121	1542.91	1542.91	323.3	1.23	0.000	1.624	14.0	6	43	55	100.0	73.87	23.88	46.50	44.59	########	########
3.90	242.80	2.87	1.25	12.80	-12.80	242.81	2.87	1.25	1.25	0.00	121	1562.75	1562.75	317.3	1.25	0.000	1.644	14.1	6	43	54	100.0	74.82	23.74	46.41	44.54	########	########
3.95	254.00	1.51	1.31	12.96	-12.96	254.01	1.51	0.59	1.31	0.00	121	1582.59	1582.59	320.0	0.59	0.000	1.386	3.9	6	40	51	100.0	75.77	22.74	46.46	44.61	########	########
4.00	234.00	1.57	1.41	13.12	-13.12	234.01	1.57	0.67	1.41	0.00	121	1602.43	1602.43	291.1	0.67	0.000	1.453	6.8	6	38	47	100.0	76.72	22.41	46.24	44.61	########	########
4.05	221.50	1.27	1.43	13.29	-13.29	221.50	1.27	0.57	1.43	0.00	121	1622.27	1622.27	270.1	0.57	0.000	1.498	5.6	6	36	44	100.0	77.67	21.21	45.73	43.90	########	########
4.10	208.10	1.05	1.59	13.45	-13.45	208.11	1.05	0.50	1.59	0.00	121	1642.11	1642.11	252.5	0.51	0.000	1.412	5.1	6	33	41	97.6	78.62	19.93	45.38	43.57	########	########
4.15	193.60	0.82	1.62	13.62	-13.62	193.60	0.82	0.42	1.62	0.00	121	1661.95	1661.95	233.7	0.42	0.000	1.412	4.7	6	32	38	95.5	79.57	18.90	45.08	43.29	########	########
4.20	179.80	0.59	1.59	13.78	-13.78	179.81	0.59	0.41	1.59	0.00	121	1681.79	1681.79	227.1	0.41	0.000	1.393	4.2	6	31	37	94.1	80.52	18.37	44.89	43.13	########	########
4.25	195.15	0.86	1.41	13.94	-13.94	195.16	0.86	0.44	1.41	0.00	121	1701.64	1701.64	228.4	0.44	0.000	1.409	4.9	6	31	37	94.6	81.47	18.69	44.91	43.18	########	########
4.30	198.50	0.93	1.41	14.11	-14.11	198.50	0.93	0.47	1.41	0.00	121	1721.48	1721.48	230.4	0.47	0.000	1.417	5.2	6	32	37	95.6	82.42	19.01	44.97	43.23	########	########
4.35	211.70	1.27	1.41	14.27	-14.27	211.71	1.27	0.60	1.41	0.00	121	1741.32	1741.32	242.2	0.60	0.000	1.476	7.8	6	35	40	97.2	83.37	20.27	45.19	43.51	########	########
4.40	208.00	1.11	1.57	14.44	-14.44	208.01	1.11	0.53	1.57	0.00	121	1761.16	1761.16	232.4	0.53	0.000	1.492	6.8	6	34	38	96.1	84.32	19.62	45.05	43.40	########	########
4.45	205.50	1.07	1.71	14.60	-14.60	205.51	1.07	0.52	1.71	0.00	121	1781.00	1781.00	229.8	0.52	0.000	1.453	6.8	6	33	38	95.6	85.27	19.08	44.94	43.32	########	########
4.50	208.10	0.99	1.59	14.76	-14.76	208.11	0.99	0.48	1.59	0.00	121	1800.84	1800.84	230.1	0.48	0.000	1.427	5.7	6	34	38	95.8	86.22	19.93	44.95	43.35	########	########
4.55	210.70	0.92	1.44	14.93	-14.93	210.70	0.92	0.44	1.44	0.00	121	1820.68	1820.68	230.4	0.44	0.000	1.417	5.7	6	34	38	96.1	87.17	20.18	45.02	43.40	########	########
4.60	210.40	0.89	1.85	15.09	-15.09	210.41	0.89	0.42	1.85	0.00	121	1840.52	1840.52	227.6	0.42	0.000	1.399	4.5	6	34	37	95.8	88.12	20.15	44.90	43.35	########	########
4.65	219.80	1.08	1.71	15.26	-15.26	219.81	1.08	0.49	1.71	0.00	121	1860.36	1860.36	232.0	0.49	0.000	1.407	5.4	6	34	38	97.1	89.07	20.98	45.04	43.39	########	########
4.70	229.10	0.85	1.08	15.42	-15.42	229.11	0.85	0.37	1.08	0.00	121	1880.21	1880.21	242.7	0.37	0.000	1.343	2.1	6	36	39	98.6	90.02	21.94	45.20	43.71	########	########
4.75	236.40	1.13	0.97	15.58	-15.58

Sounding Name

CPT-08

Insert Raw Data

Surface Elevation [ft]	Unequal End Area Ratio, a	Pre-drill Depth [ft]	Sat. Unit Weight for Pre-drill [pcf]	Depth to Water [ft]	From SBT, Iterated
0.0	0.83	0.0	110	100.0	

Davies 1999	Robertson 1990 Norm. F_r/Q_t Chart	Baldi, et al. 1986 K_G	R&C (1983) For friction angle plot	R&C (1983) For friction angle plot	R&C (1983)	K&M (1990) N_{kt}
		0.45				16

a_{max} (*g)	Contractive/ Dilative Plot
0.557	

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Elevation [ft]	q_t [tsf]	f_s [tsf]	F_r [%]	u_2 [ft]	u_0 [ft]	γ_{bar} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	L	FC [%]	SBT	$SPT\ N_{60}$ [blows/ft]	$SPT\ (N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{vo} [kPa]	q_c [MPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}	Q	$L_Q<2.6$?	Q	L	$L_Q<2.6$?	Q	L	n	q_c [kPa]	σ'_{vo} [kPa]	C_q	q_{c1n}	K_c	$(q_{c1n})_{cs}$	r_d	CSR	C_N	q_{c1} (MPa)
0.05	27.9	0	0.02	0.16	-0.16	27.90	0.00	0.00	0.02	0.00	80	13.05	13.05	4273.8	0.00	0.000	4.538	100.0	2	228	11492	########	########	########	########	########	########	########	########	4273.8	No	4273.8	Non-Iq.	No	4273.8	Non-Iq.	Non-Iq.	2671.72	0.62	1.70	3.000	1.00	3.000	0.999	0.3618	2.23	########
0.1	37	0.19	0.18	0.33	-0.33	37.00	0.19	0.51	0.18	0.00	127	33.94	33.94	2179.5	0.51	0.000	0.940	0.0	7	5	125	100.0	1.62	3.54	53.85	44.59	########	########	########	2179.4	Yes	276.0	1.388	Yes	276.0	1.388	0.5	3543.14	1.62	1.70	276.12	1.00	276.12	0.999	0.3618	2.21	7.82
0.15	36.1	0.26	0.18	0.49	-0.49	36.10	0.26	0.72	0.18	0.00	127	54.82	54.82	1316.0	0.72	0.000	1.133	0.0	7	5	89	100.0	2.62	3.46	52.12	43.32	########	########	########	1315.9	Yes	211.8	1.572	Yes	211.8	1.572	0.5	3456.95	2.62	1.70	211.97	1.00	211.97	0.999	0.3616	2.18	7.53
0.2	37.4	0.36	0.18	0.66	-0.66	37.40	0.36	0.96	0.18	0.00	127	75.71	75.71	987.0	0.96	0.000	1.294	0.0	7	6	75	96.9	3.62	3.58	51.07	42.72	########	########	########	987.0	Yes	186.7	1.699	Yes	186.7	1.699	0.5	3581.44	3.62	1.70	186.87	1.04	193.82	0.998	0.3615	2.15	7.71
0.25	48.1	0.42	0.21	0.82	-0.82	48.10	0.42	0.87	0.21	0.00	127	96.59	96.59	994.9	0.87	0.000	1.254	0.0	7	7	79	100.0	4.62	4.61	51.10	43.34	########	########	########	994.9	Yes	212.6	1.629	Yes	212.6	1.629	0.5	4606.08	4.62	1.70	212.77	1.00	212.77	0.998	0.3614	2.13	9.80
0.3	64.9	0.58	0.23	0.98	-0.98	64.90	0.58	0.89	0.23	0.00	127	116.47	116.47	1103.9	0.89	0.000	1.247	0.0	7	10	92	100.0	5.62	5.21	51.48	44.31	########	########	########	1103.9	Yes	260.1	1.576	Yes	260.1	1.576	0.5	6214.66	5.62	1.70	260.32	1.00	260.32	0.998	0.3612	2.10	13.08
0.35	74.4	0.67	0.35	1.15	-1.15	74.40	0.67	0.90	0.35	0.00	127	138.37	138.37	1074.4	0.90	0.000	1.254	0.0	7	11	93	100.0	6.62	7.12	51.38	44.57	########	########	########	1074.4	Yes	274.7	1.563	Yes	274.7	1.563	0.5	7124.58	6.62	1.70	274.98	1.00	274.98	0.997	0.3611	2.08	14.82
0.4	69.1	0.68	0.35	1.31	-1.31	69.10	0.68	0.98	0.35	0.00	121	158.21	158.21	872.6	0.99	0.000	1.324	1.3	6	11	79	100.0	7.57	6.62	50.61	43.89	########	########	########	872.5	Yes	238.6	1.633	Yes	238.6	1.633	0.5	6617.05	7.57	1.70	238.84	1.00	238.84	0.997	0.3609	2.06	13.62
0.45	65.7	0.63	0.35	1.48	-1.48	65.70	0.63	0.96	0.35	0.00	121	178.15	178.05	737.0	0.96	0.000	1.345	2.2	6	10	69	100.0	8.52	6.28	49.96	43.37	########	########	########	737.0	Yes	213.8	1.657	Yes	213.8	1.657	0.5	6291.47	8.52	1.70	214.07	1.01	215.83	0.997	0.3608	2.04	12.81
0.5	62.5	0.57	0.35	1.64	-1.64	62.50	0.57	0.91	0.35	0.00	121	197.89	197.89	630.7	0.91	0.000	1.358	2.7	6	10	61	96.3	9.47	5.99	49.34	42.88	########	########	########	630.7	Yes	192.9	1.673	Yes	192.9	1.673	0.5	5985.03	9.47	1.70	193.16	1.02	196.87	0.996	0.3607	2.01	12.06
0.55	56.5	0.53	0.28	1.80	-1.80	56.50	0.53	0.94	0.28	0.00	121	217.73	217.73	518.0	0.94	0.000	1.412	5.0	6	9	52	90.4	10.42	5.41	48.54	42.17	########	########	########	518.0	Yes	166.2	1.728	Yes	166.2	1.728	0.5	5410.47	10.42	1.70	166.47	1.06	175.87	0.996	0.3605	1.99	10.79
0.6	50.5	0.47	0.23	1.97	-1.97	50.50	0.47	0.93	0.23	0.00	121	237.57	237.57	424.1	0.93	0.000	1.458	7.6	6	8	44	84.3	11.37	4.84	47.70	41.43	########	########	########	424.1	Yes	142.1	1.775	Yes	142.1	1.775	0.5	4835.91	11.37	1.70	142.34	1.09	155.11	0.995	0.3604	1.97	9.54
0.65	44.6	0.41	0.21	2.13	-2.13	44.60	0.41	0.92	0.21	0.00	121	257.41	257.41	345.5	0.92	0.000	1.507	9.1	6	7	37	77.8	12.32	4.27	46.81	40.64	########	########	########	345.5	Yes	120.5	1.826	Yes	120.5	1.826	0.5	4270.92	12.32	1.70	120.86	1.13	136.06	0.995	0.3602	1.95	8.34
0.7	40	0.37	0.18	2.30	-2.30	40.00	0.37	0.93	0.18	0.00	121	277.25	277.25	287.6	0.93	0.000	1.560	11.3	6	7	32	72.1	13.27	3.83	45.98	39.94	########	########	########	287.5	Yes	104.1	1.876	Yes	104.1	1.876	0.5	3830.42	13.27	1.70	104.44	1.17	121.92	0.995	0.3601	1.93	7.41
0.75	37	0.31	0.18	2.46	-2.46	37.00	0.31	0.84	0.18	0.00	121	297.09	297.09	248.1	0.84	0.000	1.571	11.8	6	6	28	67.6	14.22	3.54	45.30	39.40	########	########	########	248.1	Yes	93.0	1.888	Yes	93.0	1.888	0.5	3543.14	14.22	1.70	93.33	1.18	109.95	0.994	0.3600	1.91	6.78
0.8	36.4	0.28	0.05	2.62	-2.62	36.40	0.28	0.77	0.05	0.00	121	316.94	316.94	228.7	0.77	0.000	1.569	11.7	6	6	26	65.6	15.17	3.49	44.92	39.17	########	########	########	228.7	Yes	88.5	1.883	Yes	88.5	1.883	0.5	3485.68	15.17	1.70	88.89	1.17	104.32	0.994	0.3598	1.90	6.61
0.85	38.55	0.28	0.00	2.79	-2.79	38.55	0.28	0.73	0.00	0.00	121	336.78	336.78	227.9	0.73	0.000	1.552	11.0	6	7	27	66.6	16.12	3.69	44.91	39.30	########	########	########	227.9	Yes	90.9	1.859	Yes	90.9	1.859	0.5	3691.57	16.12	1.70	91.33	1.15	105.28	0.993	0.3597	1.88	6.93
0.9	40.7	0.28	0.00	2.95	-2.95	40.70	0.28	0.69	0.00	0.00	121	356.62	356.62	227.3	0.69	0.000	1.537	10.3	6	7	27	67.4	17.07	3.90	44.89	39.42	########	########	########	227.3	Yes	93.3	1.837	Yes	93.3	1.837	0.5	3897.45	17.07	1.70	93.70	1.13	106.29	0.993	0.3596	1.86	7.24
0.95	43.6	0.28	-0.16	3.12	-3.12	43.60	0.28	0.64	-0.16	0.00	121	376.46	376.46	230.6	0.64	0.000	1.512	9.3	6	7	27	68.9	18.02	4.18	44.96	39.62	########	########	########	230.6	Yes	97.3	1.805	Yes	97.3	1.805	0.5	4175.16	18.02	1.70	97.70	1.11	108.44	0.993	0.3594	1.84	7.69
1	42.5	0.27	-0.02	3.28	-3.28	42.50	0.27	0.64	-0.02	0.00	121	396.30	396.30	213.5	0.64	0.000	1.534	10.2	6	7	26	66.9	18.97	4.07	44.59	39.38	########	########	########	213.5	Yes	92.4	1.820	Yes	92.4	1.820	0.5	4069.82	18.97	1.70	92.82	1.12	104.12	0.992	0.3593	1.82	7.42
1.05	43.3	0.28	-0.09	3.44	-3.44	43.30	0.28	0.65	-0.09	0.00	121	416.14	416.14	207.1	0.65	0.000	1.549	10.8	6	7	25	66.6	19.92	4.15	44.45	39.35	########	########	########	207.1	Yes	91.8	1.827	Yes	91.8	1.827	0.5	4146.43	19.92	1.70	92.28	1.13	103.98	0.992	0.3591	1.81	7.49
1.1	46.5	0.29	-0.14	3.61	-3.61	46.50	0.29	0.62	-0.14	0.00	121	435.98	435.98	212.3	0.63	0.000	1.530	10.0	6	8	26	68.3	20.87	4.45	44.57	39.58	########	########	########	212.3	Yes	96.4	1.801	Yes	96.4	1.801	0.5	4452.86	20.87	1.70	96.82	1.11	107.20	0.992	0.3590	1.79	7.97
1.15	49.1	0.34	-0.18	3.77	-3.77	49.10	0.34	0.69	-0.18	0.00	121	455.82	455.82	214.4	0.70	0.000	1.557	11.2	6	8	27	69.5	21.82	4.70	44.62	39.73	########	########	########	214.4	Yes	99.5	1.815	Yes	99.5	1.815	0.5	4701.84	21.82	1.70	99.95	1.12	111.79	0.991	0.3589	1.77	8.33
1.2	52.3	0.4	-0.18	3.94	-3.94	52.30	0.40	0.76	-0.18	0.00	121	475.66	475.66	218.9	0.77	0.000	1.581	12.2	6	9	28	71.0	22.77	5.01	44.71	39.93	########	########	########	218.9	Yes	103.8	1.826	Yes	103.8	1.826	0.5	5008.28	22.77	1.70	104.26	1.13	117.44	0.991	0.3587	1.76	8.80
1.25	55	0.45	-0.25	4.10	-4.10	55.00	0.45	0.82	-0.25	0.00	121	495.51	495.51	221.0	0.82	0.000	1.598	12.9	6	9	29	72.0	23.72	5.27	44.76	40.08	########	########	########	221.0	Yes	106.9	1.834	Yes	106.9	1.834	0.5	5266.83	23.72	1.70	107.42	1.13	121.64	0.990	0.3586	1.74	9.17
1.3	55.3	0.45	-0.32	4.27	-4.27	55.30	0.45	0.81	-0.32	0.00	121	515.35	515.35	213.6	0.82	0.000	1.607	13.3	6	9	28	71.4	24.67	5.36	44.60	40.01	########	########	########	213.6	Yes	105.4	1.838	Yes	105.4	1.838	0.5	5295.56	24.67	1.70	105.91	1.14	120.22	0.990	0.3584	1.72	9.13
1.35	52	0.42	-0.32	4.43	-4.43	52.00	0.42	0.80	-0.32	0.00	121	535.19	535.19	193.3	0.81	0.000	1.636	14.5	6	9	26	68.3	25.62	4.98	44.12	39.62	########	########	########	193.3	Yes	97.2	1.864	Yes	97.2	1.864	0.5	4979.55	25.62	1.70	97.72	1.16	113.00	0.990	0.3583	1.71	8.51
1.4	50.65	0.41	-0.35	4.59	-4.59	50.65	0.41	0.81	-0.35	0.00	121	555.03	555.03	181.5	0.81	0.000	1.657	15.4	6	9	25	66.5	26.57	4.85	43.85	39.41	########	########	########	181.5	Yes	93.0	1.880	Yes	93.0	1.880	0.5	4850.27	26.57	1.70	93.47	1.17	109.39	0.989	0.3582	1.69	8.22
1.45	51.17	0.43	-0.35	4.76	-4.76	51.17	0.43	0.84	-0.35	0.00	121	574.87	574.87	190.1	0.84	0.000	1.676	16.2	6	9	24	66.1	27.52	4.90	43.69	39.38	########	########	########	177.0	Yes	92.3	1.892	Yes	92.3	1.892	0.5	4900.07	27.52	1.70	92.79	1.18	109.63	0.989	0.3580	1.68	8.23
1.5	51.7	0.44	-0.44	4.92	-4.92	51.70	0.44	0.85	-0.44	0.00	121	594.71	594.71	172.9	0.86	0.000	1.687	16.7	6	9	24	65.8	28.47	4.95	43.57	39.35	########	########	########	172.9	Yes	91.6	1.898	Yes	91.6	1.898	0.5	4950.82	28.47	1.70	92.17	1.19	109.39	0.989	0.3579	1.67	8.24
1.55	56.9	0.51	-0.48	5.09	-5.09	56.90	0.51	0.90	-0.48	0.00	121	614.55	614.55	184.2	0.90	0.000	1.683	16.5	6	10	26	68.8	29.42	5.45	43.88	39.72	########	########	########	184.2	Yes	99.3	1.884	Yes	99.3	1.884	0.5	5448.77	29.42	1.70	99.79	1.17	117.20	0.988	0.3578	1.65	8.99
1.6	63.6	0.51	-0.53	5.25	-5.25	63.60	0.51	0.80	-0.53	0.00	121	634.39	634.39	199.5	0.81	0.000	1.624	14.0	6	11	28	72.4	30.37	6.09	44.27	40.38	########	########	########	199.5	Yes	109.2	1.822	Yes	109.2	1.822	0.5	6090.37	30.37	1.70	109.78	1.12	123.25	0.988	0.3576	1.64	9.97
1.65	67.4	0.61	-0.53	5.41	-5.41	67.40	0.61	0.91	-0.53	0.00	121	654.23	654.23	205.0	0.91	0.000	1.653	15.2	6	12	29	74.0	31.32	6.45	44.40	40.38	########	########	########	205.0	Yes	114.0	1.840	Yes	114.0	1.840	0.5	5454.26	31.32	1.70	114.56	1.14	130.28	0.987	0.3575	1.62	10.47
1.7	73.5	0.59	-0.53	5.58	-5.58	73.50	0.59	0.80	-0.53	0.00	121	674.08	674.08	217.1	0.81	0.000	1.598	12.9	6	13	30	76.7	32.27	7.04	44.67	40.73	########	########	########	217.1	Yes	122.5	1.783	Yes	122.5	1.783	0.5	7038.40	32.27	1.70	123.08	1.09	134.69	0.987	0.3573	1.61	11.33
1.75	77.9	0.66	-0.53	5.74	-5.74	77.90	0.66	0.85	-0.53	0.00	121	693.92	693.92	223.5	0.85	0.000	1.606	13.3	6	13	31	78.3	33.22	7.46	44.81	40.94	########	########	########	223.5	Yes	128.0	1.783	Yes	128.0	1.783	0.5	7459.74	33.22	1.70	128.57	1.09	140.73	0.987	0.3572	1.60	11.90
1.8	75.5	0.8	-0.53	5.91	-5.91	75.50	0.80	1.06	-0.53	0.00	121	713.76	713.76	210.5	1.06	0.000	1.694	17.0	6	13	31	76.5	34.17	7.23	44.53	40.72	########	########	########	210.6	Yes	122.3	1.862	Yes	122.3	1.862	0.5	7229.92	34.17	1.70	122.86	1.16	141.92	0.986	0.3571	1.58	11.44
1.85	77	0.87	-0.58	6.07	-6.07	77.00	0.87	1.29	-0.58	0.00	121	733.60	733.60	183.6	1.29	0.000	1.796	21.3	6	12	28	71.7	35.12	6.48	43.86	40.12	########	########	########	183.6	Yes	108.1	1.958	Yes	108.1	1.958	0.5	6482.99	35.12	1.70	108.67	1.25	135.75	0.986	0.3569	1.57	10.18
1.9	66.2	0.99	-0.65	6.23	-6.23	66.20	0.99	1.50	-0.65	0.00	121	753.44	753.44	174.7	1.50	0.000	1.860	24.0	6	12	27	70.3	36.07	6.34	43.62	39.96	########	########	########	174.7	Yes	104.3	2.015	Yes	104.3	2.015	0.5	6339.35	36.07	1.68	104.85	1.32	138.42	0.985	0.3568	1.56	9.87
1.95	65.4	1.12	-0.67	6.40	-6.40	65.40	1.12	1.71	-0.67	0.00	121	773.28	773.28	168.1	1.72	0.000	1.915	26.4	6	12	27	69.2	37.02	6.26	43.43	39.84	########	########	########	168.1	Yes	101.6	2.064	Yes	101.6	2.064	0.5	6262.74	37.02	1.68	102.05	1.39	134.27	0.984	0.3566	1.54	9.67
2	64.3	1.16	-0.67	6.56	-6.56	64.30	1.16	1.80	-0.67	0.00	121	793.12	793.12	161.1	1.82	0.000	1.945	27.6	6	12	26	68.1	37.97	6.16	43.22	39.70	########	########	########	161.1	Yes	98.7	2.089	Yes	98.7	2.089	0.5	6157.40	37.97	1.63	99.26	1.47	142.53	0.985	0.3565	1.53	9.43
2.05	62	1.12	-0.69	6.73	-6.73	62.00	1.12	1.81	-0.69	0.00	121	812.96	812.96	151.5	1.82	0.000	1.963	28.4	6	12	25	66.2	38.92	5.94	42.91	39.47	########	########	########	151.5	Yes	93.9	2.105	Yes	93.9	2.105	0.5	5937.15	38.92	1.61	94.54	1.46	138.40	0.984	0.3564	1.52	9.02
2.1	59.4	1.09	-0.69	6.89	-6.89	59.40	1.09	1.84	-0.69	0.00	121	832.80	832.80	141.6	1.85	0.000	1.957	29.4	6	12	24	64.0	39.87	5.69	42.47	39.29	########	########	########	141.7	Yes	88.9	2.127	Yes	88.9	2.127	0.5	5685.37	39.87	1.59	89.49	1.51	134.77	0.984	0.3562	1.51	8.58
2.15	57.3	1.01	-0.69	7.05	-7.05	57.30	1.01	1.76	-0.69	0.00	121	852.65	852.65	133.4	1.78	0.000	1.992	29.6	6	11	23	62.2	40.82	5.49	42.06	38.98	########	########	########	133.4	Yes	84.7	2.130	Yes	84.7	2.130	0.5	5487.08	40.82	1.58	85.31	1.51	129.01	0.984	0.3561	1.50	8.21
2.2	56.85	0.97	-0.69	7.22	-7.22	56.85	0.97	1.71	-0.69	0.00	121	872.49	872.49	129.3	1.72	0.000	1.991	29.6	6	11	22	61.4	41.77	5.44	42.10	38.88	########	########	########	129.3	Yes	83.0	2.127	Yes	83.0	2.127	0.5	5443.99	41.77	1.56	83.68	1.51	125.96	0.983	0.3560	1.48	8.08
2.25	57.38	0.94	-0.69	7.38	-7.38	57.38	0.94	1.64	-0.69	0.00	121	892.33	892.33	127.6	1.65	0.000	1.982	29.2	6	11	22	61.3	42.72	5.49	42.04	38.87	########	########	########	127.6	Yes	82.9	2.115	Yes	82.9	2.115	0.5	5494.74	42.72	1.54	83.51	1.48	123.87	0.983	0.3558	1.47	8.10
2.3	57.9	0.9	0.76	7.55	-7.55	57.90	0.90	1.55	0.76	0.00	121	912.17	912.17	125.9	1.57	0.000	1.969	28.7	6	11	22	61.2	43.67	5.54	41.97	38.86	########	########	########	126.0	Yes	82.7	2.101	Yes	82.7	2.101	0.5	5544.53	43.67	1.52	83.35	1.46	121.35	0.982	0.3557	1.46	8.11
2.35	56.6	0.85	-0.78	7.71	-7.71	56.60	0.85	1.50	-0.78	0.00	121	932.01	932.01	120.4	1.51	0.000	1.972	28.8	6	11	21	59.8	44.62	5.42	41.74	38.70	########	########	########	120.5	Yes	79.9	2.102	Yes	79.9	2.102	0.5	5420.05	44.62	1.51	80.69	1.46	117.50	0.982	0.3555	1.45	7.87
2.4	52.9	0.81	-0.83	7.87	-7.87	52.90	0.81	1.53	-0.83	0.00	121	951.85	951.85	110.1	1.55	0.000	2.006	30.2	6	10	19	56.8	45.57	5.07	41.27	38.33	########	########	########	110.2	Yes	73.9	2.133	Yes	73.9	2.133	0.5	5065.73	45.57	1.49	74.55	1.52	113.15	0.982	0.3554	1.44	7.30
2.45	50.6	0.79	-0.85	8.04	-8.04	50.60	0.79	1.56	-0.85	0.00	121	971.69	971.69	103.1	1.58	-0.001	2.033	31.4	6	10	18	54.7	46.52	4.85	40.92	38.07	########	########	########	103.1	Yes	69.9	2.157	Yes	69.9	2.157	0.5	4845.48	46.52	1.48	70.57	1.57	110.63	0.981	0.3553	1.43	6.93
2.5	50.4	0.77	-0.88	8.20	-8.20	50.40	0.77	1.53	-0.88	0.00	121	991.53	991.53	100.7	1.54	-0.001	2.034	31.4	6	10	18	54.1	47.47	4.83	40.78	38.00	########	########	########	100.7	Yes	68.9	2.156	Yes	68.9	2.156	0.5	4826.33	47.47	1.46	69.59	1.56	108.87	0.981	0.3551	1.42	6.85
2.55	54.6	0.76	-0.88	8.37	-8.37	55.40	0.76	1.37	-0.88	0.00	121	1011.37	1011.37	108.5	1.38	0.000	1.978	29.0	6	11	19	57.3	48.42	5.31	41.19	38.14	########	########	########	108.6	Yes	75.0	2.097	Yes	75.0	2.097	0.5	5245.13	48.42	1.45	76.73	1.50	120.70	0.980	0.3550	1.41	7.47
2.6	60.4	0.75	-0.88	8.53	-8.53	60.40	0.75	1.24	-0.88	0.00	121	1031.21	1031.21	116.1	1.25	0.000	1.926	26.9	6	12	20	60.2	49.37	5.78	41.54	38.77	########	########	########	116.1	Yes	81.1	2.043	Yes	81.1	2.043	0.5	5783.94	49.37	1.43	81.77	1.36	111.24	0.980	0.3548	1.40	8.09
2.65	75.8	0.76	-0.88	8.69	-8.69	75.80	0.76	1.00	-0.88	0.00	121	1051.06	1051.06	143.2	1.01	0.000	1.796	21.3	6	14	24	68.5	50.32	7.26	42.63	39.81	########	########	########	143.2	Yes	100.9	1.910	Yes	100.9	1.910	0.5	7956.65	50.32	1.42	101.65	1.20	121.80	0.980	0.3547	1.39	10.08
2.7	90.1	0.72	-0.88	8.86	-8.86	90.10	0.72	0.80	-0.88	0.00	121	1070.90	1070.90	167.3	0.80	0.000	1.679	16.4	6	16	27	74.7	51.27	8.63	42.40	40.59	########	########	########	167.3	Yes	119.0	1.792	Yes	119.0	1.792	0.5	8628.02	51.27	1.41	119.70	1.10	131.76	0.979	0.3546	1.38	11.89
2.75	99.1	0.7	-0.88	9.02	-9.02	99.10	0.70	0.71	-0.88	0.00	121	1090.74	1090.74	180.7	0.71	0.000	1.618	13.8	6	17	28	78.0	52.22	9.49	43.79	41.01	########	########	########	180.7	Yes	129.7	1.729	Yes	129.7	1.729	0.5	9489.87	52.22	1.39	130.46	1.06	137.94	0.979	0.3544	1.37	12.99
2.

Sounding Name

CPT-09

Insert Raw Data

Surface Elevation [ft]: 0.0 · Unequal End Area Ratio, a: 0.83 · Pre-drill Depth [ft]: 0.0 · Sat. Unit Weight for Pre-drill [pcf]: 110 · Depth to Water [ft]: 100.0 · γ_{sat}: From SBT, Iterated

FC: Davies 1999 · SBT: Robertson 1990 Norm. F_r/Q_t Chart · D_r: Baldi, et al. 1986, K_o 0.45 · σ'_{vo} [kPa], q_c [MPa]: R&C (1983), For friction angle plot · ϕ': R&C (1983) · ϕ': K&M (1990) · s_u: N_{kt} 16 · Q: Based on q_c, using n=1.0 for all · Q: Based on q_c, using n=0.5 for I_c<2.6 · I_c: Recalc. · I_c<2.6?: Recalc. · Q: Based on q_c, using n=0.7 for I_c>2.6 · I_c: Recalc. · CSR: a_{max} (*g) 0.557 · C_q, q_{c1}: Contractive/Dilative Plot

Depth [m]	q_c [tsf]	f_s [tsf]	u_2 [ft]	Depth [ft]	Elevation [ft]	q_t [tsf]	f_s [tsf]	R_f [%]	u_2 [ft]	u_0 [ft]	γ_{sat} [pcf]	σ_{vo} [psf]	σ'_{vo} [psf]	Q_t	F_r [%]	B_q	I_c	FC [%]	SBT	SPT N_{60} [blows/ft]	SPT $(N_1)_{60}$ [blows/ft]	D_r [%]	σ'_{vo} [kPa]	q_c [MPa]	ϕ' [deg]	ϕ' [deg]	s_u [psf]	s_u/σ'_{vo}	Q	I_c<2.6?	Q	I_c	I_c<2.6?	Q	I_c	n	q_c [kPa]	σ'_{vo} [kPa]	C_q	q_{c1N}	K_c	$(q_{c1N})_{cs}$	r_d	CSR	C_q	q_{c1} (MPa)
0.05	28.6	0	0.09	0.16	-0.16	28.60	0.00	0.00	0.09	0.00	80	13.05	13.05	4381.1	0.00	0.000	4.538	100.0	2	234	11781	#########	########	########	########	########	3574.2	273.82	4381.0	No	4381.0	Non-liq.	No	4381.0	Non-liq.	Non-liq.	2738.75	0.62	Non-liq.	Non-liq.	Non-liq.	########	1.000	0.3619	2.23	##########
0.1	44.9	0	0.09	0.33	-0.33	44.90	0.00	0.00	0.09	0.00	80	26.11	26.11	3438.8	0.00	0.000	4.538	100.0	2	368	10846	#########	########	########	########	########	5610.9	214.92	3438.7	No	3438.7	Non-liq.	No	3438.7	Non-liq.	Non-liq.	4299.65	1.25	Non-liq.	Non-liq.	Non-liq.	########	0.999	0.3618	2.22	##########
0.15	55.3	0	0.09	0.49	-0.49	55.30	0.00	0.00	0.09	0.00	80	39.16	39.16	2823.3	0.00	0.000	4.538	100.0	2	453	9776	#########	########	########	########	########	6910.1	176.46	2823.3	No	2823.3	Non-liq.	No	2823.3	Non-liq.	Non-liq.	5295.56	1.87	Non-liq.	Non-liq.	Non-liq.	########	0.999	0.3616	2.20	##########
0.2	61.3	0.01	0.09	0.66	-0.66	61.30	0.01	0.02	0.09	0.00	127	60.05	60.05	2040.8	0.02	0.000	0.589	0.0	7	8	121	100.0	2.87	5.87	53.63	45.64	########	########	2040.8	Yes	343.8	1.093	Yes	343.8	1.093	0.5	5870.12	2.87	1.70	343.93	1.00	343.93	0.998	0.3615	2.17	12.76
0.25	64.4	0.03	0.09	0.82	-0.82	64.40	0.03	0.05	0.09	0.00	127	80.93	80.93	1590.5	0.05	0.000	0.291	0.0	7	8	94	100.0	3.87	6.17	52.78	45.16	########	########	1590.5	Yes	311.0	0.984	Yes	311.0	0.984	0.5	6166.98	3.87	1.70	311.23	1.00	311.23	0.998	0.3614	2.15	13.24
0.3	65.5	0.14	0.09	0.98	-0.98	65.50	0.14	0.21	0.09	0.00	127	101.82	101.82	1285.6	0.21	0.000	0.658	0.0	7	8	88	100.0	4.87	6.27	52.04	44.69	########	########	1285.6	Yes	282.0	1.159	Yes	282.0	1.159	0.5	6272.31	4.87	1.70	282.22	1.00	282.22	0.998	0.3612	2.12	13.31
0.35	66.3	0.27	0.09	1.15	-1.15	66.30	0.27	0.41	0.09	0.00	127	122.70	122.70	1079.7	0.41	0.000	0.938	0.0	7	9	83	100.0	5.87	6.35	51.40	44.30	########	########	1079.7	Yes	260.0	1.343	Yes	260.0	1.343	0.5	6348.92	5.87	1.70	260.22	1.00	260.22	0.997	0.3611	2.10	13.32
0.4	66.2	0.33	0.05	1.31	-1.31	66.20	0.33	0.50	0.05	0.00	127	143.59	143.59	921.1	0.50	0.000	1.048	0.0	7	10	76	100.0	6.87	6.34	50.81	43.92	########	########	921.1	Yes	239.9	1.425	Yes	239.9	1.425	0.5	6339.35	6.87	1.70	240.19	1.00	240.19	0.997	0.3609	2.07	13.15
0.45	69.8	0.41	0.02	1.48	-1.48	69.80	0.41	0.59	0.02	0.00	127	164.47	164.47	847.8	0.59	0.000	1.128	0.0	7	10	74	100.0	7.87	6.68	50.50	43.85	########	########	847.8	Yes	236.3	1.477	Yes	236.3	1.477	0.5	6684.08	7.87	1.70	236.62	1.00	236.62	0.997	0.3608	2.05	13.71
0.5	73.4	0.53	0.07	1.64	-1.64	73.40	0.53	0.72	0.07	0.00	127	185.36	185.36	791.0	0.72	0.000	1.221	0.0	7	11	72	100.0	8.87	7.03	50.23	43.80	########	########	791.0	Yes	234.1	1.541	Yes	234.1	1.541	0.5	7028.82	8.87	1.70	234.39	1.00	234.39	0.996	0.3607	2.03	14.25
0.55	82.3	0.61	0.09	1.80	-1.80	82.30	0.61	0.74	0.09	0.00	127	206.24	206.24	797.1	0.74	0.000	1.230	0.0	7	12	75	100.0	9.87	7.88	50.26	44.10	########	########	797.1	Yes	248.8	1.531	Yes	248.8	1.531	0.5	7881.09	9.87	1.70	249.15	1.00	249.15	0.996	0.3605	2.01	15.81
0.6	83.1	0.63	0.09	1.97	-1.97	83.10	0.63	0.76	0.09	0.00	127	227.13	227.13	730.7	0.76	0.000	1.256	0.0	7	13	71	100.0	10.87	7.96	49.92	43.91	########	########	730.7	Yes	239.4	1.549	Yes	239.4	1.549	0.5	7957.70	10.87	1.70	239.73	1.00	239.73	0.995	0.3604	1.98	15.79
0.65	74.1	0.61	0.09	2.13	-2.13	74.10	0.61	0.82	0.09	0.00	121	246.97	246.97	599.1	0.82	0.000	1.331	1.6	6	12	61	98.1	11.82	7.10	49.13	43.16	########	########	599.1	Yes	204.7	1.623	Yes	204.7	1.623	0.5	7095.85	11.82	1.70	205.00	1.00	205.00	0.995	0.3602	1.96	13.93
0.7	64.9	0.51	0.09	2.30	-2.30	64.90	0.51	0.79	0.09	0.00	121	266.81	266.81	485.5	0.79	0.000	1.364	3.0	6	10	51	91.4	12.77	6.21	48.27	42.35	########	########	485.5	Yes	172.4	1.664	Yes	172.4	1.664	0.5	6214.86	12.77	1.70	172.74	1.01	174.97	0.995	0.3601	1.94	12.08
0.75	59.3	0.43	0.09	2.46	-2.46	59.30	0.43	0.73	0.09	0.00	121	286.65	286.65	412.7	0.73	0.000	1.378	3.6	6	9	44	86.5	13.72	5.68	47.58	41.74	########	########	412.7	Yes	151.9	1.682	Yes	151.9	1.682	0.5	5678.60	13.72	1.70	152.27	1.03	156.19	0.994	0.3600	1.92	10.93
0.8	57.2	0.36	0.00	2.62	-2.62	57.20	0.36	0.63	0.00	0.00	121	306.49	306.49	372.3	0.63	0.000	1.360	2.8	6	9	40	83.7	14.67	5.48	47.13	41.41	########	########	372.3	Yes	141.7	1.667	Yes	141.7	1.667	0.5	5477.50	14.67	1.70	142.05	1.02	144.24	0.994	0.3598	1.91	10.44
0.85	55.3	0.32	-0.02	2.79	-2.79	55.30	0.32	0.58	-0.02	0.00	121	326.33	326.33	337.9	0.58	0.000	1.361	2.9	6	9	37	81.1	15.62	5.30	46.71	41.10	########	########	337.9	Yes	132.7	1.668	Yes	132.7	1.668	0.5	5295.56	15.62	1.70	133.09	1.02	135.22	0.993	0.3597	1.89	9.99
0.9	51.4	0.31	-0.05	2.95	-2.95	51.40	0.31	0.60	-0.05	0.00	121	346.17	346.17	296.0	0.61	0.000	1.415	5.1	6	8	33	77.0	16.57	4.92	46.11	40.61	########	########	296.0	Yes	119.7	1.715	Yes	119.7	1.715	0.5	4922.09	16.57	1.70	120.11	1.05	125.86	0.993	0.3596	1.87	9.19
0.95	51	0.32	-0.07	3.12	-3.12	51.00	0.32	0.63	-0.07	0.00	121	366.02	366.02	277.7	0.63	0.000	1.446	6.5	6	8	32	75.5	17.52	4.88	45.82	40.44	########	########	277.7	Yes	115.5	1.738	Yes	115.5	1.738	0.5	4883.79	17.52	1.70	115.90	1.06	123.23	0.993	0.3594	1.85	9.04
1	51	0.3	-0.05	3.28	-3.28	51.00	0.30	0.59	-0.05	0.00	121	385.86	385.86	263.3	0.59	0.000	1.444	6.4	6	8	31	74.4	18.47	4.88	45.58	40.31	########	########	263.3	Yes	112.5	1.731	Yes	112.5	1.731	0.5	4883.79	18.47	1.70	112.88	1.06	119.50	0.992	0.3593	1.83	8.95
1.05	51.25	0.28	-0.07	3.44	-3.44	51.25	0.28	0.55	-0.07	0.00	121	405.70	405.70	251.6	0.55	0.000	1.436	6.1	6	8	30	73.6	19.42	4.91	45.37	40.22	########	########	251.7	Yes	110.2	1.720	Yes	110.2	1.720	0.5	4907.73	19.42	1.70	110.62	1.05	116.31	0.992	0.3591	1.82	8.91
1.1	51.5	0.29	-0.09	3.61	-3.61	51.50	0.29	0.56	-0.09	0.00	121	425.54	425.54	241.0	0.57	0.000	1.459	7.0	6	8	29	72.7	20.37	4.93	45.17	40.13	########	########	241.0	Yes	108.1	1.734	Yes	108.1	1.734	0.5	4931.67	20.37	1.70	108.54	1.06	115.17	0.992	0.3590	1.80	8.87
1.15	53	0.29	-0.09	3.77	-3.77	53.00	0.29	0.55	-0.09	0.00	121	445.38	445.38	237.0	0.55	0.000	1.456	6.9	6	9	29	72.9	21.32	5.08	45.09	40.15	########	########	237.0	Yes	108.7	1.725	Yes	108.7	1.725	0.5	5075.31	21.32	1.70	109.18	1.05	115.18	0.991	0.3589	1.78	9.04
1.2	52.9	0.28	-0.09	3.94	-3.94	52.90	0.28	0.53	-0.09	0.00	121	465.22	465.22	226.4	0.53	0.000	1.462	7.2	6	9	28	71.9	22.27	5.07	44.87	40.04	########	########	226.4	Yes	106.2	1.726	Yes	106.2	1.726	0.5	5065.73	22.27	1.70	106.63	1.06	112.54	0.991	0.3587	1.76	8.94
1.25	51.5	0.24	-0.09	4.10	-4.10	51.50	0.24	0.47	-0.09	0.00	121	485.06	485.06	211.3	0.47	0.000	1.451	6.7	6	8	26	70.0	23.22	4.93	44.55	39.81	########	########	211.3	Yes	101.2	1.714	Yes	101.2	1.714	0.5	4931.67	23.22	1.70	101.66	1.05	106.49	0.990	0.3586	1.75	8.63
1.3	51.3	0.2	-0.09	4.27	-4.27	51.30	0.20	0.39	-0.09	0.00	121	504.90	504.90	202.2	0.39	0.000	1.420	5.4	6	8	25	69.0	24.17	4.91	44.33	39.70	########	########	202.2	Yes	98.8	1.685	Yes	98.8	1.685	0.5	4912.51	24.17	1.70	99.26	1.03	101.98	0.990	0.3584	1.73	8.51
1.35	52.6	0.18	-0.09	4.43	-4.43	52.60	0.18	0.34	-0.09	0.00	121	524.74	524.74	199.5	0.34	0.000	1.393	4.2	6	8	25	69.1	25.12	5.04	44.27	39.73	########	########	199.5	Yes	99.3	1.656	Yes	99.3	1.656	0.5	5037.00	25.12	1.70	99.83	1.01	100.57	0.990	0.3583	1.72	8.65
1.4	53.9	0.17	-0.09	4.59	-4.59	53.90	0.17	0.32	-0.09	0.00	121	544.59	544.59	196.9	0.32	0.000	1.379	3.6	6	9	24	69.3	26.07	5.16	44.21	39.75	########	########	196.9	Yes	99.9	1.638	Yes	99.9	1.638	0.5	5161.49	26.07	1.70	100.42	1.00	100.42	0.989	0.3582	1.70	8.79
1.45	58.1	0.16	-0.09	4.76	-4.76	58.10	0.16	0.28	-0.09	0.00	121	564.43	564.43	204.9	0.28	0.000	1.334	1.7	6	9	25	71.4	27.02	5.56	44.40	40.03	########	########	204.9	Yes	105.8	1.590	Yes	105.8	1.590	0.5	5563.69	27.02	1.70	106.32	1.00	106.32	0.989	0.3580	1.69	9.39
1.5	61.8	0.14	-0.09	4.92	-4.92	61.80	0.14	0.23	-0.09	0.00	127	585.31	585.31	210.2	0.23	0.000	1.284	0.0	7	10	26	73.0	28.02	5.92	44.52	40.24	########	########	210.2	Yes	110.5	1.539	Yes	110.5	1.539	0.5	5918.00	28.02	1.70	111.06	1.00	111.06	0.989	0.3579	1.67	9.89
1.55	65.5	0.09	-0.09	5.09	-5.09	65.50	0.09	0.14	-0.09	0.00	127	606.20	606.20	215.1	0.14	0.000	1.193	0.0	7	10	26	74.5	29.02	6.27	44.63	40.43	########	########	215.1	Yes	115.1	1.454	Yes	115.1	1.454	0.5	6272.31	29.02	1.70	115.66	1.00	115.66	0.988	0.3578	1.66	10.39
1.6	69.7	0.1	-0.09	5.25	-5.25	69.70	0.10	0.14	-0.09	0.00	127	627.08	627.08	221.3	0.14	0.000	1.187	0.0	7	10	27	76.2	30.02	6.67	44.77	40.65	########	########	221.3	Yes	120.5	1.440	Yes	120.5	1.440	0.5	6674.51	30.02	1.70	121.01	1.00	121.01	0.988	0.3576	1.64	10.96
1.65	68.5	0.11	-0.09	5.41	-5.41	68.50	0.11	0.16	-0.09	0.00	127	647.97	647.97	210.4	0.16	0.000	1.224	0.0	7	10	26	74.8	31.02	6.56	44.53	40.48	########	########	210.4	Yes	116.4	1.468	Yes	116.4	1.468	0.5	6559.60	31.02	1.70	116.99	1.00	116.99	0.987	0.3575	1.63	10.67
1.7	69.3	0.14	-0.09	5.58	-5.58	69.30	0.14	0.20	-0.09	0.00	127	668.85	668.85	206.2	0.20	0.000	1.270	0.0	7	11	26	74.6	32.02	6.64	44.43	40.46	########	########	206.2	Yes	115.9	1.501	Yes	115.9	1.501	0.5	6636.20	32.02	1.70	116.50	1.00	116.50	0.987	0.3573	1.61	10.70
1.75	67.4	0.14	-0.09	5.74	-5.74	67.40	0.14	0.21	-0.09	0.00	127	689.74	689.74	194.4	0.21	0.000	1.299	0.2	7	10	25	72.9	33.02	6.45	44.14	40.26	########	########	194.4	Yes	111.0	1.523	Yes	111.0	1.523	0.5	6454.26	33.02	1.70	111.58	1.00	111.58	0.987	0.3572	1.60	10.32
1.8	65.7	0.1	-0.09	5.91	-5.91	65.70	0.10	0.15	-0.09	0.00	127	710.62	710.62	183.9	0.15	0.000	1.272	0.0	7	10	23	71.3	34.02	6.29	43.87	40.06	########	########	183.9	Yes	106.6	1.498	Yes	106.6	1.498	0.5	6291.47	34.02	1.70	107.15	1.00	107.15	0.986	0.3571	1.58	9.97
1.85	64	0.1	-0.09	6.07	-6.07	64.00	0.10	0.16	-0.09	0.00	127	731.51	731.51	174.0	0.16	0.000	1.298	0.2	7	10	22	69.6	35.02	6.13	43.60	39.87	########	########	174.0	Yes	102.3	1.518	Yes	102.3	1.518	0.5	6128.67	35.02	1.70	102.88	1.00	102.88	0.986	0.3569	1.57	9.63
1.9	60.7	0.12	-0.16	6.23	-6.23	60.70	0.12	0.20	-0.16	0.00	121	751.35	751.35	160.6	0.20	0.000	1.367	3.1	6	10	21	67.0	35.97	5.81	43.20	39.55	########	########	160.6	Yes	95.7	1.577	Yes	95.7	1.577	0.5	5812.66	35.97	1.68	96.28	1.00	96.28	0.985	0.3568	1.56	9.06
1.95	60.2	0.14	-0.21	6.40	-6.40	60.20	0.14	0.23	-0.21	0.00	121	771.19	771.19	155.1	0.23	0.000	1.409	4.9	6	10	21	66.2	36.92	5.76	43.03	39.45	########	########	155.1	Yes	93.6	1.610	Yes	93.6	1.610	0.5	5764.78	36.92	1.66	94.25	1.00	94.25	0.985	0.3566	1.55	8.91
2	59.4	0.2	-0.23	6.56	-6.56	59.40	0.20	0.34	-0.23	0.00	121	791.03	791.03	149.2	0.34	0.000	1.498	8.7	6	10	21	65.1	37.87	5.69	42.83	39.33	########	########	149.2	Yes	91.2	1.686	Yes	91.2	1.686	0.5	5688.17	37.87	1.64	91.82	1.03	94.43	0.985	0.3565	1.53	8.72
2.05	60.3	0.13	-0.25	6.73	-6.73	60.30	0.13	0.22	-0.25	0.00	121	810.87	810.87	147.7	0.22	0.000	1.415	5.1	6	10	20	65.2	38.82	5.77	42.78	39.34	########	########	147.7	Yes	91.4	1.608	Yes	91.4	1.608	0.5	5774.36	38.82	1.62	92.06	1.00	92.06	0.984	0.3564	1.52	8.78
2.1	55.9	0.1	-0.25	6.89	-6.89	55.90	0.10	0.18	-0.25	0.00	121	830.72	830.72	133.6	0.18	0.000	1.426	5.6	6	9	19	61.8	39.77	5.35	42.27	38.92	########	########	133.6	Yes	83.7	1.619	Yes	83.7	1.619	0.5	5353.01	39.77	1.60	84.32	1.00	84.32	0.984	0.3562	1.51	8.08
2.15	55.7	0.1	-0.25	7.05	-7.05	55.70	0.10	0.18	-0.25	0.00	121	850.56	850.56	130.0	0.18	0.000	1.438	6.1	6	9	18	61.1	40.72	5.33	42.13	38.85	########	########	130.0	Yes	82.4	1.626	Yes	82.4	1.626	0.5	5333.86	40.72	1.58	83.03	1.00	83.03	0.984	0.3561	1.50	7.99
2.2	55.65	0.09	-0.25	7.22	-7.22	55.65	0.09	0.16	-0.25	0.00	121	870.40	870.40	126.9	0.16	0.000	1.433	5.9	6	9	18	60.6	41.67	5.33	42.01	38.79	########	########	126.9	Yes	81.4	1.618	Yes	81.4	1.618	0.5	5329.07	41.67	1.56	82.01	1.00	82.01	0.983	0.3560	1.49	7.92
2.25	55.83	0.09	-0.25	7.38	-7.38	55.83	0.09	0.16	-0.25	0.00	121	890.24	890.24	124.4	0.16	0.000	1.441	6.3	6	9	18	60.3	42.62	5.35	41.90	38.75	########	########	124.4	Yes	80.7	1.621	Yes	80.7	1.621	0.5	5346.31	42.62	1.54	81.35	1.00	81.35	0.983	0.3558	1.47	7.88
2.3	56	0.08	-0.25	7.55	-7.55	56.00	0.08	0.14	-0.25	0.00	121	910.08	910.08	122.1	0.14	0.000	1.434	6.0	6	9	17	59.9	43.57	5.36	41.80	38.71	########	########	122.1	Yes	80.0	1.612	Yes	80.0	1.612	0.5	5362.59	43.57	1.52	80.70	1.00	80.70	0.982	0.3557	1.46	7.85
2.35	56.2	0.07	-0.25	7.71	-7.71	56.20	0.07	0.12	-0.25	0.00	121	929.92	929.92	119.9	0.13	0.000	1.427	5.7	6	9	17	59.6	44.52	5.38	41.71	38.68	########	########	119.9	Yes	79.5	1.602	Yes	79.5	1.602	0.5	5381.74	44.52	1.51	80.12	1.00	80.12	0.982	0.3555	1.45	7.82
2.4	57.1	0.07	-0.25	7.87	-7.87	57.10	0.07	0.12	-0.25	0.00	121	949.76	949.76	119.2	0.12	0.000	1.428	5.7	6	9	17	59.8	45.47	5.47	41.68	38.70	########	########	119.2	Yes	79.9	1.598	Yes	79.9	1.598	0.5	5467.93	45.47	1.49	80.55	1.00	80.55	0.982	0.3554	1.44	7.88
2.45	59.4	0.08	-0.25	8.04	-8.04	59.40	0.08	0.13	-0.25	0.00	121	969.60	969.60	121.5	0.14	0.000	1.430	5.8	6	10	17	60.8	46.42	5.69	41.78	38.84	########	########	121.5	Yes	82.3	1.594	Yes	82.3	1.594	0.5	5688.17	46.42	1.48	82.94	1.00	82.94	0.981	0.3553	1.43	8.14
2.5	62	0.09	-0.25	8.20	-8.20	62.00	0.09	0.15	-0.25	0.00	121	989.44	989.44	124.3	0.15	0.000	1.428	5.7	6	10	18	62.1	47.37	5.94	41.90	39.00	########	########	124.3	Yes	85.0	1.588	Yes	85.0	1.588	0.5	5937.15	47.37	1.46	85.69	1.00	85.69	0.981	0.3551	1.42	8.43
2.55	65.8	0.1	-0.25	8.37	-8.37	65.80	0.10	0.15	-0.25	0.00	121	1009.29	1009.29	129.4	0.15	0.000	1.417	5.3	6	11	19	63.9	48.32	6.30	42.11	39.23	########	########	129.4	Yes	89.4	1.572	Yes	89.4	1.572	0.5	6301.04	48.32	1.45	90.05	1.00	90.05	0.980	0.3550	1.41	8.88
2.6	63	0.09	-0.25	8.53	-8.53	63.00	0.09	0.14	-0.25	0.00	121	1029.13	1029.13	121.4	0.14	0.000	1.436	6.1	6	10	18	61.8	49.27	6.03	41.78	38.98	########	########	121.4	Yes	84.7	1.588	Yes	84.7	1.588	0.5	6032.91	49.27	1.43	85.38	1.00	85.38	0.980	0.3548	1.40	8.44
2.65	61.6	0.1	-0.25	8.69	-8.69	61.60	0.10	0.16	-0.25	0.00	121	1048.97	1048.97	116.4	0.16	0.000	1.469	7.5	6	10	17	60.6	50.22	5.90	41.56	38.83	########	########	116.4	Yes	82.0	1.616	Yes	82.0	1.616	0.5	5898.85	50.22	1.42	82.69	1.00	82.69	0.980	0.3547	1.39	8.19
2.7	51.9	0.1	-0.25	8.86	-8.86	51.90	0.10	0.19	-0.25	0.00	121	1068.81	1068.81	96.1	0.19	0.000	1.572	11.8	6	9	15	53.6	51.17	4.97	40.54	37.96	########	########	96.1	Yes	68.3	1.713	Yes	68.3	1.713	0.5	4969.97	51.17	1.41	69.02	1.05	72.24	0.979	0.3546	1.38	6.85
2.75	36.4	0.23	-0.25	9.02	-9.02	36.40	0.23	0.63	-0.25	0.00	121	1088.65	1088.65	65.9	0.64	0.000	1.945	27.6	6	7	12	39.6	52.12	3.49	38.44	36.22	########	########	65.9	Yes	47.2	2.069	Yes	47.2	2.069	0.5	3485.68	52.12	1.39	47.96	1.40	67.18	0.979	0.3544	1.37	4.77
2.8	24	0.36	-0.25	9.19	-9.19	24.00	0.36	1.50	-0.25	0.00	118	1107.97	1107.97	42.3	1.54	0.000	2.319	43.5	5	5	9	23.3	53.05	2.30	35.83	34.19	########	########	42.3	Yes	30.6	2.432	Yes	30.6	2.432	0.5	2298.25	53.05	1.38	31.35	2.45	76.70	0.979	0.3543	1.36	3.13
2.85	22.9	0.44	-0.25	9.35	-9.35	22.90	0.44	1.92	-0.25	0.00	118	1127.29	1127.29	39.6	1.97	0.000	2.408	47.3	5	5	9	21.2	53.97	2.19	35.43	33.93	########	########	39.6	Yes	28.9	2.516	Yes	28.9	2.516	0.5	2192.92	53.97	1.37	29.65	2.85	84.48	0.978	0.3542	1.35	2.96
2.9	21.6	0.57	-0.25	9.51	-9.51	21.60	0.57	2.64	-0.25	0.00	118	1146.61	1146.61	36.7	2.71	0.000	2.523	52.2	5	5	9	18.6	54.90	2.07	34.95	33.61	########	########	36.7	Yes	27.0	2.625	No	30.5	2.584	0.7	2068.43	54.90	1.54	31.35	3.23	101.18	0.978	0.3540	1.34	2.77
2.95	15.7	0.42	-0.25	9.68	-9.68	15.70	0.42	2.68	-0.25	0.00	115	1165.40	1165.40	25.9	2.78	-0.001	2.645	57.3	4	4	7	#########	########	########	########	########	1889.5	1.62	25.9	No	25.9	Non-liq.	No	25.9	Non-liq.	Non-liq.	1503.44	55.80	Non-liq.	Non-liq.	Non-liq.	########	0.977	0.3539	1.33	##########
3	12.3	0.29	-0.25	9.84	-9.84	12.30	0.29	2.36	-0.25	0.00	115	1184.20	1184.20	19.8	2.48	-0.001	2.708	60.0	4	3	5	#########	########	########	########	########	1463.3	1.24	19.8	No	19.8	Non-liq.	No	19.8	Non-liq.	Non-liq.	1177.85	56.70	Non-liq.	Non-liq.	Non-liq.	########	0.977	0.3537	1.32	##########
3.05	12.3	0.3	-0.25	10.01	-10.01	12.30	0.30	2.44	-0.25	0.00	115	1203.00	1203.00	19.4	2.56	-0.001	2.722	60.6	4	3	5	#########	########	########	########	########	1462.1	1.22	19.4	No	19.4	Non-liq.	No	19.4	Non-liq.	Non-liq.	1177.85	57.60	Non-liq.	Non-liq.	Non-liq.	########	0.977	0.3536	1.32	##########
3.1	14.75	0.31	-0.25	10.17	-10.17	14.75	0.31	2.10	-0.25	0.00	115	1221.79	1221.79	23.1	2.19	-0.001	2.621	56.3	4	4	6	#########	########	########	########	########	1767.2	1.45	23.1	No	23.1	Non-liq.	No	23.1	Non-liq.	Non-liq.	1412.47	58.50	Non-liq.	Non-liq.	Non-liq.	########	0.976	0.3535	1.31	##########
3.15	17.2	0.32	-0.25	10.33	-10.33	17.20	0.32	1.86	-0.25	0.00	118	1241.11	1241.11	26.7	1.93	0.000	2.538	52.8	5	4	6	8.2	59.42	1.65	32.95	32.33	########	########	26.7	Yes	20.5	2.632	No	22.8	2.594	0.7	1647.08	59.42	1.45	23.62	3.29	77.75	0.976	0.3533	1.30	2.14
3.2	33	0.38	-0.25	10.50	-10.50	33.00	0.38	1.15	-0.25	0.00	118	1260.43	1260.43	51.4	1.17	0.000	2.181	37.7	5	7	10	32.8	60.35	3.16	36.99	35.41	########	########	51.4	Yes	39.6	2.273	Yes	39.6	2.273	0.5	3160.10	60.35	1.30	40.41	1.87	75.38	0.976	0.3532	1.29	4.08
3.25	55.5	0.39	-0.44	10.66	-10.66	55.50	0.39	0.70	-0.44	0.00	121	1280.27	1280.27	85.7	0.71	0.000	1.874	24.6	6	10	15	52.4	61.30	5.31	39.91	37.85	########	########	85.7	Yes	66.7	1.964	Yes	66.7	1.964	0.5	5314.71	61.30	1.29	67.44	1.26	84.71	0.975	0.3530	1.28	6.81
3.3	87.1	0.4	-0.53	10.83	-10.83	87.10	0.40	0.46	-0.53	0.00	121	1300.11	1300.11	133.0	0.46	0.000	1.611	13.5	6	15	22	69.3	62.25	8.34	42.25	39.97	########	########	133.0	Yes	104.2	1.701	Yes	104.2	1.701	0.5	8340.74	62.25	1.28	105.02	1.04	109.04	0.975	0.3529	1.27	10.61
3.35	115.4	0.4	-0.58	10.99	-10.99	115.40	0.40	0.35	-0.58	0.00	121	1319.96	1319.96	173.8	0.35	0.000	1.447	6.5	6	19	27	79.8	63.20	11.05	43.60	41.28	########	########	173.9	Yes	137.3	1.535	Yes	137.3	1.535	0.5	11050.76	63.20	1.27	138.09	1.00	138.09	0.974	0.3528	1.26	13.97
3.4	143.4	0.41	-0.60	11.15	-11.15	143.40	0.41	0.29	-0.60	0.00	121	1339.80	1339.80	213.1	0.29	0.000	1.328	1.5	6	22	32	87.8	64.15	13.73	44.58	42.28	########	########	213.1	Yes	169.5	1.414	Yes	169.5	1.414	0.5	13732.06	64.15	1.26	170.33	1.00	170.33	0.974	0.3526	1.26	17.25
3.45	161.8	0.41	-0.62	11.32	-11.32	161.80	0.41	0.25	-0.62	0.00	127	1360.68	1360.68	236.8	0.25	0.000	1.262	0.0	7	25	35	92.1	65.15	15.49	45.09	42.82	########	########	236.8	Yes	189.9	1.346	Yes	189.9	1.346	0.5	15494.05	65.15	1.25	190.70	1.00	190.70	0.974	0.3525	1.25	19.33
3.5	172.7	0.5	-0.62	11.48	-11.48	172.70	0.50	0.29	-0.62	0.00	127	1381.57	1381.57	249.0	0.29	0.000	1.273	0.0	7	27	37	94.3	66.15	16.54	45.32	43.09	########	########	249.0	Yes	201.2	1.352	Yes	201.2	1.352	0.5	16537.84	66.15	1.24	202.00	1.00	202.00	0.973	0.3524	1.24	20.49
3.55	177.2	0.59	-0.60	11.65	-11.65	177.20	0.59	0.33	-0.60	0.00	127	1402.45	1402.45	251.7	0.33	0.000	1.303	0.4	7	27	38	94.9	67.15	16.97	45.37	43.18	########	########	251.7	Yes	204.9	1.377	Yes	204.9	1.377	0.5	16968.76	67.15	1.23	205.72	1.00	205.72	0.973	0.3522	1.23	20.88
3.6	180.2	0.68	-0.60	11.81	-11.81	180.20	0.68	0.38	-0.60	0.00	121	1422.29	1422.29	252.4	0.38	0.000	1.333	1.7	6	28	38	95.3	68.10	17.26	45.38	43.23	########	########	252.4	Yes	206.9	1.403	Yes	206.9	1.403	0.5	17256.05	68.10	1.22	207.74	1.00	207.74	0.972	0.3521	1.22	21.10
3.65	184	0.69	-0.44	11.98	-11.98	184.00	0.69	0.38	-0.44	0.00	121	1442.13	1442.13	254.2	0.38	0.000	1.329	1.5	6	29	39	95.8	69.05	17.62	45.42	43.29	########	########	254.2	Yes	209.8	1.397	Yes	209.8	1.397	0.5	17619.94	69.05	1.21	210.65	1.00	210.65	0.972	0.3519	1.22	21.41
3.7	189.4	0.98	-0.44	12.14	-12.14	189.40	0.98	0.52	-0.44	0.00	121	1461.98	1461.98	258.1	0.52	0.000	1.412	5.1	6	30	40	96.6	70.00	18.14	45.49	43.40	########	########	258.1	Yes	214.5	1.474	Yes	214.5	1.474	0.5	18137.04	70.00	1.20	215.36	1.00	215.36	0.972	0.3518	1.21	21.90
3.75	203.2	1.27	-0.35	12.30	-12.30	203.20	1.27	0.63	-0.35	0.00	121	1481.82	1481.82	273.3	0.63	0.000	1.450	6.7	6	33	43	99.0	70.95	19.46	45.75	43.70	########	########	273.3	Yes	228.7	1.506	Yes	228.7	1.506	0.5	19458.54	70.95	1.20	229.50	1.00	229.50	0.971	0.3517	1.20	23.35
3.8	220.1	1.31	-0.25	12.47	-12.47	220.10	1.31	0.60	-0.25	0.00	121	1501.66	1501.66	292.1	0.60	0.000	1.415	5.1	6	35	46	100.0	71.90	21.08	46.05	44.05	########	########	292.1	Yes	246.1	1.468	Yes	246.1	1.468	0.5	21076.89	71.90	1.19	246.94	1.00	246.94	0.971	0.3515	1.19	25.13
3.85	230.7	1.43	-0.16	12.63	-12.63	230.70	1.43	0.62	-0.16	0.00	121	1521.50	1521.50	302.3	0.62	0.000	1.417	5.2	6	37	48	100.0	72.85	22.09	46.21	44.25	########	########	302.3	Yes	256.3	1.468	Yes	256.3	1.468	0.5	22091.95	72.85	1.18	257.14	1.00	257.14	0.971	0.3514	1.19	26.18
3.9	252.1	1.57	-0.02	12.80	-12.80	252.10	1.57	0.62	-0.02	0.00	121	1541.34	1541.34	326.1	0.62	0.000	1.395	4.3	6	40	51	100.0	73.80	24.14	46.55	44.64	########	########	326.1	Yes	278.3	1.443	Yes	278.3	1.443	0.5	24141.23	73.80	1.17	279.17	1.00	279.17	0.970	0.3512	1.18	28.43
3.95	257.2	1.46	0.37	12.96	-12.96	257.20	1.46	0.57	0.37	0.00	121	1561.18	1561.18	328.5	0.57	0.000	1.364	3.0	6	41	51	100.0	74.75	24.63	46.58	44.70	########	########	328.5	Yes	282.1	1.411	Yes	282.1	1.411	0.5	24629.61	74.75	1.16	283.01	1.00	283.01	0.970	0.3511	1.17	28.83
4	265.8	1.41	0.09	13.12	-13.12	265.80	1.41	0.53	0.09	0.00	121	1581.02	1581.02	335.2	0.53	0.000	1.337	1.8	6	42	52	100.0	75.70	25.45	46.67	44.83	########	########	335.2	Yes	289.8	1.382	Yes	289.8	1.382	0.5	25453.15	75.70	1.16	290.63	1.00	290.63	0.969	0.3510	1.16	29.61
4.05	280.2	1.49	0.25	13.29	-13.29	280.20	1.49	0.53	0.25	0.00	121	1600.86	1600.86	349.1	0.53	0.000	1.325	1.4	6	44	54	100.0	76.65	26.83	46.85	45.05	########	########	349.1	Yes	303.6	1.368	Yes	303.6	1.368	0.5	26832.10	76.65	1.15	304.47	1.00	304.47	0.969	0.3508	1.16	31.03
4.1	288.9	1.56	0.25	13.45	-13.45	288.90	1.56	0.54	0.25	0.00	121	1620.70	1620.70	355.5	0.54	0.000	1.324	1.3	6	45	55	100.0	77.60	27.67	46.93	45.17	########	########	355.5	Yes	311.1	1.365	Yes	311.1	1.365	0.5	27665.21	77.60	1.14	311.99	1.00	311.99	0.969	0.3507	1.15	31.80
4.15	299	1.56	0.44	13.62	-13.62	299.00	1.56	0.52	0.44	0.00	127	1641.59	1641.59	363.3	0.52	0.000	1.307	0.6	7	46	56	100.0	78.60	28.63	47.03	45.30	########	########	363.3	Yes	320.0	1.346	Yes	320.0	1.346	0.5	28632.40	78.60	1.14	320.84	1.00	320.84	0.968	0.3506	1.14	32.71
4.2	291.9	1.59	0.62	13.78	-13.78	291.90	1.59	0.54	0.62	0.00	121	1661.43	1661.43	350.4	0.55	0.000	1.332	1.6	6	46	55	100.0	79.55	27.95	46.87	45.16	########	########	350.4	Yes	310.5	1.369	Yes	310.5	1.369	0.5	27952.50	79.55	1.13	311.35	1.00	311.35	0.968	0.3504	1.14	31.74
4.25	300.9	1.54	0.62	13.94	-13.94	300.90	1.54	0.51	0.62	0.00	127	1682.32	1682.32	356.7	0.51	0.000	1.307	0.6	7	47	56	100.0	80.55	28.81	46.95	45.28	########	########	356.7	Yes	318.1	1.342	Yes	318.1	1.342	0.5	28814.34	80.55	1.12	318.95	1.00	318.95	0.967	0.3503	1.13	32.52
4.3	301.5	1.5	0.78	14.11	-14.11	301.50	1.50	0.50	0.78	0.00	127	1703.20	1703.20	353.0	0.50	0.000	1.301	0.3	7	47	55	100.0	81.55	28.87	46.90	45.26	########	########	353.0	Yes	316.7	1.335	Yes	316.7	1.335	0.5	28871.80	81.55	1.11	317.62	1.00	317.62	0.967	0.3501	1.12	32.38
4.35	288.7	1.51	0.92	14.27	-14.27	288.70	1.51	0.52	0.92	0.00	121	1723.04	1723.04	334.1	0.52	0.000	1.334	1.7	6	45	53	100.0	82.50	27.65	46.66	45.02	########	########	334.1	Yes	301.5	1.366	Yes	301.5	1.366	0.5	27646.06	82.50	1.11	302.38	1.00	302.38	0.967	0.3500	1.12	30.83
4.4	275.8	1.52	0.97	14.44	-14.44	275.81	1.52	0.55	0.97	0.00	121	1742.88	1742.88	315.5	0.55	0.000	1.367	3.1	6	44	51	100.0	83.45	26.41	46.40	44.78	########	########	315.5	Yes	286.3	1.398	Yes	286.3	1.398	0.5	26410.75	83.45	1.10	287.22	1.00	287.22	0.966	0.3499	1.11	29.28
4.45	275.3	1.54	1.15	14.60	-14.60	275.31	1.54	0.56	1.15	0.00	121	1762.72	1762.72	311.4	0.56	0.000	1.376	3.5	6	44	50	100.0	84.40	26.36	46.34	44.74	########	########	311.4	Yes	284.2	1.404	Yes	284.2	1.404	0.5	26362.87	84.40	1.10	285.08	1.00	285.08	0.966	0.3497	1.10	29.06
4.5	271.8	1.55	1.31	14.76	-14.76	271.81	1.55	0.57	1.31	0.00	121	1782.57	1782.57	304.0	0.57	0.000	1.389	4.1	6	43	49	100.0	85.35	26.03	46.23	44.65	########	########	304.0	Yes	279.0	1.416	Yes	279.0	1.416	0.5	26027.71	85.35	1.09	279.88	1.00	279.88	0.966	0.3496	1.10	28.53
4.55	270.2	1.55	1.36	14.93	-14.93	270.21	1.55	0.57	1.36	0.00	121	1802.41	1802.41	298.8	0.58	0.000	1.396	4.4	6	43	49	100.0	86.30	25.87	46.16	44.60	########	########	298.8	Yes	275.8	1.421	Yes	275.8	1.421	0.5	25874.49	86.30	1.08	276.70	1.00	276.70	0.965	0.3494	1.09	28.20
4.6	268.6	1.51	1.50	15.09	-15.09	268.61	1.51	0.56	1.50	0.00	121	1822.25	1822.25	293.8	0.56	0.000	1.395	4.3	6	43	48	100.0	87.25	25.72	46.08	44.54	########	########	293.8	Yes	272.6	1.419	Yes	272.6	1.419	0.5	25721.28	87.25	1.08	273.56	1.00	273.56	0.965	0.3493	1.08	27.87
4.65	275.3	1.29	1.50	15.26	-15.26	275.31	1.29	0.47	1.50	0.00	121	1842.09	1842.09	297.9	0.47	0.000	1.337	1.9	6	43	48	100.0	88.20	26.36	46.14	44.63	########	########	297.9	Yes	277.9	1.360	Yes	277.9	1.360	0.5	26362.87	88.20	1.07	278.87	1.00	278.87	0.964	0.3492	1.08	28.41
4.7	267.6	1.26	1.59	15.42	-15.42	267.61	1.26	0.47	1.59	0.00	121	1861.93	1861.93	286.5	0.47	0.000	1.351	2.5	6	42	46	100.0	89.15	25.63	45.96	44.47	########	########	286.4	Yes	268.7	1.372	Yes	268.7	1.372	0.5	25625.52	89.15	1.07	269.62	1.00	269.62	0.964	0.3490	1.07	27.46
4.75	239.1	1.16	1.68	15.58	-15.58	239.11	1.16	0.49	1.68	0.00	121	1881.77	1881.77	253.1	0.49	0.000	1.401	4.5	6	38	42	100.0	90.10	22.90	45.40	43.91	########	########	253.1	Yes	238.7	1.420	Yes	238.7	1.420	0.5	22896.34	90.10	1.06	239.63	1.00	239.63	0.964	0.3489	1.07	24.40
4.8	226.1	1.13	1.68	15.75	-15.75	226.11	1.13	0.50	1.68	0.00	121	1901.61	1901.61	236.8	0.50	0.000	1.431	5.8	6	36	40	97.9	91.05	21.65	45.08	43.62	########	########	236.8	Yes	224.5	1.449	Yes	224.5	1.449	0.5	21651.45	91.05	1.05	225.42	1.00	225.42	0.963	0.3488	1.06	22.94
4.85	223.7	1	1.68	15.91	-15.91	223.71	1.00	0.45	1.68	0.00	121	1921.45	1921.45	231.9	0.45	0.000	1.408	4.8	6	36	39	97.2	92.00	21.42	44.99	43.54	########	########	231.8	Yes	220.9	1.424	Yes	220.9	1.424	0.5	21421.63	92.00	1.05	221.87	1.00	221.87	0.963	0.3486	1.05	22.58
4.9	227.25	1.11	1.71	16.08	-16.08	227.26	1.11	0.49	1.71	0.00	121	1941.29	1941.29	233.1	0.49	0.000	1.430	5.8	6	37	39	97.6	92.95	21.76	45.01	43.59	########	########	233.1	Yes	223.3	1.444	Yes	223.3	1.444	0.5	21761.58	92.95	1.04	224.24	1.00	224.24	0.963	0.3485	1.05	22.81
4.95	230.8	1.23	1.73	16.24	-16.24	230.81	1.23	0.53	1.73	0.00	121	1961.14	1961.14	234.4	0.54	0.000	1.453	6.8	6	38	40	98.0	93.90	22.10	45.04	43.64	########	########	234.4	Yes	225.6	1.465	Yes	225.6	1.465	0.5	22101.53	93.90	1.04	226.59	1.00	226.59	0.962	0.3483	1.04	23.04
5	242.8	1.34	1.85	16.40	-16.40	242.81	1.34	0.55	1.85	0.00	121	1980.98	1980.98	244.1	0.55	0.000	1.449	6.6	6	39	41	99.7	94.85	23.25	45.23	43.86	########	########	244.1	Yes	236.2	1.460	Yes	236.2	1.460	0.5	23250.65	94.85	1.03	237.17	1.00	237.17	0.962	0.3482	1.04	24.11
5.05	258.2	1.26	1.85	16.57	-16.57	258.21	1.26	0.49	1.85	0.00	121	2000.82	2000.82	257.1	0.49	0.000	1.397	4.4	6	41	43	100.0	95.80	24.73	45.47	44.13	########	########	257.1	Yes	250.0	1.406	Yes	250.0	1.406	0.5	24725.37	95.80	1.03	250.96	1.00	250.96	0.961	0.3481	1.03	25.50
5.1	283.8	1.32	1.89	16.73	-16.73	283.81	1.32	0.47	1.89	0.00	121	2020.66	2020.66	279.9	0.47	0.000	1.355	2.6	6	45	46	100.0	96.75	27.18	45.86	44.56	########	########	279.9	Yes	273.5	1.363	Yes	273.5	1.363	0.5	27176.84	96.75	1.02	274.48	1.00	274.48	0.961	0.3479	1.03	27.88
5.15	314.2	1.61	2.10	16.90	-16.90	314.21	1.61	0.51	2.10	0.00	121	2040.50	2040.50	307.0	0.51	0.000	1.354	2.6	6	50	51	100.0	97.70	30.09	46.28	45.02	########	########	307.0	Yes	301.4	1.360	Yes	301.4	1.360	0.5	30087.96	97.70	1.02	302.40	1.00	302.40	0.961	0.3478	1.02	30.70
5.2	333.7	1.84	2.21	17.06	-17.06	333.71	1.84	0.55	2.21	0.00	121	2060.34	2060.34	322.9	0.55	0.000	1.360	2.8	6	53	54	100.0	98.65	31.96	46.51	45.29	########	########	322.9	Yes	318.6	1.364	Yes	318.6	1.364	0.5	31955.29	98.65	1.01	319.62	1.00	319.62	0.960	0.3476	1.01	32.43
5.25	347.4	2.02	2.38	17.22	-17.22	347.41	2.02	0.58	2.38	0.00	121	2080.18	2080.18	333.0	0.58	0.000	1.367	3.1	6	55	56	100.0	99.60	33.27	46.64	45.46	########	########	333.0	Yes	330.2	1.370	Yes	330.2	1.370	0.5	33267.20	99.60	1.01	331.15	1.00	331.15	0.960	0.3475	1.01	33.58
5.3	336.1	2.25	2.26	17.39	-17.39	336.11	2.25	0.67	2.26	0.00	121	2100.02	2100.02	319.1	0.67	0.000	1.425	5.6	6	54	54	100.0	100.55	32.19	46.45	45.27	########	########	319.1	Yes	317.9	1.426	Yes	317.9	1.426	0.5	32185.11	100.55	1.00	318.86	1.00	318.86	0.959	0.3474	1.00	32.32
5.35	323.7	2.5	2.56	17.55	-17.55	323.71	2.50	0.77	2.56	0.00	121	2119.86	2119.86	304.4	0.77	0.000	1.484	8.1	6	53	53	100.0	101.50	31.00	46.24	45.07	########	########	304.4	Yes	304.7	1.484	Yes	304.7	1.484	0.5	30997.68	101.50	1.00	305.66	1.00	305.66	0.959	0.3472	1.00	30.97
5.4	316.1	2.04	2.47	17.72	-17.72	316.11	2.04	0.65	2.47	0.00	121	2139.71	2139.71	294.5	0.65	0.000	1.437	6.1	6	51	51	100.0	102.45	30.27	46.09	44.94	########	########	294.5	Yes	296.1	1.435	Yes	296.1	1.435	0.5	30269.90	102.45	0.99	297.10	1.00	297.10	0.959	0.3471	0.99	30.08
5.45	312	2.04	2.56	17.88	-17.88	312.01	2.04	0.65	2.56	0.00	121	2159.55	2159.55	288.0	0.66	0.000	1.448	6.6	6	51	50	100.0	103.40	29.88	45.99	44.85	########	########	287.9	Yes	290.9	1.445	Yes	290.9	1.445	0.5	29877.28	103.40	0.99	291.89	1.00	291.89	0.958	0.3470	0.99	29.54
5.5	301.9	2.15	2.33	18.04	-18.04	301.91	2.15	0.71	2.33	0.00	121	2179.39	2179.39	276.1	0.71	0.000	1.487	8.2	6	50	48	100.0	104.35	28.91	45.80	44.67	########	########	276.1	Yes	280.1	1.483	Yes	280.1	1.483	0.5	28910.10	104.35	0.99	281.15	1.00	281.15	0.958	0.3468	0.98	28.44
5.55	288.4	2.27	2.28	18.21	-18.21	288.41	2.27	0.79	2.28	0.00	121	2199.23	2199.23	261.3	0.79	0.000	1.535	10.3	6	48	47	100.0	105.30	27.62	45.54	44.43	########	########	261.3	Yes	266.3	1.530	Yes	266.3	1.530	0.5	27617.33	105.30	0.98	267.37	1.00	267.37	0.958	0.3467	0.98	27.03
5.6	283.3	2.06	2.26	18.37	-18.37	283.31	2.06	0.73	2.26	0.00	121	2219.07	2219.07	254.3	0.73	0.000	1.519	9.6	6	47	45	100.0	106.25	27.13	45.42	44.33	########	########	254.3	Yes	260.4	1.512	Yes	260.4	1.512	0.5	27128.96	106.25	0.98	261.46	1.00	261.46	0.957	0.3465	0.97	26.42
5.65	267	1.72	2.21	18.54	-18.54	267.01	1.72	0.64	2.21	0.00	121	2238.91	2238.91	237.5	0.65	0.000	1.503	8.9	6	44	42	100.0	107.20	25.57	45.10	44.02	########	########	237.5	Yes	244.3	1.494	Yes	244.3	1.494	0.5	25568.06	107.20	0.97	245.33	1.00	245.33	0.957	0.3464	0.97	24.77
5.7	270.35	1.66	2.10	18.70	-18.70	270.36	1.66	0.61	2.10	0.00	121	2258.75	2258.75	238.4	0.62	0.000	1.488	8.3	6	44	42	100.0	108.15	25.89	45.12	44.06	########	########	238.4	Yes	246.3	1.478	Yes	246.3	1.478	0.5	25888.86	108.15	0.97	247.31	1.00	247.31	0.956	0.3463	0.96	24.96
5.75	273.7	1.54	2.08	18.86	-18.86	273.71	1.54	0.56	2.08	0.00	121	2278.59	2278.59	239.2	0.56	0.000	1.461	7.1	6	45	42	100.0	109.10	26.21	45.13	44.10	########	########	239.2	Yes	248.2	1.449	Yes	248.2	1.449	0.5	26209.65	109.10	0.96	249.28	1.00	249.28	0.956	0.3461	0.96	25.14
5.8	283.5	1.49	2.10	19.03	-19.03	283.51	1.49	0.53	2.10	0.00	121	2298.43	2298.43	245.7	0.53	0.000	1.433	5.9	6	46	43	100.0	110.05	27.15	45.26	44.25	########	########	245.7	Yes	256.0	1.420	Yes	256.0	1.420	0.5	27148.11	110.05	0.96	257.09	1.00	257.09	0.956	0.3460	0.95	25.91
5.85	291.5	1.54	2.15	19.19	-19.19	291.51	1.54	0.53	2.15	0.00	121	2318.28	2318.28	250.5	0.53	0.000	1.428	5.7	6	47	44	100.0	111.00	27.91	45.35	44.36	########	########	250.5	Yes	262.2	1.413	Yes	262.2	1.413	0.5	27914.19	111.00	0.96	263.21	1.00	263.21	0.955	0.3458	0.95	26.51
5.9	300.3	1.58	2.08	19.36	-19.36	300.31	1.58	0.53	2.08	0.00	121	2338.12	2338.12	255.9	0.53	0.000	1.420	5.4	6	48	45	100.0	111.95	28.76	45.45	44.48	########	########	255.9	Yes	269.0	1.404	Yes	269.0	1.404	0.5	28756.88	111.95	0.95	270.01	1.00	270.01	0.955	0.3457	0.94	27.17
5.95	315.4	1.62	2.21	19.52	-19.52	315.41	1.62	0.51	2.21	0.00	121	2357.96	2357.96	266.5	0.52	0.000	1.400	4.5	6	50	46	100.0	112.90	30.20	45.63	44.69	########	########	266.5	Yes	281.3	1.382	Yes	281.3	1.382	0.5	30202.87	112.90	0.95	282.39	1.00	282.39	0.954	0.3456	0.94	28.40
6	320.2	1.86	2.28	19.68	-19.68	320.21	1.86	0.58	2.28	0.00	121	2377.80	2377.80	268.3	0.58	0.000	1.434	6.0	6	52	47	100.0	113.85	30.66	45.67	44.75	########	########	268.3	Yes	284.4	1.416	Yes	284.4	1.416	0.5	30662.52	113.85	0.94	285.49	1.00	285.49	0.954	0.3454	0.94	28.69
6.05	322	1.69	2.35	19.85	-19.85	322.01	1.69	0.52	2.35	0.00	121	2397.64	2397.64	267.6	0.53	0.000	1.405	4.7	6	52	47	100.0	114.80	30.83	45.65	44.75	########	########	267.6	Yes	284.8	1.385	Yes	284.8	1.385	0.5	30834.89	114.80	0.94	285.90	1.00	285.90	0.954	0.3453	0.93	28.71
6.1	317.9	1.78	2.21	20.01	-20.01	317.91	1.78	0.56	2.21	0.00	121	2417.48	2417.48	262.0	0.56	0.000	1.431	5.8	6	51	46	100.0	115.75	30.44	45.56	44.67	########	########	262.0	Yes	280.0	1.409	Yes	280.0	1.409	0.5	30442.27	115.75	0.94	281.10	1.00	281.10	0.953	0.3452	0.93	28.21
6.15	317.75	1.88	2.21	20.18	-20.18	317.76	1.88	0.59	2.21	0.00	121	2437.32	2437.32	259.7	0.59	0.000	1.450	6.6	6	52	46	100.0	116.70	30.43	45.52	44.65	########	########	259.7	Yes	278.7	1.427	Yes	278.7	1.427	0.5	30427.91	116.70	0.93	279.82	1.00	279.82	0.953	0.3450	0.92	28.06
6.2	317.6	1.85	2.24	20.34	-20.34	317.61	1.85	0.58	2.24	0.00	121	2457.16	2457.16	257.5	0.58	0.000	1.448	6.6	6	52	46	100.0	117.65	30.41	45.48	44.63	########	########	257.5	Yes	277.5	1.424	Yes	277.5	1.424	0.5	30413.54	117.65	0.93	278.56	1.00	278.56	0.953	0.3449	0.92	27.91
6.25	317.5	1.94	2.28	20.51	-20.51	317.51	1.94	0.61	2.28	0.00	121	2477.00	2477.00	255.4	0.61	0.000	1.465	7.3	6	52	46	100.0	118.60	30.40	45.44	44.61	########	########	255.4	Yes	276.3	1.440	Yes	276.3	1.440	0.5	30403.97	118.60	0.92	277.35	1.00	277.35	0.952	0.3447	0.91	27.77
6.3	320.35	2.02	2.24	20.67	-20.67	320.36	2.02	0.63	2.24	0.00	121	2496.85	2496.85	255.6	0.63	0.000	1.474	7.7	6	52	46	100.0	119.55	30.68	45.44	44.63	########	########	255.6	Yes	277.6	1.448	Yes	277.6	1.448	0.5	30676.88	119.55	0.92	278.73	1.00	278.73	0.952	0.3446	0.91	27.89
6.35	323.2	1.95	2.24	20.83	-20.83	323.21	1.95	0.60	2.24	0.00	121	2516.69	2516.69	255.9	0.61	0.000	1.460	7.1	6	53	46	100.0	120.50	30.95	45.45	44.66	########	########	255.8	Yes	279.0	1.433	Yes	279.0	1.433	0.5	30949.80	120.50	0.92	280.10	1.00	280.10	0.951	0.3445	0.90	28.01
6.4	325.8	1.93	2.21	21.00	-21.00	325.81	1.93	0.59	2.21	0.00	121	2536.53	2536.53	255.9	0.59	0.000	1.455	6.9	6	53	46	100.0	121.45	31.20	45.45	44.67	########	########	255.9	Yes	280.1	1.426	Yes	280.1	1.426	0.5	31198.78	121.45	0.91	281.24	1.00	281.24	0.951	0.3443	0.90	28.10
6.45	325.1	1.92	2.24	21.16	-21.16	325.11	1.92	0.59	2.24	0.00	121	2556.37	2556.37	253.4	0.59	0.000	1.457	6.9	6	53	46	100.0	122.40	31.13	45.40	44.65	########	########	253.3	Yes	278.4	1.427	Yes	278.4	1.427	0.5	31131.75	122.40	0.91	279.55	1.00	279.55	0.951	0.3442	0.90	27.91
6.5	322.7	1.91	2.26	21.33	-21.33	322.71	1.91	0.59	2.26	0.00	121	2576.21	2576.21	249.5	0.59	0.000	1.463	7.2	6	53	45	100.0	123.35	30.90	45.33	44.59	########	########	249.5	Yes	275.3	1.432	Yes	275.3	1.432	0.5	30901.92	123.35	0.91	276.41	1.00	276.41	0.950	0.3440	0.89	27.57
6.55	323.25	1.92	2.38	21.49	-21.49	323.26	1.92	0.59	2.38	0.00	121	2596.05	2596.05	248.0	0.60	0.000	1.465	7.3	6	53	45	100.0	124.30	30.95	45.30	44.58	########	########	248.0	Yes	274.7	1.433	Yes	274.7	1.433	0.5	30954.59	124.30	0.90	275.82	1.00	275.82	0.950	0.3439	0.89	27.49
6.6	323.8	1.9	2.38	21.65	-21.65	323.81	1.90	0.59	2.38	0.00	121	2615.89	2615.89	246.6	0.59	0.000	1.464	7.2	6	53	45	100.0	125.25	31.01	45.27	44.57	########	########	246.6	Yes	274.1	1.430	Yes	274.1	1.430	0.5	31007.26	125.25	0.90	275.24	1.00	275.24	0.950	0.3438	0.88	27.41
6.65	321.4	1.92	2.38	21.82	-21.82	321.41	1.92	0.60	2.38	0.00	121	2635.73	2635.73	242.9	0.60	0.000	1.474	7.7	6	53	44	100.0	126.20	30.78	45.20	44.52	########	########	242.9	Yes	271.1	1.439	Yes	271.1	1.439	0.5	30777.43	126.20	0.90	272.17	1.00	272.17	0.949	0.3436	0.88	27.08
6.7	299	1.94	2.38	21.98	-21.98	299.01	1.94	0.65	2.38	0.00	121	2655.57	2655.57	224.2	0.65	0.000	1.524	9.8	6	50	42	100.0	127.15	28.63	44.83	44.16	########	########	224.2	Yes	251.1	1.488	Yes	251.1	1.488	0.5	28632.40	127.15	0.89	252.26	1.00	252.26	0.949	0.3435	0.88	25.08
6.75	299.1	2.11	2.38	22.15	-22.15	299.11	2.11	0.71	2.38	0.00	121	2675.42	2675.42	222.6	0.71	0.000	1.551	10.9	6	50	42	100.0	128.10	28.64	44.79	44.14	########	########	222.6	Yes	250.3	1.515	Yes	250.3	1.515	0.5	28641.97	128.10	0.89	251.40	1.00	251.40	0.948	0.3434	0.87	24.98
6.8	292.9	2.15	2.38	22.31	-22.31	292.91	2.15	0.73	2.38	0.00	121	2695.26	2695.26	216.4	0.74	0.000	1.572	11.8	6	49	41	100.0	129.05	28.05	44.66	44.02	########	########	216.3	Yes	244.2	1.534	Yes	244.2	1.534	0.5	28048.26	129.05	0.89	245.28	1.00	245.28	0.948	0.3432	0.87	24.35
6.85	296.65	2.25	2.38	22.47	-22.47	296.66	2.25	0.76	2.38	0.00	121	2715.10	2715.10	217.5	0.76	0.000	1.580	12.2	6	50	41	100.0	130.00	28.41	44.68	44.06	########	########	217.5	Yes	246.4	1.542	Yes	246.4	1.542	0.5	28407.36	130.00	0.88	247.52	1.00	247.52	0.948	0.3431	0.86	24.55
6.9	300.4	2.36	2.38	22.64	-22.64	300.41	2.36	0.79	2.38	0.00	121	2734.94	2734.94	218.7	0.79	0.000	1.589	12.6	6	51	42	100.0	130.95	28.77	44.71	44.11	########	########	218.7	Yes	248.6	1.550	Yes	248.6	1.550	0.5	28766.46	130.95	0.88	249.73	1.00	249.73	0.947	0.3429	0.86	24.75
6.95	308.2	2.34	2.38	22.80	-22.80	308.21	2.34	0.76	2.38	0.00	121	2754.78	2754.78	222.8	0.76	0.000	1.573	11.9	6	52	43	100.0	131.90	29.51	44.80	44.21	########	########	222.8	Yes	254.2	1.533	Yes	254.2	1.533	0.5	29513.39	131.90	0.88	255.29	1.00	255.29	0.947	0.3428	0.86	25.28
7	319.1	3.49	2.40	22.97	-22.97	319.11	3.49	1.09	2.40	0.00	121	2774.62	2774.62	229.0	1.10	0.000	1.680	16.4	6	56	45	100.0	132.85	30.56	44.93	44.36	########	########	229.0	Yes	262.2	1.642	Yes	262.2	1.642	0.5	30557.18	132.85	0.87	263.38	1.00	262.66	0.946	0.3427	0.85	26.05
7.05	354.1	4.89	2.42	23.13	-23.13	354.11	4.89	1.38	2.42	0.00	121	2794.46	2794.46	252.4	1.39	0.000	1.731	18.6	6	63	51	100.0	133.80	33.91	45.38	44.84	########	########	252.4	Yes	290.1	1.694	Yes	290.1	1.694	0.5	33908.80	133.80	0.87	291.22	1.03	301.07	0.946	0.3425	0.85	28.78
7.1	376.7	4.33	3.25	23.29	-23.29	376.72	4.33	1.15	3.25	0.00	121	2814.30	2814.30	266.7	1.15	0.000	1.653	15.3	6	65	52	100.0	134.75	36.07	45.64	45.12	########	########	266.7	Yes	307.6	1.615	Yes	307.6	1.615	0.5	36072.99	134.75	0.87	308.72	1.00	308.72	0.946	0.3424	0.85	30.49
7.15	362.3	4.9	2.86	23.46	-23.46	362.32	4.90	1.35	2.86	0.00	121	2834.14	2834.14	254.7	1.36	0.000	1.721	18.1	6	64	51	100.0	135.70	34.69	45.42	44.92	########	########	254.7	Yes	294.7	1.683	Yes	294.7	1.683	0.5	34694.04	135.70	0.86	295.87	1.03	303.59	0.945	0.3422	0.84	29.19
7.2	391	4.3	3.00	23.62	-23.62	391.02	4.30	1.10	3.00	0.00	121	2853.99	2853.99	273.0	1.10	0.000	1.632	14.4	6	67	54	100.0	136.65	37.44	45.74	45.26	########	########	273.0	Yes	317.0	1.592	Yes	317.0	1.592	0.5	37442.36	136.65	0.86	318.20	1.00	318.20	0.945	0.3421	0.84	31.37
7.25	390.6	4.26	3.14	23.79	-23.79	390.62	4.26	1.09	3.14	0.00	121	2873.83	2873.83	270.8	1.09	0.000	1.631	14.3	6	67	53	100.0	137.60	37.40	45.71	45.24	########	########	270.8	Yes	315.6	1.590	Yes	315.6	1.590	0.5	37404.06	137.60	0.86	316.78	1.00	316.78	0.945	0.3420	0.83	31.20
7.3	400.2	4.22	3.23	23.95	-23.95	400.22	4.22	1.05	3.23	0.00	121	2893.67	2893.67	275.6	1.06	0.000	1.615	13.7	6	69	54	100.0	138.55	38.32	45.79	45.34	########	########	275.6	Yes	322.3	1.573	Yes	322.3	1.573	0.5	38323.36	138.55	0.86	323.45	1.00	323.45	0.944	0.3418	0.83	31.83
7.35	422.3	4.13	3.09	24.11	-24.11	422.32	4.13	0.98	3.09	0.00	121	2913.51	2913.51	288.9	0.98	0.000	1.577	12.0	6	71	56	100.0	139.50	40.44	46.00	45.58	########	########	288.9	Yes	339.0	1.534	Yes	339.0	1.534	0.5	40439.67	139.50	0.85	340.14	1.00	340.14	0.944	0.3417	0.83	33.44
7.4	436.3	3.85	3.21	24.28	-24.28	436.32	3.85	0.88	3.21	0.00	121	2933.35	2933.35	296.5	0.89	0.000	1.536	10.3	6	73	57	100.0	140.45	41.78	46.12	45.72	########	########	296.5	Yes	349.1	1.491	Yes	349.1	1.491	0.5	41780.31	140.45	0.85	350.23	1.00	350.23	0.943	0.3416	0.82	34.40
7.45	435.7	3.57	3.09	24.44	-24.44	435.72	3.57	0.82	3.09	0.00	121	2953.19	2953.19	294.1	0.82	0.000	1.514	9.3	6	72	56	100.0	141.40	41.72	46.08	45.70	########	########	294.1	Yes	347.4	1.467	Yes	347.4	1.467	0.5	41722.86	141.40	0.85	348.57	1.00	348.57	0.943	0.3414	0.82	34.21
7.5	452.3	4.19	3.04	24.61	-24.61	452.32	4.19	0.93	3.04	0.00	121	2973.03	2973.03	303.3	0.93	0.000	1.545	10.7	6	76	58	100.0	142.35	43.31	46.22	45.86	########	########	303.3	Yes	359.5	1.499	Yes	359.5	1.499	0.5	43312.48	142.35	0.84	360.64	1.00	360.64	0.943	0.3413	0.82	35.36
7.55	447.9	3.32	3.02	24.77	-24.77	447.92	3.32	0.74	3.02	0.00	121	2992.87	2992.87	298.3	0.74	0.000	1.477	7.8	6	73	56	100.0	143.30	42.89	46.15	45.80	########	########	298.3	Yes	354.8	1.427	Yes	354.8	1.427	0.5	42891.14	143.30	0.84	355.95	1.00	355.95	0.942	0.3411	0.81	34.87
7.6	423.4	2.34	3.21	24.93	-24.93	423.42	2.34	0.55	3.21	0.00	121	3012.71	3012.71	280.1	0.55	0.000	1.405	4.8	6	68	52	100.0	144.25	40.55	45.86	45.52	########	########	280.1	Yes	334.2	1.351	Yes	334.2	1.351	0.5	40545.00	144.25	0.84	335.37	1.00	335.37	0.942	0.3410	0.81	32.82
7.65	396.1	2.08	2.61	25.10	-25.10	396.11	2.08	0.53	2.61	0.00	121	3032.56	3032.56	260.2	0.53	0.000	1.414	5.1	6	64	48	100.0	145.20	37.93	45.52	45.18	########	########	260.2	Yes	311.5	1.357	Yes	311.5	1.357	0.5	37930.74	145.20	0.84	312.72	1.00	312.72	0.941	0.3409	0.81	30.58
7.7	338.9	2	1.27	25.26	-25.26	338.91	2.00	0.59	1.27	0.00	121	3052.40	3052.40	221.1	0.59	0.000	1.501	8.8	6	56	42	100.0	146.15	32.45	44.76	44.42	########	########	221.1	Yes	265.5	1.442	Yes	265.5	1.442	0.5	32453.24	146.15	0.83	266.69	1.00	266.69	0.941	0.3407	0.80	26.05
7.75	315.6	1.93	0.72	25.43	-25.43	315.60	1.93	0.61	0.72	0.00	121	3072.24	3072.24	204.5	0.61	0.000	1.537	10.3	6	53	40	100.0	147.10	30.22	44.39	44.07	########	########	204.5	Yes	246.3	1.477	Yes	246.3	1.477	0.5	30222.02	147.10	0.83	247.55	1.00	247.55	0.941	0.3406	0.80	24.16
7.8	318.6	1.98	0.67	25.59	-25.59	318.60	1.98	0.62	0.67	0.00	121	3092.08	3092.08	205.1	0.62	0.000	1.540	10.5	6	53	40	100.0	148.05	30.51	44.40	44.09	########	########	205.1	Yes	247.9	1.479	Yes	247.9	1.479	0.5	30509.30	148.05	0.83	249.10	1.00	249.10	0.940	0.3404	0.80	24.29
7.85	289.3	1.73	0.32	25.75	-25.75	289.30	1.73	0.60	0.32	0.00	121	3111.92	3111.92	184.9	0.60	0.000	1.564	11.5	6	49	36	96.9	149.00	27.70	43.90	43.62	########	########	184.9	Yes	224.3	1.500	Yes	224.3	1.500	0.5	27703.52	149.00	0.82	225.47	1.00	225.47	0.940	0.3403	0.79	21.96
7.9	265	1.6	0.42	25.92	-25.92	265.00	1.60	0.60	0.42	0.00	121	3131.76	3131.76	168.2	0.61	0.000	1.598	12.9	6	45	33	93.4	149.95	25.38	43.44	43.18	########	########	168.2	Yes	204.7	1.533	Yes	204.7	1.533	0.5	25376.54	149.95	0.82	205.87	1.00	205.87	0.940	0.3402	0.79	20.04
7.95	271	1.72	0.32	26.08	-26.08	271.00	1.72	0.63	0.32	0.00	121	3151.60	3151.60	171.0	0.64	0.000	1.607	13.3	6	46	34	94.2	150.90	25.95	43.52	43.28	########	########	171.0	Yes	208.7	1.541	Yes	208.7	1.541	0.5	25951.10	150.90	0.82	209.87	1.00	209.87	0.939	0.3400	0.79	20.40
8	277	1.83	0.37	26.25	-26.25	277.00	1.83	0.66	0.37	0.00	121	3171.44	3171.44	173.7	0.66	0.000	1.613	13.5	6	47	35	94.9	151.85	26.53	43.59	43.37	########	########	173.7	Yes	212.6	1.547	Yes	212.6	1.547	0.5	26525.66	151.85	0.82	213.85	1.00	213.85	0.939	0.3399	0.78	20.77
8.05	357.8	1.96	0.39	26.41	-26.41	357.80	1.96	0.55	0.39	0.00	121	3191.28	3191.28	223.2	0.55	0.000	1.476	7.8	6	59	43	100.0	152.80	34.26	44.81	44.57	########	########	223.2	Yes	274.1	1.410	Yes	274.1	1.410	0.5	34263.11	152.80	0.81	275.36	1.00	275.36	0.938	0.3398	0.78	26.72
8.1	360.7	2.04	0.44	26.57	-26.57	360.70	2.04	0.57	0.44	0.00	121	3211.28	3211.12	223.7	0.57	0.000	1.485	8.1	6	59	43	100.0	153.75	34.54	44.82	44.60	########	########	223.7	Yes	275.5	1.418	Yes	275.5	1.418	0.5	34540.82	153.75	0.81	276.74	1.00	276.74	0.938	0.3396	0.78	26.83
8.15	337.8	1.84	0.25	26.74	-26.74	337.80	1.84	0.54	0.25	0.00	121	3230.97	3230.97	208.1	0.55	0.000	1.498	8.7	6	56	40	100.0	154.70	32.35	44.47	44.27	########	########	208.1	Yes	257.1	1.429	Yes	257.1	1.429	0.5	32347.90	154.70	0.81	258.37	1.00	258.37	0.938	0.3395	0.77	25.02
8.2	332.65	1.93	0.21	26.90	-26.90	332.65	1.93	0.58	0.21	0.00	121	3250.81	3250.81	203.7	0.58	0.000	1.523	9.7	6	55	40	100.0	155.65	31.85	44.37	44.18	########	########	203.7	Yes	252.4	1.453	Yes	252.4	1.453	0.5	31854.74	155.65	0.81	253.65	1.00	253.65	0.937	0.3393	0.77	24.54
8.25	343.32	2.02	0.07	27.07	-27.07	343.32	2.02	0.59	0.07	0.00	121	3270.65	3270.65	208.9	0.59	0.000	1.519	9.6	6	57	41	100.0	156.60	32.88	44.49	44.32	########	########	208.9	Yes	259.8	1.448	Yes	259.8	1.448	0.5	32876.50	156.60	0.80	260.99	1.00	260.99	0.937	0.3392	0.77	25.23
8.3	354	1.89	0.16	27.23	-27.23	354.00	1.89	0.53	0.16	0.00	121	3290.49	3290.49	214.2	0.54	0.000	1.483	8.0	6	58	41	100.0	157.55	33.90	44.61	44.45	########	########	214.2	Yes	267.1	1.411	Yes	267.1	1.411	0.5	33899.22	157.55	0.80	268.30	1.00	268.30	0.937	0.3391	0.76	25.91
8.35	372.3	1.77	0.25	27.39	-27.39	372.30	1.77	0.48	0.25	0.00	121	3310.33	3310.33	223.9	0.48	0.000	1.436	6.1	6	60	43	100.0	158.50	35.65	44.82	44.68	########	########	223.9	Yes	280.1	1.362	Yes	280.1	1.362	0.5	35651.64	158.50	0.80	281.32	1.00	281.32	0.936	0.3389	0.76	27.14
8.4	386.3	2.24	0.16	27.56	-27.56	386.30	2.24	0.58	0.16	0.00	121	3330.17	3330.17	231.0	0.58	0.000	1.481	8.0	6	63	45	100.0	159.45	36.99	44.97	44.84	########	########	231.0	Yes	289.8	1.409	Yes	289.8	1.409	0.5	36992.29	159.45	0.80	291.03	1.00	291.03	0.936	0.3388	0.76	28.05
8.45	355.1	2.71	0.21	27.72	-27.72	355.10	2.71	0.76	0.21	0.00	121	3350.01	3350.01	211.0	0.77	0.000	1.592	12.7	6	60	42	100.0	160.40	34.00	44.54	44.42	########	########	211.0	Yes	265.5	1.521	Yes	265.5	1.521	0.5	34004.56	160.40	0.79	266.73	1.00	266.73	0.935	0.3386	0.76	25.69
8.5	341.1	2.46	0.25	27.89	-27.89	341.10	2.46	0.72	0.25	0.00	121	3369.85	3369.85	201.4	0.72	0.000	1.589	12.6	6	58	40	100.0	161.35	32.66	44.32	44.22	########	########	201.4	Yes	254.2	1.517	Yes	254.2	1.517	0.5	32663.91	161.35	0.79	255.46	1.00	255.46	0.935	0.3385	0.75	24.58
8.55	339.95	2.4	0.23	28.05	-28.05	339.95	2.40	0.71	0.23	0.00	121	3389.69	3389.69	199.6	0.71	0.000	1.586	12.4	6	58	40	100.0	162.30	32.55	44.27	44.19	########	########	199.6	Yes	252.6	1.512	Yes	252.6	1.512	0.5	32553.79	162.30	0.79	253.85	1.00	253.85	0.935	0.3384	0.75	24.40
8.6	354.52	2.34	0.23	28.22	-28.22	354.52	2.34	0.66	0.23	0.00	121	3409.54	3409.54	207.0	0.66	0.000	1.555	11.1	6	60	41	100.0	163.25	33.95	44.45	44.37	########	########	207.0	Yes	262.7	1.479	Yes	262.7	1.479	0.5	33949.02	163.25	0.79	263.96	1.00	263.96	0.934	0.3382	0.75	25.34
8.65	369.1	3.14	0.23	28.38	-28.38	369.10	3.14	0.85	0.23	0.00	121	3429.38	3429.38	214.3	0.85	0.000	1.620	13.9	6	63	44	100.0	164.20	35.35	44.61	44.55	########	########	214.3	Yes	272.7	1.548	Yes	272.7	1.548	0.5	35345.21	164.20	0.79	274.02	1.00	274.02	0.934	0.3381	0.74	26.28
8.7	401.4	2.92	0.25	28.54	-28.54	401.40	2.92	0.73	0.25	0.00	121	3449.22	3449.22	231.7	0.73	0.000	1.548	10.8	6	67	46	100.0	165.15	38.44	44.98	44.94	########	########	231.7	Yes	295.9	1.474	Yes	295.9	1.474	0.5	38438.27	165.15	0.78	297.14	1.00	297.14	0.933	0.3380	0.74	28.47
8.75	403.5	2.84	0.55	28.71	-28.71	403.50	2.84	0.70	0.55	0.00	121	3469.06	3469.06	231.6	0.71	0.000	1.538	10.4	6	67	46	100.0	166.10	38.64	44.98	44.95	########	########	231.6	Yes	296.6	1.463	Yes	296.6	1.463	0.5	38639.37	166.10	0.78	297.84	1.00	297.84	0.933	0.3378	0.74	28.51
8.8	377.9	2.77	0.44	28.87	-28.87	377.90	2.77	0.73	0.44	0.00	121	3488.90	3488.90	215.6	0.74	0.000	1.573	11.8	6	64	43	100.0	167.05	36.19	44.64	44.62	########	########	215.6	Yes	276.9	1.496	Yes	276.9	1.496	0.5	36187.90	167.05	0.78	278.15	1.00	278.15	0.933	0.3377	0.74	26.60
8.85	351	2.76	0.44	29.04	-29.04	351.00	2.76	0.79	0.44	0.00	121	3508.74	3508.74	199.1	0.79	0.000	1.619	13.8	6	60	41	100.0	168.00	33.61	44.26	44.26	########	########	199.1	Yes	256.3	1.541	Yes	256.3	1.541	0.5	33611.94	168.00	0.78	257.62	1.00	257.62	0.932	0.3375	0.73	24.61
8.9	337	2.77	0.35	29.20	-29.20	337.00	2.77	0.82	0.35	0.00	121	3528.58	3528.58	190.0	0.83	0.000	1.647	15.0	6	58	39	100.0	168.95	32.27	44.03	44.05	########	########	190.0	Yes	245.4	1.568	Yes	245.4	1.568	0.5	32271.30	168.95	0.77	246.65	1.00	246.65	0.932	0.3374	0.73	23.54
8.95	340.7	2.07	0.35	29.36	-29.36	340.70	2.07	0.61	0.35	0.00	121	3548.42	3548.42	191.0	0.61	0.000	1.557	11.2	6	57	38	100.0	169.90	32.63	44.06	44.09	########	########	191.0	Yes	247.4	1.473	Yes	247.4	1.473	0.5	32625.61	169.90	0.77	248.66	1.00	248.66	0.932	0.3373	0.73	23.71
9	344.4	1.94	0.48	29.53	-29.53	344.40	1.94	0.56	0.48	0.00	121	3568.26	3568.26	192.0	0.57	0.000	1.535	10.2	6	57	38	100.0	170.85	32.98	44.08	44.12	########	########	192.0	Yes	249.4	1.449	Yes	249.4	1.449	0.5	32979.92	170.85	0.77	250.66	1.00	250.66	0.931	0.3371	0.72	23.88
9.05	347	1.69	0.62	29.69	-29.69	347.00	1.69	0.49	0.62	0.00	121	3588.11	3588.11	192.4	0.49	0.000	1.495	8.5	6	57	38	100.0	171.80	33.23	44.09	44.15	########	########	192.4	Yes	250.6	1.405	Yes	250.6	1.405	0.5	33228.90	171.80	0.77	251.85	1.00	251.85	0.931	0.3370	0.72	23.97
9.1	366.3	0	0.62	29.86	-29.86	366.30	0.00	0.00	0.62	0.00	80	3601.16	3601.16	202.4	0.00	0.000	4.538	100.0	2	3000	1992	#########	########	########	########	########	45562.8	12.65	202.4	No	202.4	Non-liq.	No	202.4	Non-liq.	Non-liq.	35077.08	172.42	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3368	0.72	##########
9.15	389	0	0.62	30.02	-30.02	389.00	0.00	0.00	0.62	0.00	80	3614.21	3614.21	214.3	0.00	0.000	4.538	100.0	2	3186	2110	#########	########	########	########	########	48399.5	13.39	214.3	No	214.3	Non-liq.	No	214.3	Non-liq.	Non-liq.	37250.84	173.05	Non-liq.	Non-liq.	Non-liq.	########	0.930	0.3367	0.72	##########
				########	##########	########	########	########	########	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	########	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	1.000	#NUM!	#NUM!	#NUM!
Average																																														
4.60	**216.52**	**1.34**	**0.83**	**15.09**	**-15.09**	**216.52**	**1.34**	**0.60**	**0.83**	**0.00**	**120.40**	**1819.99**	**1819.99**	**327.92**	**0.61**	**0.00**	**1.57**	**11.37**	**5.95**	**74.24**	**238.63**	**89.16**	**88.33**	**21.29**	**44.96**	**42.92**	**12959.98**	**77.42**	**327.92**		**269.50**	**1.53**		**269.53**	**1.53**	**0.50**	**20733.94**	**87.14**	**1.18**	**220.29**	**1.06**	**222.50**	**0.98**	**0.35**		

Sounding Name

CPT-10

Hidden Frame Data

Depth [ft]	q_c [tsf]	f_s [tsf]	u_1 [psi]	u_2 [psi]	u_3 [psi]	u_0 [psi]	q_t [psi]	f_s [psi]	R_f [%]	I_c	Q	I_r	C_1=Z-57	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_10
0.05	45	0	0.16	0.16	0.16	0.16	13.05	6893.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	52.2	0	0.16	0.16	0.16	0.16	38.16	20211.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	58.4	0	0.16	0.16	0.16	0.16	43.11	22829.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	64.6	0	0.16	0.16	0.16	0.16	48.06	25446.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	70.8	0.1	0.16	0.16	0.16	0.16	53.02	28064.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	77	0.1	0.16	0.16	0.16	0.16	57.97	30682.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	83.2	0.1	0.16	0.16	0.16	0.16	62.93	33300.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	89.4	0.1	0.16	0.16	0.16	0.16	67.88	35918.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	95.6	0.1	0.16	0.16	0.16	0.16	72.84	38536.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	101.8	0.1	0.16	0.16	0.16	0.16	77.79	41154.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	108	0.1	0.16	0.16	0.16	0.16	82.75	43772.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	114.2	0.1	0.16	0.16	0.16	0.16	87.70	46390.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.65	120.4	0.1	0.16	0.16	0.16	0.16	92.66	49008.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.7	126.6	0.1	0.16	0.16	0.16	0.16	97.61	51626.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	132.8	0.1	0.16	0.16	0.16	0.16	102.57	54244.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.8	139	0.1	0.16	0.16	0.16	0.16	107.52	56862.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.85	145.2	0.1	0.16	0.16	0.16	0.16	112.48	59480.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.9	151.4	0.1	0.16	0.16	0.16	0.16	117.43	62098.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.95	157.6	0.1	0.16	0.16	0.16	0.16	122.39	64716.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	163.8	0.1	0.16	0.16	0.16	0.16	127.34	67334.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.05	170	0.1	0.16	0.16	0.16	0.16	132.30	69952.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.1	176.2	0.1	0.16	0.16	0.16	0.16	137.25	72570.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.15	182.4	0.1	0.16	0.16	0.16	0.16	142.21	75188.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.2	188.6	0.1	0.16	0.16	0.16	0.16	147.16	77806.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	194.8	0.1	0.16	0.16	0.16	0.16	152.12	80424.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.3	201	0.1	0.16	0.16	0.16	0.16	157.07	83042.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.35	207.2	0.1	0.16	0.16	0.16	0.16	162.03	85660.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.4	213.4	0.1	0.16	0.16	0.16	0.16	166.98	88278.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.45	219.6	0.1	0.16	0.16	0.16	0.16	171.94	90896.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	225.8	0.1	0.16	0.16	0.16	0.16	176.89	93514.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.55	232	0.1	0.16	0.16	0.16	0.16	181.85	96132.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.6	238.2	0.1	0.16	0.16	0.16	0.16	186.80	98750.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.65	244.4	0.1	0.16	0.16	0.16	0.16	191.76	101368.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.7	250.6	0.1	0.16	0.16	0.16	0.16	196.71	103986.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	256.8	0.1	0.16	0.16	0.16	0.16	201.67	106604.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.8	263	0.1	0.16	0.16	0.16	0.16	206.62	109222.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.85	269.2	0.1	0.16	0.16	0.16	0.16	211.58	111840.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.9	275.4	0.1	0.16	0.16	0.16	0.16	216.53	114458.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.95	281.6	0.1	0.16	0.16	0.16	0.16	221.49	117076.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	287.8	0.1	0.16	0.16	0.16	0.16	226.44	119694.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.05	294	0.1	0.16	0.16	0.16	0.16	231.40	122312.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.1	300.2	0.1	0.16	0.16	0.16	0.16	236.35	124930.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.15	306.4	0.1	0.16	0.16	0.16	0.16	241.31	127548.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.2	312.6	0.1	0.16	0.16	0.16	0.16	246.26	130166.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	318.8	0.1	0.16	0.16	0.16	0.16	251.22	132784.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.3	325	0.1	0.16	0.16	0.16	0.16	256.17	135402.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.35	331.2	0.1	0.16	0.16	0.16	0.16	261.13	138020.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.4	337.4	0.1	0.16	0.16	0.16	0.16	266.08	140638.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.45	343.6	0.1	0.16	0.16	0.16	0.16	271.04	143256.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	349.8	0.1	0.16	0.16	0.16	0.16	275.99	145874.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.55	356	0.1	0.16	0.16	0.16	0.16	280.95	148492.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.6	362.2	0.1	0.16	0.16	0.16	0.16	285.90	151110.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.65	368.4	0.1	0.16	0.16	0.16	0.16	290.86	153728.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.7	374.6	0.1	0.16	0.16	0.16	0.16	295.81	156346.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	380.8	0.1	0.16	0.16	0.16	0.16	300.77	158964.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.8	387	0.1	0.16	0.16	0.16	0.16	305.72	161582.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.85	393.2	0.1	0.16	0.16	0.16	0.16	310.68	164200.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.9	399.4	0.1	0.16	0.16	0.16	0.16	315.63	166818.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.95	405.6	0.1	0.16	0.16	0.16	0.16	320.59	169436.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	411.8	0.1	0.16	0.16	0.16	0.16	325.54	172054.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.05	418	0.1	0.16	0.16	0.16	0.16	330.50	174672.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.1	424.2	0.1	0.16	0.16	0.16	0.16	335.45	177290.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.15	430.4	0.1	0.16	0.16	0.16	0.16	340.41	179908.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.2	436.6	0.1	0.16	0.16	0.16	0.16	345.36	182526.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	442.8	0.1	0.16	0.16	0.16	0.16	350.32	185144.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.3	449	0.1	0.16	0.16	0.16	0.16	355.27	187762.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.35	455.2	0.1	0.16	0.16	0.16	0.16	360.23	190380.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.4	461.4	0.1	0.16	0.16	0.16	0.16	365.18	192998.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.45	467.6	0.1	0.16	0.16	0.16	0.16	370.14	195616.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	473.8	0.1	0.16	0.16	0.16	0.16	375.09	198234.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.55	480	0.1	0.16	0.16	0.16	0.16	380.05	200852.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.6	486.2	0.1	0.16	0.16	0.16	0.16	385.00	203470.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.65	492.4	0.1	0.16	0.16	0.16	0.16	389.96	206088.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.7	498.6	0.1	0.16	0.16	0.16	0.16	394.91	208706.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	504.8	0.1	0.16	0.16	0.16	0.16	399.87	211324.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.8	511	0.1	0.16	0.16	0.16	0.16	404.82	213942.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.85	517.2	0.1	0.16	0.16	0.16	0.16	409.78	216560.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.9	523.4	0.1	0.16	0.16	0.16	0.16	414.73	219178.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.95	529.6	0.1	0.16	0.16	0.16	0.16	419.69	221796.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	535.8	0.1	0.16	0.16	0.16	0.16	424.64	224414.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.05	542	0.1	0.16	0.16	0.16	0.16	429.60	227032.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.1	548.2	0.1	0.16	0.16	0.16	0.16	434.55	229650.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.15	554.4	0.1	0.16	0.16	0.16	0.16	439.51	232268.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.2	560.6	0.1	0.16	0.16	0.16	0.16	444.46	234886.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.25	566.8	0.1	0.16	0.16	0.16	0.16	449.42	237504.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.3	573	0.1	0.16	0.16	0.16	0.16	454.37	240122.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.35	579.2	0.1	0.16	0.16	0.16	0.16	459.33	242740.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.4	585.4	0.1	0.16	0.16	0.16	0.16	464.28	245358.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.45	591.6	0.1	0.16	0.16	0.16	0.16	469.24	247976.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.5	597.8	0.1	0.16	0.16	0.16	0.16	474.19	250594.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.55	604	0.1	0.16	0.16	0.16	0.16	479.15	253212.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.6	610.2	0.1	0.16	0.16	0.16	0.16	484.10	255830.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.65	616.4	0.1	0.16	0.16	0.16	0.16	489.06	258448.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.7	622.6	0.1	0.16	0.16	0.16	0.16	494.01	261066.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.75	628.8	0.1	0.16	0.16	0.16	0.16	498.97	263684.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.8	635	0.1	0.16	0.16	0.16	0.16	503.92	266302.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.85	641.2	0.1	0.16	0.16	0.16	0.16	508.88	268920.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.9	647.4	0.1	0.16	0.16	0.16	0.16	513.83	271538.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.95	653.6	0.1	0.16	0.16	0.16	0.16	518.79	274156.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	659.8	0.1	0.16	0.16	0.16	0.16	523.74	276774.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.05	666	0.1	0.16	0.16	0.16	0.16	528.70	279392.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.1	672.2	0.1	0.16	0.16	0.16	0.16	533.65	282010.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.15	678.4	0.1	0.16	0.16	0.16	0.16	538.61	284628.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.2	684.6	0.1	0.16	0.16	0.16	0.16	543.56	287246.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.25	690.8	0.1	0.16	0.16	0.16	0.16	548.52	289864.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.3	697	0.1	0.16	0.16	0.16	0.16	553.47	292482.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.35	703.2	0.1	0.16	0.16	0.16	0.16	558.43	295100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.4	709.4	0.1	0.16	0.16	0.16	0.16	563.38	297718.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.45	715.6	0.1	0.16	0.16	0.16	0.16	568.34	300336.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.5	721.8	0.1	0.16	0.16	0.16	0.16	573.29	302954.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.55	728	0.1	0.16	0.16	0.16	0.16	578.25	305572.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.6	734.2	0.1	0.16	0.16	0.16	0.16	583.20	308190.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.65	740.4	0.1	0.16	0.16	0.16	0.16	588.16

Appendix C

Shear and Compression Wave Velocity Test Results

DRAFT

Seismic CPT Data Summary
Viking Solar Project
Preliminary Geotechnical Investigation
June, 2013

CPT Shear Wave Measurements

Shear Wave Source Offset = 5 ft
S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)
Seismic CPT sounding performed by Kehoe Testing, Inc.

CPT-1

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	S-Wave Velocity Interval (ft/sec)
5.11	4.11	6.47	6.47	11.38	569	
10.15	9.15	10.43	3.95	15.70	664	915
15.15	14.15	15.01	4.58	20.18	744	1,022
20.13	19.13	19.77	4.77	25.81	766	846
24.25	23.25	23.78	4.01	30.36	783	881

CPT-6

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	S-Wave Velocity Interval (ft/sec)
5.10	4.10	6.47	6.47	11.08	584	
10.17	9.17	10.44	3.98	16.41	636	746
15.09	14.09	14.95	4.51	22.15	675	785
20.19	19.19	19.83	4.88	27.43	723	924
25.19	24.19	24.70	4.87	33.97	727	745
30.05	29.05	29.48	4.78	38.95	757	959

CPT-7

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	S-Wave Velocity Interval (ft/sec)
5.07	4.07	6.45	6.45	11.74	549	
10.14	9.14	10.42	3.97	17.87	583	648
15.11	14.11	14.97	4.55	21.78	687	1,164
20.08	19.08	19.72	4.75	25.60	770	1,245
25.10	24.10	24.61	4.89	30.37	810	1,025
30.03	29.03	29.46	4.84	35.39	832	965

CPT-10

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	S-Wave Velocity Interval (ft/sec)
5.11	4.11	6.47	6.47	10.17	636	
10.49	9.49	10.73	4.25	16.37	655	686
15.11	14.11	14.97	4.24	21.21	706	877
20.18	19.18	19.82	4.85	26.54	747	910
25.01	24.01	24.53	4.70	34.20	717	614
30.10	29.10	29.53	5.00	39.79	742	895

DRAFT

Seismic CPT Data Summary
Viking Solar Project
Preliminary Geotechnical Investigation
June, 2013

CPT Compression Wave Measurements

Compression Wave Source Offset = 5 ft
P-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval P-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)
Seismic CPT sounding performed by Kehoe Testing, Inc.

CPT-1

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	P-Wave Arrival (msec)	P-Wave Velocity from Surface (ft/sec)	P-Wave Velocity Interval (ft/sec)
5.11	4.11	6.47	6.47	5.67	1,142	
10.15	9.15	10.43	3.95	7.79	1,339	1,865
15.15	14.15	15.01	4.58	11.68	1,285	1,177
20.13	19.13	19.77	4.77	14.03	1,409	2,028
24.25	23.25	23.78	4.01	16.65	1,428	1,530

CPT-6

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	P-Wave Arrival (msec)	P-Wave Velocity from Surface (ft/sec)	P-Wave Velocity Interval (ft/sec)
5.10	4.10	6.47	6.47	6.25	1,035	
10.17	9.17	10.44	3.98	8.39	1,245	1,859
15.09	14.09	14.95	4.51	11.87	1,260	1,295
20.19	19.19	19.83	4.88	14.80	1,340	1,665
25.19	24.19	24.70	4.87	18.39	1,343	1,357
30.05	29.05	29.48	4.78	19.81	1,488	3,363

CPT-7

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	P-Wave Arrival (msec)	P-Wave Velocity from Surface (ft/sec)	P-Wave Velocity Interval (ft/sec)
5.07	4.07	6.45	6.45	6.59	978	
10.14	9.14	10.42	3.97	10.36	1,006	1,053
15.11	14.11	14.97	4.55	12.64	1,184	1,996
20.08	19.08	19.72	4.75	14.33	1,376	2,813
25.10	24.10	24.61	4.89	16.58	1,485	2,173
30.03	29.03	29.46	4.84	18.64	1,580	2,352

CPT-10

Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	Interval Distance (ft)	P-Wave Arrival (msec)	P-Wave Velocity from Surface (ft/sec)	P-Wave Velocity Interval (ft/sec)
5.11	4.11	6.47	6.47	5.18	1,250	
10.49	9.49	10.73	4.25	8.14	1,318	1,437
15.11	14.11	14.97	4.24	10.98	1,363	1,494
20.18	19.18	19.82	4.85	12.36	1,604	3,515
25.01	24.01	24.53	4.70	16.09	1,524	1,261
30.10	29.10	29.53	5.00	19.76	1,494	1,363

DRAFT

Appendix D

General Site Photos

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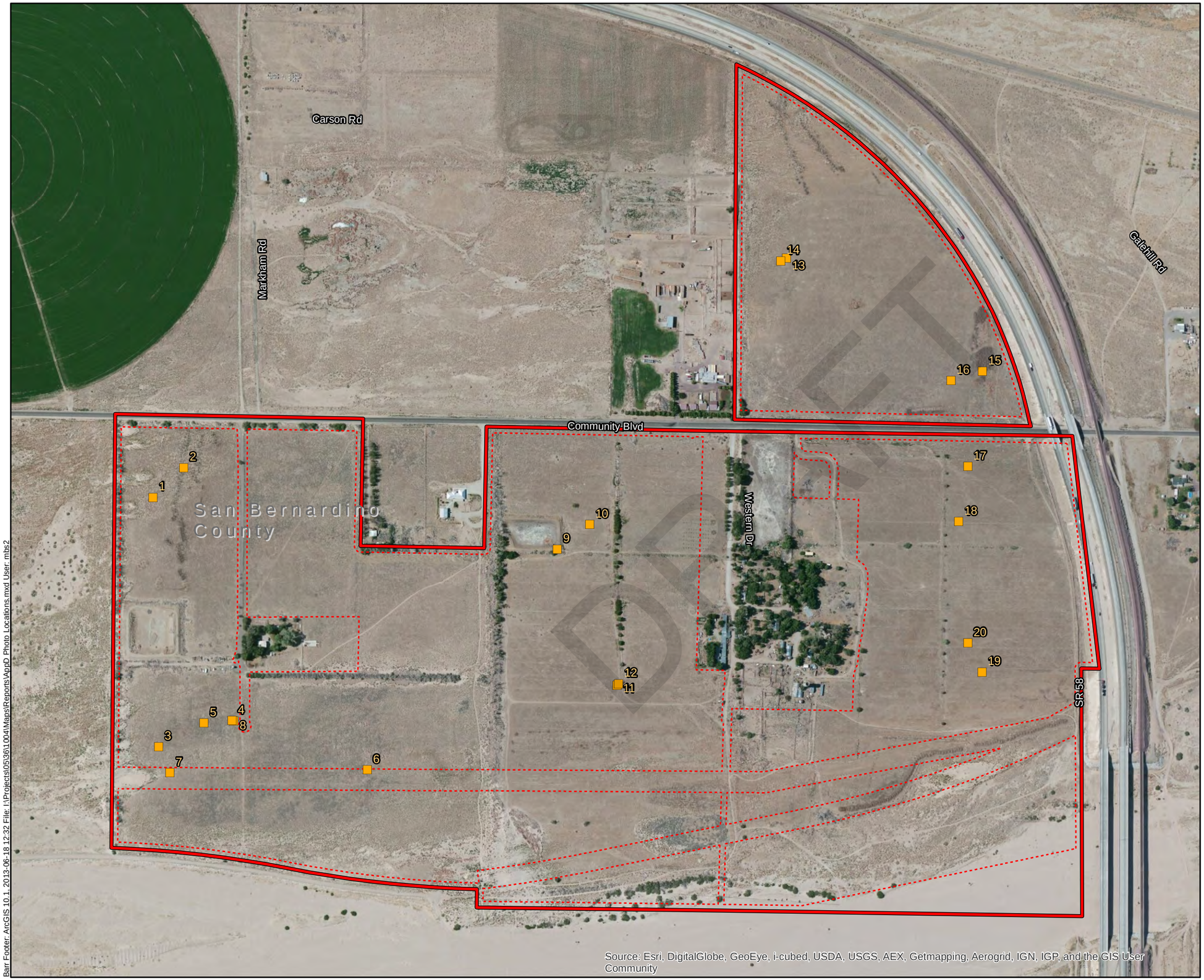

GPS Photo Location
Buildable Land
Project Boundary

Feet
500 0 500

Meters
150 0 150

Appendix D

PHOTO LOCATIONS
Viking Solar Project
EDF Renewable Energy
Barstow, California

Barr Footer: ArcGIS 10.1, 2013-06-18 12:32 File: I:\Projects\05\36\01\004\Maps\Reports\AppD Photo Locations.mxd User: mbs2

272° W

Photo 1

193° SSW

Photo 2

DRAFT

229° SW

Photo 3

314° NW

Photo 4

DRAFT

34° NE

Photo 5

72° ENE

Photo 6

DRAFT

100° E

Photo 7

28° NNE

Photo 8

DRAFT

290° WNW

Photo 9

153° SSE

Photo 10

DRAFT

179° S

Photo 11

342° NNW

Photo 12

DRAFT

119° ESE

Photo 13

223° SW

Photo 14

DRAFT

359° N

Photo 15

301° WNW

Photo 16

DRAFT

22° NNE

Photo 17

282° WNW

Photo 18

DRAFT

187° S

Photo 19

277° W

Photo 20

DRAFT

Appendix B

Test Pit Logs

DRAFT

Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING Switch

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	Physical Properties: WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots to 2.5 feet.												
	2.5	SILTY SAND (SM): fine to medium grained; brown; dry to moist; trace mica; moderate cementation. 3.0												
	5.0	Bottom of Boring at 5.6 feet 5.6												
	7.5													
	10.0													

DRAFT

Completion Depth:	5.6
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90662° Long: -117.10401°
Datum:	NAD 83

Remarks: Thermal resistivity sample collected at depth 3-5 feet.

SAMPLE TYPES: Grab Sample

WATER LEVELS (ft): At Time of Drilling Dry

LEGEND

- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

M:\GINT\PROJECTS\05361004_VIKING_LONGBOAT_FINALGEO.GPJ BARRLIBRARY.GLB HORIZONTAL LOG REPORT BARR GEOTECH TEMPLATE.GDT

Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING Therm-01

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	Physical Properties: WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots.												
	2.5	POORLY GRADED SAND WITH SILT (SP-SM): fine to coarse grained; brown; dry to moist; trace roots to 5.1 feet; some issues encountered with coarser sand caving in on test pit. 2.4					1 – 91	1.1						
	5.0	Bottom of Boring at 5.8 feet 5.8												
	7.5													
	10.0													

Graphic Log scale: 0.0, 2.5, 5.0, 7.5, 10.0

STANDARD PENETRATION TEST DATA: N in blows/ft — 10, 20, 30, 40

WATER CONTENT %: PL, LL — 20, 40, 60

SIEVE ANALYSIS: GRAVEL, SAND, SILT, CLAY, FINES — 20, 40, 60, 80

DRAFT

Completion Depth:	5.8
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90385° Long: -117.10545°
Datum:	NAD 83

Remarks: Thermal resistivity sample collected at depth 3-5 feet.

SAMPLE TYPES

Grab Sample

WATER LEVELS (ft)

At Time of Drilling
Dry

LEGEND

MC Moisture Content
γ Dry Unit Weight
ϕ Friction Angle
Q_u Unconfined Compression
Q_p Hand Penetrometer UC
Gs Specific Gravity
RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING Therm-02

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL – LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	Physical Properties: WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 1.8 feet.												
	2.5						1 / 77	2.1						
	3.8	SILTY TO CLAYEY SAND (SC-SM): fine to medium grained; brown; dry to moist; subrounded; trace small to large gravel; occasional small cobbles; trace mica; weak cementation.												
	5.0													
	5.8	Bottom of Boring at 5.8 feet												
	7.5													
	10.0													

DRAFT

Completion Depth:	5.8
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90888° Long: -117.09834°
Datum:	NAD 83

Remarks: Manure on ground surface. Thermal resistivity sample collected at depth 3-5 feet.

SAMPLE TYPES: Grab Sample

WATER LEVELS (ft): At Time of Drilling Dry

LEGEND

- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING Therm-03

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	Physical Properties: WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 1.7 feet.												
	2.5	SILTY TO CLAYEY SAND (SC-SM): fine to medium grained; brown; dry to moist; trace mica; weak cementation. (2.0)					0.1 – 76.9	2.1						
		SILTY SAND (SM): fine to medium grained; brown to light brown; dry to moist; trace mica. (4.3)												
	5.0	Bottom of Boring at 5.1 feet (5.1)												
	7.5													
	10.0													

Graphic Log scale: 0.0, 2.5, 5.0, 7.5, 10.0

STANDARD PENETRATION TEST DATA: N in blows/ft — 10, 20, 30, 40

WATER CONTENT %: PL, LL — 20, 40, 60

SIEVE ANALYSIS: GRAVEL, SAND, SILT, CLAY, FINES — 20, 40, 60, 80

DRAFT

Completion Depth:	5.1
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90471° Long: -117.09669°
Datum:	NAD 83

Remarks: Thermal resistivity sample collected at depth 3-5 feet.

SAMPLE TYPES

Grab Sample

WATER LEVELS (ft)

At Time of Drilling
Dry

LEGEND

MC Moisture Content
γ Dry Unit Weight
ϕ Friction Angle
Q_u Unconfined Compression
Q_p Hand Penetrometer UC
Gs Specific Gravity
RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-01

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL – LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots to 2.5 feet.												
	2.5													
	3.7	SILTY SAND (SM): fine to medium grained; brown to dark brown; dry to moist; trace mica; weak cementation.		Modified California Sampler			0.2 – 85.5	1.9	94.5					
	5.0													
	7.0	POORLY GRADED SAND WITH SILT (SP-SM): fine grained; grayish brown; moist; subangular; occasional 6-inch thick layers of coarser sand; no HCl reaction. 8.0 feet: trace fine grained rounded gravel.		Grab Sample			0 – 95.4	1.1						
	7.5													
	9.7	Bottom of Boring at 9.7 feet												
	10.0													

DRAFT

Completion Depth:	9.7
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90525° Long: -117.11098°
Datum:	NAD 83

Remarks: CBR sample collected from 0.5 to 1.5 feet.

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling
- Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-02

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)		Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots to 2.1 feet.													
	2.5	SILTY SAND (SM): fine to coarse grained; brown to light brown; dry to moist; some issues encountered with coarser material caving in on test pit; trace mica.	3.0						1	105.8					
	5.0														
	7.5	POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; grayish brown; moist; subangular; trace mica; weak cementation.	7.0												
	10.0	Bottom of Boring at 10.0 feet	10.0												

Completion Depth: 10.0
Date Boring Started: 8/13/14
Date Boring Completed: 8/13/14
Logged By: RJR
Drilling Contractor: Don Brown
Drilling Method: Backhoe with 3 foot wide bucket
Ground Surface Elevation:
Coordinates: Lat: 34.90532° Long: -117.10822°
Datum: NAD 83

Remarks: Trace gravel on ground surface.

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling; Dry

LEGEND: MC Moisture Content; γ Dry Unit Weight; ϕ Friction Angle; Q_u Unconfined Compression; Q_p Hand Penetrometer UC; Gs Specific Gravity; RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-03

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 2.5 feet.												
	2.5						0 – 65	4.9	89.5					
	4.0	SILTY TO CLAYEY SAND (SC-SM): fine to medium grained; brown; moist; subangular; trace mica; weak HCl reaction; weak cementation.												
	5.0	6.0 - 8.0 feet: some 3-5 inch thick layers of coarser sand.												
	7.5						0 – 73.5	6.1						
	9.9	Bottom of Boring at 9.9 feet												
	10.0													

Physical Properties

Completion Depth:	9.9
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90299° Long: -117.09768°
Datum:	NAD 83

Remarks: Trace gravel on ground surface. CBR sample collected from 0.5 to 1.5 feet.

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling
- Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-04

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)		Sample Type & Rec.	N in blows/ft (10 20 30 40)	PL — LL (20 40 60)	Sieve: Gravel / Sand / Silt / Clay (Fines) (20 40 60 80)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots.												
	2.5	SANDY SILT (ML): very fine to fine grained; light brown to brown; dry to moist; trace mica; weak HCl reaction; weak cementation.	2.4				0 35	6.2	79.7					
	5.0	SILTY SAND (SM): fine grained; light brown to brown; dry to moist; trace mica; weak HCl reaction; weak cementation.	5.5				0 69	3.1						
	7.5	POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; reddish brown to brown; moist; trace mica; no HCl reaction.	7.3				0 89	4.8						
	10.0	SANDY LEAN CLAY (CL): brown; moist; very stiff; medium plasticity; weak HCl reaction.	9.3				0 33	18.6				2.3		
		Bottom of Boring at 10.7 feet	10.7											

DRAFT

Completion Depth:	10.7
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90257° Long: -117.10950°
Datum:	NAD 83

Remarks:

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling; Dry

LEGEND: MC Moisture Content; γ Dry Unit Weight; ϕ Friction Angle; Q_u Unconfined Compression; Q_p Hand Penetrometer UC; Gs Specific Gravity; RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-05

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL – LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots to 2.5 feet.												
	2.5			Modified California Sampler				2.9	81.3					
	5.0	5.2 feet: 3 inch layer of dark brown organic clay. Some 3-5 inch coarser layers of sand after 5.5 feet.												
	7.5	POORLY GRADED SAND (SP): fine to medium grained; brown; moist; trace mica; no HCl reaction. 8.0		Grab Sample			96	1.6						
	10.0	Bottom of Boring at 9.9 feet 9.9												

Physical Properties

Completion Depth:	9.9
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90382° Long: -117.10684°
Datum:	NAD 83

Remarks:

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling
- Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-06

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace to few roots to 2.1 feet.												
	2.5	2.5 feet: brown to dark brown.												
	4.0	SILTY SAND (SM): fine to medium grained; brown; dry to moist; trace mica.					84	3.3	86.9					
	7.5	SILTY SAND (SM): fine to medium grained; brown to dark brown; dry to moist; trace mica; weak HCl reaction; weak cementation.												
	9.5	Bottom of Boring at 9.5 feet												
	10.0													

Physical Properties

Completion Depth:	9.5
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90387° Long: -117.10442°
Datum:	NAD 83

Remarks: Trace gravel on ground surface.

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling; Dry

LEGEND: MC Moisture Content; γ Dry Unit Weight; ϕ Friction Angle; Q_u Unconfined Compression; Q_p Hand Penetrometer UC; Gs Specific Gravity; RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

DRAFT

M:\GINT\PROJECTS\05361004_VIKING_LONGBOAT_FINALGEO.GPJ BARRLIBRARY.GLB HORIZONTAL LOG REPORT BARR GEOTECH TEMPLATE.GDT

Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-07

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)		Sample Type & Rec.	N in blows/ft	PL–LL	Sieve (% Gravel / Sand / Fines)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 1.9 feet.												
	2.5	SILTY SAND (SM): medium to coarse grained; light brown; dry to moist.	2.0	Modified California Sampler				2.1	94.8					
	5.0	SILT WITH SAND (ML): very fine to fine grained; brown; dry to moist; trace mica; weak HCl reaction; weak cementation.	4.5	Grab Sample			19	6.9						
	7.5	SILTY SAND (SM): fine grained; brown; dry to moist; slightly harder excavating than silt above; weak HCl reaction; weak cementation.	8.0											
	10.0	Bottom of Boring at 10.0 feet	10.0											

Physical Properties

Graphic Log

STANDARD PENETRATION TEST DATA: N in blows/ft (10, 20, 30, 40)

WATER CONTENT %: PL – LL (20, 40, 60)

SIEVE ANALYSIS: GRAVEL, SAND, SILT, CLAY, FINES (20, 40, 60, 80)

Completion Depth:	10.0
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90560° Long: -117.10300°
Datum:	NAD 83

Remarks:

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling — Dry

LEGEND:
MC Moisture Content
γ Dry Unit Weight
ϕ Friction Angle
Q_u Unconfined Compression
Q_p Hand Penetrometer UC
Gs Specific Gravity
RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-08

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL – LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; brown; dry to moist; trace roots to 1.2 feet.												
	2.5	POORLY GRADED SAND WITH SILT (SP-SM): fine grained; light brown to brown; dry to moist; trace mica. 4.0 - 4.5 feet: dark brown sandy lean clay lenses. 5.5 - 6.0 feet: dark brown sandy lean clay lenses.					92	1.9	93.3	34.1				
	7.5	POORLY GRADED SAND: fine grained; light brown to brown with some reddish brown patches; dry to moist.					96	1.6						
	10.0	Bottom of Boring at 10.2 feet												

Completion Depth: 10.2
Date Boring Started: 8/13/14
Date Boring Completed: 8/13/14
Logged By: RJR
Drilling Contractor: Don Brown
Drilling Method: Backhoe with 3 foot wide bucket
Ground Surface Elevation:
Coordinates: Lat: 34.90241° Long: -117.10211°
Datum: NAD 83

Remarks: Trace gravel on ground surface.

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling; Dry

LEGEND: MC Moisture Content; γ Dry Unit Weight; ϕ Friction Angle; Q_u Unconfined Compression; Q_p Hand Penetrometer UC; Gs Specific Gravity; RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-09

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)		Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL – LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 1.6 feet.													
	2.5	CLAYEY TO SILTY SAND (SC-SM): fine to medium grained; brown; dry to moist; trace mica; weak cementation.	1.8					55	4.9	86.5					
	5.0														
	7.5	POORLY GRADED SAND WITH SILT (SP-SM): medium grained; brown with some reddish brown streaks; moist; subangular; few to little rounded to subrounded large gravel up to 1" in diameter; occasional 2" diameter cobbles. 7.0 - 8.0 feet: dark brown; no HCl reaction.	6.0												
		LEAN CLAY WITH SAND (CL): medium brown; moist; little fine sand; medium plasticity; weak HCl reaction.	8.5				25 – 46	14	29.2						
	10.0	SILTY SAND (SM): fine to medium grained; brown; moist; trace gravel.	9.5												
		Bottom of Boring at 10.3 feet	10.3												

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Completion Depth:	10.3
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90593° Long: -117.09741°
Datum:	NAD 83

Remarks:

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling
- Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-10

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots.												
	2.5	CLAYEY SAND (SC): fine to medium grained; brown; dry to moist; trace mica; weak cementation. (2.4)		Modified California Sampler			1 / 77	2.7	85.3					
	5.0													
	7.5	POORLY GRADED SAND (SP): fine to medium grained; brown to reddish brown; moist; trace mica; no HCl reaction. (7.5)		Grab Sample			97	2.6						
		SILTY SAND (SM): fine grained; grayish brown to brown; moist; trace mica; no HCl reaction. (9.0)		Grab Sample										
	10.0	Bottom of Boring at 9.7 feet (9.7)												

Physical Properties

Completion Depth:	9.7
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90353° Long: -117.09541°
Datum:	NAD 83

Remarks:

SAMPLE TYPES: Modified California Sampler; Grab Sample

WATER LEVELS (ft): At Time of Drilling — Dry

LEGEND:
MC Moisture Content
γ Dry Unit Weight
ϕ Friction Angle
Q_u Unconfined Compression
Q_p Hand Penetrometer UC
Gs Specific Gravity
RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-11

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	SILTY SAND (SM): fine to medium grained; light brown; dry to moist; trace roots to 2.3 feet.												
	2.5			Modified California Sampler				1.9	88.1					
	4.7	CLAYEY SAND (SC): fine to medium grained; brown; dry to moist; trace mica; weak HCl reaction; weak cementation.												
	6.5	SANDY LEAN CLAY (CL): brown; moist; trace mica; low plasticity; weak HCl reaction; weak cementation.		Grab Sample		PL 20, LL 34		8.2						
	7.5													
	9.2	SILTY SAND (SM): fine to medium grained; brown with some reddish brown; moist; trace mica.												
	10.0	Bottom of Boring at 10.0 feet												

Physical Properties

Completion Depth:	10.0
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90837° Long: -117.09718°
Datum:	NAD 83

Remarks: Manure on ground surface.

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling: Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING TP-12

Project: Longboat Solar Project | Location: San Bernardino County, California | Client: EDF Renewable Development, Inc.

Barr Project Number: 05361004.00

Surface Elev.:

Elevation, feet	Depth, feet	MATERIAL DESCRIPTION (ASTM D2488)	Graphic Log	Sample Type & Rec.	STANDARD PENETRATION TEST DATA (N in blows/ft)	WATER CONTENT % (PL–LL)	SIEVE ANALYSIS (GRAVEL, SAND, SILT, CLAY, FINES)	WC %	γ pcf	ϕ °	Q_u tsf	Q_p tsf	Gs	RQD %
	0.0	POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; light brown; dry to moist; trace roots to 2.0 feet.												
	2.5			Modified California Sampler			96	1.9	89.5					
	5.0	5.0 - 7.0 feet: some coarser layers of sand that tended to cave in on test pit.												
	7.5													
	8.5	POORLY GRADED SAND WITH GRAVEL (SP): medium grained; brown with some reddish brown patches; moist; occasional 0.5" to 1.5" diameter gravel.		Grab Sample			20 / 99	1.3	1.3					
	10.0													
	10.4	Bottom of Boring at 10.4 feet												

Physical Properties

Completion Depth:	10.4
Date Boring Started:	8/13/14
Date Boring Completed:	8/13/14
Logged By:	RJR
Drilling Contractor:	Don Brown
Drilling Method:	Backhoe with 3 foot wide bucket
Ground Surface Elevation:	
Coordinates:	Lat: 34.90993° Long: -117.09940°
Datum:	NAD 83

Remarks: Manure on ground surface.

SAMPLE TYPES
- Modified California Sampler
- Grab Sample

WATER LEVELS (ft)
- At Time of Drilling: Dry

LEGEND
- MC Moisture Content
- γ Dry Unit Weight
- ϕ Friction Angle
- Q_u Unconfined Compression
- Q_p Hand Penetrometer UC
- Gs Specific Gravity
- RQD Rock Quality Designation

The stratification lines represent approximate boundaries. The transition may be gradual.

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Appendix C

Test Pit Photographs

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Test Pit TP-01 (10')

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Test Pit TP-02 (10')

Test Pit TP-03 (10')

Test Pit TP-04 (10')

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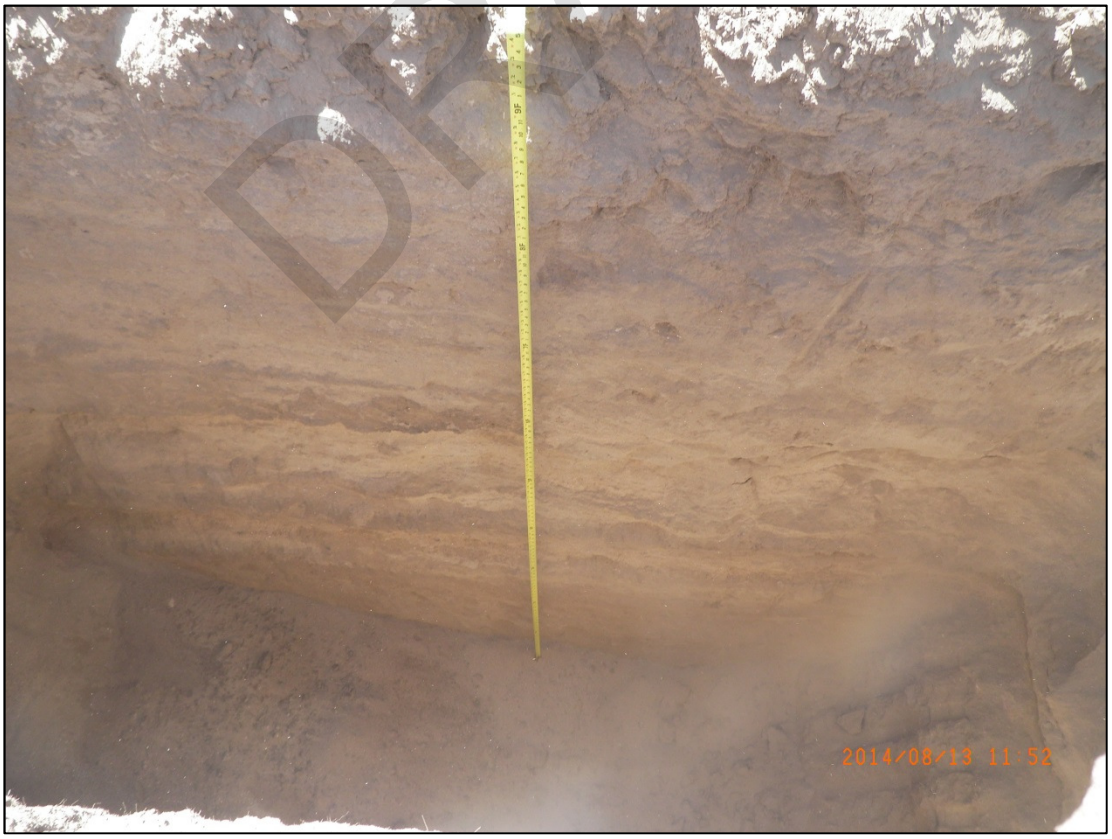
Test Pit TP-05 (10')

Test Pit TP-06 (10')



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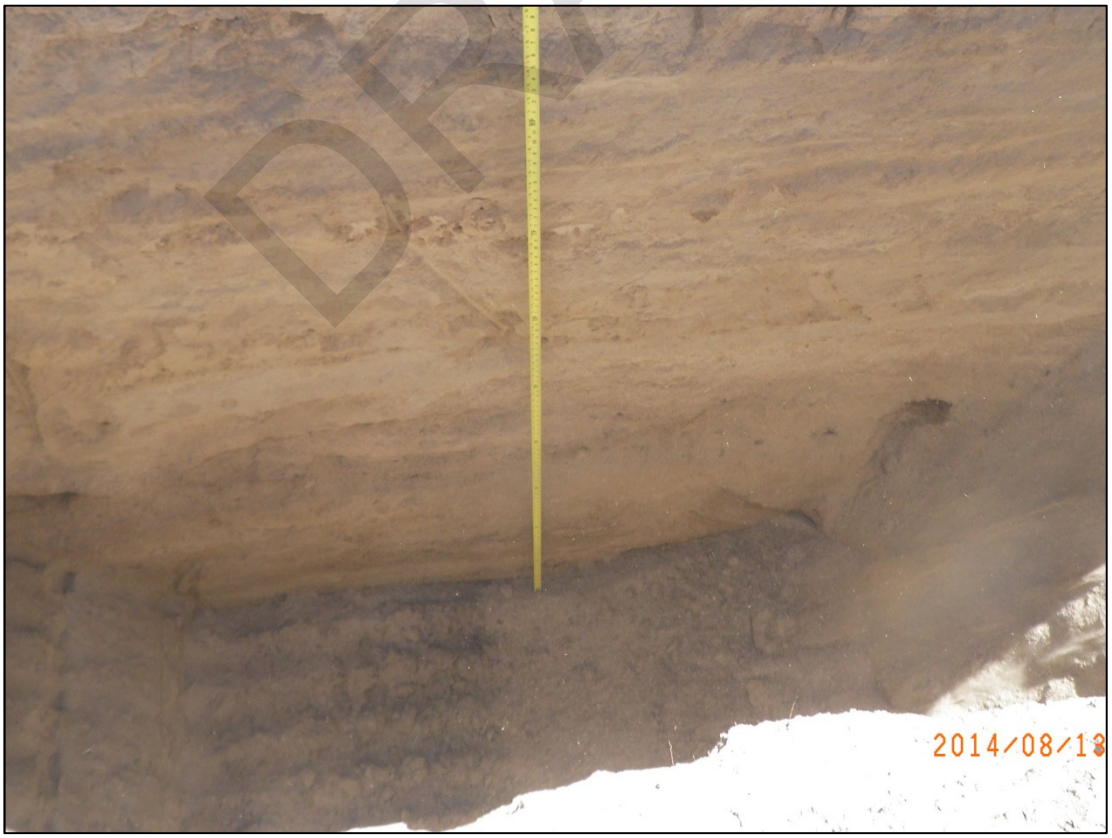
Test Pit TP-07 (10')

Test Pit TP-08 (10')

DRAFT

Test Pit TP-09 (10')



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Test Pit TP-10 (10')

Test Pit TP-11 (10')

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Test Pit TP-12 (10')

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Test Pit <u>SWITCH</u> (5')

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Test Pit Therm-01 (5')

Test Pit Therm-02 (5')

Test Pit Therm-03 (5')

Appendix D

General Laboratory Test Results

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Laboratory Test Summary

Project: Longboat Solar Job: 9522

Client: Barr Engineering Company Date: 8/29/2014

Sample Information & Classification								
Boring #	TP-11							
Sample #								
Depth (ft)	7-8							
Type or BPF	Bag							
Material Classification	Sandy Lean Clay (CL)							
Moisture Contents & Atterberg Limits								
Moisture Content (%)	8.2							
Liquid Limit (%)	33.8							
Plastic Limit (%)	20.3							
Plasticity Index (%)	13.5							

Sample Information & Classification								
Boring #								
Sample #								
Depth (ft)								
Type or BPF								
Material Classification								
Moisture Contents & Atterberg Limits								
Moisture Content (%)								
Liquid Limit (%)								
Plastic Limit (%)								
Plasticity Index (%)								

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Laboratory Test Summary

Project: Longboat Solar **Job:** 9522

Client: Barr Engineering Company **Date:** 8/28/14

Sample Information & Classification

Boring #	TP-01	TP-02	TP-03	TP-04	TP-05	TP-06	TP-07
Sample							
Depth (ft)	3.5-4	3-3.5	3-3.5	4-4.5	3-3.5	3.7-4.2	3.5-4
Type or BPF	Liner	Liner	Liner	Liner	Liner	Liner	Liner
Classification	Silty Sand (SM/SP-SM)	Sand (SP)	Silty Sand (SM)	Sandy Silt (ML)	Sand (SP)	Silty Sand (SM)	Sand (SP)

Water Content, Dry Density

Water Content (%)	1.9	1.0	4.9	6.2	2.9	3.3	2.1
Dry Density (pcf)	94.5	105.8	89.5	79.7	81.3	86.9	94.8

Sample Information & Classification

Boring #	TP-08	TP-09	TP-10	TP-11	TP-12		
Sample							
Depth (ft)	3.5-4	3-3.5	3.2-3.7	3.5-4	3.5-4		
Type or BPF	Liner	Liner	Liner	Liner	Liner		
Classification	Sand w/ silt (SP-SM)	Silty Sand (SM)	Silty Sand (SM)	Sand (SP)	Sand (SP/SP-SM)		

Water Content, Dry Density

Water Content (%)	1.9	4.9	2.7	1.9	1.9		
Dry Density (pcf)	93.3	86.5	85.3	88.1	89.5		

Sample Information & Classification

Boring #							
Sample							
Depth (ft)							
Type or BPF							
Classification							

Water Content, Dry Density

Water Content (%)							
Dry Density (pcf)							

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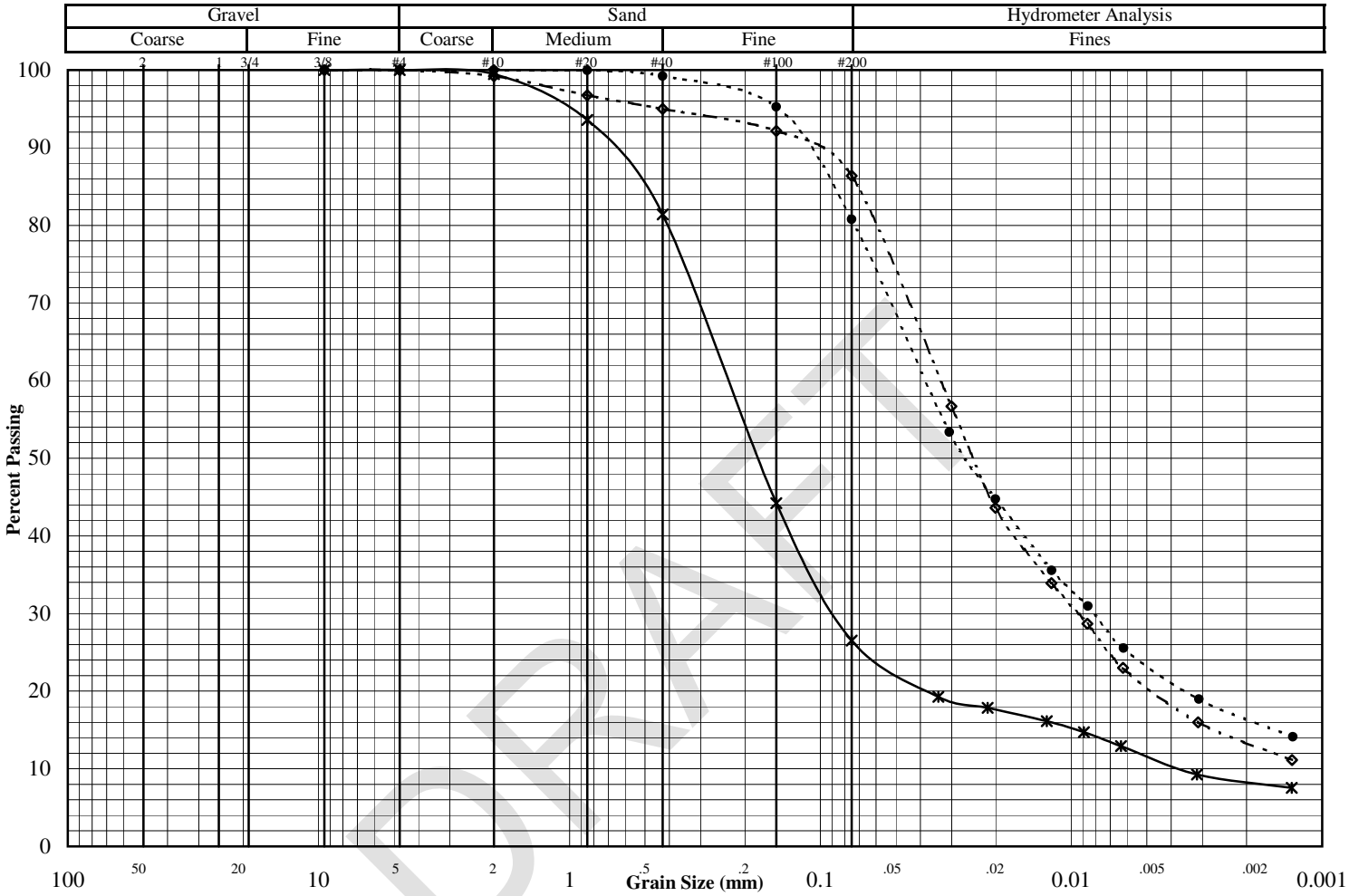
Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/29/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-03		7.5-8	Bag	Silty Sand (SM)
●	TP-07		6-7	Bag	Silt with sand (ML)
◇	TP-09		8.5-9	Bag	Lean Clay (CL)



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Other Tests

	*	●	◇
Liquid Limit			45.6
Plastic Limit			25.0
Plasticity Index			20.6
Water Content	6.1	6.9	29.2
Dry Density (pcf)			
Specific Gravity	2.68*	2.68*	2.68*
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	205.8	177.6	144.3
2"			
1.5"			
1"			
3/4"			
3/8"	100.0		100.0
#4	100.0	100.0	100.0
#10	99.5	100.0	99.2
#20	93.6	100.0	96.8
#40	81.4	99.2	95.0
#100	44.2	95.2	92.2
#200	26.5	80.8	86.4

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/29/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
Spec 1	TP-03		7.5-8	Bag	Silty Sand (SM)
Spec 2	TP-07		6-7	Bag	Silt with sand (ML)
Spec 3	TP-09		8.5-9	Bag	Lean Clay (CL)

Sieve Data

Specimen 1		Specimen 2		Specimen 3	
Sieve	% Passing	Sieve	% Passing	Sieve	% Passing
2"		2"		2"	
1.5"		1.5"		1.5"	
1"		1"		1"	
3/4"		3/4"		3/4"	
3/8"	100.0	3/8"		3/8"	100.0
#4	100.0	#4	100.0	#4	100.0
#10	99.5	#10	100.0	#10	99.2
#20	93.6	#20	100.0	#20	96.8
#40	81.4	#40	99.2	#40	95.0
#100	44.2	#100	95.2	#100	92.2
#200	26.5	#200	80.8	#200	86.4

Hydrometer Data

Specimen 1		Specimen 2		Specimen 3	
Diameter (mm)	% Passing	Diameter	% Passing	Diameter	% Passing
0.034	19.3	0.031	53.4	0.030	56.7
0.022	17.8	0.020	44.7	0.020	43.6
0.013	16.1	0.012	35.6	0.012	33.9
0.009	14.7	0.009	31.0	0.009	28.7
0.006	12.9	0.006	25.5	0.006	23.0
0.003	9.3	0.003	19.0	0.003	16.0
0.001	7.5	0.001	14.1	0.001	11.1

Remarks

Specimen 1	Specimen 2	Specimen 3

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2401 West 66th Street

SOIL ENGINEERING TESTING, INC.

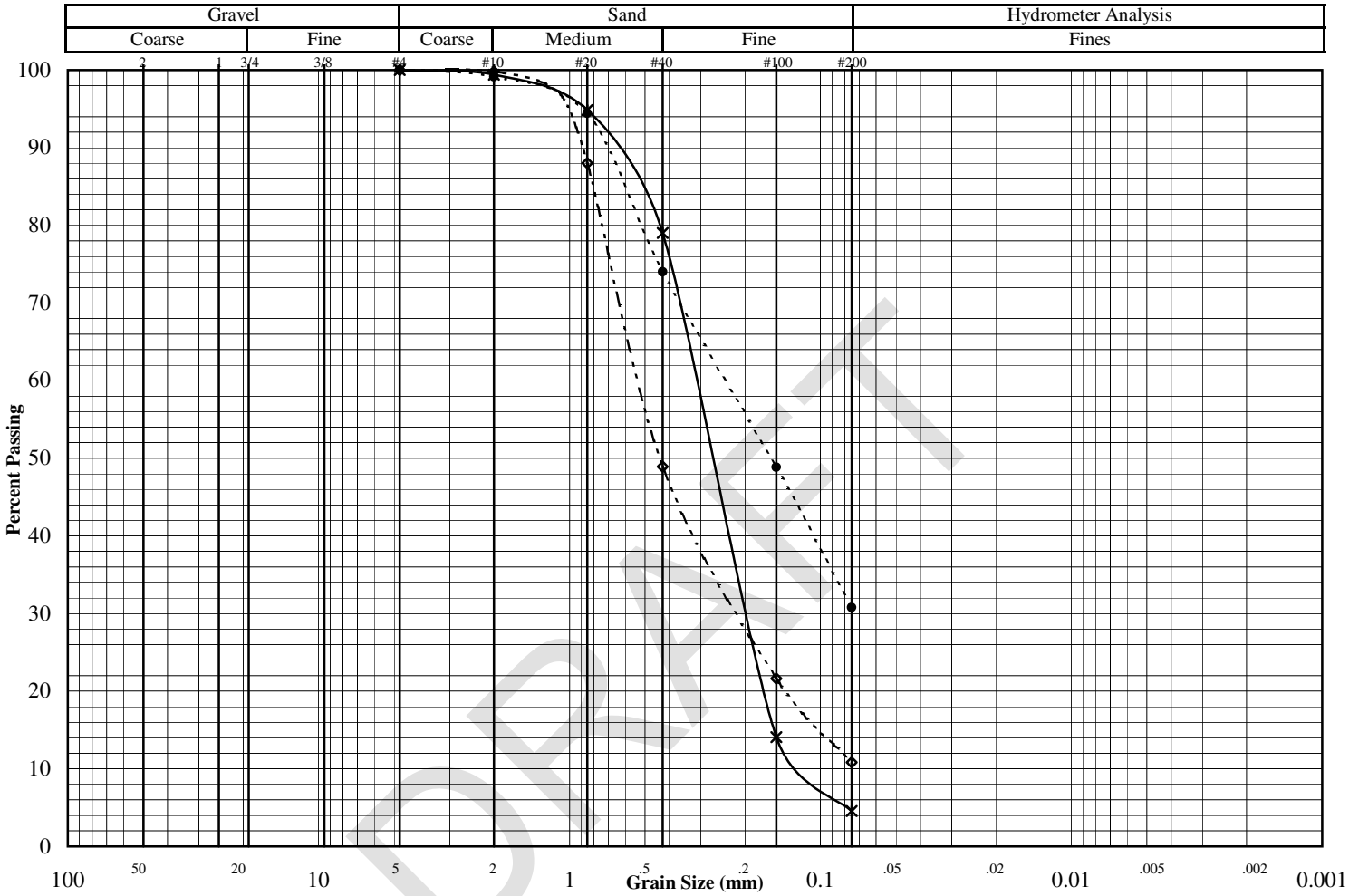
Richfield, MN 55423

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/25/14
Reported To:	Barr Engineering Company	Report Date:	8/26/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-01		8-9	Bag	Sand, fine grained (SP/SP-SM)
●	TP-04		6-7	Bag	Silty Sand (SM)
◇	TP-04		7.5-8	Bag	Sand w/silt, medium to fine grained (SP-SM)



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Other Tests

	*	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	1.1	3.1	4.8
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	181.0	185.1	146.3
2"			
1.5"			
1"			
3/4"			
3/8"			
#4	100.0	100.0	100.0
#10	99.4	99.1	99.8
#20	94.9	94.4	88.0
#40	79.0	74.0	48.9
#100	14.1	48.8	21.6
#200	4.6	30.8	10.8

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

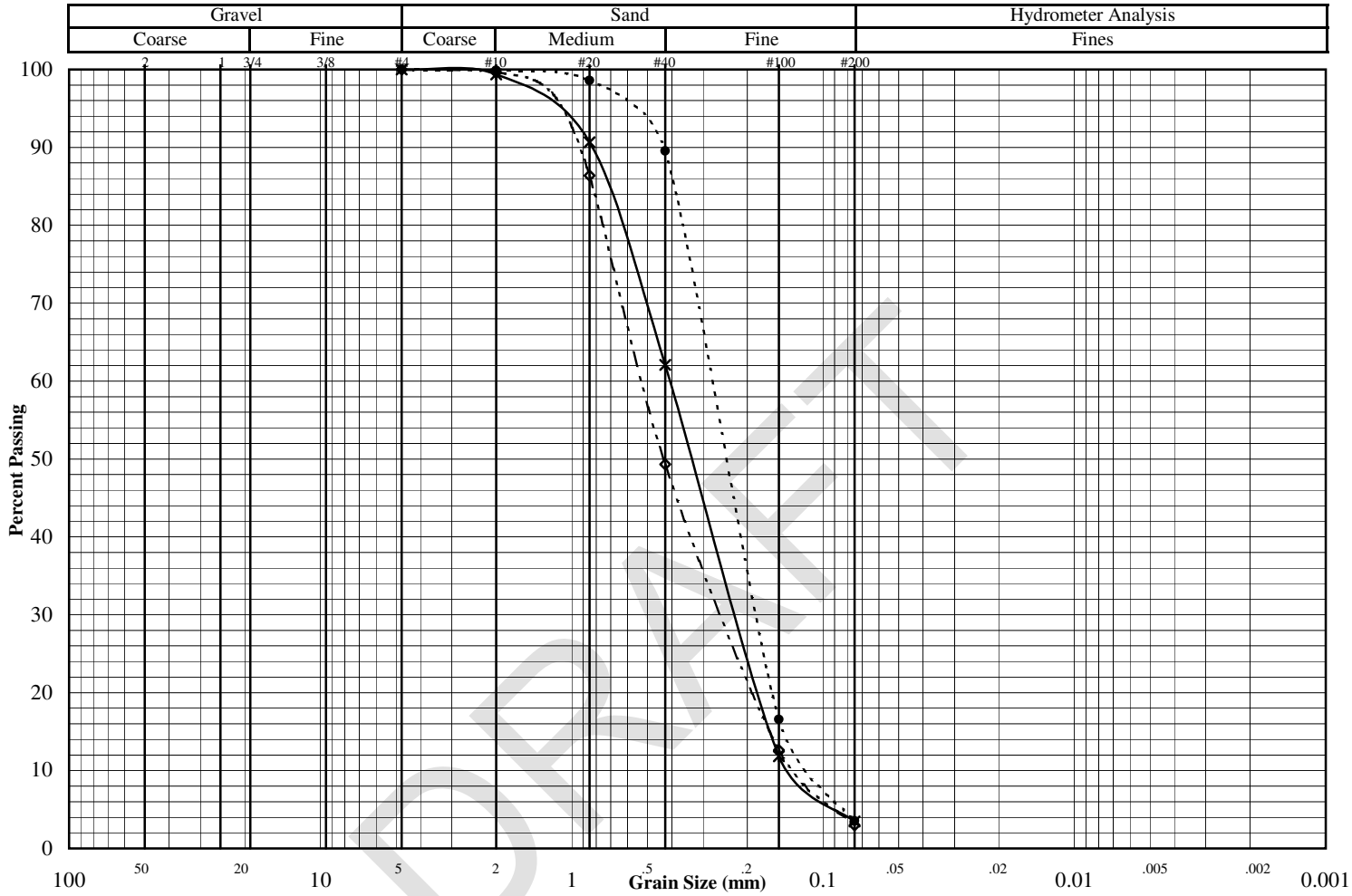
SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/25/14
Reported To:	Barr Engineering Company	Report Date:	8/26/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-05		9-9.5	Bag	Sand, fine to medium grained (SP)
●	TP-08		8-9	Bag	Sand, fine grained (SP)
◇	TP-10		8-8.5	Bag	Sand, medium to fine grained (SP)



	Other Tests *	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	1.6	1.4	2.6
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing	*	●	◇
Mass (g)	188.8	228.4	198.5
2"			
1.5"			
1"			
3/4"			
3/8"			
#4	100.0	100.0	100.0
#10	99.4	99.9	99.6
#20	90.7	98.6	86.4
#40	62.1	89.5	49.3
#100	11.8	16.6	12.6
#200	3.5	3.6	3.0

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

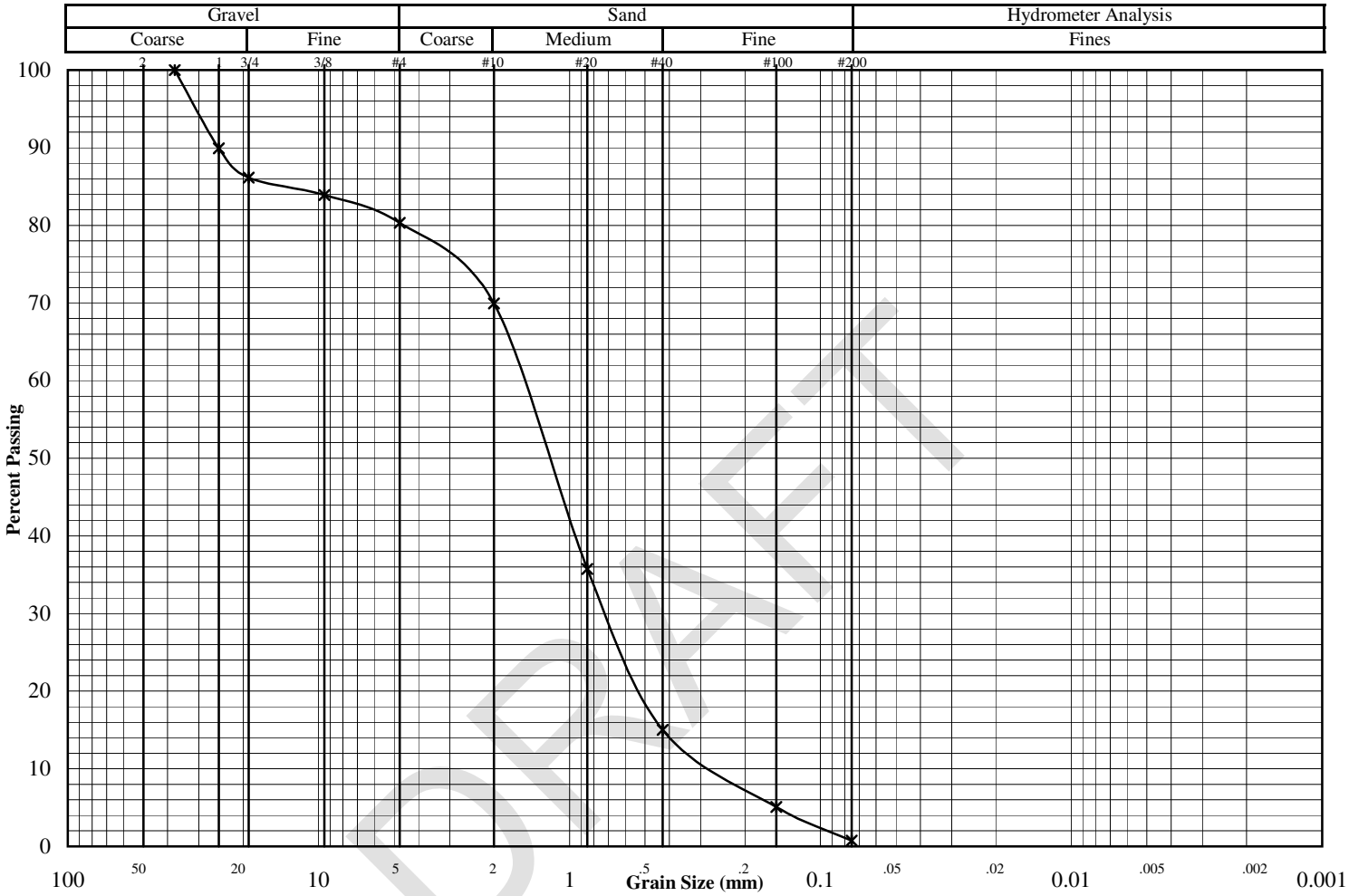
Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/25/14
Reported To:	Barr Engineering Company	Report Date:	8/26/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-12		9-10	Bag	Sand w/gravel, medium grained (SP)
●					
◇					



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Other Tests

	*	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	1.3		
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	1105.9		
2"			
1.5"	100.0		
1"	89.9		
3/4"	86.1		
3/8"	83.9		
#4	80.3		
#10	69.9		
#20	35.7		
#40	15.0		
#100	5.1		
#200	0.7		

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

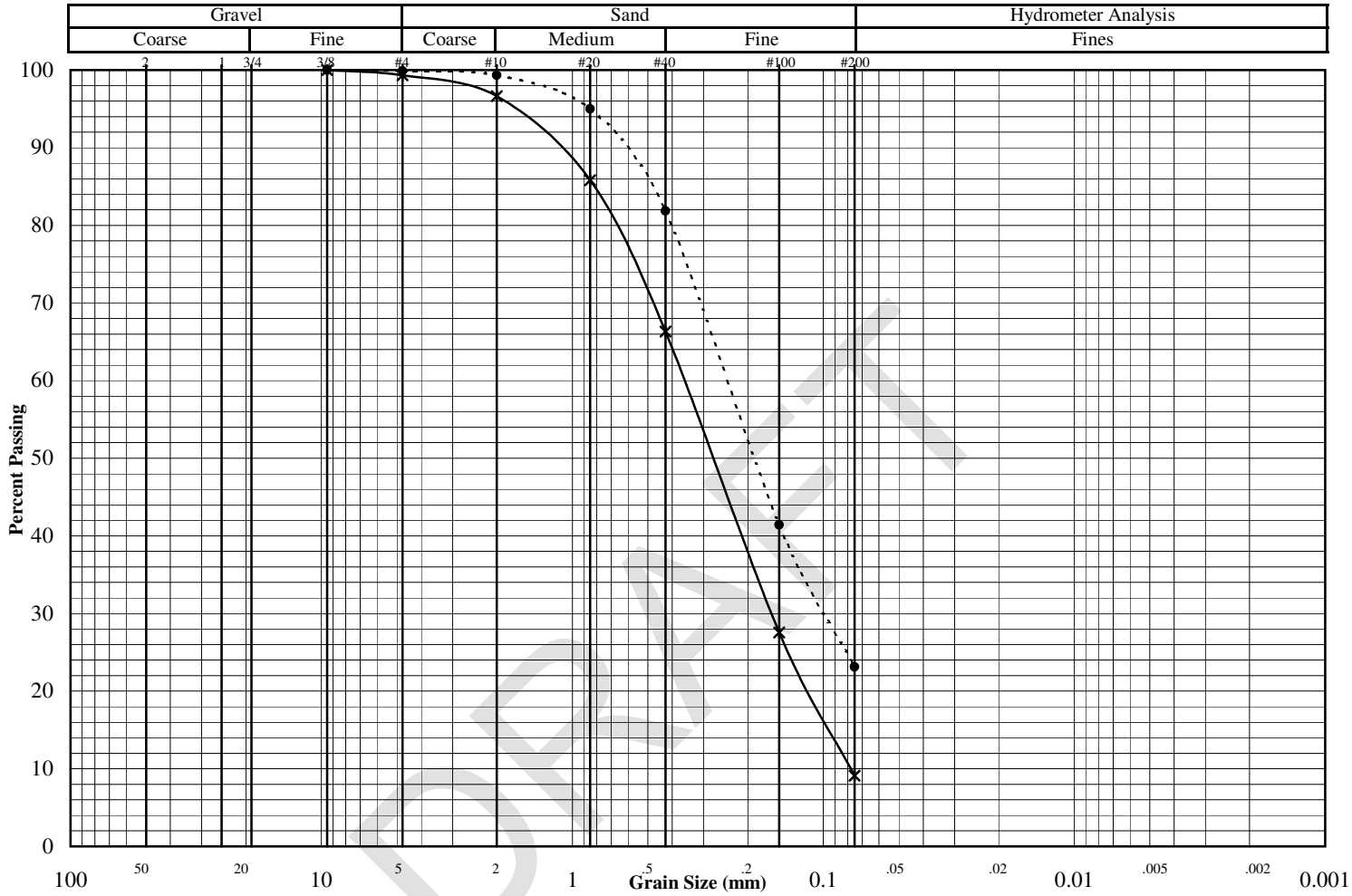
Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/21/14
Reported To:	Barr Engineering Company	Report Date:	8/25/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	Thermal 1			Bucket	Sand with silt, fine to medium grained (SP-SM)
●	Thermal 3			Bucket	Silty Sand (SM)
◇					



Other Tests	*	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	1.1	2.1	
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing	*	●	◇
Mass (g)	149.2	160.3	
2"			
1.5"			
1"			
3/4"			
3/8"	100.0	100.0	
#4	99.3	99.9	
#10	96.6	99.3	
#20	85.8	95.0	
#40	66.3	81.8	
#100	27.6	41.4	
#200	9.1	23.1	

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

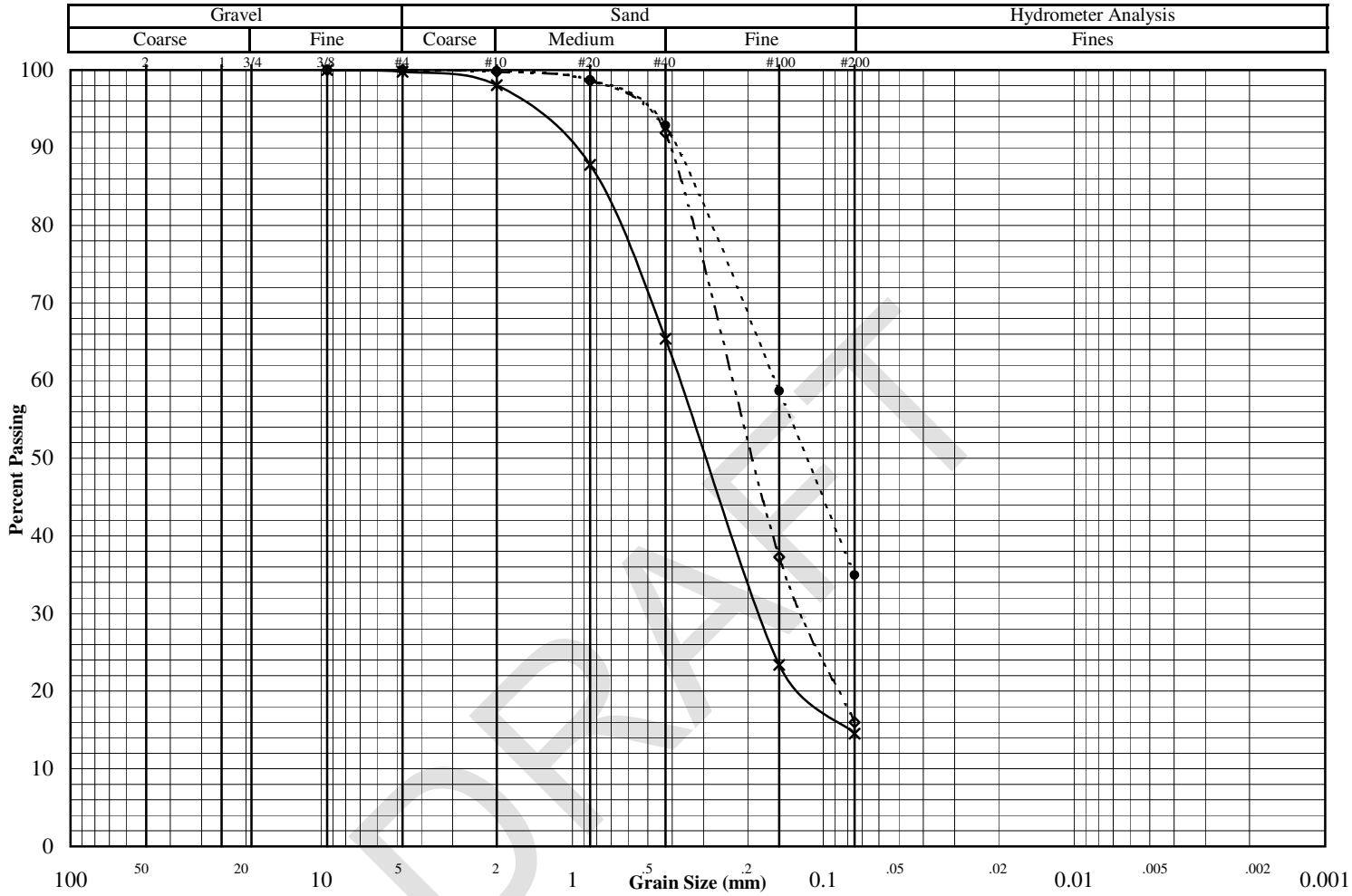
SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/27/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-01		3.5-4	Liner	Silty Sand (SM/SP-SM)
●	TP-03		3-3.5	Liner	Silty Sand (SM)
◇	TP-06		3.7-4.2	Liner	Silty Sand (SM)



	Other Tests *	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	1.9	4.9	3.3
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing	*	●	◇
Mass (g)	196.8	197.3	191.1
2"			
1.5"			
1"			
3/4"			
3/8"	100.0	100.0	100.0
#4	99.8	100.0	100.0
#10	98.1	99.9	99.8
#20	87.8	98.7	98.6
#40	65.4	92.9	91.9
#100	23.4	58.7	37.3
#200	14.5	34.9	16.0

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

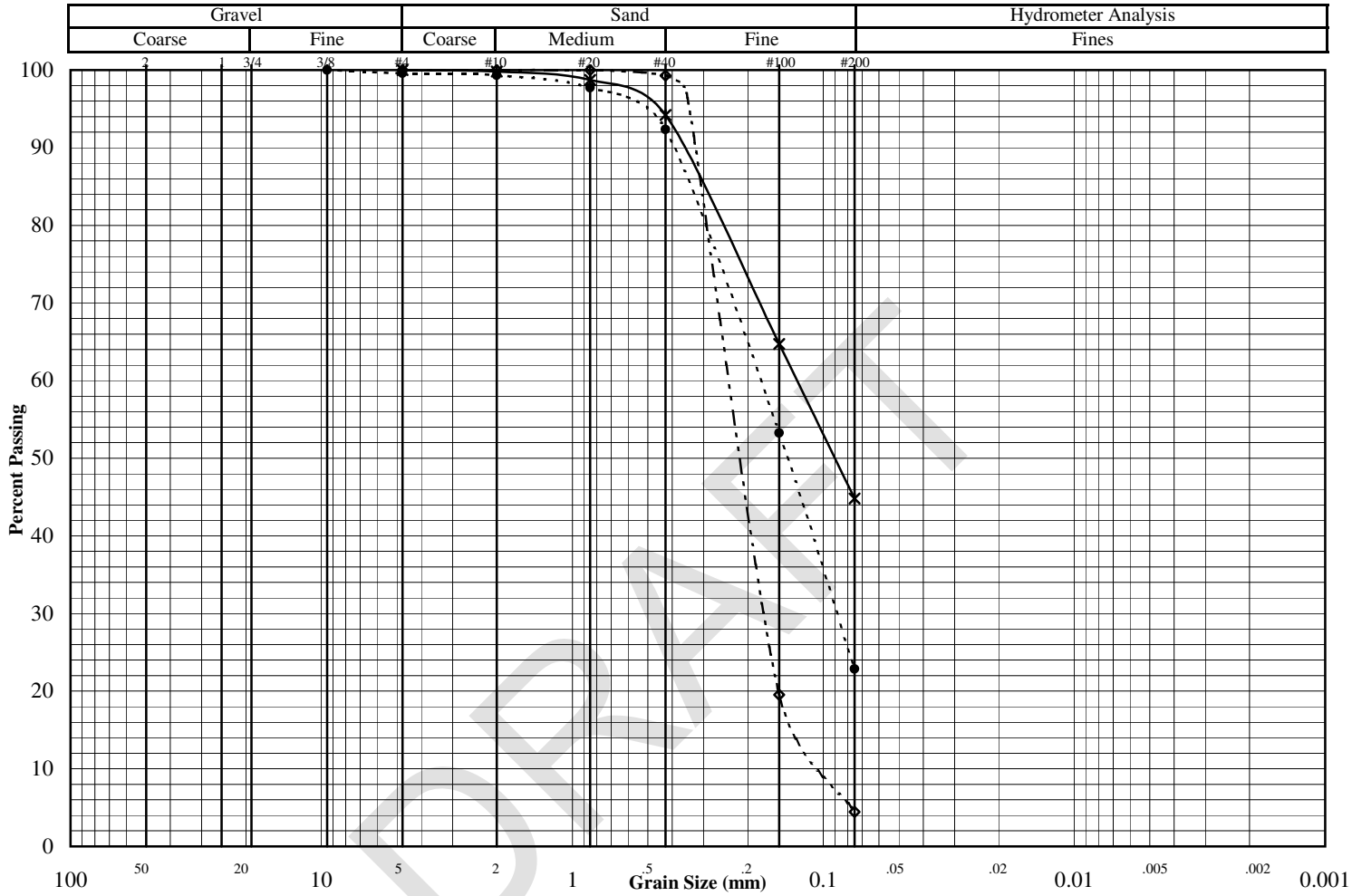
Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/27/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-09		3-3.5	Liner	Silty Sand (SM)
●	TP-10		3.2-3.7	Liner	Silty Sand (SM)
◇	TP-12		3.5-4	Liner	Sand, fine grained (SP/SP-SM)



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Other Tests

	*	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	4.9	2.7	1.9
Dry Density (pcf)			
Specific Gravity			
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	171.7	184.7	141.9
2"			
1.5"			
1"			
3/4"			
3/8"		100.0	
#4	100.0	99.6	100.0
#10	99.8	99.3	100.0
#20	98.7	97.7	100.0
#40	94.2	92.4	99.3
#100	64.7	53.3	19.5
#200	44.8	22.9	4.4

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

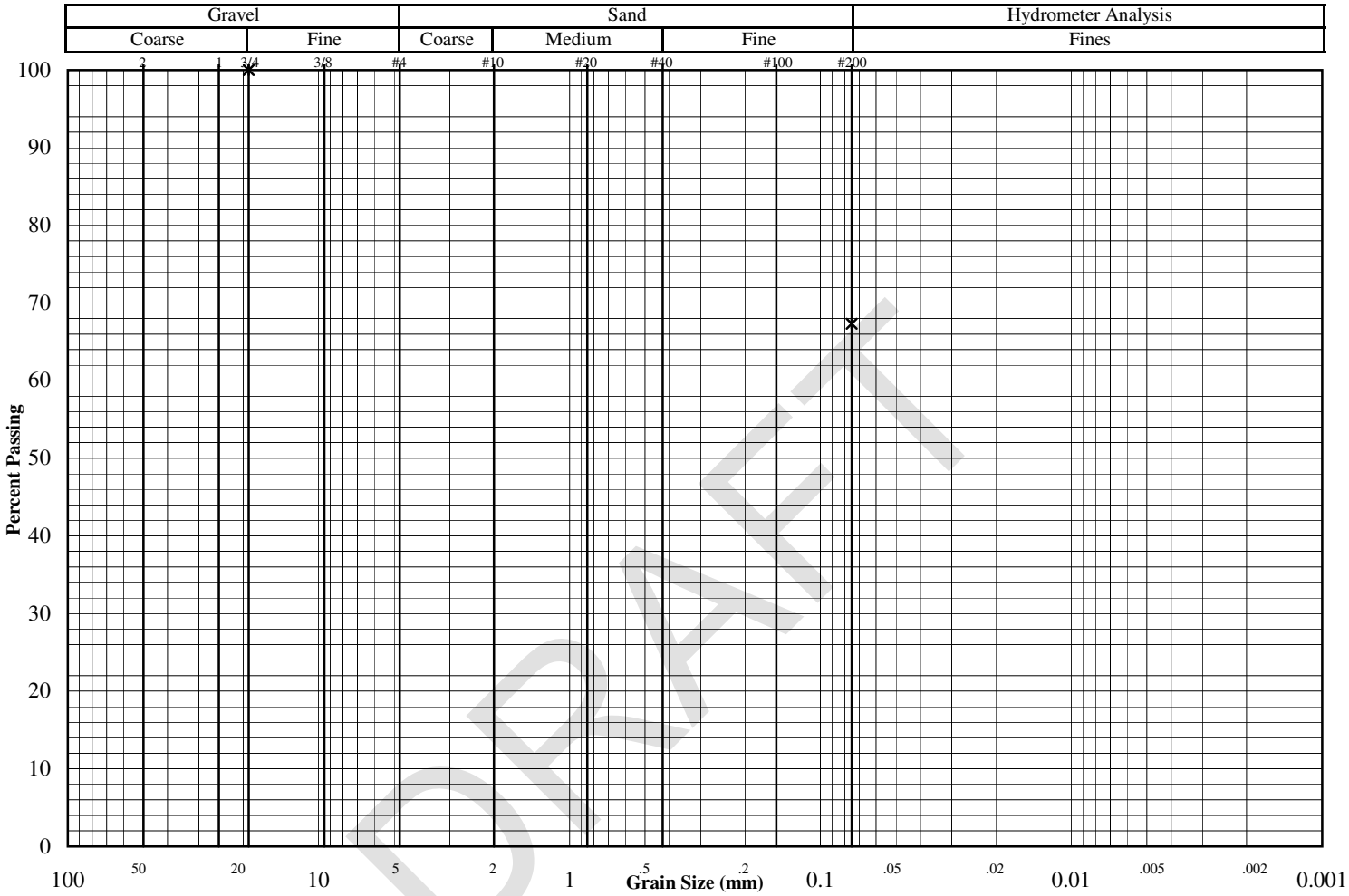
SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/25/14
Reported To:	Barr Engineering Company	Report Date:	8/26/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-04		9.5-10	Bag	Sandy Lean Clay (CL)
●					
◇					



Other Tests

	*	●	◇
Liquid Limit	39.4		
Plastic Limit	15.6		
Plasticity Index	23.8		
Water Content	18.6		
Dry Density (pcf)			
Specific Gravity			
Pq	2.3		
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	160.1		
2"			
1.5"			
1"			
3/4"	100.0		
3/8"			
#4			
#10			
#20			
#40			
#100			
#200	67.3		

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

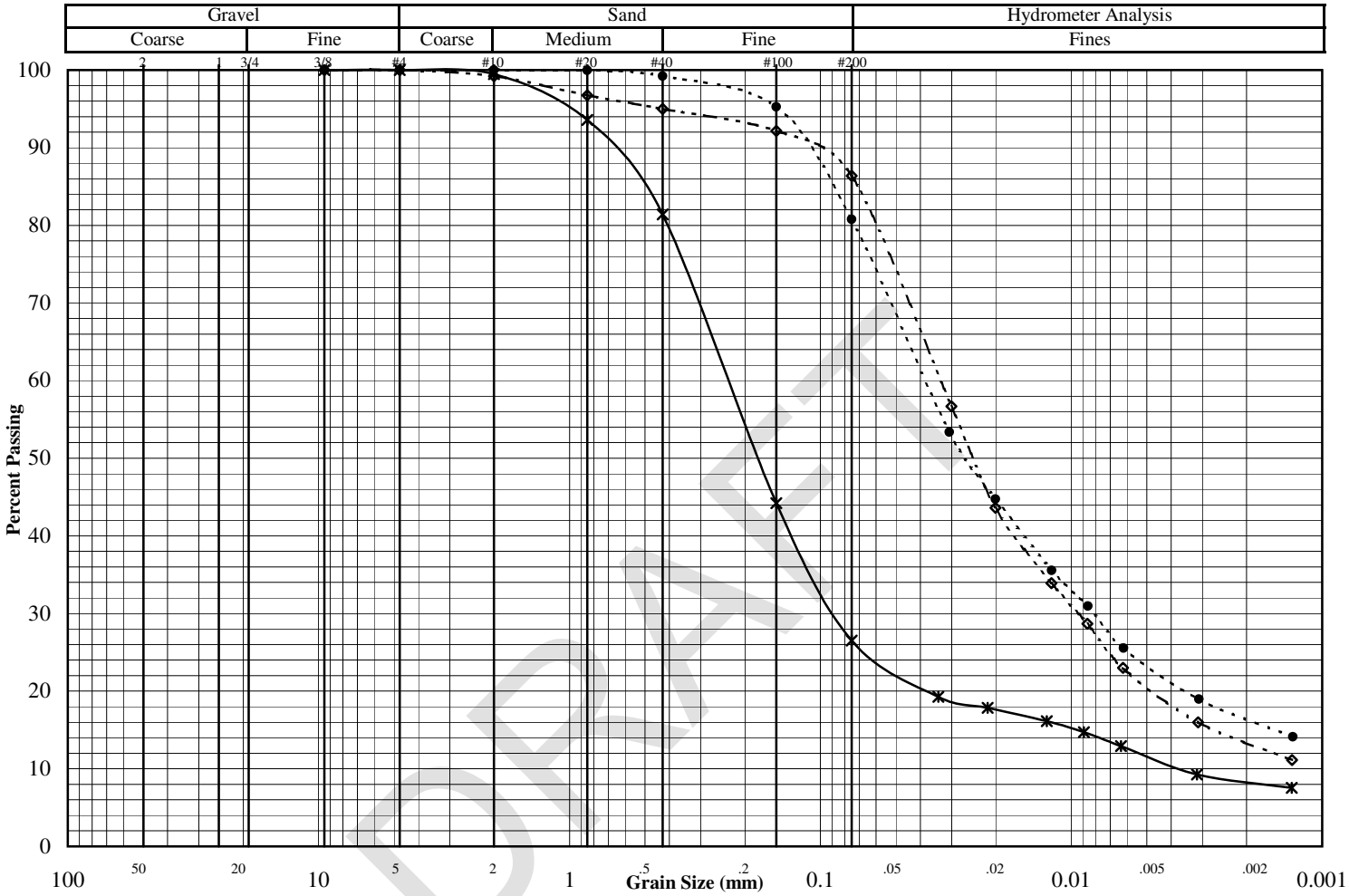
SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/29/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-03		7.5-8	Bag	Silty Sand (SM)
●	TP-07		6-7	Bag	Silt with sand (ML)
◇	TP-09		8.5-9	Bag	Lean Clay (CL)



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Other Tests

	*	●	◇
Liquid Limit			45.6
Plastic Limit			25.0
Plasticity Index			20.6
Water Content	6.1	6.9	29.2
Dry Density (pcf)			
Specific Gravity	2.68*	2.68*	2.68*
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	205.8	177.6	144.3
2"			
1.5"			
1"			
3/4"			
3/8"	100.0		100.0
#4	100.0	100.0	100.0
#10	99.5	100.0	99.2
#20	93.6	100.0	96.8
#40	81.4	99.2	95.0
#100	44.2	95.2	92.2
#200	26.5	80.8	86.4

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/26/14
Reported To:	Barr Engineering Company	Report Date:	8/29/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
Spec 1	TP-03		7.5-8	Bag	Silty Sand (SM)
Spec 2	TP-07		6-7	Bag	Silt with sand (ML)
Spec 3	TP-09		8.5-9	Bag	Lean Clay (CL)

Sieve Data

Specimen 1		Specimen 2		Specimen 3	
Sieve	% Passing	Sieve	% Passing	Sieve	% Passing
2"		2"		2"	
1.5"		1.5"		1.5"	
1"		1"		1"	
3/4"		3/4"		3/4"	
3/8"	100.0	3/8"		3/8"	100.0
#4	100.0	#4	100.0	#4	100.0
#10	99.5	#10	100.0	#10	99.2
#20	93.6	#20	100.0	#20	96.8
#40	81.4	#40	99.2	#40	95.0
#100	44.2	#100	95.2	#100	92.2
#200	26.5	#200	80.8	#200	86.4

Hydrometer Data

Specimen 1		Specimen 2		Specimen 3	
Diameter (mm)	% Passing	Diameter	% Passing	Diameter	% Passing
0.034	19.3	0.031	53.4	0.030	56.7
0.022	17.8	0.020	44.7	0.020	43.6
0.013	16.1	0.012	35.6	0.012	33.9
0.009	14.7	0.009	31.0	0.009	28.7
0.006	12.9	0.006	25.5	0.006	23.0
0.003	9.3	0.003	19.0	0.003	16.0
0.001	7.5	0.001	14.1	0.001	11.1

Remarks

Specimen 1	Specimen 2	Specimen 3

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2401 West 66th Street

SOIL ENGINEERING TESTING, INC.

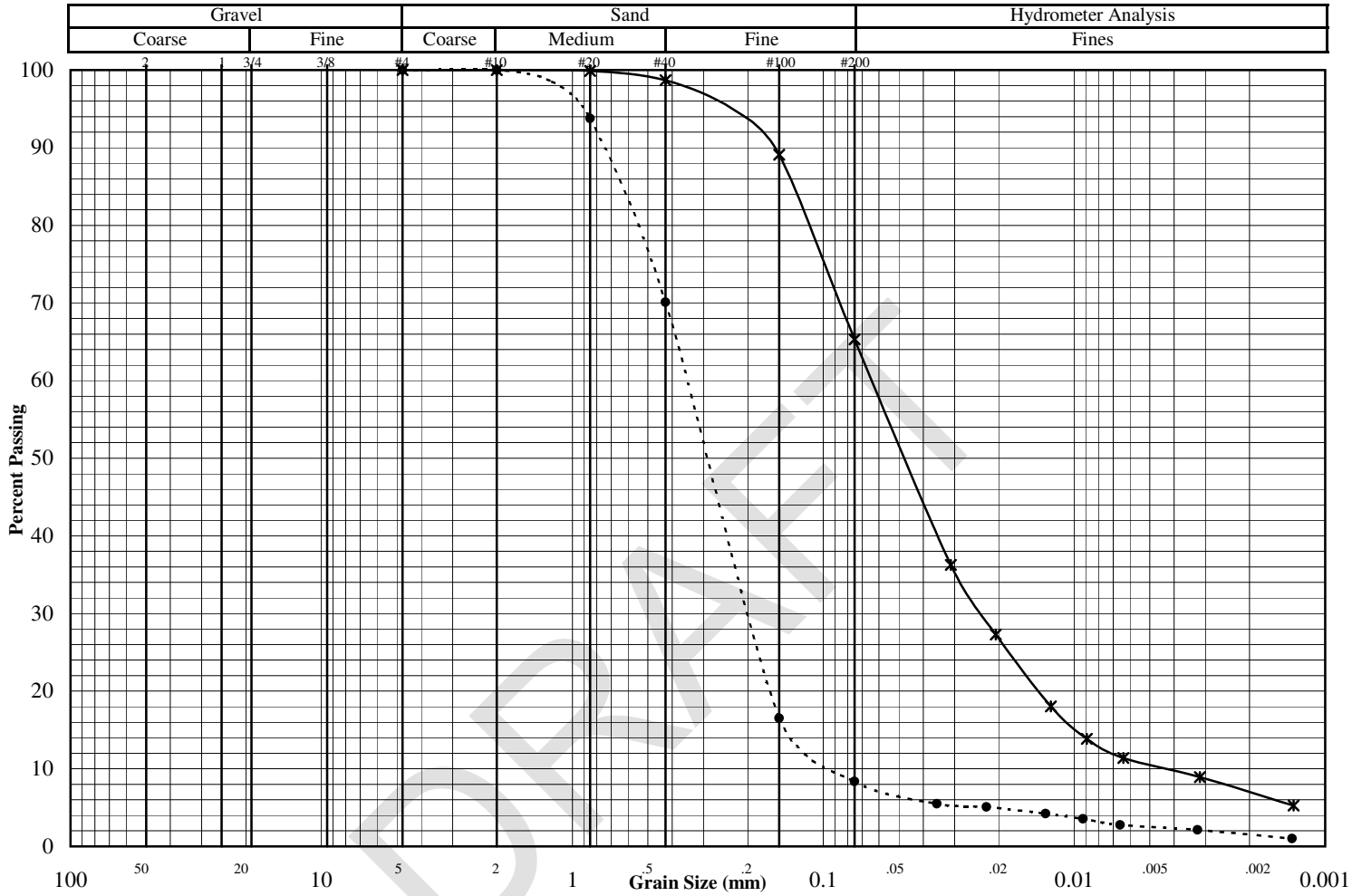
Richfield, MN 55423

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/29/14
Reported To:	Barr Engineering Company	Report Date:	9/2/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-04		4-4.5	Liner	Sandy Silt (ML)
●	TP-08		3.5-4	Liner	Sand w/silt, fine grained (SP-SM)
◇					



Other Tests	*	●	◇
Liquid Limit			
Plastic Limit			
Plasticity Index			
Water Content	6.2	1.4	
Dry Density (pcf)	79.7	93.3	
Specific Gravity	2.68*	2.68*	
Porosity			
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing	*	●	◇
Mass (g)	251.5	337.1	
2"			
1.5"			
1"			
3/4"			
3/8"			
#4	100.0	100.0	
#10	100.0	100.0	
#20	99.9	93.8	
#40	98.7	70.1	
#100	89.1	16.5	
#200	65.3	8.4	

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Grain Size Distribution ASTM D422

Job No. : **9522**

Project:	Longboat Solar	Test Date:	8/29/14
Reported To:	Barr Engineering Company	Report Date:	9/2/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
Spec 1	TP-04		4-4.5	Liner	Sandy Silt (ML)
Spec 2	TP-08		3.5-4	Liner	Sand w/silt, fine grained (SP-SM)
Spec 3					

Sieve Data

Specimen 1		Specimen 2		Specimen 3	
Sieve	% Passing	Sieve	% Passing	Sieve	% Passing
2"		2"		2"	
1.5"		1.5"		1.5"	
1"		1"		1"	
3/4"		3/4"		3/4"	
3/8"		3/8"		3/8"	
#4	100.0	#4	100.0	#4	
#10	100.0	#10	100.0	#10	
#20	99.9	#20	93.8	#20	
#40	98.7	#40	70.1	#40	
#100	89.1	#100	16.5	#100	
#200	65.3	#200	8.4	#200	

Hydrometer Data

Specimen 1		Specimen 2		Specimen 3	
Diameter (mm)	% Passing	Diameter	% Passing	Diameter	% Passing
0.031	36.3	0.035	5.5		
0.021	27.3	0.022	5.1		
0.012	18.0	0.013	4.2		
0.009	13.9	0.009	3.5		
0.006	11.4	0.007	2.8		
0.003	8.9	0.003	2.1		
0.001	5.3	0.001	1.0		

Remarks

Specimen 1	Specimen 2	Specimen 3

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2401 West 66th Street

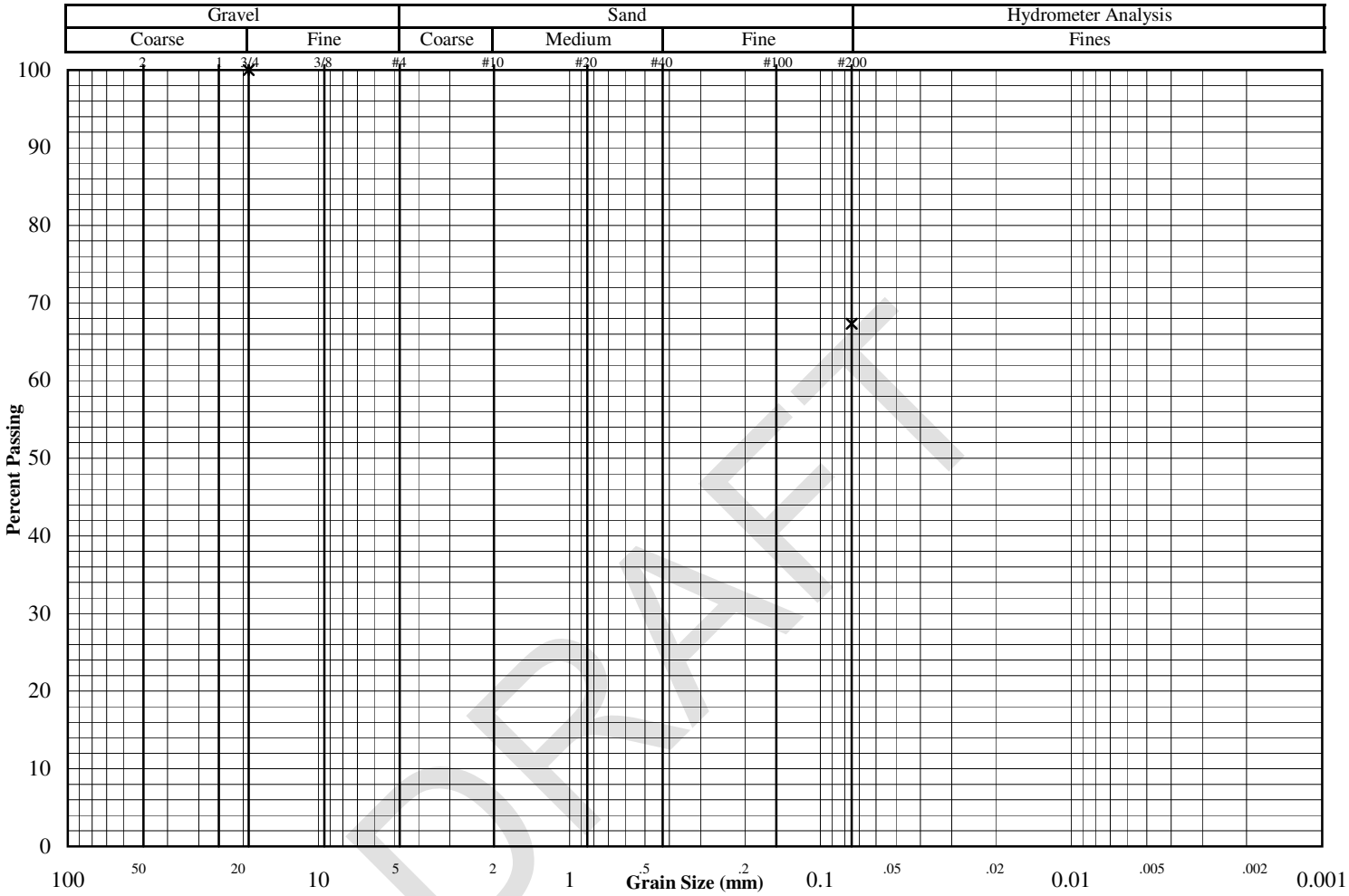
SOIL ENGINEERING TESTING, INC.

Richfield, MN 55423

Grain Size Distribution ASTM D422

		Job No. :	**9522**
Project:	Longboat Solar	Test Date:	8/25/14
Reported To:	Barr Engineering Company	Report Date:	8/26/14

	Location / Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Classification
*	TP-04		9.5-10	Bag	Sandy Lean Clay (CL)
●					
◇					



Other Tests

	*	●	◇
Liquid Limit	39.4		
Plastic Limit	15.6		
Plasticity Index	23.8		
Water Content	18.6		
Dry Density (pcf)			
Specific Gravity			
Pq (tsf)	2.3		
Organic Content			
pH			
Shrinkage Limit			
Penetrometer			
Qu (psf)			

(* = assumed)

Percent Passing

	*	●	◇
Mass (g)	160.1		
2"			
1.5"			
1"			
3/4"	100.0		
3/8"			
#4			
#10			
#20			
#40			
#100			
#200	67.3		

	*	●	◇
D_{60}			
D_{30}			
D_{10}			
C_U			
C_C			

Remarks:

2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

Max/Min Summary

Project: Longboat Solar Job: 9522

Client Barr Engineering Company Date: 9/2/2014

Sample Information & Classification

Boring #	Thermal 1	Thermal 3		
Sample #				
Depth				
Type or BPF	Bucket	Bucket		
Material Classification	Sand with silt, fine to medium grained (SP-SM)	Silty Sand (SM)		
Water Content (%)	0.0	0.0		
Minimum Index Density (ASTM:D4254)				
SCS 1-point Proctor (Maximum Dry Density)	107.7	109.8		

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Direct Shear Test

ASTM: D3080

Job No.: 9522

Project/Client: **Longboat Solar / Barr Engineering Company**

Boring No.: **TP-08** Sample No. Depth: **3.5-4**

Location: Sample Type: **Bag**

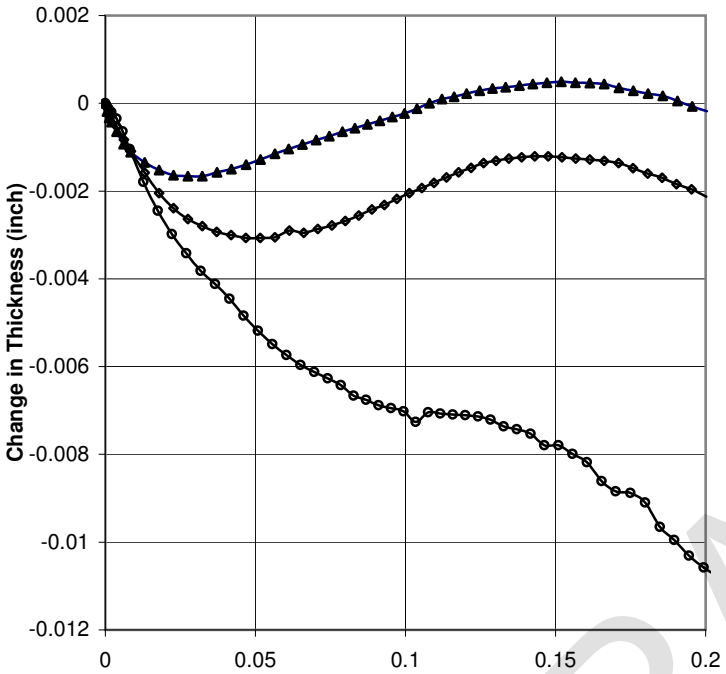
Soil Type: **Sand with Silt, fine grained (SP-SM)**

Test Date:	**8/25/2014**
Date Reported:	**8/28/2014**
Shear Rate	
0.005 (in/min)	

Remarks: Specimens compacted measured mod. Cal. densities using -#10 material; Inundated after applying normal load. Consolidated and sheared to given displacements at constant rate of 0.003 inches/minute.

Liquid Limit:	
Plastic Limit:	
Plasticity Index:	
Specific Gravity (*):	**2.67**

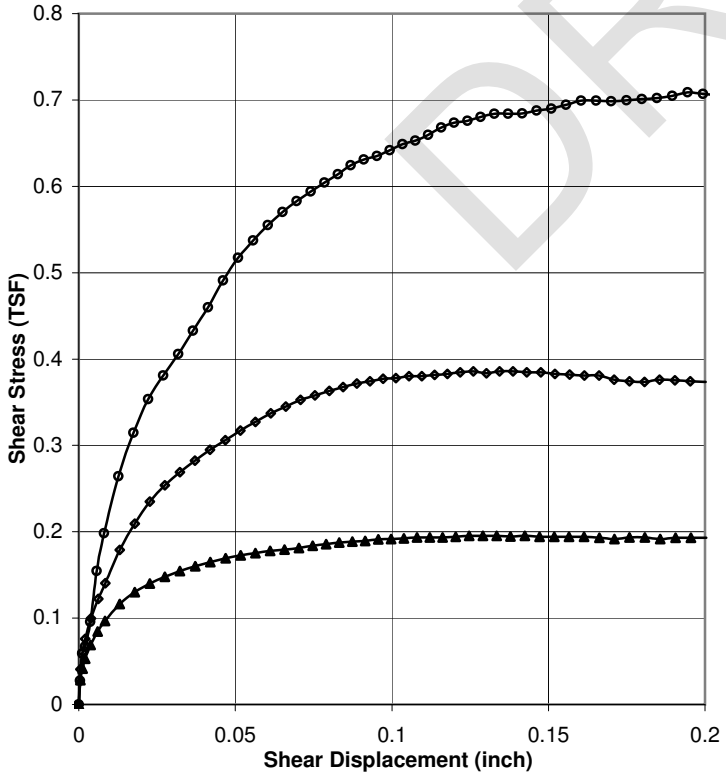
(*) = Assumed Specific Gravity

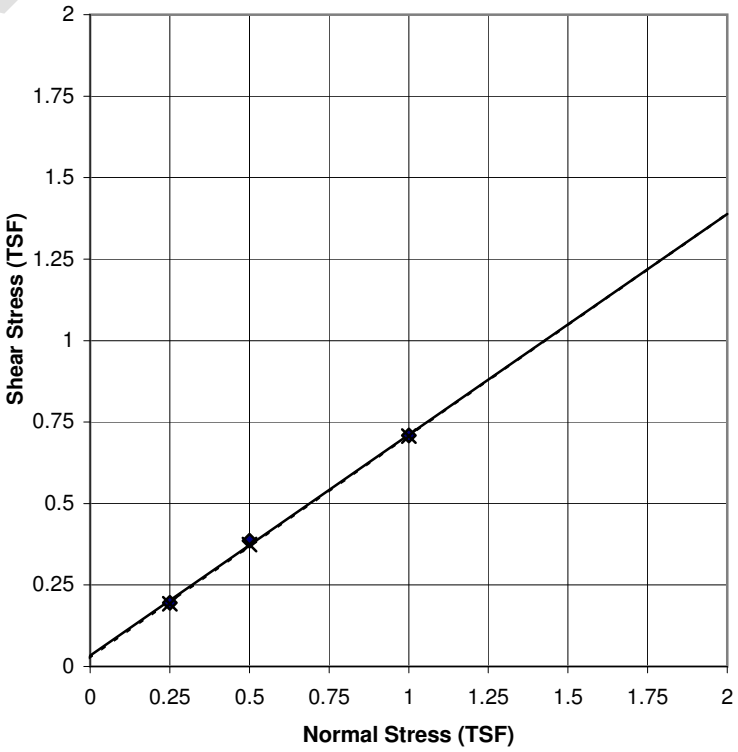


Failure Criterion:				
Max Stress	A	B	C	D
Initial	▲	◇	○	X
Diameter (In.)	2.50	2.50	2.50	
Thickness (In.)	0.91	0.91	0.91	
Water Content (%)	1.9	1.9	1.9	
Dry Density (pcf)	93.3	93.3	93.3	
Before Shear				
Thickness (In.)	0.90	0.90	0.88	
Water Content (%)	28.6	28.5	27.5	
Dry Density (pcf)	94.5	94.7	96.2	
Normal Stress	0.25	0.50	1.00	
Shear Stress	0.20	0.39	0.71	

"These tests are for informational purposes only and must be reviewed by a qualified professional engineer to verify that the test parameters shown are appropriate for any particular design."

Peak Conditions		At Given Shear Disp. Of: 0.2	
Friction Angle:	ϕ= **34.1 deg.**	Friction Angle:	ϕ= **34.3 deg.**
Apparent Cohesion	**0.034 TSF**	Apparent Cohesion	**0.027 TSF**





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Direct Shear Test

ASTM: D3080

Job No.: 9522

Project/Client: **Longboat Solar / Barr Engineering Company**

Boring No.: **TP-04** Sample No. Depth: **4-4.5**

Location: Sample Type: **Bag**

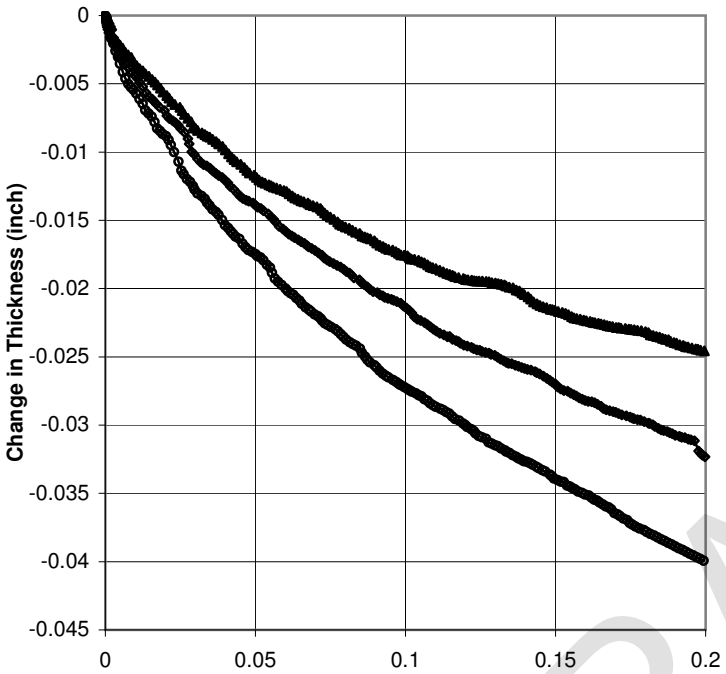
Soil Type: **Sandy Silt (ML)**

Test Date:	**8/25/2014**
Date Reported:	**8/28/2014**
Shear Rate	
0.003 (in/min)	

Remarks: Specimens compacted to measured mod. Cal. densities using -#10 material; Inundated after applying normal load. Consolidated and sheared to given displacements at constant rate of 0.003 inches/minute.

Liquid Limit:	
Plastic Limit:	
Plasticity Index:	
Specific Gravity (*):	**2.67**

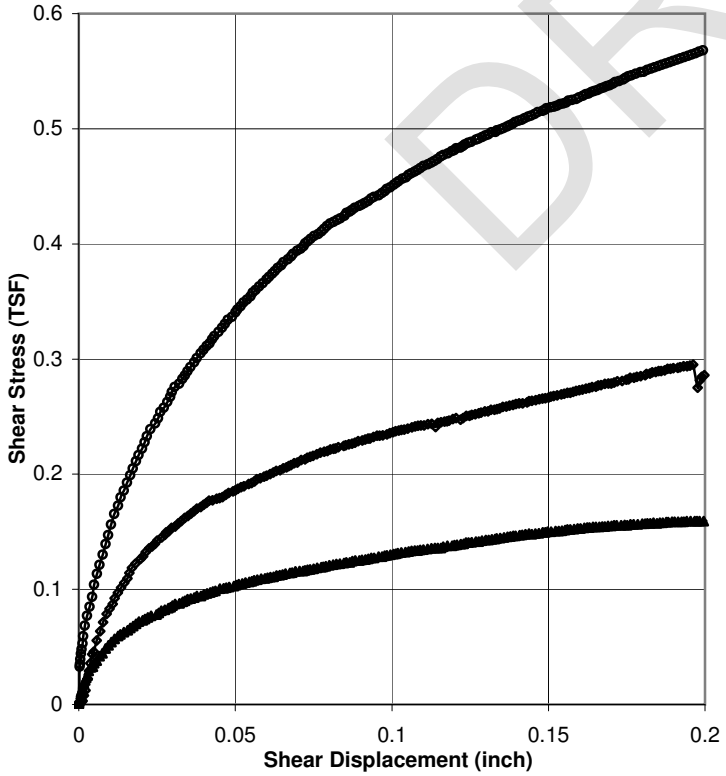
(*) = Assumed Specific Gravity

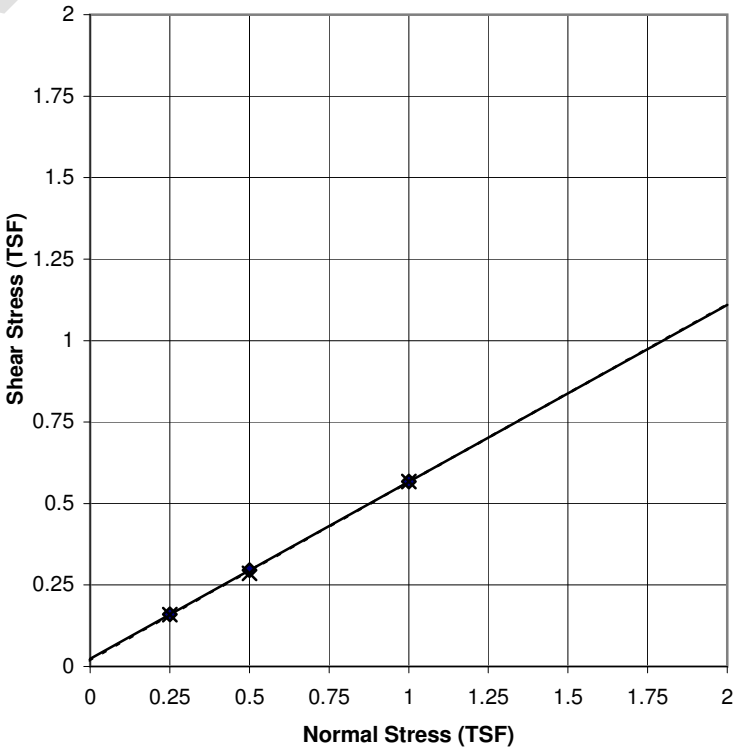


Failure Criterion:				
Max Stress	A	B	C	D
Initial	▲	◇	○	X
Diameter (In.)	2.50	2.50	2.50	
Thickness (In.)	0.91	0.91	0.91	
Water Content (%)	6.2	6.2	6.2	
Dry Density (pcf)	79.7	79.7	79.7	
Before Shear				
Thickness (In.)	0.87	0.85	0.83	
Water Content (%)	37.1	35.8	34.0	
Dry Density (pcf)	83.7	85.2	87.3	
Normal Stress	0.25	0.50	1.00	
Shear Stress	0.16	0.30	0.57	

"These tests are for informational purposes only and must be reviewed by a qualified professional engineer to verify that the test parameters shown are appropriate for any particular design."

Peak Conditions		At Given Shear Disp. Of: 0.2	
Friction Angle:	ϕ= **28.5 deg.**	Friction Angle:	ϕ= **28.7 deg.**
Apparent Cohesion	**0.023 TSF**	Apparent Cohesion	**0.018 TSF**





DRAFT

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

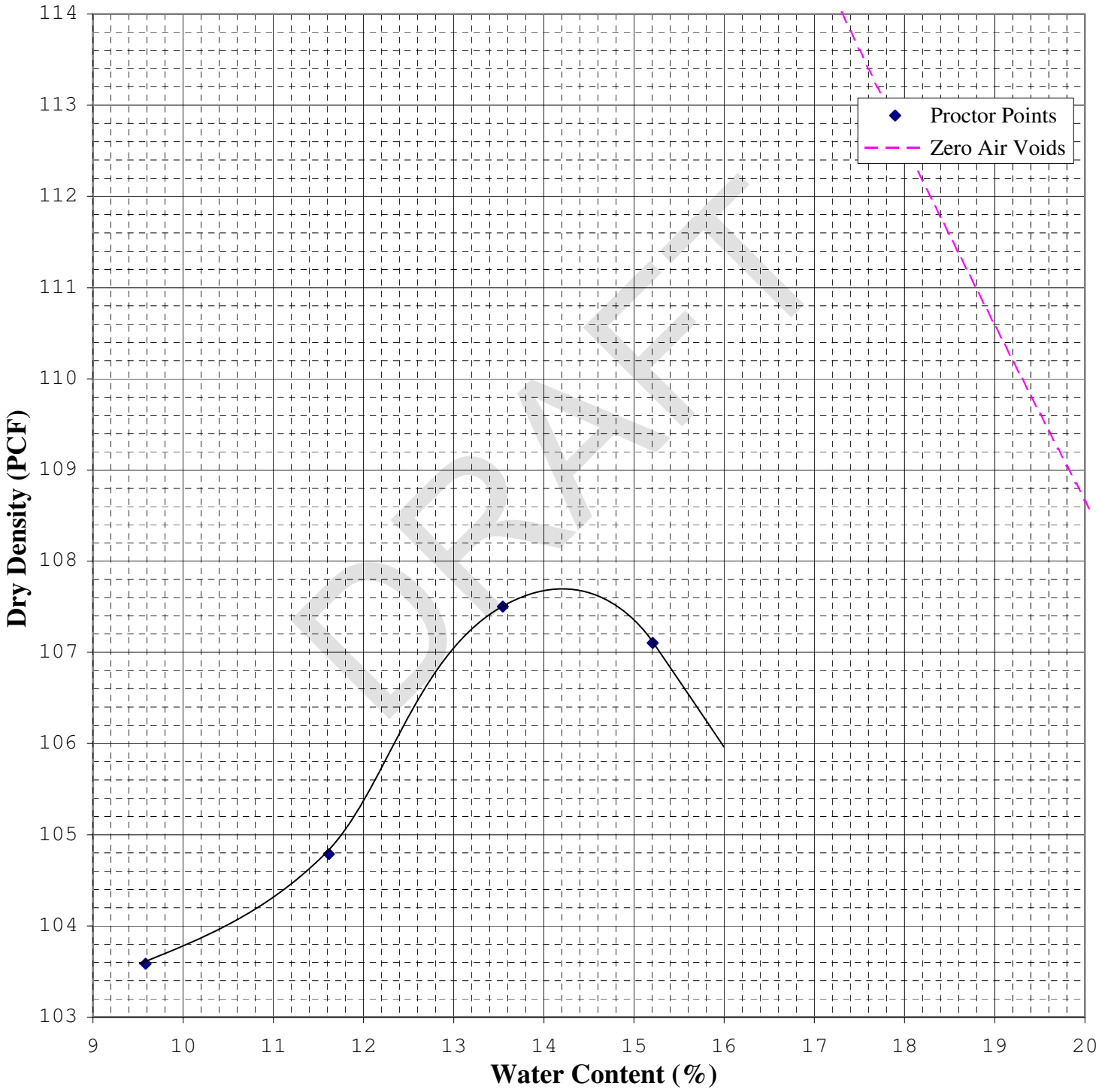
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **Thermal 1** Sample: Depth(ft): Location:

Soil Type: **Sand with silt, fine to medium grained (SP-SM)**

As Received W.C. (%): **1.4** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **107.7** Opt. Water Content (%): **14.2**



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SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

SET-R18a

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

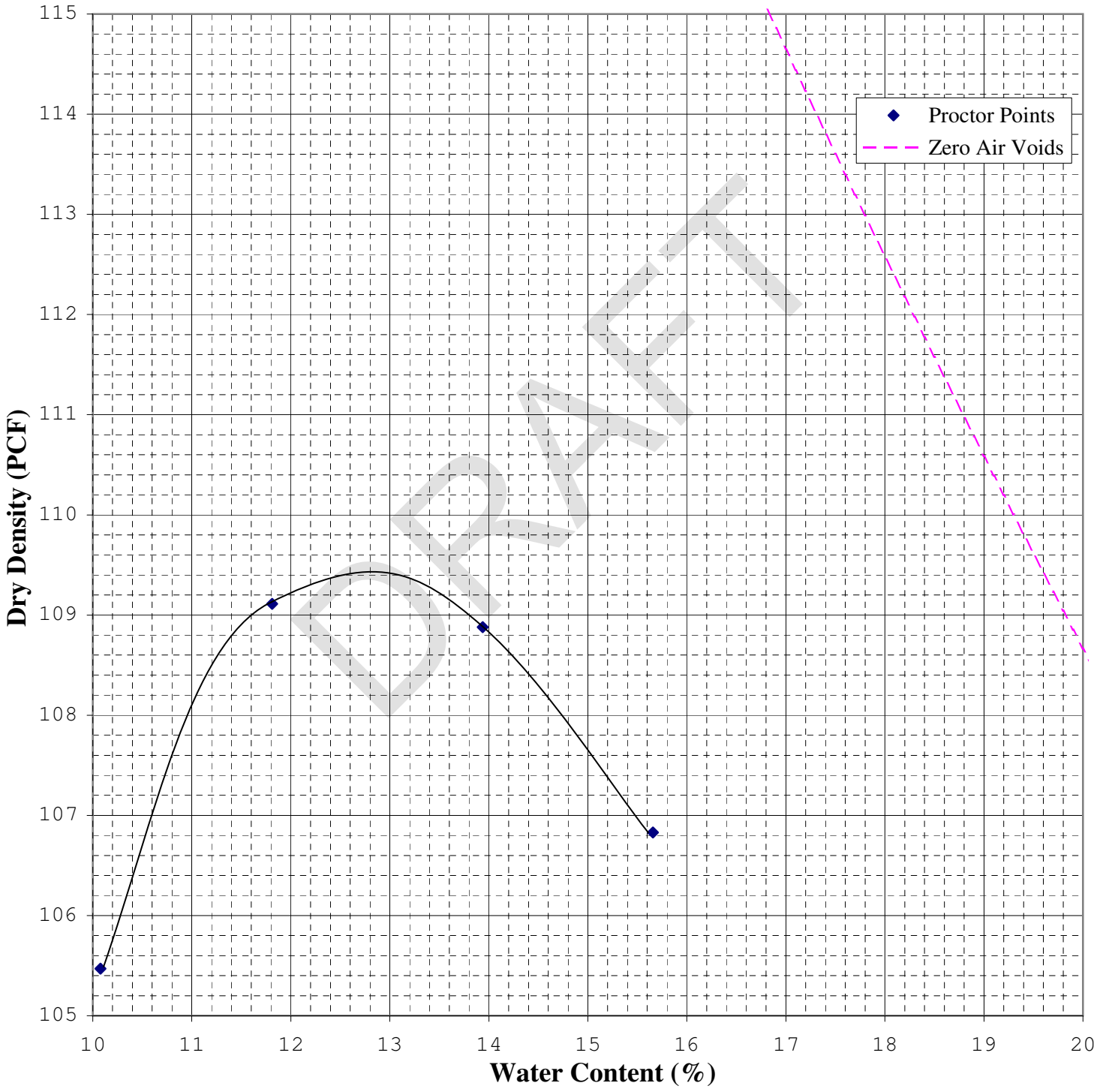
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **Thermal 2** Sample: Depth(ft): Location:

Soil Type: **Silty Sand (SM)**

As Received W.C. (%): **2.3** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **109.4** Opt. Water Content (%): **12.8**



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Richfield, Minnesota 55423-2031

SET-R18a

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

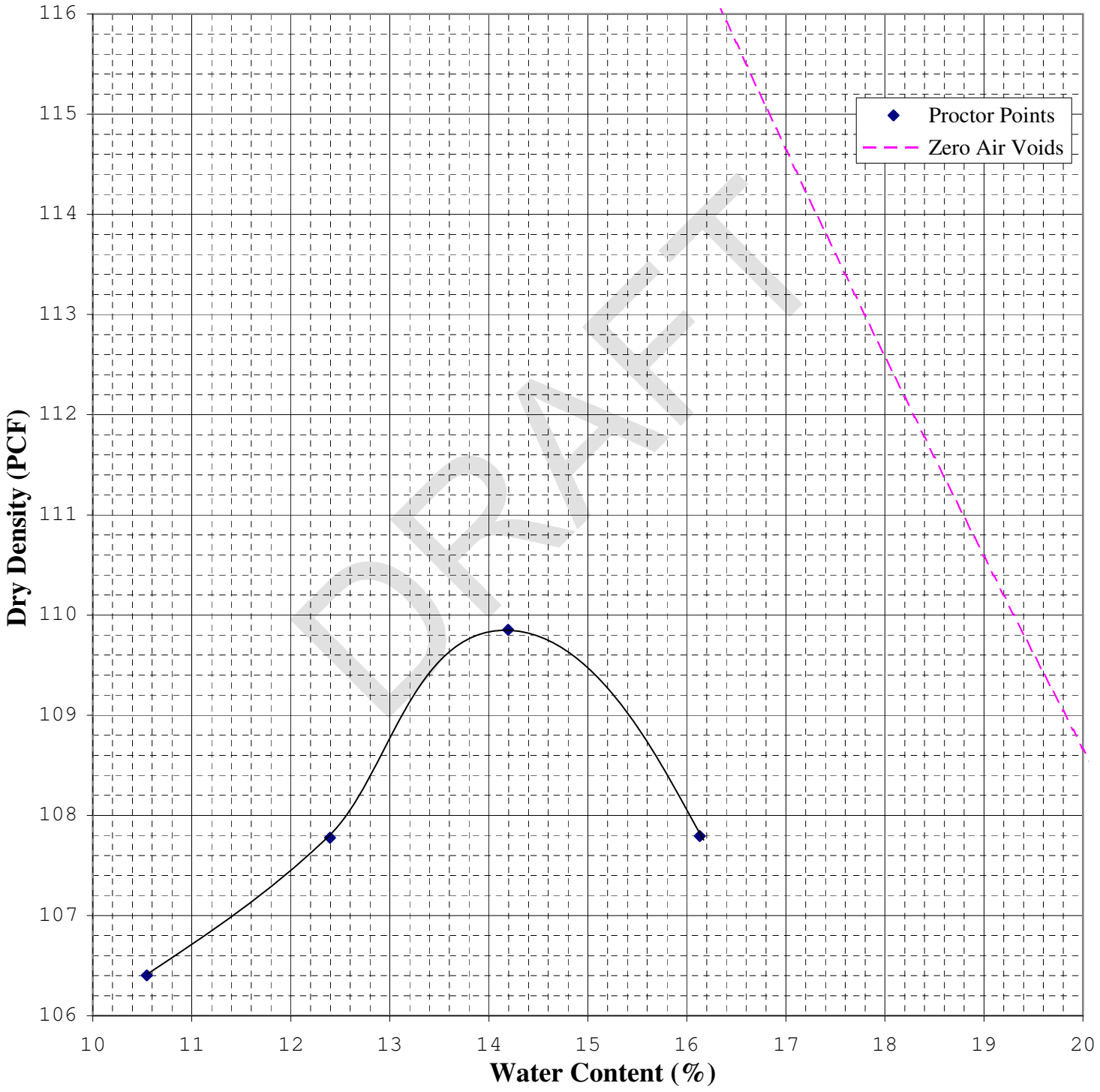
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **Thermal 3** Sample: Depth(ft): Location:

Soil Type: **Silty Sand (SM)**

As Received W.C. (%): **1.9** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **109.8** Opt. Water Content (%): **14.2**



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Richfield, Minnesota 55423-2031

SET-R18a

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

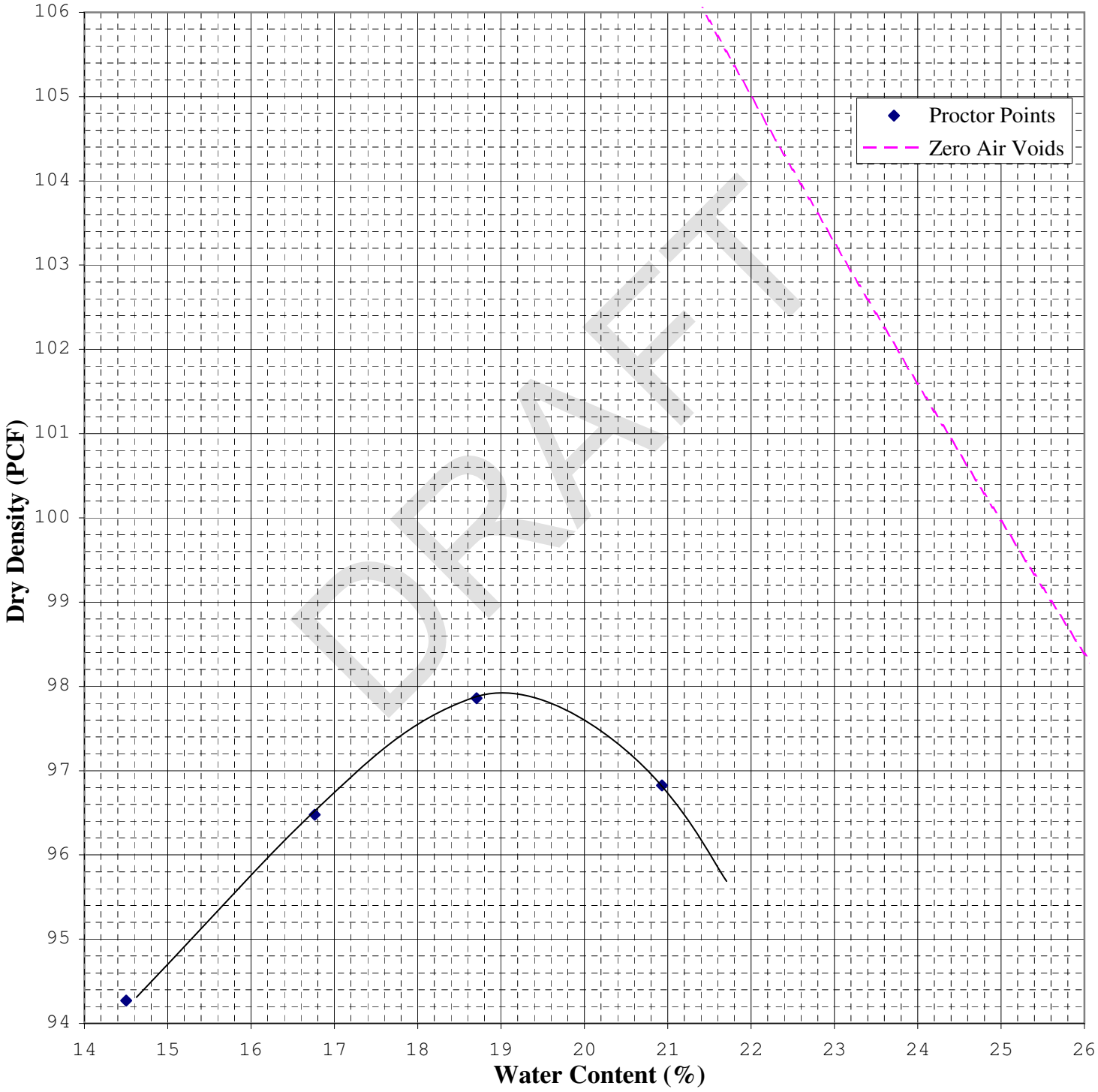
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **Thermal** Sample: **Switch** Depth(ft): Location:

Soil Type: **Silty Sand (SM)**

As Received W.C. (%): **1.5** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **97.9** Opt. Water Content (%): **19.0**



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Richfield, Minnesota 55423-2031

SET-R18a

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

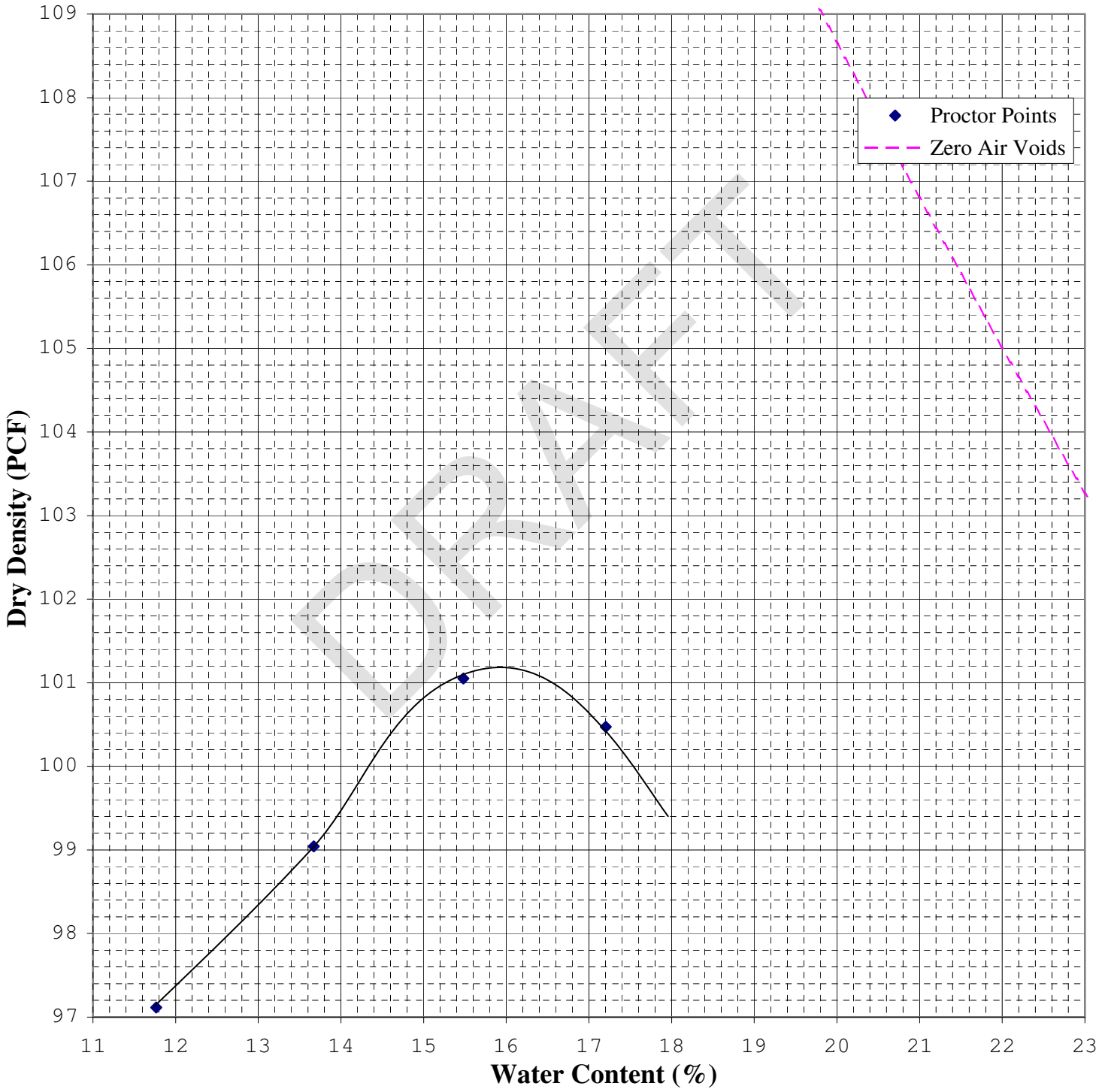
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **TP-01** Sample: **CBR** Depth(ft): Location:

Soil Type: **Sand, fine grained (SP)**

As Received W.C. (%): **0.8** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **101.2** Opt. Water Content (%): **16.0**



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SET-R18a

Moisture Density Curve ASTM: D698, Method B

Project: **Longboat Solar** Date: **8/21/14**

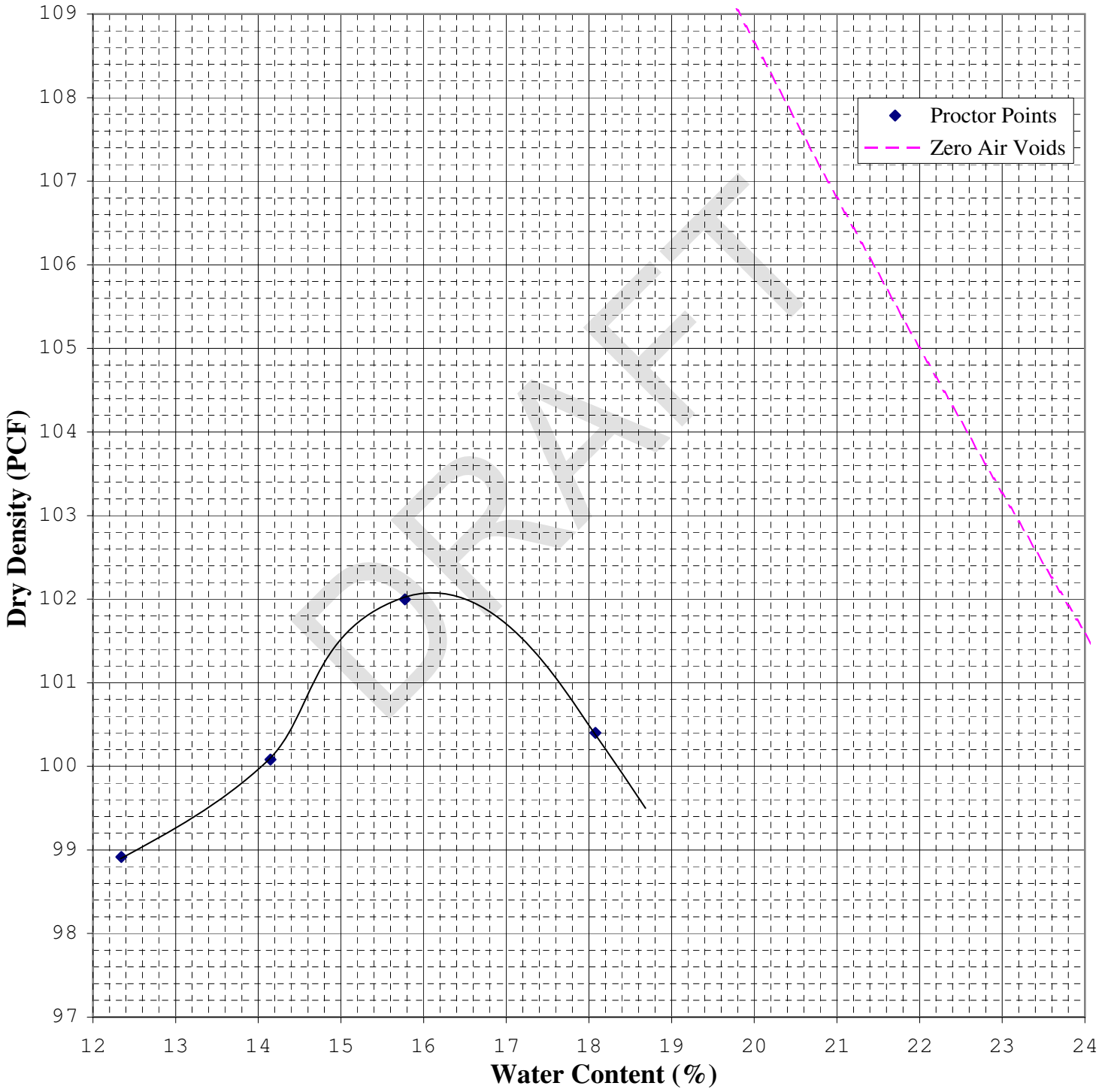
Client: **Barr Engineering Company** Job No. **9522**

Boring No. **TP-03** Sample: **CBR** Depth(ft): Location:

Soil Type: **Sand, fine grained (SP)**

As Received W.C. (%): **0.7** LL: PL: PI: Specific Gravity: **2.67** *Assumed

Maximum Dry Density (pcf): **102.1** Opt. Water Content (%): **16.1**



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SOIL ENGINEERING TESTING, INC.

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SET-R18a

California Bearing Ratio ASTM:D1883

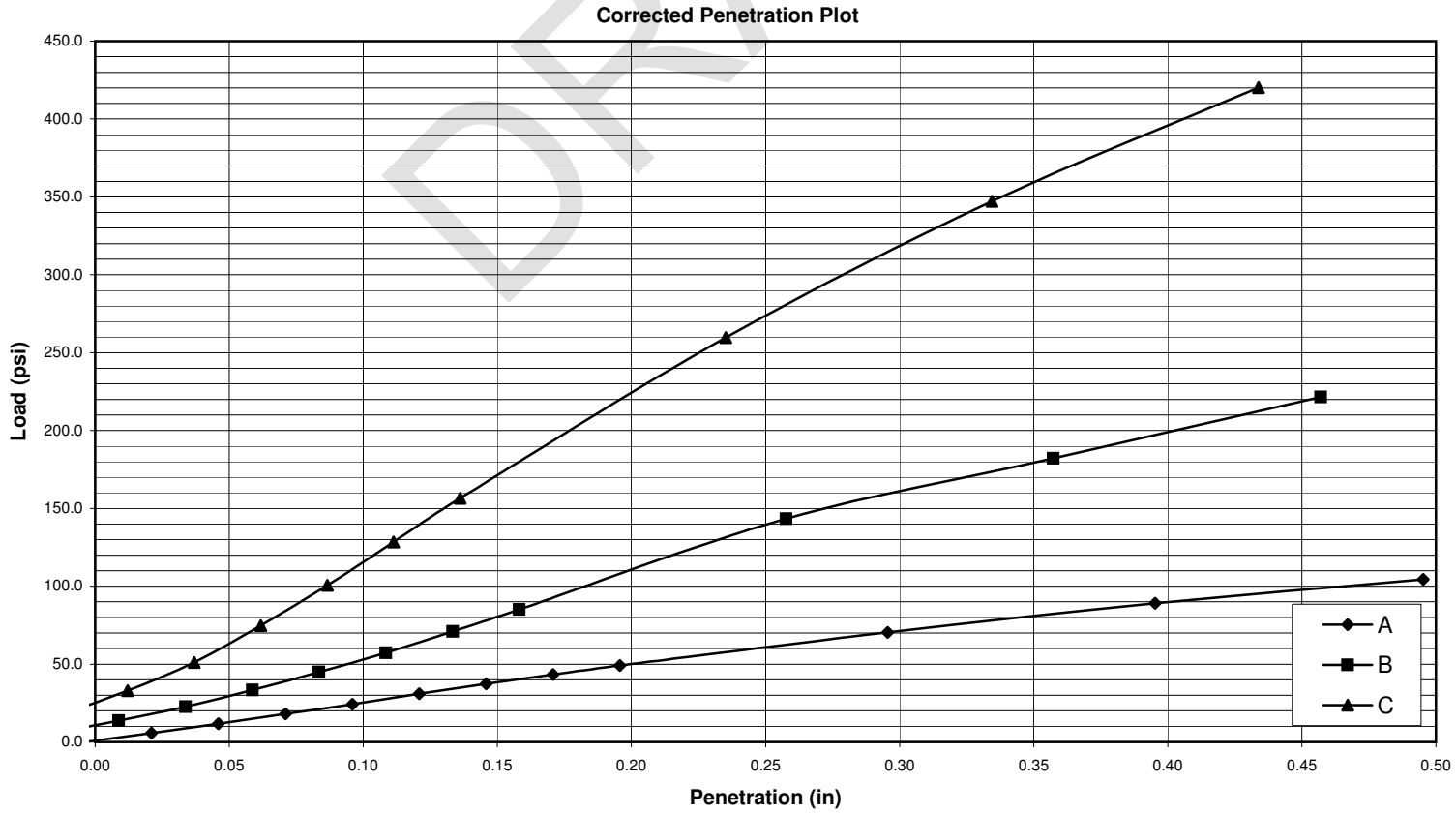
Project:	Longboat Solar	Job:	**9522**
Client:	Barr Engineering Company	Date:	8/29/14

Boring #: TP-01		Procedural Method:
Sample:		Specimens compacted to approximately 90%, 95% and 98% of maximum standard proctor density at optimum moisture content. Specimens soaked for a period of 4 days before CBR test was performed.
Depth (ft):	Type: Bulk	
Location:		
Classification: Sand, fine grained (SP)		

Laboratory Moisture-Density Values		Index Properties	
Method:	ASTM:D698 Method B	LL:	Gs:
Maximum Dry Density (PCF):	101.2	PL:	Organic Content:
Optimum Water Content:	16.0%	PI:	pH:

Initial Molding Conditions			
Specimen	A	B	C
Compaction Hammer:	5 lb	5 lb	5 lb
Number of Layers:	3	3	3
Blows per Layer:	NA	NA	NA
Initial Moisture Content:	16.0%	16.0%	16.0%
Initial Dry Density (PCF)	91.1	96.3	99.3
Relative Compaction	90.0%	95.1%	98.1%
Soaking Phase			
Days Soaked	4	4	4
Surcharge (psf)	50	50	50
Total Swell (%)	-0.4%	-0.5%	-0.3%
Penetration Phase			
Surcharge (psf)	50	50	50
Corrected CBR Values			
at 0.1 inch (%)	**2.6%**	**5.2%**	**11.5%**
at 0.2 inch (%)	3.3%	7.3%	14.9%
Moisture Content After Penetration			
Top 1" of Specimen:	24.0%	20.9%	19.0%
Average of specimen:	23.1%	19.4%	17.7%

Stress vs. Penetration Graph



DRAFT

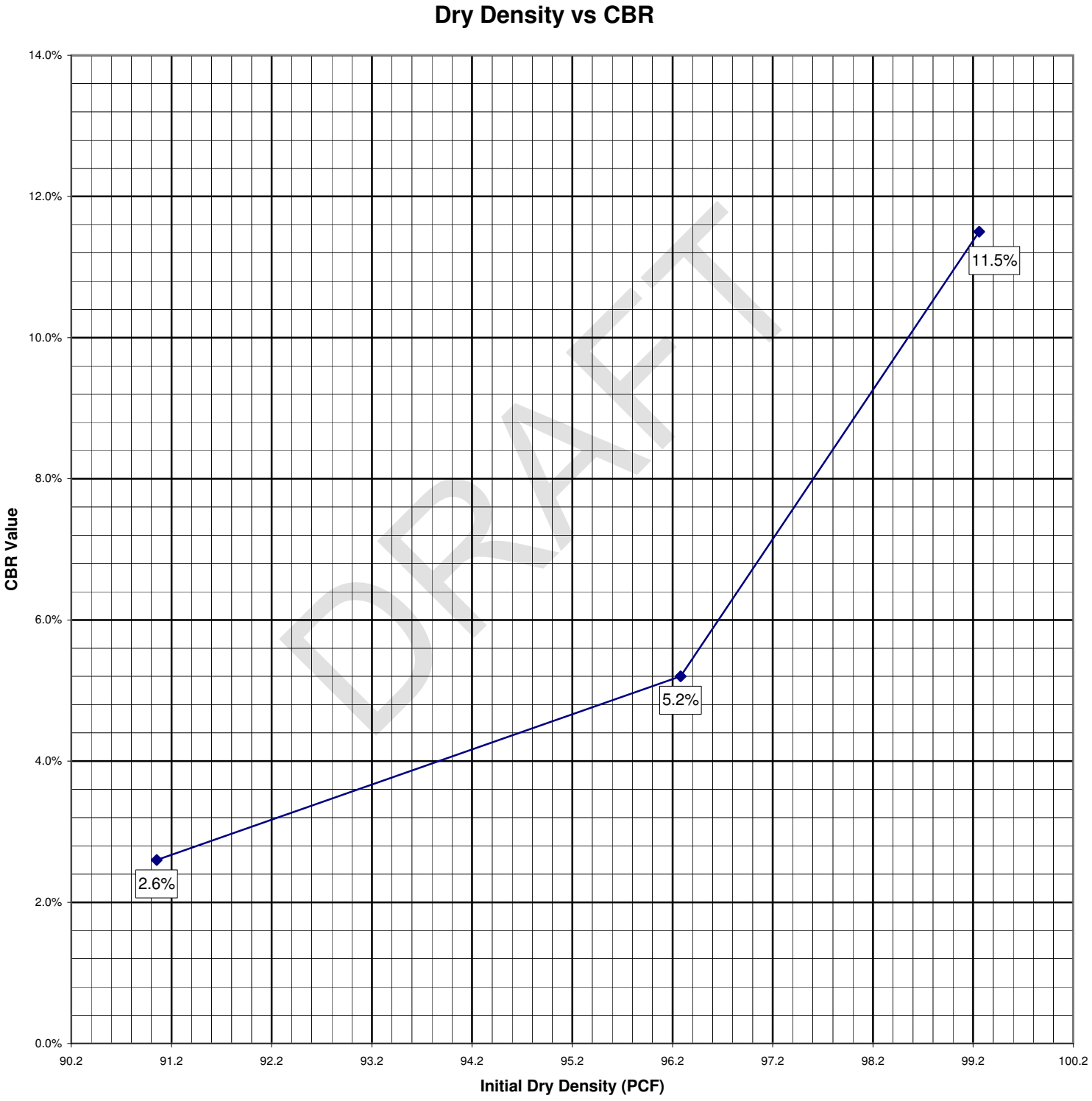
SOIL ENGINEERING TESTING, INC.

California Bearing Ratio ASTM:D1883

Project:	Longboat Solar	Job:	9522
Client:	Barr Engineering Company	Date:	8/29/14

Boring #: TP-01		Procedural Method:
Sample:		Specimens compacted to approximately 90%, 95% and 98% of maximum standard proctor density at optimum moisture content. Specimens soaked for a period of 4 days before CBR test was performed.
Depth (ft):	Type: Bulk	
Location:		
Classification: Sand, fine grained (SP)		

Test Plot



SOIL ENGINEERING TESTING, INC.

California Bearing Ratio ASTM:D1883

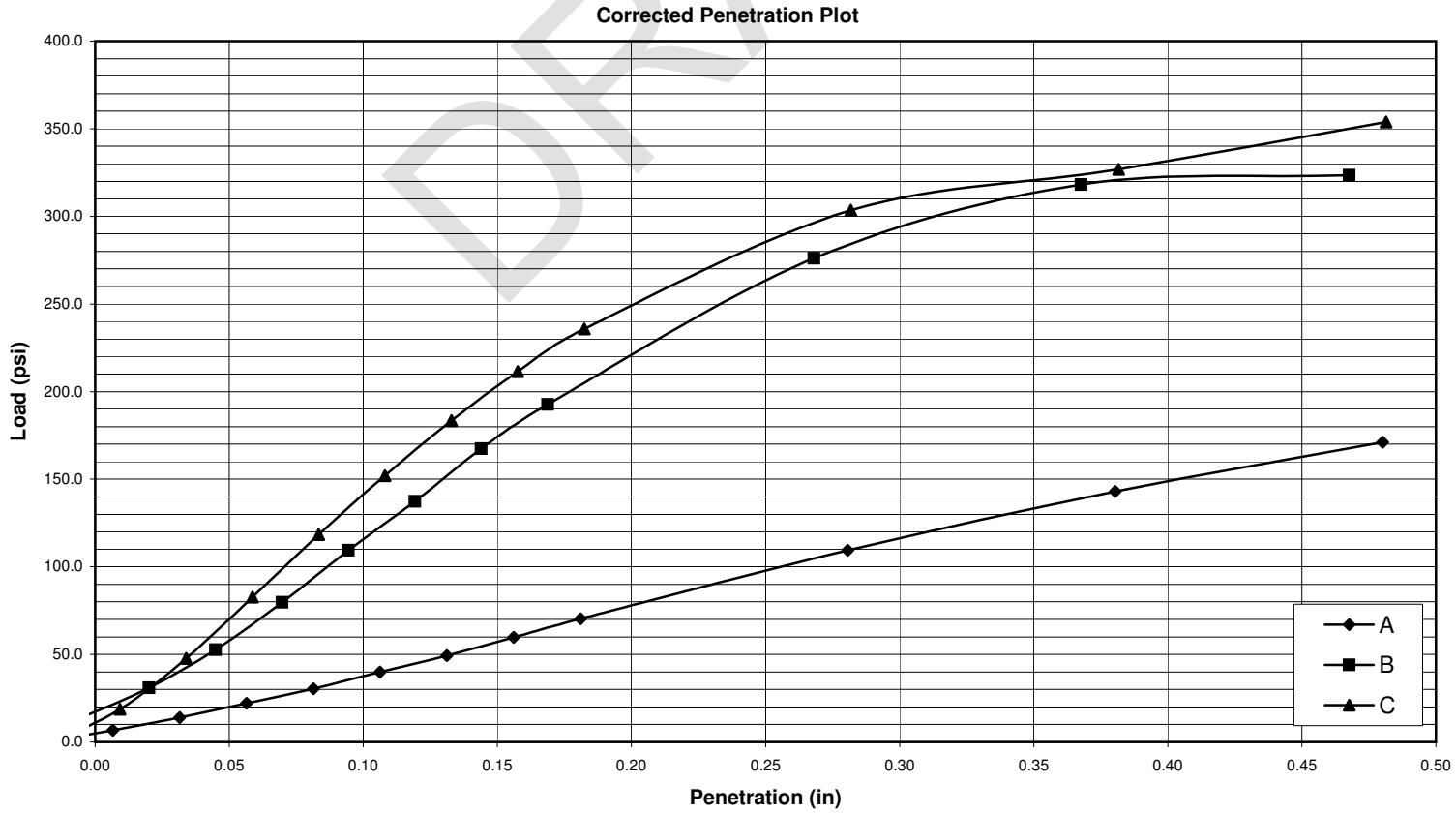
Project:	Longboat Solar	Job:	**9522**
Client:	Barr Engineering Company	Date:	8/29/14

Boring #: TP-03		Procedural Method:
Sample:		Specimens compacted to approximately 90%, 95% and 98% of maximum standard proctor density at optimum moisture content. Specimens soaked for a period of 4 days before CBR test was performed.
Depth (ft):	Type: Bulk	
Location:		
Classification: Sand, fine grained (SP)		

Laboratory Moisture-Density Values		Index Properties	
Method:	ASTM:D698 Method B	LL:	Gs:
Maximum Dry Density (PCF):	102.1	PL:	Organic Content:
Optimum Water Content:	16.1%	PI:	pH:

Initial Molding Conditions			
Specimen	A	B	C
Compaction Hammer:	5 lb	5 lb	5 lb
Number of Layers:	3	3	3
Blows per Layer:	NA	NA	NA
Initial Moisture Content:	16.1%	16.1%	16.1%
Initial Dry Density (PCF)	92.0	96.9	99.6
Relative Compaction	90.1%	94.9%	97.5%
Soaking Phase			
Days Soaked	4	4	4
Surcharge (psf)	50	50	50
Total Swell (%)	-0.1%	-0.1%	-0.3%
Penetration Phase			
Surcharge (psf)	50	50	50
Corrected CBR Values			
at 0.1 inch (%)	**3.7%**	**11.6%**	**14.2%**
at 0.2 inch (%)	5.2%	14.7%	16.5%
Moisture Content After Penetration			
Top 1" of Specimen:	20.3%	18.5%	18.9%
Average of specimen:	21.5%	18.4%	18.1%

Stress vs. Penetration Graph



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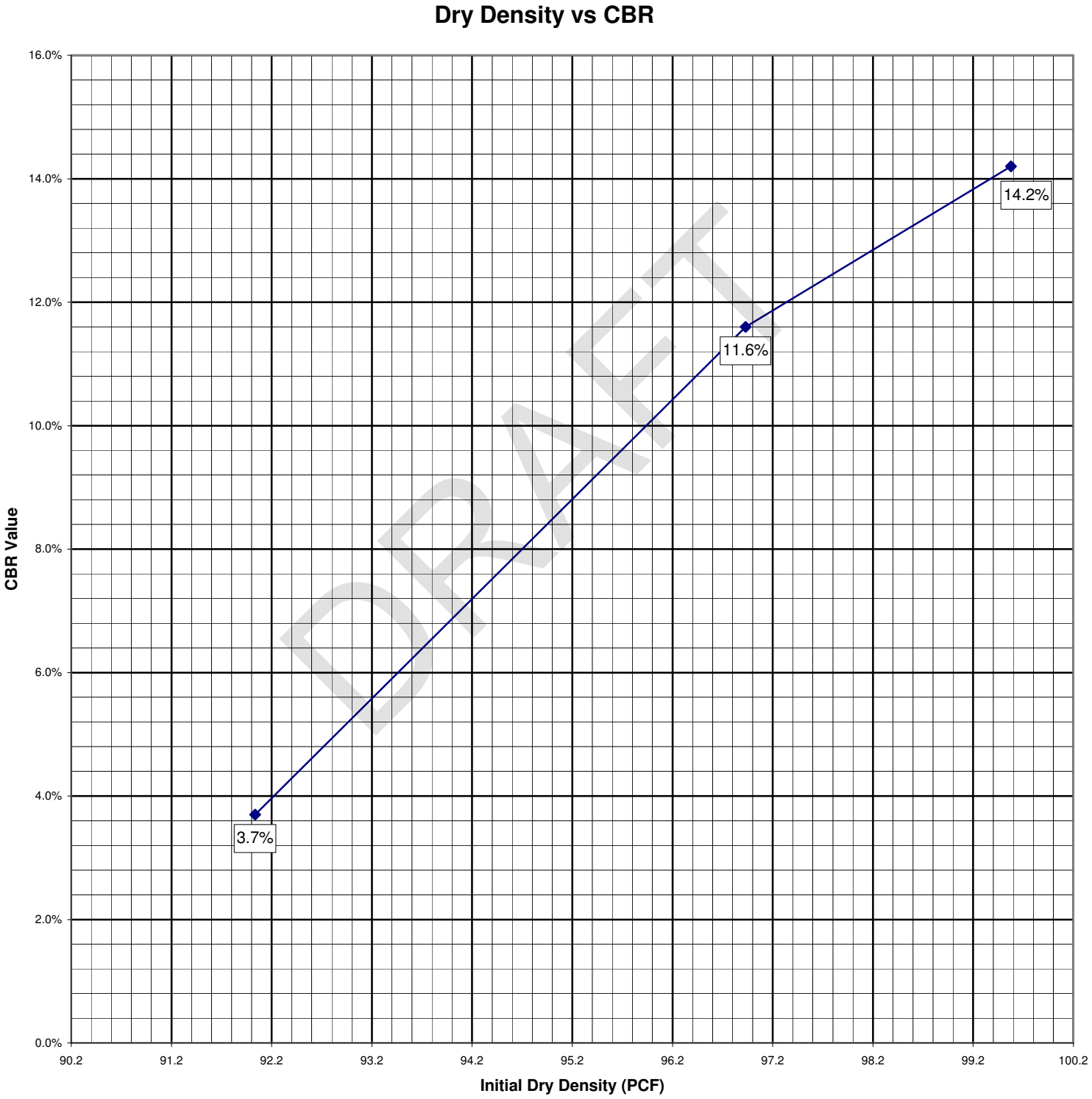
SOIL ENGINEERING TESTING, INC.

California Bearing Ratio ASTM:D1883

Project:	Longboat Solar	Job:	9522
Client:	Barr Engineering Company	Date:	8/29/14

Boring #: TP-03		Procedural Method:
Sample:		Specimens compacted to approximately 90%, 95% and 98% of maximum standard proctor density at optimum moisture content. Specimens soaked for a period of 4 days before CBR test was performed.
Depth (ft):	Type: Bulk	
Location:		
Classification: Sand, fine grained (SP)		

Test Plot



SOIL ENGINEERING TESTING, INC.

Laboratory Test Summary

Job: **9522**

Project: **Longboat Solar**

Date: **8/29/2014**

Client: **Barr Engineering Company**

Sample Information & Classification

Boring #	Thermal 1	Thermal 2	Thermal 3	Switch
Sample				
Type or BPF	Bulk	Bulk	Bulk	Bulk
Soil Classification ASTM: D2487/2488	Sand w/ silt, fine to medium grained (SP-SM)	Silty Sand (SM)	Silty Sand (SM)	Silty Sand (SM)
Water Content & Density (As Received)				
Water Content (%)				1.8
Dry Density (PCF)				89.9
Water Content & Density (Saturated)				
Water Content (%)				34.1
Dry Density (PCF)				82.7
Resistivity (ohm-cm) (ASTM G-187-05)				
As Received Moisture Content Resistivity (ohm-cm)				**>50,000**
Saturated Condition Resistivity (ohm-cm)				**4,625**
pH Corrosion (ASTM G-51-05)				
pH	**8.0**	**7.9**	**8.0**	**8.0**

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2401 W 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, Minnesota 55423-2031

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Mt. Juliet, TN 37122
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

John Whelan
Soil Engineering Testing, Inc.
2401 West 66th Street
Richfield, MN 55423

Report Summary

Friday August 29, 2014

Report Number: L717656
Samples Received: 08/22/14
Client Project: 9522

Description: Longboat

DRAFT

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Alan Harvill

T. Alan Harvill , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

John Whelan
Soil Engineering Testing, Inc.
2401 West 66th Street
Richfield, MN 55423

August 29, 2014

ESC Sample # : L717656-01

Site ID :

Project # : 9522

Date Received : August 22, 2014
Description : Longboat

Sample ID : THERMAL 01

Collected By :
Collection Date : 08/21/14 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	43.	10.	mg/kg	9056MOD	08/27/14	1
Sulfate	65.	50.	mg/kg	9056MOD	08/27/14	1
Total Solids	98.9	0.100	%	2540 G-2011	08/29/14	1

DRAFT

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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.
Reported: 08/29/14 10:54 Printed: 08/29/14 10:55

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REPORT OF ANALYSIS

John Whelan
Soil Engineering Testing, Inc.
2401 West 66th Street
Richfield, MN 55423

August 29, 2014

ESC Sample # : L717656-02

Site ID :

Project # : 9522

Date Received : August 22, 2014
Description : Longboat

Sample ID : THERMAL 02

Collected By :
Collection Date : 08/21/14 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	160	10.	mg/kg	9056MOD	08/24/14	1
Sulfate	110	50.	mg/kg	9056MOD	08/24/14	1
Total Solids	97.9	0.100	%	2540 G-2011	08/29/14	1

DRAFT

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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.
Reported: 08/29/14 10:54 Printed: 08/29/14 10:55

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REPORT OF ANALYSIS

John Whelan
Soil Engineering Testing, Inc.
2401 West 66th Street
Richfield, MN 55423

August 29, 2014

ESC Sample # : L717656-03

Site ID :

Project # : 9522

Date Received : August 22, 2014
Description : Longboat

Sample ID : THERMAL 03

Collected By :
Collection Date : 08/21/14 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	96.	10.	mg/kg	9056MOD	08/24/14	1
Sulfate	BDL	50.	mg/kg	9056MOD	08/24/14	1
Total Solids	98.1	0.100	%	2540 G-2011	08/29/14	1

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BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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.
Reported: 08/29/14 10:54 Printed: 08/29/14 10:55

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REPORT OF ANALYSIS

John Whelan
Soil Engineering Testing, Inc.
2401 West 66th Street
Richfield, MN 55423

August 29, 2014

ESC Sample # : L717656-04

Site ID :

Project # : 9522

Date Received : August 22, 2014
Description : Longboat

Sample ID : SWITCH

Collected By :
Collection Date : 08/21/14 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	15.	10.	mg/kg	9056MOD	08/27/14	1
Sulfate	BDL	50.	mg/kg	9056MOD	08/27/14	1
Total Solids	98.1	0.100	%	2540 G-2011	08/29/14	1

DRAFT

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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.
Reported: 08/29/14 10:54 Printed: 08/29/14 10:55

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L717656-02	WG738889	SAMP	Chloride	R2980966	B
L717656-03	WG738889	SAMP	Chloride	R2980966	B

DRAFT

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC.
Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

DRAFT

Summary of Remarks For Samples Printed
08/29/14 at 10:55:14

TSR Signing Reports: 341
R5 - Desired TAT

Note samples for Sulfate and Chloride routinely shipped and recieved without ice per clients instructions, No NCF needed. Not for Compliance. Do not log TS. JVH 01-24-10 No TS - use WetWeight pkey

Sample: L717656-01 Account: SOIENGBMN Received: 08/22/14 09:00 Due Date: 09/02/14 00:00 RPT Date: 08/29/14 10:54

Sample: L717656-02 Account: SOIENGBMN Received: 08/22/14 09:00 Due Date: 09/02/14 00:00 RPT Date: 08/29/14 10:54

Sample: L717656-03 Account: SOIENGBMN Received: 08/22/14 09:00 Due Date: 09/02/14 00:00 RPT Date: 08/29/14 10:54

Sample: L717656-04 Account: SOIENGBMN Received: 08/22/14 09:00 Due Date: 09/02/14 00:00 RPT Date: 08/29/14 10:54

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Soil Engineering Testing, Inc.
John Whelan
2401 West 66th Street

Richfield, MN 55423

Quality Assurance Report
Level II

L717656

August 29, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Chloride	< 10	mg/kg			WG738889	08/24/14 12:27
Sulfate	< 50	mg/kg			WG738889	08/24/14 12:27
Chloride	< 10	mg/kg			WG739392	08/27/14 14:06
Sulfate	< 50	mg/kg			WG739392	08/27/14 14:06
Total Solids	< .1	%			WG739948	08/29/14 08:03

Duplicate

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Chloride	mg/kg	110.	117.	10.0	20	L717032-07	WG738889
Sulfate	mg/kg	92.0	91.4	0.0	20	L717032-07	WG738889
Chloride	mg/kg	45.0	43.4	4.00	20	L717656-01	WG739392
Sulfate	mg/kg	61.0	65.1	6.00	20	L717656-01	WG739392
Total Solids	%	82.2	84.9	3.30	5	L718102-04	WG739948

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Chloride	mg/kg	200	203.	101.	80-120	WG738889
Sulfate	mg/kg	200	205.	103.	80-120	WG738889
Chloride	mg/kg	200	210.	105.	80-120	WG739392
Sulfate	mg/kg	200	207.	103.	80-120	WG739392
Total Solids	%	50	50.0	100.	85-115	WG739948

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Chloride	mg/kg	206.	203.	103.	80-120	2.00	20	WG738889
Sulfate	mg/kg	209.	205.	104.	80-120	2.00	20	WG738889
Chloride	mg/kg	207.	210.	103.	80-120	1.00	20	WG739392
Sulfate	mg/kg	204.	207.	102.	80-120	1.00	20	WG739392

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Chloride	mg/kg	605.	80.5	500	100.	80-120	L717032-05	WG738889
Sulfate	mg/kg	654.	178.	500	95.0	80-120	L717032-05	WG738889

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Chloride	mg/kg	597.	605.	103.	80-120	1.00	20	L717032-05	WG738889
Sulfate	mg/kg	664.	654.	97.3	80-120	2.00	20	L717032-05	WG738889

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Soil Engineering Testing, Inc.
John Whelan
2401 West 66th Street

Richfield, MN 55423

Quality Assurance Report
Level II

L717656

August 29, 2014

Batch number /Run number / Sample number cross reference

WG738889: R2980966: L717656-02 03
WG739392: R2982192: L717656-01 04
WG739948: R2982648: L717656-01 02 03 04

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* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L717656

August 29, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Appendix E

Electrical Resistivity Testing Results

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Electrical Resistivity Test Results
Summary Table
Viking Solar Project - Longboat
Final Geotechnical Investigation - August, 2014
San Bernardino County, California
05361004.00

	Electrode "a" Spacing [feet]	Therm-01 Resistivity ra=K(V/I) Ohm-cm	Therm-02 Resistivity ra=K(V/I) Ohm-cm	Therm-03 Resistivity ra=K(V/I) Ohm-cm	Switch Resistivity ra=K(V/I) Ohm-cm
N/S Orientation	2	268,683	89,574	76,663	766,244
	5	57,468	28,159	26,244	123,653
	10	53,637	43,293	28,543	62,257
	20	48,273	59,384	53,637	40,611
	40	59,767	57,468	42,143	32,182
E/W Orientation	2	279,219	95,857	78,348	766,244
	5	53,924	27,872	26,723	119,917
	10	53,446	44,825	28,734	62,066
	20	49,040	60,916	51,721	44,059
	40	59,001	59,001	43,676	30,650
	Average:	**98,246**	**56,635**	**45,643**	**204,788**

	Statistical Summary - Apparent Resistivity Averages (Ohm-cm)					
	Electrode Spacing [feet]	**Max**	**Min**	**Range (NS & EW)**	**Mean (NS & EW)**	**St Dev (NS & EW)**
N/S Orientation	2	766,244	76,663	76,663 - 766,244	302,604	297,870
	5	123,653	26,244	26,244 - 123,653	57,995	41,310
	10	62,257	28,543	28,543 - 62,257	47,100	13,299
	20	59,384	40,611	40,611 - 60,916	50,955	7,005
	40	59,767	32,182	30,650 - 59,767	47,986	12,389
E/W Orientation	2	766,244	78,348			
	5	119,917	26,723			
	10	62,066	28,734			
	20	60,916	44,059			
	40	59,001	30,650			

Apparent Resistivity Average-Ohm-cm:	**101,328**

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WENNER SOUNDING

PROJECT: **Viking Solar Project - Longboat**

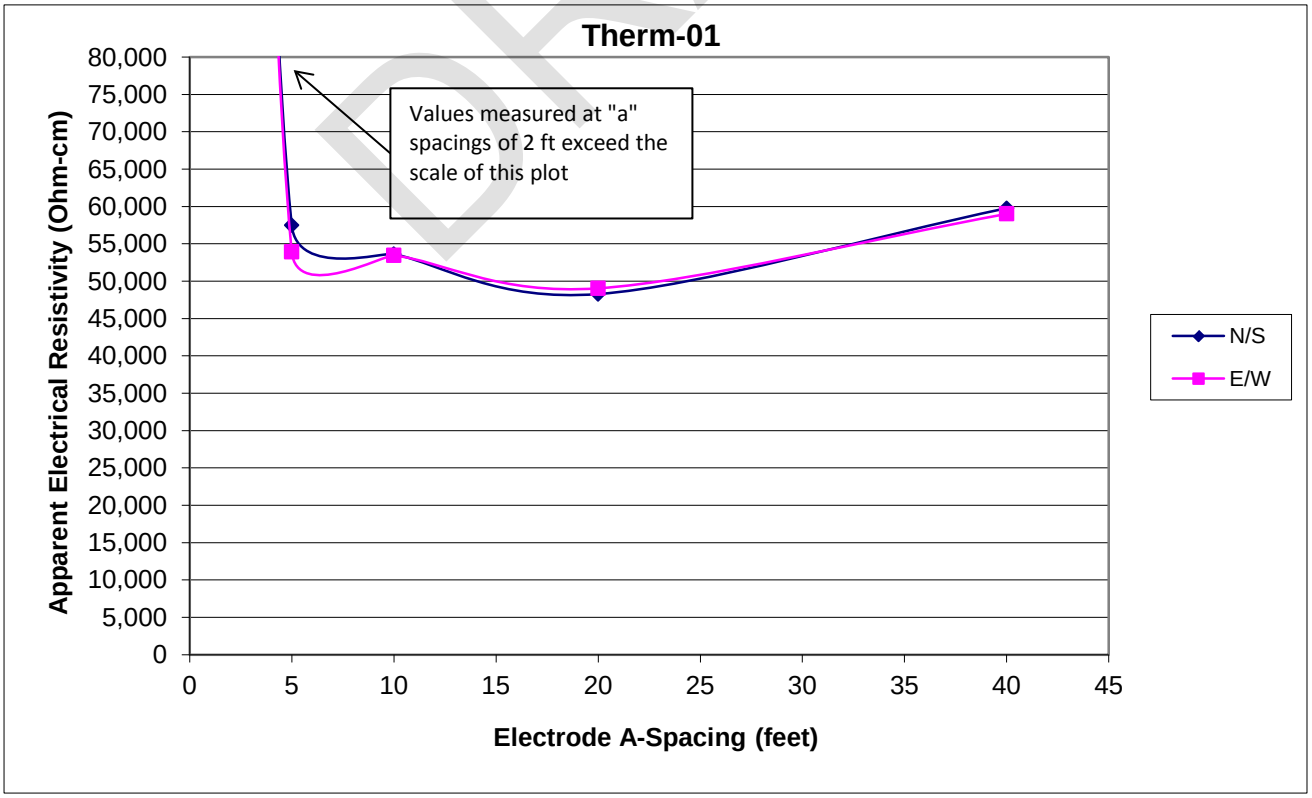
Sounding No. **1** **Date** **8/12/2014**

Observer **RJR**

Location **Therm-01** **N 34.90381** **W 117.10542**

Electrode Spacing "a" feet	Resistance V/I Ohms	Geometric Factor $K=2\pi a$ feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-cm
N/S Orientation				
2	701.3	12.57	8812.82	268683.4
5	60.000	31.42	1884.96	57468.3
10	28.000	62.83	1759.30	53637.1
20	12.600	125.66	1583.37	48273.4
40	7.800	251.33	1960.36	59767.0
E/W Orientation				
2	728.800	12.57	9158.39	279219.3
5	56.300	31.42	1768.72	53924.4
10	27.900	62.83	1753.01	53445.5
20	12.800	125.66	1608.50	49039.6
40	7.700	251.33	1935.23	59000.8

Cultural Features	None
Ground Cover	Bare with sparse patches of brush; loose surfical sand
Ambient Air Temp. (^oF)	78
Line Bearing	NS/EW



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WENNER SOUNDING

PROJECT: **Viking Solar Project - Longboat**

Sounding No. **3** **Date** **8/12/2014**

Observer **RJR**

Location **Therm-02** **N 34.90886** **W 117.09837**

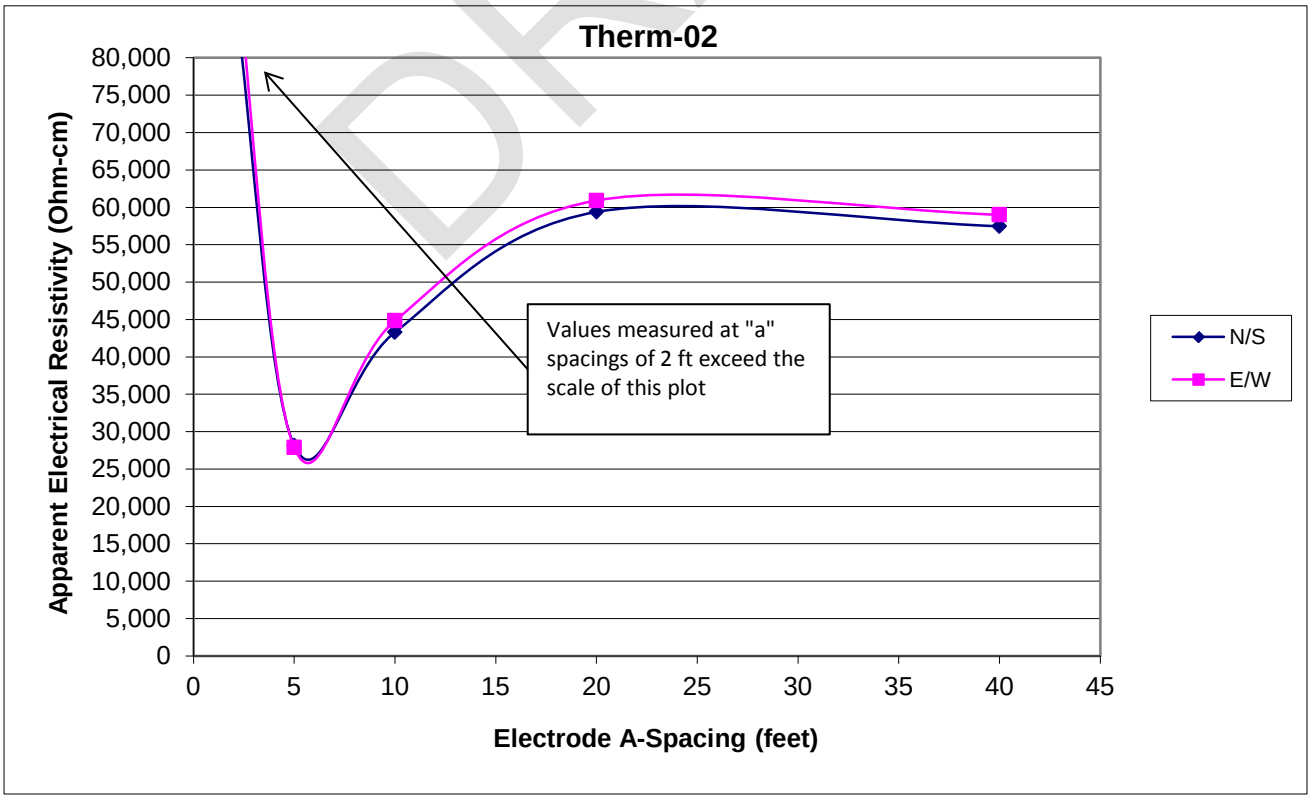
Electrode Spacing "a" feet	Resistance V/I Ohms	Geometric Factor $K=2\pi a$ feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-cm
N/S Orientation				
2	233.8	12.57	2938.02	89573.9
5	29.400	31.42	923.63	28159.5
10	22.600	62.83	1420.00	43292.8
20	15.500	125.66	1947.79	59383.9
40	7.500	251.33	1884.96	57468.3
E/W Orientation				
2	250.2	12.57	3144.11	95857.1
5	29.100	31.42	914.21	27872.1
10	23.400	62.83	1470.27	44825.3
20	15.900	125.66	1998.06	60916.4
40	7.700	251.33	1935.23	59000.8

Cultural Features: None

Ground Cover: Bare with sparse patches of brush, loose surfical sand with manure

Ambient Air Temp. (^{o}F): 91

Line Bearing: NS/EW



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WENNER SOUNDING

PROJECT: **Viking Solar Project - Longboat**

Sounding No. **3** **Date** **8/12/2014**

Observer **RJR**

Location **Therm-03** **N 34.90466** **W 117.09657**

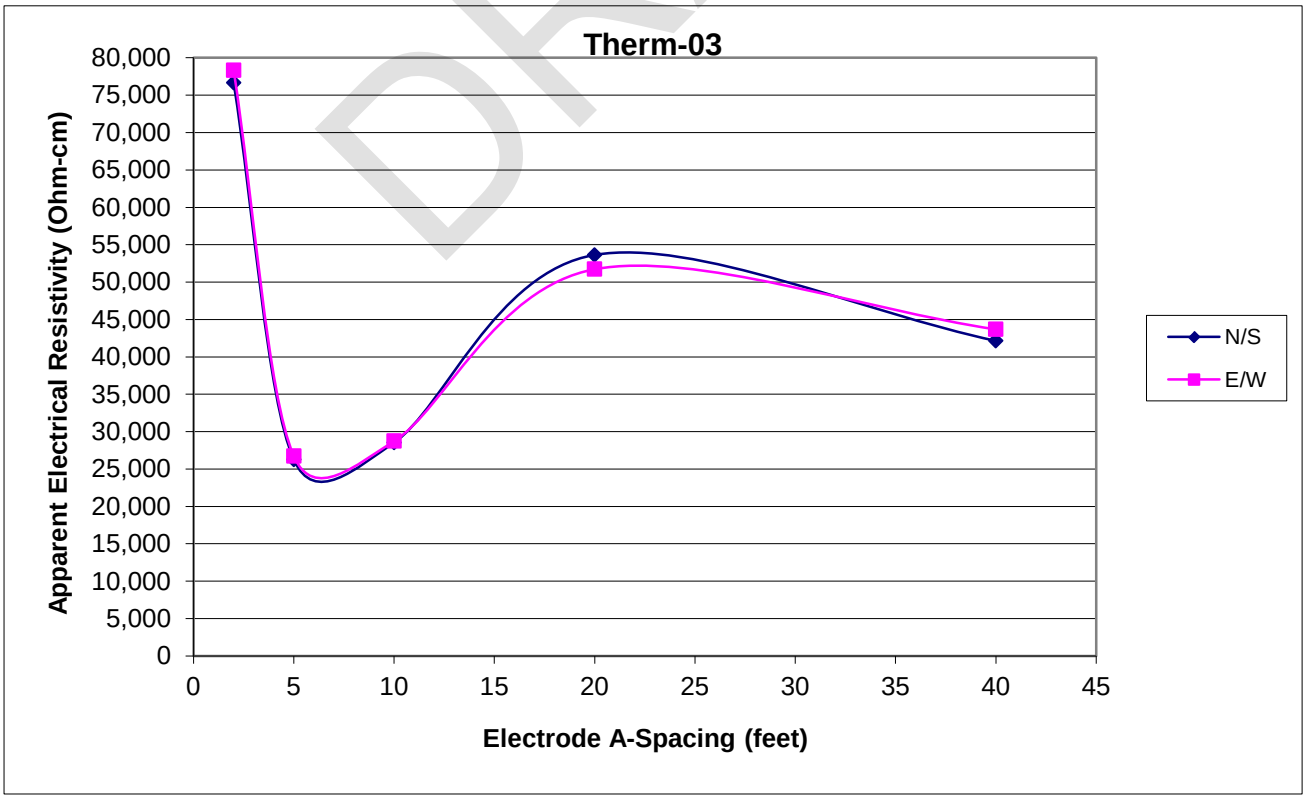
Electrode Spacing "a" feet	Resistance V/I Ohms	Geometric Factor $K=2\pi a$ feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-cm
N/S Orientation				
2	200.1	12.57	2514.54	76662.7
5	27.400	31.42	860.80	26243.9
10	14.900	62.83	936.20	28542.6
20	14.000	125.66	1759.30	53637.1
40	5.500	251.33	1382.30	42143.4
E/W Orientation				
2	204.5	12.57	2569.83	78348.4
5	27.900	31.42	876.51	26722.8
10	15.000	62.83	942.48	28734.1
20	13.500	125.66	1696.46	51721.5
40	5.700	251.33	1432.57	43675.9

Cultural Features: None

Ground Cover: Bare with sparse patches of brush, loose surfical sand with gravel

Ambient Air Temp. (^{o}F): 93

Line Bearing: NS/EW



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WENNER SOUNDING

PROJECT: **Viking Solar Project - Longboat**

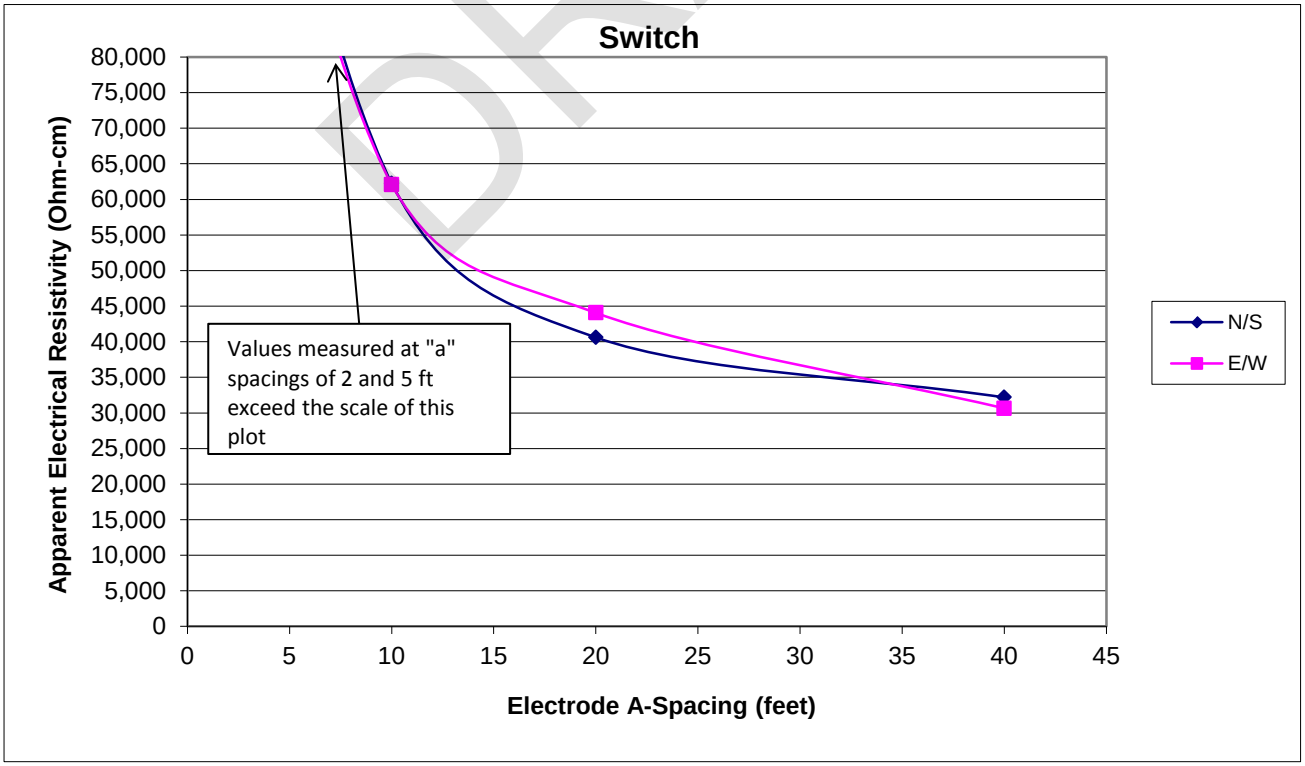
Sounding No. **2** **Date** **8/12/2014**

Observer **RJR**

Location **Switch** **N 34.90657** **W 117.10403**

Electrode Spacing "a" feet	Resistance V/I Ohms	Geometric Factor $K=2\pi a$ feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-feet	Apparent Resistivity $\rho_a=K(V/I)$ Ohm-cm
N/S Orientation				
2	2000.0	12.57	25132.80	766243.9
5	129.100	31.42	4055.81	123652.6
10	32.500	62.83	2042.04	62257.3
20	10.600	125.66	1332.04	40610.9
40	4.200	251.33	1055.58	32182.2
E/W Orientation				
2	2000.0	12.57	25132.80	766243.9
5	125.200	31.42	3933.28	119917.2
10	32.400	62.83	2035.76	62065.8
20	11.500	125.66	1445.14	44059.0
40	4.000	251.33	1005.31	30649.8

Cultural Features	None
Ground Cover	Bare with sparse patches of brush; loose surfical sand
Ambient Air Temp. (^oF)	86
Line Bearing	NS/EW



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Appendix F

Thermal Resistivity Testing Results

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Thermal Resistivity Report ASTM D:5334

Project: **Longboat Solar** Job #: **9522**

Client: **Barr Engineering Company** Date: **8/29/14**

Boring	Sample	Location	Depth	Type	Classification	Initial Conditions			Dry
						Dry Density (PCF)	WC (%)	Thermal Resistivity (ºC-cm/W)	Thermal Resistivity (ºC-cm/W)
Thermal 1				**Bulk**	**Sand with silt, fine to medium grained (SP-SM)**	**91.7**	**14.0%**	**88**	**334**
Thermal 2				**Bulk**	**Silty Sand (SM)**	**92.8**	**12.9%**	**89**	**280**
Thermal 3				**Bulk**	**Silty Sand (SM)**	**93.4**	**14.2%**	**84**	**259**
Switch				**Bulk**	**Silty Sand (SM)**	**83.0**	**19.3%**	**103**	**405**
	Specimens reconstituted to approximately 85% of maximum standard proctor density near optimum moisture content.								

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http://www.soilengineeringtesting.com

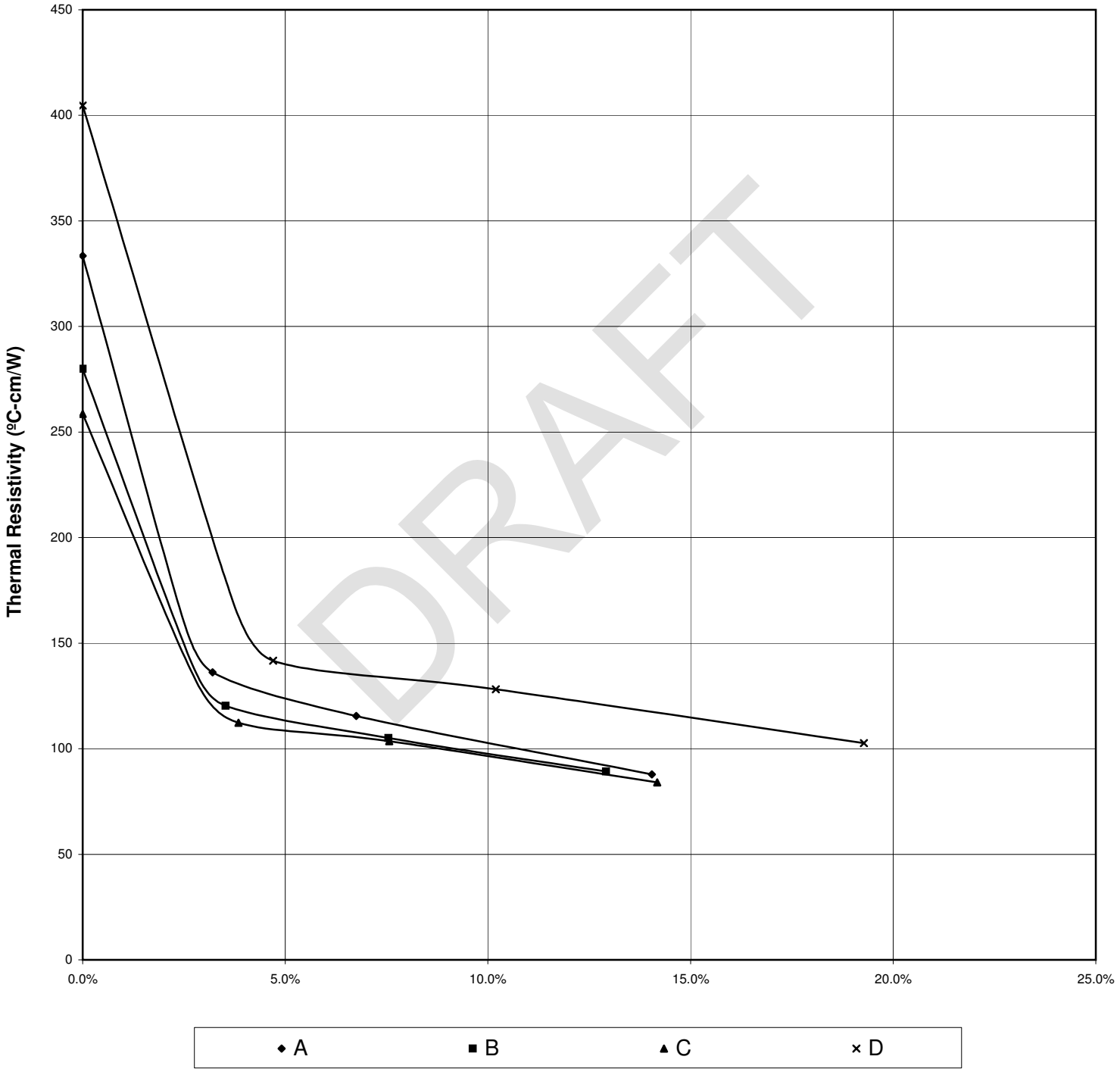
Thermal Resistivity Report ASTM D:5334

Project: Longboat Solar — Job: 9522

Client: Barr Engineering Company — Date: 8/29/14

	Boring	Sample		Boring	Sample
Specimen A:	Thermal 1		Specimen F:		
Specimen B:	Thermal 2		Specimen G:		
Specimen C:	Thermal 3		Specimen H:		
Specimen D:	Switch		Specimen I:		
Specimen E:			Specimen J:		

Thermal Dryout Curves (Resistivity vs. Water Content)



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2401 West 66th Street

SOIL ENGINEERING TESTING, INC.

Richfield, MN 55423

http://www.soilengineeringtesting.com

Thermal Resistivity Report ASTM D:5334

Project: **Longboat Solar** Job #: **9522**

Client: **Barr Engineering Company** Date: **8/29/14**

Boring	Sample	Location	Depth	Type	Classification	Initial Conditions			Dry
						Dry Density (PCF)	WC (%)	Thermal Resistivity (ºC-cm/W)	Thermal Resistivity (ºC-cm/W)
Thermal 1				**Bulk**	**Sand with silt, fine to medium grained (SP-SM)**	**97.2**	**14.0%**	**73**	**261**
Thermal 2				**Bulk**	**Silty Sand (SM)**	**98.0**	**13.2%**	**77**	**240**
Thermal 3				**Bulk**	**Silty Sand (SM)**	**98.8**	**14.3%**	**70**	**199**
Switch				**Bulk**	**Silty Sand (SM)**	**88.0**	**19.2%**	**88**	**333**
	Specimens reconstituted to approximately 90% of maximum standard proctor density near optimum moisture content.								

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http://www.soilengineeringtesting.com

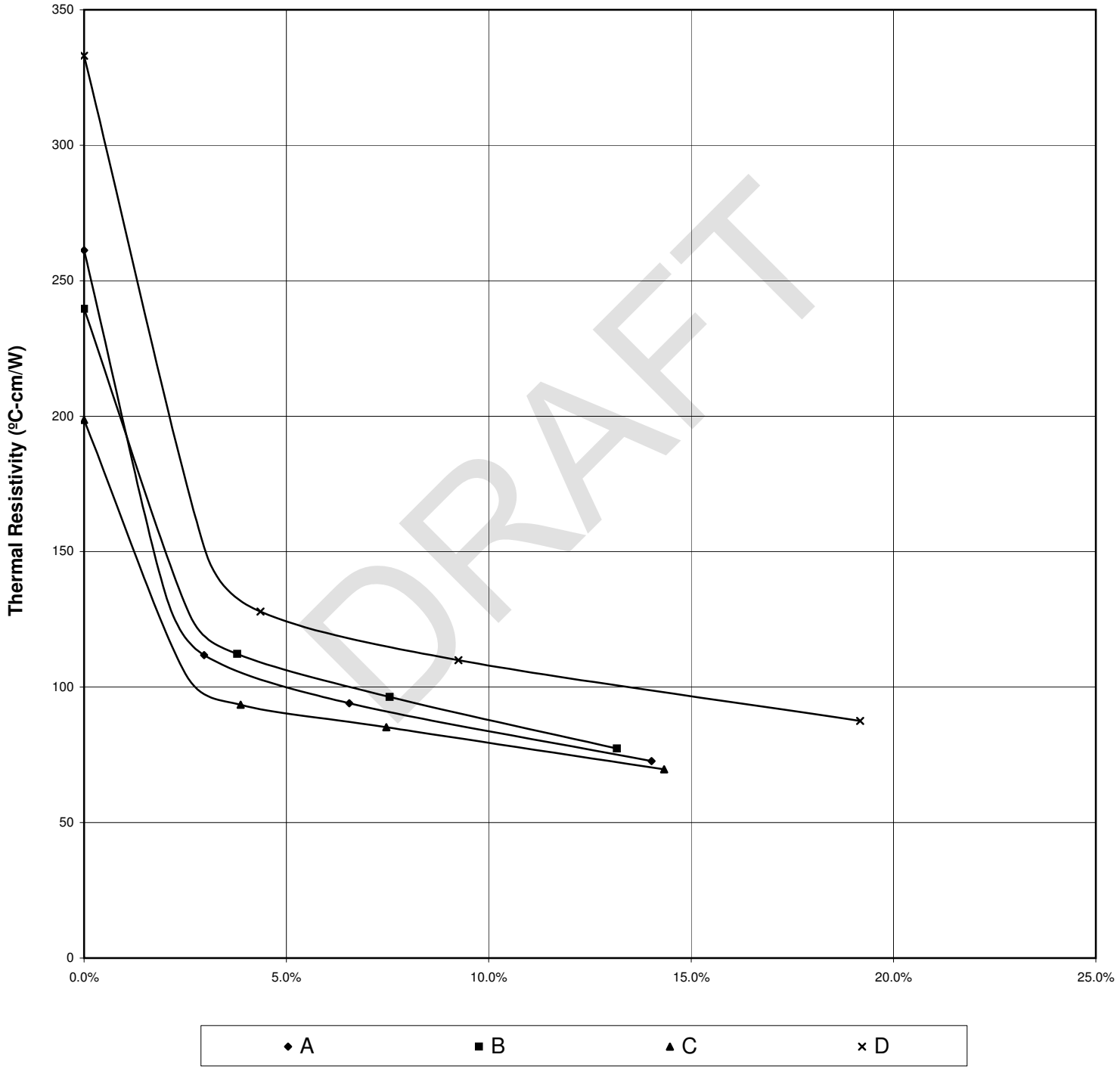
Thermal Resistivity Report ASTM D:5334

Project: Longboat Solar — Job: 9522

Client: Barr Engineering Company — Date: 8/29/14

	Boring	Sample		Boring	Sample
Specimen A:	Thermal 1		Specimen F:		
Specimen B:	Thermal 2		Specimen G:		
Specimen C:	Thermal 3		Specimen H:		
Specimen D:	Switch		Specimen I:		
Specimen E:			Specimen J:		

Thermal Dryout Curves (Resistivity vs. Water Content)



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Richfield, MN 55423

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Appendix G

General Site Photographs

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Existing site features – previously used irrigation infrastructure (east of TP-03)

Existing dry reservoir previously used for flood irrigation (west of TP-07)

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Existing dry reservoir used for flood irrigation (west of TP-07)

Southeast corner of site, probable flood protection berm (manure fill at right in photo)

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Southeast corner of site, manure and fine sand piles between south edge of site and river

Southeast corner of site –fine sand berm found along river

Switch: Looking southwest, loose surficial sand and native vegetation

Switch: Looking east, loose surficial sand and native vegetation

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Therm-01: Looking north, loose surficial sand and native vegetation

Therm-01: Looking southwest, loose surficial sand and native vegetation and trees

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Therm-02: Looking south, field covered with manure, existing debris

Therm-02: Close up of cobble encountered in test pit

Therm-03: Looking east, surficial soil in the southeast corner of site

Therm-03: Looking northwest, flood irrigation channels (bounded by vegetation)

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TP-01: Looking southwest, test pit excavation area

TP-01: Looking southwest, after test pit is backfilled

TP-02: Looking west, surficial sand and native vegetation

TP-02: Looking north, surficial sand and scattered vegetation

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TP-03: Looking north, surficial sand and native vegetation

TP-03: Looking east, surficial sand and native vegetation

DRAFT

TP-04: Looking south towards Mojave River, loose surficial sand and vegetation

TP-04: Looking northwest towards dry, existing reservoir for flood irrigation

DRAFT

TP-04: Silty to clayey fine-grained sand at depth of 3.0 feet

TP-04: Moist silty sand at depth of 8.0 feet

DRAFT

TP-05: Looking north, after backfilling test pit

TP-06: Looking west, surficial sand and scattered trees and vegetation

DRAFT

TP-06: Close up of surficial sand (no visible gravel)

TP-06: Looking north, loose surficial sand and scattered shrubs

DRAFT

TP-07: Looking north, loose surficial sand and native weeds

TP-07: Looking southeast, loose surficial sand and scattered trees and shrubs

DRAFT

TP-07: Close up of cemented sand at 5.0 feet

TP-07: Close up of cemented sand at 5.0 feet

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TP-08: Looking south towards Mojave River, loose surficial sand

TP-08: Looking northwest, loose surficial sand and sparse vegetation

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TP-08: Close up of trace gravel on ground surface near test pit

TP-09: Close up of alluvial gravel encountered between 6.0 to 8.5 feet

TP-09: Looking south, surficial sand is more dense in south east corner of site, sparse shrubs

TP-09: Looking north, surficial sand and vegetation

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TP-10: Looking northwest, surficial soil and scattered vegetation

TP-10: Looking south towards Mojave River, sparse vegetation and surficial sand

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TP-11: Looking northeast, manure spread over field

TP-11: Looking west, manure spread over field

DRAFT

TP-12: Looking west, manure spread over field, higher density vegetation

TP-12: Looking southeast, manure spread over field

DRAFT

TP-12: Spoils from test pit, trace alluvial gravel after 8.5 feet

TP-12: Close up of alluvial gravel and coarser sands at depth of 9.0 feet

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DRAFT