

# Groundwater Monitoring System

**CPS Energy Calaveras Power Station  
San Antonio, TX**

October 2017

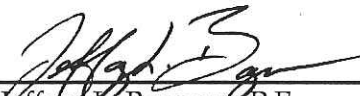
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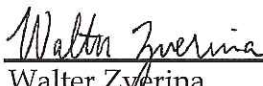
CPS Energy Calaveras Power Station

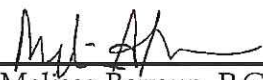
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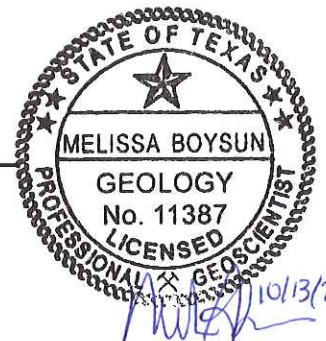
October 2017

Project No. 0366643

  
\_\_\_\_\_  
Jeffrey L. Bauguss, P.E.  
Partner-in-Charge

  
\_\_\_\_\_  
Walter Zverina  
Senior Consultant / Project Manager

  
\_\_\_\_\_  
Melissa Boysun, P.G.  
Project Geologist



**Environmental Resources Management**  
206 East 9<sup>th</sup> Street, Suite 1700  
Austin, TX 78701  
T: 512-459-4700  
F: 512-597-8368

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## **1.0 INTRODUCTION**

On behalf of CPS Energy, Environmental Resource Management Southwest, Inc. (ERM) conducted a characterization of the subsurface hydrogeology around existing Coal Combustible Residuals (CCR) Units associated with the Calaveras Power Station located southeast of San Antonio, in Bexar County, Texas. The hydrogeologic investigation was conducted to obtain site-specific technical data necessary to assess compliance with Title 40, Code of Federal Regulations, Part 257 (40 CFR Part 257) (a/k/a the “CCR Rule”).

## **2.0 BACKGROUND**

### **2.1 SITE DESCRIPTION**

CPS Energy owns and operates the Calaveras Power Station located southeast of San Antonio in Bexar County, Texas. Within this power station, two plants are coal fired plants (JT Deely Power Plant and JK Spruce Power Plant) that generate CCR that are subject to the CCR Rule. A general site location map is provided as **Figure 1**.

### **2.2 USEPA CCR RULE**

The USEPA published rules for the management of CCR generated from electric utilities. The CCR Rule specifies requirements for active and inactive surface impoundments and active piles and landfills that manage CCR.

CPS Energy has identified five onsite CCR Units:

1. Fly Ash Landfill;
2. Evaporation Pond;
3. Sludge Recycle Holding (SRH) Pond;
4. North Bottom Ash Pond (BAP); and
5. South BAP.

For the purposes of this investigation, the Fly Ash Landfill and the Evaporation Pond are termed the Northern CCR Units and the SRH Pond and BAPs are termed the Southern CCR Units.

This report presents site-specific data obtained by ERM that is intended to address the following CCR Rule requirements in the vicinity of the CCR Units:

**40 CFR §257.91 Groundwater monitoring systems.**

*“(a) Performance standard. The owner or operator of a CCR unit must install a groundwater monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer...”*

*“(b) The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information ...”*

### **3.0 SCOPE AND OBJECTIVES**

ERM conducted a phased investigation of the hydrogeology at the Calaveras Power Station (the final phase of which was contemporaneous with installation of the groundwater monitoring system) to identify the uppermost groundwater-bearing unit (i.e., aquifer, as described by the CCR Rule) and characterize the subsurface hydrogeology near the CCR Units which are subject to the CCR Rule. Specifically, the hydrogeologic investigation included:

#### Initial Evaluation

1. Measure groundwater elevations from existing monitor wells located in the vicinity of the Fly Ash Landfill and Evaporation Pond to evaluate preliminary groundwater flow direction;
2. Inspect existing wells located in the vicinity of the Fly Ash Landfill and Evaporation Pond for potential future use in CCR monitor well networks; and
3. Evaluate placement and construction requirements for future well installation activities to take place during Phase I activities.

#### Phase I: Hydrogeological Investigation

1. Advance soil borings to obtain lithologic and stratigraphic information about the underlying soil and the underlying groundwater-bearing unit;
2. Install monitor wells and measuring groundwater elevations to determine the apparent groundwater flow direction; and
3. Collect geotechnical information to assess the confining and/or semi-confining units above and below the uppermost groundwater-bearing unit.

#### Phase II: Hydrogeological Investigation and Installation of Groundwater Monitor Well Network

1. Confirm and further characterize the hydrogeologic information obtained during the Phase I hydrogeologic investigation in the vicinity of the Northern and Southern CCR Units;

2. Confirm the extent of the lower confining unit in the vicinity of the Northern CCR Units and the presence/extent of the semi-confining unit in the vicinity of the Southern CCR Units;
3. Measure additional site-wide groundwater flow direction data at each CCR Unit; and
4. Complete installation of groundwater monitor well networks at the Fly Ash Landfill, Evaporation Pond, and Southern CCR Units.

## 4.0 *METHODOLOGY*

### 4.1 *INITIAL EVALUATION*

An initial evaluation was conducted which included 1) collecting water level measurements to determine the depth to water and groundwater flow direction in proximity to the Northern CCR units; 2) inspecting selected wells to determine their viability/usability in a future groundwater monitoring network; and 3) evaluating the placement of the monitor well filter packs and screens relative to encountered groundwater-bearing zones.

The water levels in seven existing monitor wells in proximity to the Northern CCR units would suggest that the wells are screened in the same groundwater-bearing unit. As there is no detailed lithologic/hydrogeologic information from the previous well installations, it is unclear whether these water levels indicate confined or semi-confined conditions, or if there is a shallow water bearing unit that is not currently being monitored.

Three existing monitor wells (JKS-31, JKS-33, and JKS-36) were identified as potentially viable/useable in a future groundwater monitoring network (**Figure 2**). The screen lengths in all three monitor wells were 10 feet, which is an industry recognized standard length. The filter pack length in JKS-31 and JKS-33 is approximately 10 to 12 feet in length, which is consistent with industry standards. The filter pack in JKS-36 is reported to be approximately 45 to 50 feet in length.

### 4.2 *HYDROGEOLOGIC INVESTIGATION*

#### 4.2.1 *Soil Boring Installation and Monitor Well Completions*

Prior to initiating any subsurface disturbance activities, proposed boring locations were evaluated for the presence of any features (i.e., buried utilities/piping) in the subsurface. This subsurface clearance process included:

1. A review of available site drawings showing the location of buried utilities;
2. A site-walk of each boring location with CPS personal knowledgeable of known and potential subsurface assets;

3. Geophysical clearance using a third party line locator. Geophysical clearance was performed by Ground Penetrating Radar Systems, Inc. on February 29, 2016 and on August 24, 2016; and
4. Manual clearance of each boring location to visually confirm that no subsurface utilities were present by using a high-pressure water sprayer and an air vacuum (hydro-excavation) to remove soil to a depth of 5 feet below ground surface (bgs). Hydro-excavation activities were conducted by Best Drilling Services, Inc. on March 1, 2016 and August 29 – September 2, 2016.

ERM subcontracted Strata Core Services, LLC (Strata Core) to advance soil borings and install groundwater monitor wells using a hollow-stem auger (HSA) drill rig. Drilling and well installation were completed by Strata Core under the supervision of an ERM geologist from April 4-8, 2016 and September 1-12, 2016. An ERM geologist visually classified the stratigraphic column at each soil boring location. ERM boring logs, based on visual field-classification of geologic materials, are provided in **Appendix A**.

#### Phase I - April 2016

The investigation included the advancement of three (3) soil borings within a 100- to 200-foot distance from the Northern CCR Units and the advancement of four (4) soil borings within a 100-to 200-foot distance from the Southern CCR Units (**Figure 2**). The seven (7) soil borings were installed to address the lack of lithologic/hydrogeologic information in the vicinity of the Northern and Southern CCR Units.

Around the Northern CCR Units, three soil borings (JKS-45, JKS-46, and JKS-47) were initially advanced to depths corresponding to water levels measured in existing monitor wells during the initial evaluation in August 2015 (approximately 25 to 35 feet bgs). Groundwater was encountered in JKS-46 and JKS-47 at similar depths; however, groundwater was encountered in JKS-45 at a deeper depth (approximately 45 feet bgs). At the initial soil boring in the northern area (JKS-45), the top of the uppermost aquifer and an underlying confining/semi-confining unit were identified, then a monitor well was installed. In subsequent soil borings, a monitor well was installed once the top of the uppermost aquifer was identified.

Around the Southern CCR Units, four soil borings (JKS-48, JKS-49, JKS-50, and JKS-51) were advanced until a groundwater-bearing unit was encountered. An underlying confining/semi-confining unit was not encountered in the southern area. Each soil boring was terminated when bedrock was encountered.

#### Phase II - September 2016

The investigation included the advancement of eight (8) soil borings within a 100- to 200-foot distance from the Northern CCR Units and the advancement of six (6) soil borings within a 100-to 200-foot distance from the Southern CCR Units (**Figure 2**). The fourteen (14) additional soil borings were installed to confirm

and further characterize the lithologic/hydrogeologic information obtained during Phase I of the hydrogeologic investigation, and to complete the monitoring well networks in the Northern and Southern CCR Units.

Around the Northern CCR Units, eight soil borings (JKS-57, JKS-58, JKS-59, JKS-60, JKS-61, JKS-62, JKS-63, JKS-64) were initially advanced to depths corresponding to water levels measured in existing monitor wells during an August 2016 groundwater gauging event (approximately 15-30 feet bgs for the Fly Ash Landfill, and approximately 25-30 feet bgs for the Evaporation Pond). Groundwater was encountered at similar depths in all borings, with the exception of JKS-57 where groundwater was not initially observed during well installation, and JKS-63 where groundwater was encountered at 38 feet bgs (due to its higher topographic elevation). After JKS-57 was allowed to equilibrate, groundwater was observed at a similar depth as the other monitor wells.

Around the Southern CCR Units, six soil borings (JKS-50R, JKS-52, JKS-53, JKS-54, JKS-55, JKS-56) were initially advanced to depths corresponding either to where bedrock was encountered during Phase I activities (15-30 feet bgs) or the presence of groundwater. JKS-50, installed during the initial investigation, was plugged and abandoned and JKS-50R was re-installed in its place.

#### Well Construction

Monitor wells were constructed of 2-inch diameter PVC casing with 0.010-inch slotted well-screen. Screen lengths were installed based on the thickness of the encountered groundwater-bearing unit, and ranged from 7.5 feet to 15 feet during Phase I of the hydrogeologic investigation and 10 feet to 20 feet during Phase II. The borehole annulus around the well screen was backfilled one to two feet above the top of the well-screen with 20/40 silica sand filter pack, and the remaining borehole annulus was backfilled with 3/8-inch bentonite pellets up to the ground surface. Soil boring logs, well completion logs, and state well reports are provided in **Appendix A**.

Phase I and Phase II wells were completed with a concrete pad at ground surface. With the exception of JKS-52, all wells were completed above ground surface with a protective steel casing, extending several feet above grade. JKS-52, which was drilled in the middle of a berm roadway, was completed as flush mount well in a sub-grade steel vault.

#### 4.2.2

#### *Geotechnical Testing*

Once an underlying confining/semi-confining unit had been encountered in the northern and Southern CCR Units, undisturbed samples were collected by advancing Shelby tubes into the underlying units (i.e., clay and clayey units) to document the bulk density, hydraulic conductivity, specific gravity, Atterberg limits, and grain size distribution of the materials in these units. The geotechnical results will aid in the evaluation of whether these confining/semi-confining units can affect the downward vertical migration of CCR. In addition, grab samples were collected from representative materials overlying the

confining/semi-confining unit to document the Atterberg limits and grain size distribution. Samples were containerized, labeled, and transported to the HTS, Inc. Consultants (HTS) laboratory in Houston, Texas. A summary of the geotechnical testing results is provided in **Table 1**. HTS laboratory test results are provided in **Appendix B**.

#### 4.2.3 *Surveying*

To better define the water levels and the groundwater flow direction in the vicinity of the Northern CCR Units, the top of casing and ground surface of three monitor wells (JKS-31, JKS-33, and JKS-36) within the existing groundwater monitoring network were surveyed. In addition, the top of casing and ground surface elevations of the 21 newly installed monitor wells were surveyed by a land surveyor. Monitor well survey data are summarized in **Table 2**.

## 5.0 **INVESTIGATION RESULTS**

### 5.1 **SITE-WIDE GEOLOGY**

According to the Bureau of Economic Geology (BEG) Geologic Atlas of Texas San Antonio Sheet<sup>1</sup>, the geology in the area of Calaveras Power Station consists of the Carizzo Sand and the Wilcox Group. According to the United States Geological Survey, the Carizzo Sand consists of medium to coarse grained sandstone, with finer grained material towards the top of the formation<sup>2</sup>. The Wilcox Group consists mostly of mudstone, with various amounts of sandstone, lignite, ironstone concretions, and is glauconitic<sup>3</sup>. The surface topography of Calaveras Power Station slopes in multiple directions towards Calaveras Lake. Generally, the topography in the northern and southern area slopes towards the southeast.

ERM constructed cross sections of the subsurface lithology/stratigraphy in the vicinities of the Northern CCR Units and the Southern CCR Units using data from the newly installed borings (**Appendix A**). Cross section transects are shown in **Figure 3**.

- Cross section A-A' (**Figure 4A**), B-B' (**Figure 4B**), and C-C' (**Figure 4C**) reflect subsurface lithology/stratigraphy in the vicinity of the Northern CCR Units; and
- Cross section D-D' (**Figure 4D**), E-E' (**Figure 4E**), and F-F' (**Figure 4F**) reflect subsurface lithology/stratigraphy in the vicinity of the Southern CCR Units.

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<sup>1</sup> Bureau of Economic Geology. 1974, revised 1982. *Geologic Atlas of Texas, San Antonio Sheet*. Bureau of Economic Geology, University of Texas at Austin.

<sup>2</sup> Eargle, D.H. 1968. *Nomenclature of Formations of Claiborne Group, Middle Eocene, Coastal Plain of Texas*. U.S. Geological Survey Bulletin 1251-D.

<sup>3</sup> United States Geological Survey. 2016. *Wilcox Group, undivided*. U.S. Geological Survey Mineral Resources On-line Spatial Data. July 25, 2016. <http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=TXEOPNwi:0>.

### 5.1.1

#### *Northern CCR Units*

The stratigraphic sequence is generally characterized by approximately 8 feet to 32 feet of unconsolidated material (sands, silts, and low to medium plasticity clays), underlain by a clayey/silty to well-sorted sand (groundwater-bearing unit) approximately 5 to over 25 feet thick, underlain by grey to brown, high plasticity clay (lower confining unit). The ground water bearing unit is at its greatest observed thickness near the southwest corner of the Evaporation Pond, and thins towards the northwest (northwest of the Fly Ash Landfill). The lower confining unit (generally observed at a depth between approximately 471 feet to 478 feet above mean sea level) was not observed at monitor wells JKS-47 and JKS-60 (drilled to depths of 462 feet and 466 feet above mean sea level, respectively). This possibly suggests the presence of erosional channels or gradational changes in lithology between JKS-45 and JKS-47, and JKS-46 and JKS-60. Interbedded sands and clays were observed within both the unconsolidated material and ground water bearing unit in monitor wells JKS-57, JKS-58, and JKS-61 through JKS-64. A high plasticity clay interval was observed above the groundwater-bearing unit at monitor well JKS-45, but appears to be discontinuous as it was not encountered during the installation of any other monitor wells in the vicinity of the Northern CCR Units.

Visual classifications of the geologic materials described above are consistent with results from the soil materials testing analysis conducted by HTS for samples collected at JKS-45, JKS-58, JKS-62, and JKS-64. The laboratory USCS results classify the high plasticity clay unit (above the groundwater-bearing unit) and the lower confining unit as fat clay (CH). Sandy lean clay (CL) and clayey sand (SC) USCS results from JKS-58 and JKS-62, respectively, suggest that the contact between the groundwater bearing unit and lower confining unit is gradational in some areas. The laboratory USCS results classify the groundwater-bearing unit from a silty sand (SM) at JKS-45 to a clayey sand (SC) at JKS-64. Hydraulic conductivities from cohesive samples collected from the lower confining unit were reported on the order of  $10^{-7}$  to  $10^{-8}$  centimeters per second (cm/sec), which is within the range of values for clay<sup>4</sup>. A summary of the geotechnical testing results is provided in **Table 1**. HTS laboratory test results are provided in **Appendix B**.

### 5.1.2

#### *Southern CCR Units*

The stratigraphic sequence is generally characterized by approximately 6 feet to 18 feet of unconsolidated material (sands, silts, and low to medium plasticity clays), underlain by clayey/silty sand to moderately-sorted sand (groundwater-bearing unit) approximately 9.5 to 21.5 feet thick, underlain by bedrock (sandstone). Discontinuous silts and interbedded clay material were observed within the groundwater-bearing unit in monitor wells JKS-48, JKS-49, and JKS-51 through JKS-55.

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<sup>4</sup> Freeze, R. A., and J. A. Cherry. 1979. *Groundwater*. Prentice-Hall, Inc. Englewood Cliffs, N.J.



Visual classifications of the geologic materials described above are consistent with results from the soil materials testing analysis conducted by HTS for samples collected at JKS-48, JKS-53, and JKS-54. The laboratory USCS results classify the groundwater-bearing unit from a silty clayey sand (SC-SM) at JKS-54 to a clayey sand (SC) at JKS-48 and JKS-53. Hydraulic conductivities from cohesive samples collected from the lower confining unit were reported on the order of  $10^{-6}$  to  $10^{-8}$  (cm/sec). A summary of the geotechnical testing results is provided in **Table 1**. HTS laboratory test results are provided in **Appendix B**.

## 5.2 *SITE-WIDE HYDROGEOLOGY*

Based on water level measurements collected on December 6, 2016, ERM constructed potentiometric surface maps in the vicinities of the Northern CCR Units and the Southern CCR Units (**Figures 5A** and **5B**). In addition, based on water level measurements and stratigraphic information collected during the advancement of the soil borings, ERM has provided an interpretation of the confining nature of the underlying stratigraphy.

### 5.2.1 *Northern CCR Units*

Groundwater in the vicinity of the Fly Ash Landfill and the Evaporation Pond appears to flow towards Lake Calaveras (southeast to east). Groundwater elevation data is summarized in **Table 2**.

The groundwater-bearing unit in the vicinity of the Northern CCR Units appears to exhibit unconfined conditions based on the potentiometric surface of groundwater in relation to the first encountered water during drilling and the lack of continuous confining units (i.e., clay, sandy clay, or silty clay). As shown on Cross Sections A-A' through C-C' (**Figure 4A** through **4C**) and indicated on the boring logs, the potentiometric surface is within approximately three feet of the first water encountered during drilling, and no continuous confining units are observed. The minimal change in elevation and the stratigraphic information indicates that a significant, laterally continuous confining layer is not present above the groundwater-bearing unit in the northern area. However, a laterally continuous lower confining unit was observed in multiple borings below the groundwater bearing unit.

### 5.2.2 *Southern CCR Units*

The groundwater flow in the vicinity of the Southern CCR Units is radial toward the lake and adjacent channel and away from a groundwater high represented by the water level elevation measured in JKS-49. Groundwater elevation data is summarized in **Table 2**.

The groundwater-bearing unit in the vicinity of the Southern CCR Units appears to exhibit semi-confined conditions with confining units (i.e., clay, sandy clay, or silty clay) present in all the wells except JKS-49 and JKS-56. As shown on Cross Sections D-D' through F-F' (**Figure 4D** through **4F**) and indicated on the boring logs, the potentiometric surface is within approximately 4 feet to 11 feet of where water was first encountered during drilling for all wells except JKS-56, indicative

of groundwater under hydraulic head pressure with semi-confined conditions. JKS-56 appears to demonstrate unconfined conditions, due to the approximately 0.5 foot difference between the first encountered water during drilling and the potentiometric surface. As shown on Cross Section D-D' and E-E' (Figures 4D and 4E, respectively), and indicated on the boring logs, there is a bedrock unit underlying the groundwater-bearing unit in the southern area.

Three surface water elevations were measured on Calaveras Lake in April 2016 to understand the potentiometric relationship of the lake water levels and the groundwater elevations in the Southern CCR Units monitor wells. In general, lake surface water elevations are comparable to groundwater elevations measured within the monitor well closest to the lake. Surface water elevation data is also summarized in Table 2.

## 6.0

### CCR UNIT MONITOR WELL NETWORKS

According to the CCR Rule, the groundwater monitoring system requires that wells be installed both upgradient from each CCR Unit (to establish background concentrations of the constituents listed in Appendix III and IV of the CCR Rule), and downgradient from each CCR Unit to detect potential releases. Due to the horizontal distance between the Fly Ash Landfill and the Evaporation Pond, and the differing groundwater flow directions, the two Northern CCR Units require separate monitor well networks. Even though the SRH Pond and the BAPs are in close proximity, two separate monitor well networks will be used to monitor the groundwater in the vicinity of these two Southern CCR Units. ERM developed the monitor well networks utilizing one to three upgradient wells and at least three or more downgradient wells.

The locations for groundwater monitor well networks at the Northern and Southern CCR Units are shown in Figure 2, and the respective well functions are as follows:

#### Fly Ash Landfill Monitor Well Network

Well ID	Well Function	Comment
JKS-45	Background Monitoring	Collect sample and measure water elevation
JKS-57	Background Monitoring	Collect sample and measure water elevation
JKS-31	Downgradient Monitoring	Collect sample and measure water elevation
JKS-33	Downgradient Monitoring	Collect sample and measure water elevation
JKS-46	Downgradient Monitoring	Collect sample and measure water elevation
JKS-60	Downgradient Monitoring	Collect sample and measure water elevation
JKS-58	Groundwater Observation	Measure water elevation only
JKS-59	Groundwater Observation	Measure water elevation only

### Evaporation Pond Monitor Well Network

<b>Well ID</b>	<b>Well Function</b>	<b>Comment</b>
JKS-47	<i>Background Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-63	<i>Background Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-64	<i>Background Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-36	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-61	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-62	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>

### SRH Pond Monitor Well Network

<b>Well ID</b>	<b>Well Function</b>	<b>Comment</b>
JKS-51	<i>Background Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-52	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-53	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-54	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>

### BAPs Monitor Well Network

<b>Well ID</b>	<b>Well Function</b>	<b>Comment</b>
JKS-49	<i>Background Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-48	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-50R	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-52	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-55	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>
JKS-56	<i>Downgradient Monitoring</i>	<i>Collect sample and measure water elevation</i>

## 7.0

### CONCLUSIONS

1. The groundwater flow in the vicinity of the Fly Ash Landfill and Evaporation Pond is generally to the southeast to east, towards the lake.
2. The groundwater-bearing unit in the vicinity of the Northern CCR Units appears to exhibit unconfined conditions and is underlain by a lower confining unit.
3. The groundwater flow in the vicinity of the Southern CCR Units is radial toward the lake and adjacent channel.
4. The groundwater-bearing unit in the vicinity of the Southern CCR Units appears to exhibit semi-confined conditions and is underlain by bedrock (sandstone).
5. Lake surface water elevations are comparable to groundwater elevations measured within the monitor well closest to the lake and channel.

6. The following groundwater monitoring systems, installed for each CCR Unit at the Calaveras Power Station, meets the groundwater monitoring system requirements specified in the CCR Rule:
  - Fly Ash Landfill Unit: 2 background wells; 4 downgradient wells; 2 observation wells
  - Evaporation Pond Unit: 3 background wells; 3 downgradient wells
  - SRH Pond: 1 background well; 3 downgradient wells
  - BAPs: 1 background well; 5 downgradient wells
7. Certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of 40 C.F.R. Part 257.91 is provided in **Appendix C**.

# Tables

TABLE 1  
Geotechnical Testing Results Summary

CPS Energy  
Calaveras Power Station

Well ID	Depth (feet bgs)	USCS Description	Moisture (%)	Density (pcf)	Atterberg Liquid Limit (%)	Atterberg Plastic Limit (%)	Atterberg Plastic Index (%)	Particle Size	Hydraulic Conductivity (cm/sec)	Specific Gravity
			ASTM D2487	ASTM D2216	ASTM D2937	ASTM D4318	ASTM D4318		ASTM D4318	ASTM D421/D422
JKS-45	28-30	Fat Clay (CH)	24.3	--	61	22	39	91.6	-	-
JKS-45	36-38	Fat Clay (CH)	19.0	--	67	24	43	90.5	-	-
JKS-45	50-52	Silty Sand (SM)	18.0	--	Non Plastic	Non Plastic	Non Plastic	12.6	-	-
JKS-45	55-57	Fat Clay (CH)	27.9	--	75	28	47	97.0	-	-
JKS-45	60-62	Fat Clay (CH)	22.6	120.9	75	26	49	86.4	1.82E-08	2.696
JKS-48	10-12.5	Clayey Sand (SC)	20.5	--	35	16	19	44.6	-	-
JKS-48	15-16.5	Sandy Lean Clay (CL)	19.1	--	48	19	29	58.9	-	-
JKS-48	19-20	Clayey Sand (SC)	25.2	--	26	16	10	48.7	-	-
JKS-53	10-12.5	Clayey Sand (SC)	24.2	101.8	30	14	16	35.9	5.34E-06	2.68
JKS-53	12.5-15	Clayey Sand (SC)	23.6	97.1	29	15	14	48.8	4.13E-08	2.68
JKS-53	20-21	Clayey Sand (SC)	29.5	--	27	14	13	37.6	--	--
JKS-54	13-14	Silty Clayey Sand (SC-SM)	25.5	--	22	15	7	33.5	--	--
JKS-58	26-27	Sandy Lean Clay (CL)	22.7	--	38	18	20	50.9	--	--
JKS-58	30-32.5	Fat Clay (CH)	20.3	100.0	57	20	37	89.1	1.53E-07	2.72
JKS-62	35-37	Clayey Sand (SC)	18.4	93.8	38	17	21	32.3	6.63E-07	2.68
JKS-64	20-30	Clayey Sand (SC)	28.6	--	29	14	15	30.1	--	--

NOTES:

feet bgs = feet below ground surface  
USCS = Unified Soil Classification System  
pcf = pounds per cubic foot  
cm/sec = centimeters per second  
-- = Not analyzed for this parameter  
All analyses performed by HTS, Inc. Consultants.

TABLE 2

Well Survey and Water Levels Summary  
CPS Energy  
Calaveras Power Station

Monitor Well Survey Data						Groundwater Elevation									
Well ID	Northing (US Survey Feet)	Easting (US Survey Feet)	TOC Elevation (feet MSL)	Ground Surface Elevation (feet MSL)	Casing Height (feet)	05/31/16		08/03/16		09/21/16		10/28/16		12/06/16	
						DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE
						(feet BTOC)	(feet MSL)	(feet BTOC)	(feet MSL)	(feet BTOC)	(feet MSL)	(feet BTOC)	(feet MSL)	(feet BTOC)	(feet MSL)
<b>Fly Ash Landfill</b>															
JKS-31	13666796.23	2187611.68	507.45	505.27	2.18	27.25	480.20	27.53	479.92	26.89	480.56	27.60	479.85	27.01	480.44
JKS-33	13666778.96	2188466.98	498.71	497.77	0.94	--	--	--	--	--	--	--	--	18.03	480.68
JKS-45	13667132.78	2186615.40	531.46	528.31	3.15	47.19	484.27	47.15	484.31	47.01	484.45	47.07	484.39	46.83	484.63
JKS-46	13667810.11	2187972.31	499.08	495.75	3.33	19.38	479.70	17.87	481.21	17.55	481.53	18.51	480.57	17.61	481.47
JKS-57	13668235.72	2187486.38	506.91	503.83	3.08	--	--	--	--	20.07	486.84	20.71	486.20	19.89	487.02
JKS-58	13667994.99	2187797.39	504.45	500.94	3.51	--	--	--	--	21.09	483.36	19.41	485.04	18.85	485.60
JKS-59	13667779.88	2188352.07	496.45	493.53	2.92	--	--	--	--	15.49	480.96	16.84	479.61	15.67	480.78
JKS-60	13667357.02	2188465.44	495.70	492.68	3.02	--	--	--	--	17.40	478.30	17.57	478.13	17.15	478.55
<b>Evaporation Pond</b>															
JKS-36	13666288.91	2187227.29	508.41	506.95	1.46	26.38	482.03	26.45	481.96	26.24	482.17	26.46	481.95	25.99	482.42
JKS-47	13665709.79	2186503.87	513.63	510.28	3.35	31.37	482.26	30.39	483.24	31.16	482.47	31.24	482.39	30.98	482.65
JKS-61	13665721.04	2187196.65	505.51	502.52	2.99	--	--	--	--	24.46	481.05	24.30	481.21	23.95	481.56
JKS-62	13666020.13	2187153.88	509.84	506.71	3.13	--	--	--	--	28.90	480.94	28.90	480.94	28.63	481.21
JKS-63	13666230.86	2186553.38	526.86	523.55	3.31	--	--	--	--	44.70	482.16	44.75	482.11	44.45	482.41
JKS-64	13665627.14	2186778.76	507.84	504.38	3.46	--	--	--	--	25.06	482.78	25.12	482.72	24.98	482.86
<b>SRH Pond</b>															
JKS-51	13660243.53	2185630.39	496.92	494.04	2.88	10.56	486.36	11.04	485.88	10.61	486.31	11.16	485.76	10.76	486.16
JKS-52	13659683.26	2186139.05	493.15	493.56	-0.41	--	--	--	--	7.30	485.85	7.64	485.51	7.53	485.62
JKS-53	13659757.34	2185892.80	494.74	491.33	3.41	--	--	--	--	8.50	486.24	8.91	485.83	7.70	487.04
JKS-54	13659753.34	2185641.96	496.40	492.69	3.71	--	--	--	--	10.79	485.61	11.28	485.12	10.19	486.21
<b>Bottom Ash Ponds</b>															
JKS-48	13659658.78	2186490.78	497.19	493.71	3.48	11.28	485.91	11.69	485.50	11.70	485.49	12.22	484.97	11.47	485.72
JKS-49	13660519.40	2186229.15	498.63	495.17	3.46	9.32	489.31	12.37	486.26	11.61	487.02	12.60	486.03	8.81	489.82
JKS-50	13660122.87	2186836.72	498.20	494.87	3.33	11.76	486.44	DRY	DRY	P&A	--	P&A	--	P&A	--
JKS-50R	13660149.90	2186841.92	498.48	494.96	3.52	--	--	--	--	12.67	485.81	13.61	484.87	12.50	485.98
JKS-55	13659749.75	2186840.46	493.81	490.13	3.68	--	--	--	--	8.36	485.45	9.10	484.71	8.15	485.66
JKS-56	13660382.47	2186847.61	496.66	493.07	3.59	--	--	--	--	11.20	485.46	11.87	484.79	11.12	485.54

Surface Water Location	Northing (US Survey Feet)	Easting (US Survey Feet)	Surface Water Elevation (feet MSL)
SWA-1 (Southeast of JKS-48)	13659530.02	2186591.55	484.97
SWA-2 (West of JKS-48)	13659654.68	2185974.38	485.08
SWB-1 (East-Northeast of JKS-49)	13660737.32	2186922.00	484.91

NOTES:

TOC = top of casing

feet MSL = feet above mean sea level

feet BTOC = feet below top of casing

DTW = depth to water

GWE = groundwater elevation

P&A = JKS-50 was plugged and abandoned on 09/09/16

Surface water survey elevations collected on 5/31/16.

Surveying performed by Pape-Dawson Engineers, Inc. using NAD 83 State Plane Coordinates 4204 Texas South Central (NAVD88 computed using GEOID 03).



# Figures



# Environmental Resources Management





DESIGN:	NH	DRAWN:	EFC	CHKD.:	WZ
DATE:	7/25/2016	SCALE:	AS SHOWN	REVISION:	1
W.O.NO.:	K:\GIS\CPS\Calaveras\MXD\0337367_CPSCalaveras_SiteLoc.mxd				

FIGURE 1  
 GENERAL SITE LOCATION MAP  
 CPS Energy - Calaveras Power Station  
 San Antonio, Texas





**Legend**

-  Background Monitor Well
-  Downgradient Monitor Well
-  Groundwater Elevation Observation Well
-  CCR Unit



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 NOAA, Increment P, Corp.

# Environmental Resources Management

**FIGURE 2**  
**CCR WELL NETWORK LOCATION MAP**






CPS Energy - Calaveras Power Station  
 San Antonio, Texas

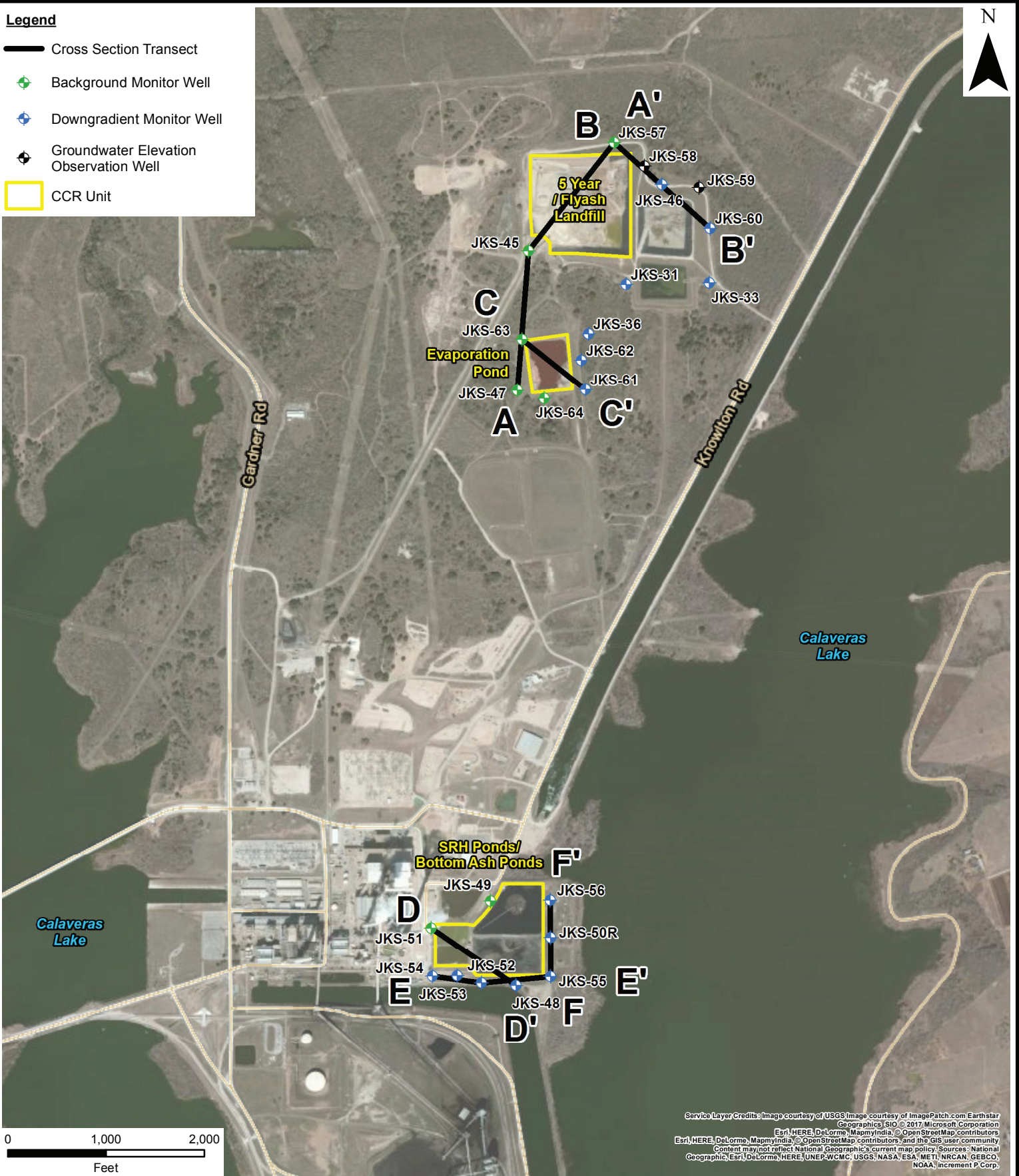


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**Legend**

-  Cross Section Transect
-  Background Monitor Well
-  Downgradient Monitor Well
-  Groundwater Elevation Observation Well
-  CCR Unit



# Environmental Resources Management

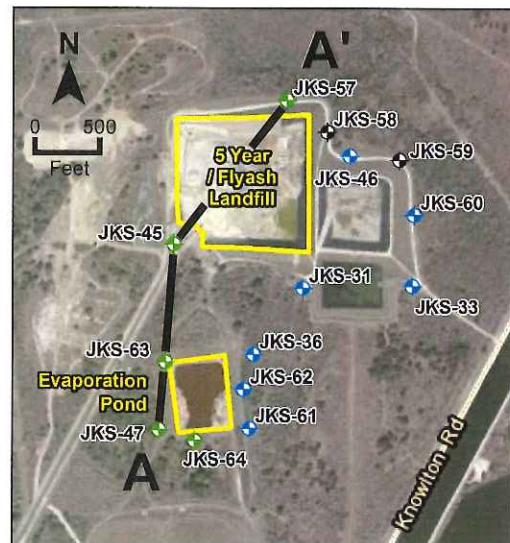
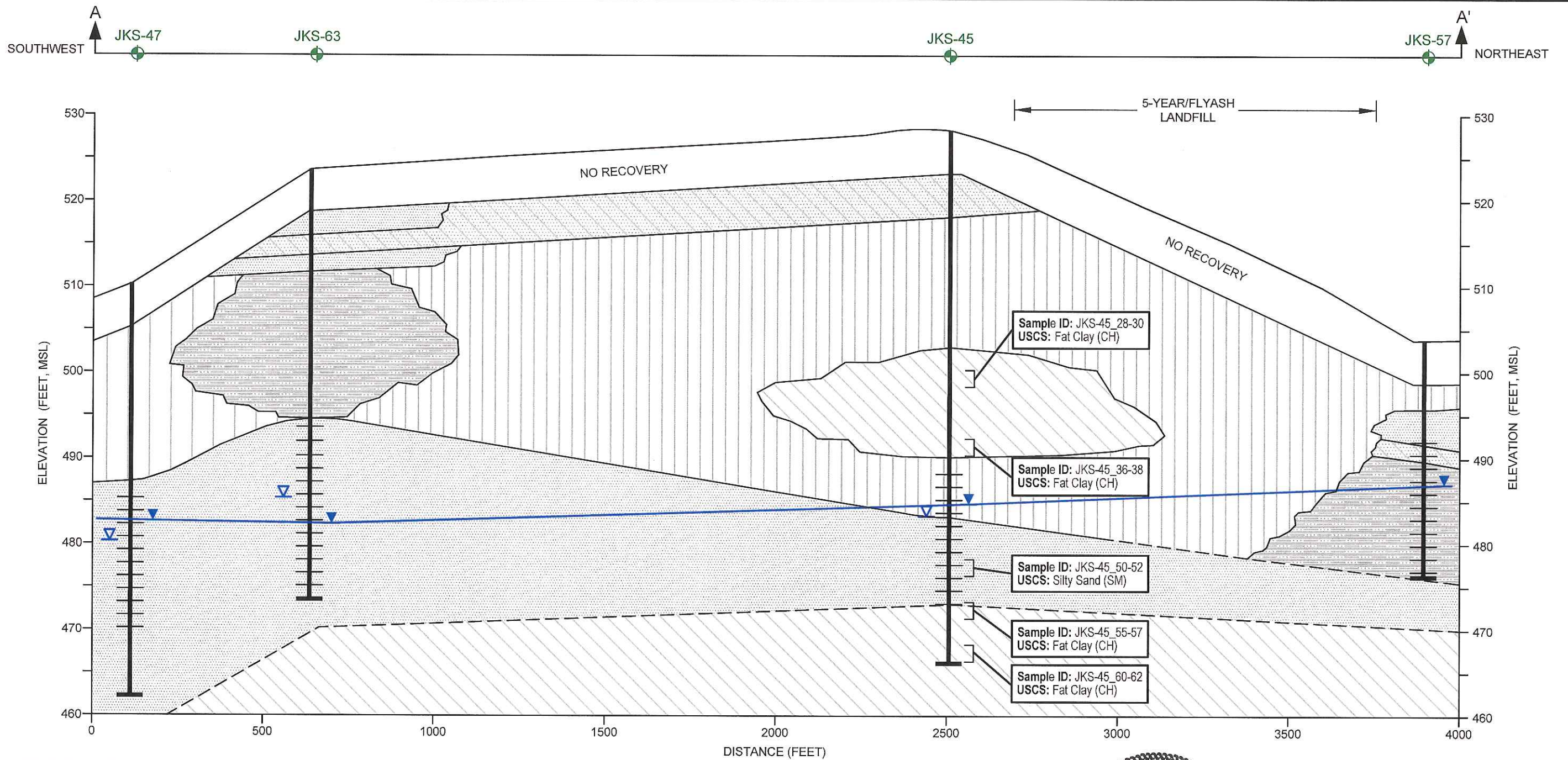
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FIGURE 3  
STRATIGRAPHIC CROSS SECTION  
TRANSECT MAP

CPS Energy - Calaveras Power Station  
San Antonio, Texas





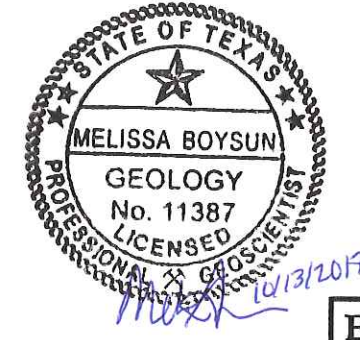


- SAND, SILTY SAND, AND/OR CLAYEY SAND
- SILT, SANDY SILT, AND/OR CLAYEY SILT
- LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
- HIGH PLASTICITY CLAY
- INTERBEDDED SAND, AND CLAY

- LEGEND**
- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 6, 2016)
  - INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION
  - MONITOR WELL (SCREENED INTERVAL DASHED)
  - BACKGROUND MONITOR WELL

**SOIL TEST DATA KEY**

Sample ID  
USCS Soil Classification



- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.

**Environmental Resources Management**

Figure 4A  
Stratigraphic Cross Section A-A'

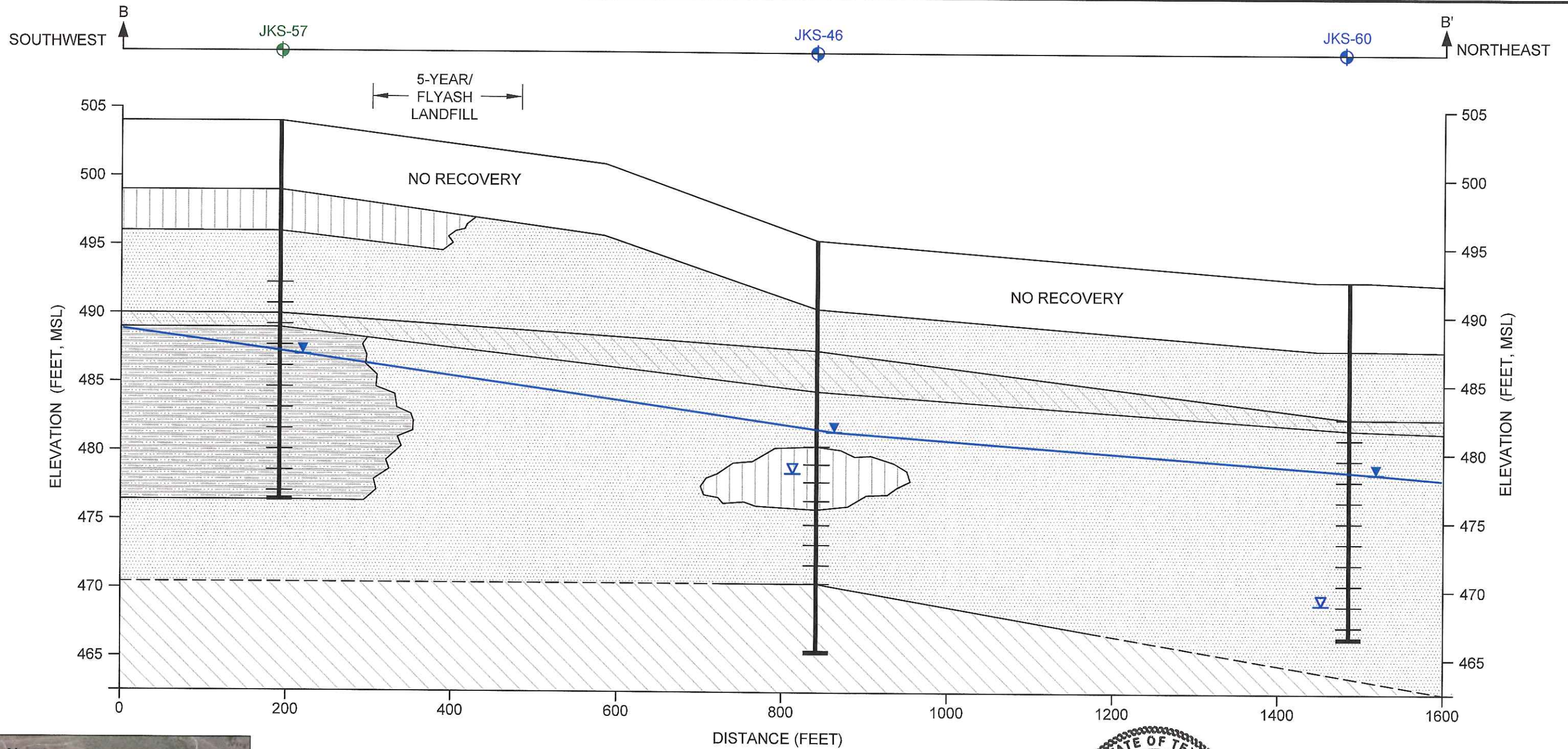
CPS Energy - Calaveras Power Station  
San Antonio, Texas

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- SAND, SILTY SAND, AND/OR CLAYEY SAND
- SILT, SANDY SILT, AND/OR CLAYEY SILT
- LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
- HIGH PLASTICITY CLAY
- INTERBEDDED SAND, AND CLAY

- LEGEND**
- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 6, 2016)
  - INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION

- MONITOR WELL (SCREENED INTERVAL DASHED)
- DOWNGRADIENT MONITOR WELL
- BACKGROUND MONITOR WELL



- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.

**Environmental Resources Management**

Figure 4B  
Stratigraphic Cross Section B-B'  
CPS Energy - Calaveras Power Station  
San Antonio, Texas

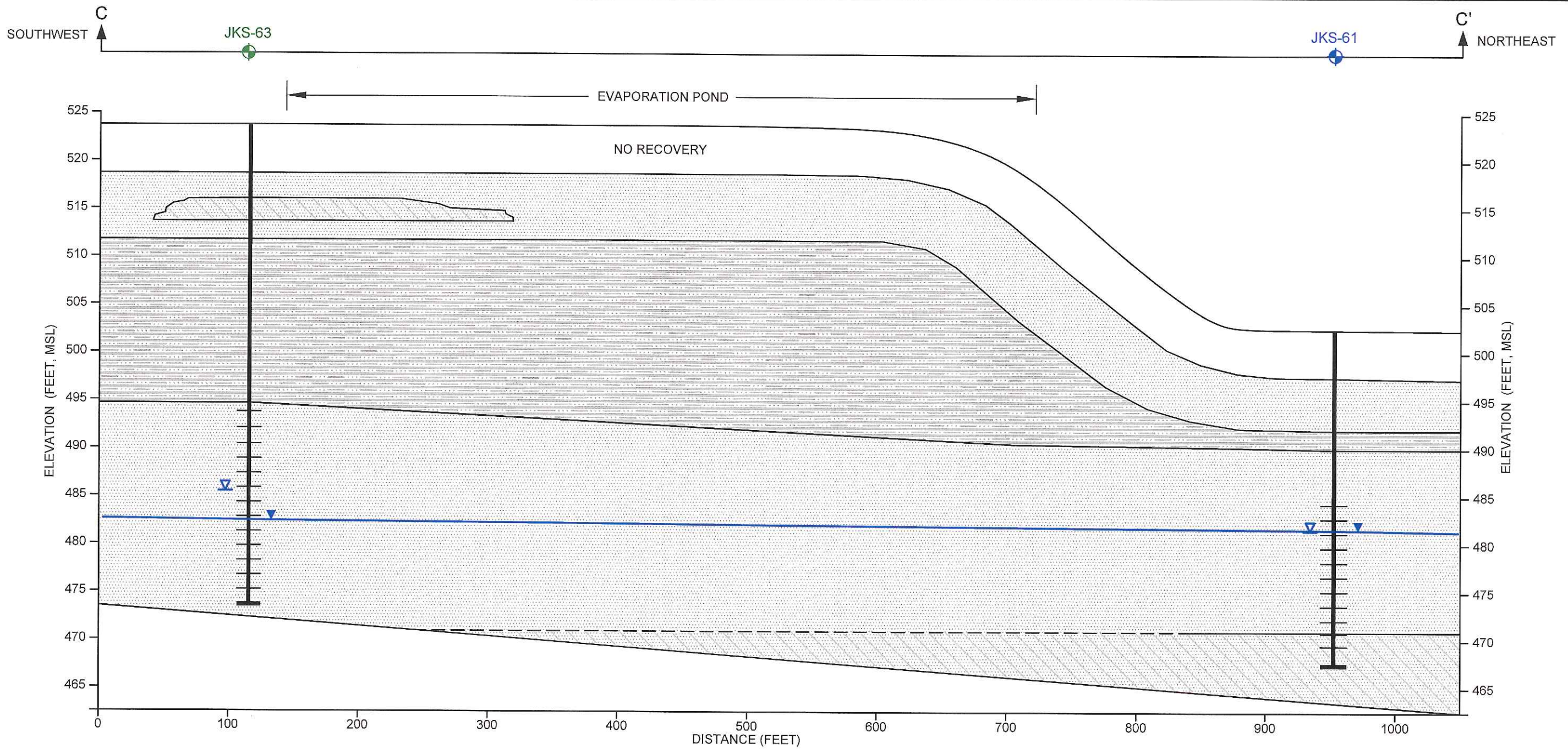
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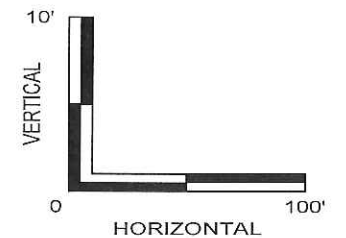
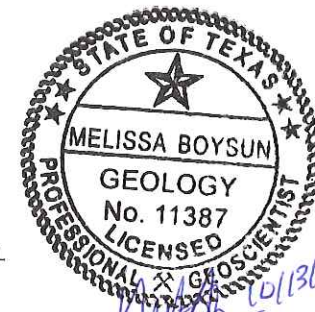




- LEGEND**
- SAND, SILTY SAND, AND/OR CLAYEY SAND
  - SILT, SANDY SILT, AND/OR CLAYEY SILT
  - LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
  - HIGH PLASTICITY CLAY
  - INTERBEDDED SAND, AND CLAY

- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 6, 2016)
- INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION

- MONITOR WELL (SCREENED INTERVAL DASHED)
- DOWNGRADE MONITOR WELL
- BACKGROUND MONITOR WELL



- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.

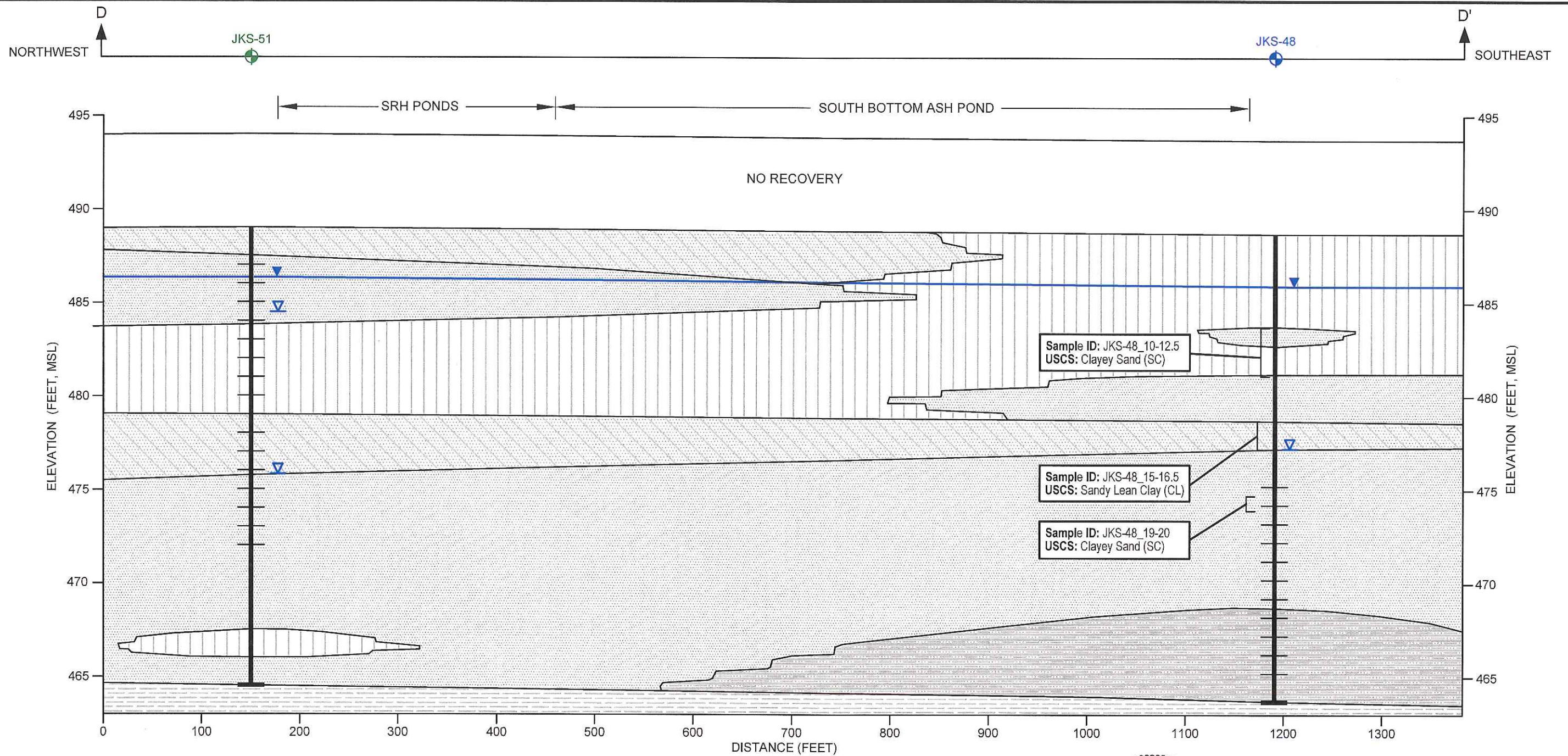
**Environmental Resources Management**

Figure 4C  
Stratigraphic Cross Section C-C'  
CPS Energy - Calaveras Power Station  
San Antonio, Texas

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DATE: 1/10/2017	SCALE: AS SHOWN	REV.:
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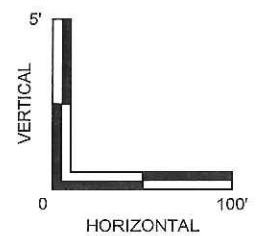
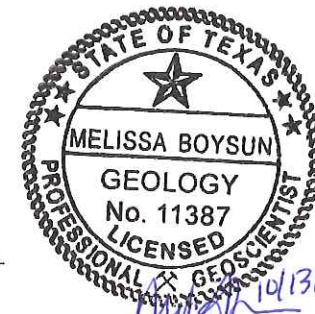


- SAND, SILTY SAND, AND/OR CLAYEY SAND
- SILT, SANDY SILT, AND/OR CLAYEY SILT
- LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
- INTERBEDDED SAND, SILT, AND CLAY
- BEDROCK (SANDSTONE)

- LEGEND**
- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 6, 2016)
  - INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION

- SOIL TEST DATA KEY**
- |           |                          |
|-----------|--------------------------|
| Sample ID | USCS Soil Classification |
|-----------|--------------------------|

- MONITOR WELL (SCREENED INTERVAL DASHED)
- DOWNGRADEMENT MONITOR WELL
- BACKGROUND MONITOR WELL

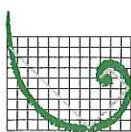


- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.

**Environmental Resources Management**

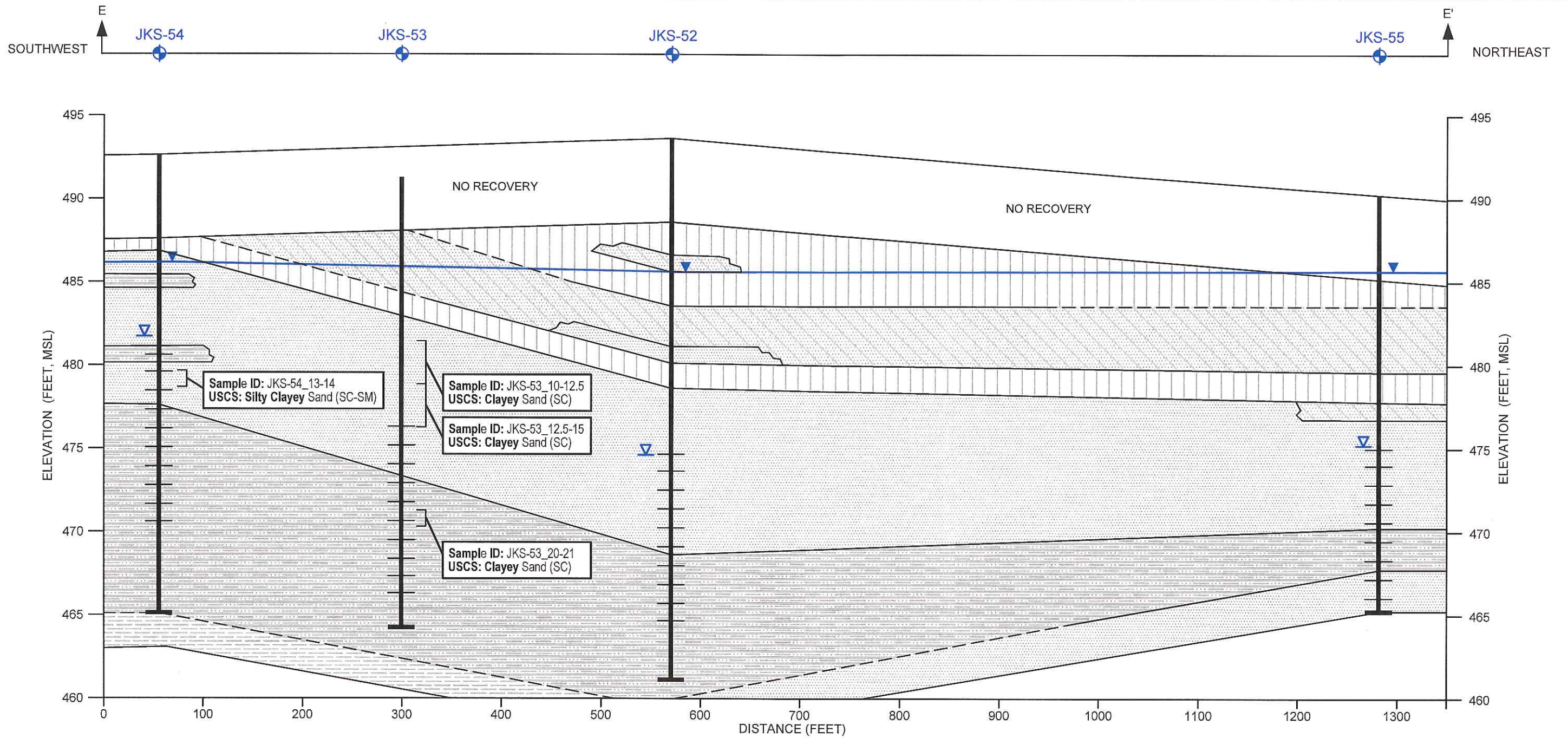
Figure 4D  
Stratigraphic Cross Section D-D'  
CPS Energy - Calaveras Power Station  
San Antonio, Texas

DESIGN: NH	DRAWN: RLM	CHKD.: WZ
DATE: 1/10/2017	SCALE: AS SHOWN	REV.: 1



**ERM**



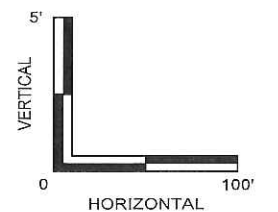
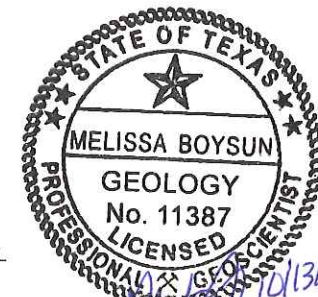


- LEGEND**
- SAND, SILTY SAND, AND/OR CLAYEY SAND
  - SILT, SANDY SILT, AND/OR CLAYEY SILT
  - LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
  - INTERBEDDED SAND, SILT, AND CLAY
  - BEDROCK (SANDSTONE)

- LEGEND**
- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 8, 2016)
  - INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION
  - MONITOR WELL (SCREENED INTERVAL DASHED)
  - DOWNGRADE MONITOR WELL

**SOIL TEST DATA KEY**

Sample ID  
USCS Soil Classification



- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.

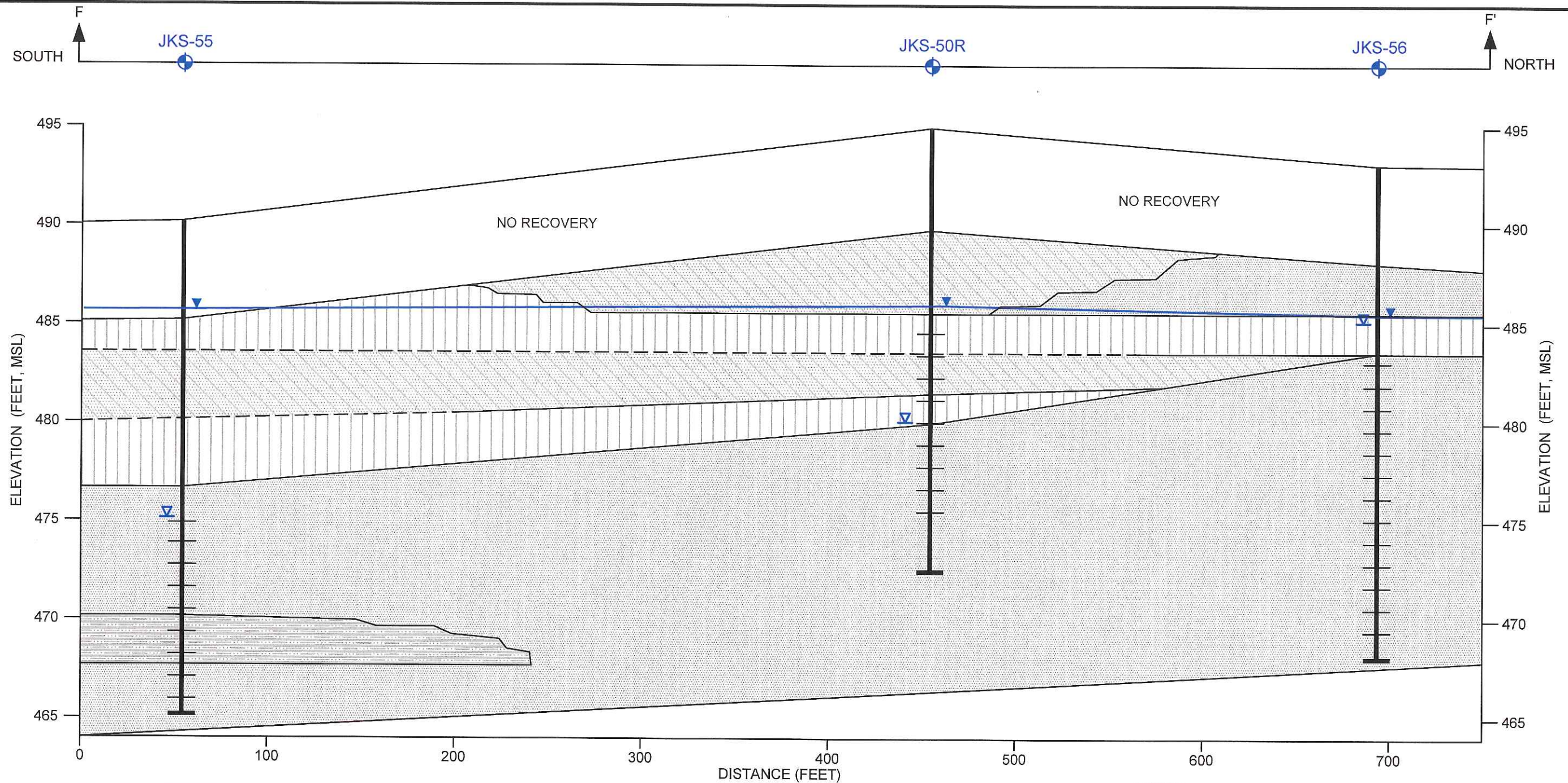
**Environmental Resources Management**

Figure 4E  
Stratigraphic Cross Section E-E'  
CPS Energy - Calaveras Power Station  
San Antonio, Texas

DESIGN: NH	DRAWN: RLM	CHKD.: WZ
DATE: 2/16/2017	SCALE: AS SHOWN	REV.: 1



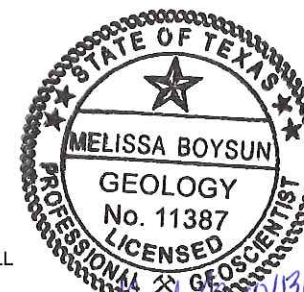




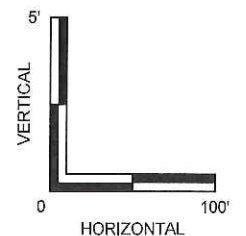
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- SILT, SANDY SILT, AND/OR CLAYEY SILT
- LOW TO MEDIUM PLASTICITY CLAY, SANDY CLAY, AND/OR SILTY CLAY
- INTERBEDDED SAND, AND CLAY
- BEDROCK (SANDSTONE)

- LEGEND**
- POTENTIOMETRIC SURFACE (MEASURED DECEMBER 6, 2016)
  - INITIAL GROUNDWATER LEVEL ENCOUNTERED DURING WELL INSTALLATION

- MONITOR WELL (SCREENED INTERVAL DASHED)
- DOWNGRADE MONITOR WELL



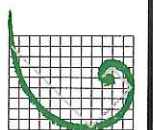
- Notes:**
1. Approximate ground surface elevation interpolated from surveyed elevations.
  2. Aerial Source: ESRI.



**Environmental Resources Management**

Figure 4F  
Stratigraphic Cross Section F-F'  
CPS Energy - Calaveras Power Station  
San Antonio, Texas

DESIGN: NH	DRAWN: EFC	CHKD: WZ
DATE: 1/10/2017	SCALE: AS SHOWN	REV.: 1









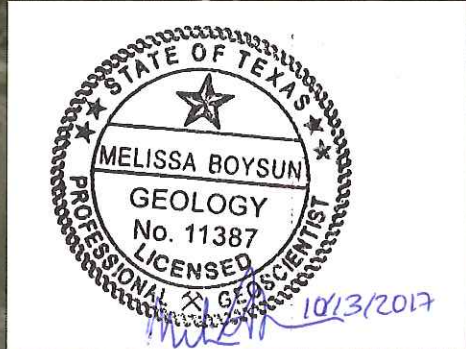
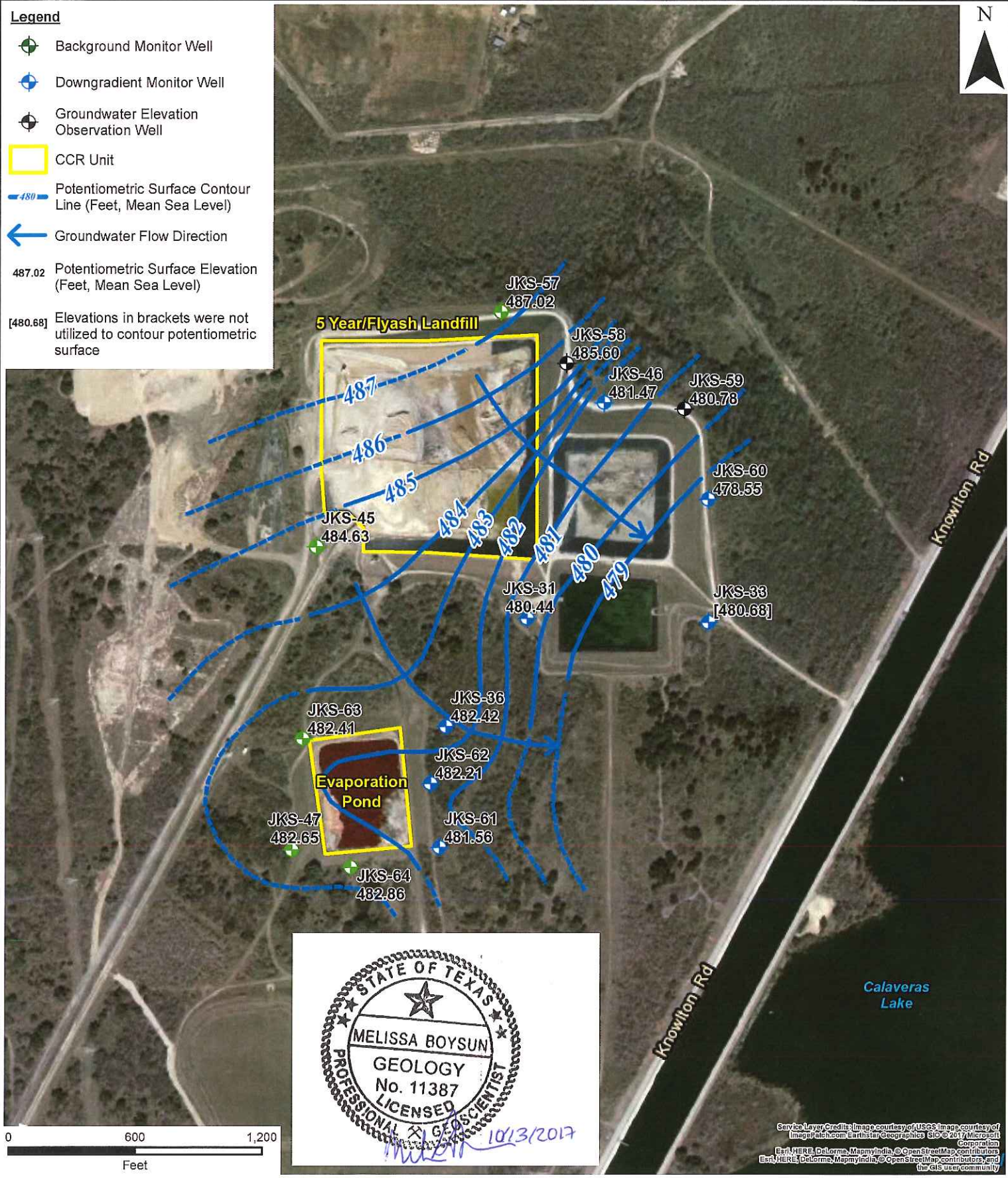
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**Legend**

-  Background Monitor Well
-  Downgradient Monitor Well
-  Groundwater Elevation Observation Well
-  CCR Unit
-  Potentiometric Surface Contour Line (Feet, Mean Sea Level)
-  Groundwater Flow Direction
- 487.02 Potentiometric Surface Elevation (Feet, Mean Sea Level)
- [480.68] Elevations in brackets were not utilized to contour potentiometric surface



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# Environmental Resources Management

FIGURE 5A  
 POTENTIOMETRIC SURFACE MAP -  
 DECEMBER 6, 2016  
 NORTHERN CCR UNITS






DESIGN: NH/AH	DRAWN: EFC	CHKD.: WZ
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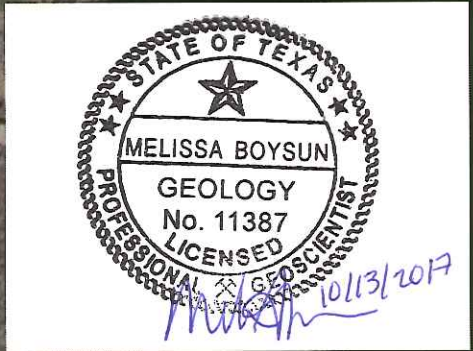
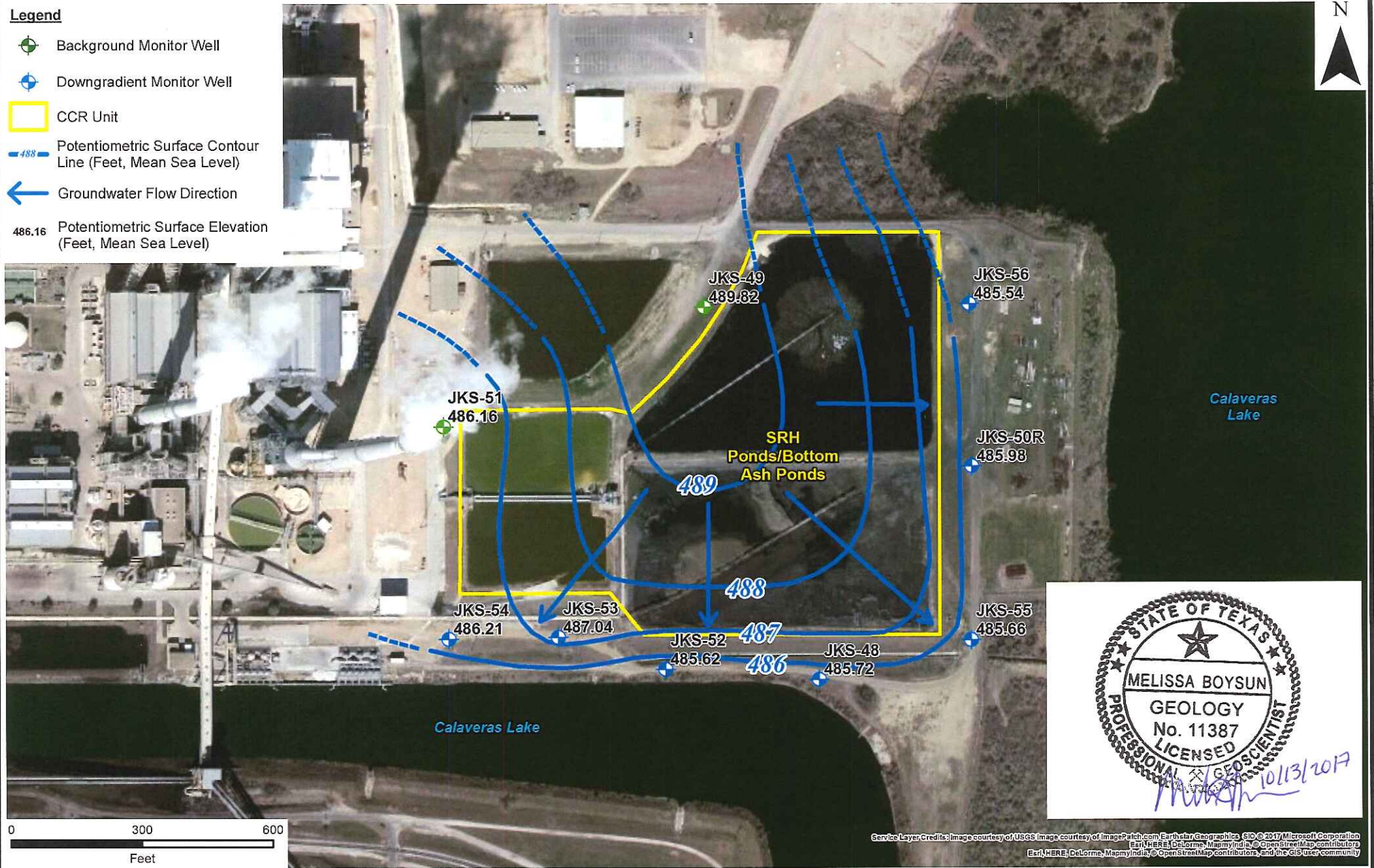
CPS Energy - Calaveras Power Station  
 San Antonio, Texas





**Legend**

-  Background Monitor Well
-  Downgradient Monitor Well
-  CCR Unit
-  Potentiometric Surface Contour Line (Feet, Mean Sea Level)
-  Groundwater Flow Direction
- 486.16** Potentiometric Surface Elevation (Feet, Mean Sea Level)



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## Environmental Resources Management

DESIGN: NH/AH	DRAWN: EFC	CHKD.: WZ
DATE: 1/10/2017	SCALE: AS SHOWN	REVISION: 1
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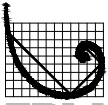
FIGURE 5B  
POTENTIOMETRIC SURFACE MAP -  
DECEMBER 6, 2016  
SOUTHERN CCR UNITS

CPS Energy - Calaveras Power Station  
San Antonio, Texas



**Soil Boring Logs, Well Completion Logs,  
and State Well Reports**  
*Appendix A*

**Environmental Resources Management**  
206 East 9<sup>th</sup> Street, Suite 1700  
Austin, Texas 78701  
(512) 459-4700



**ERM Environmental Resources Management**

**JKS-45  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-45 Date Drilled 2016-04-04  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 62.00' Boring Diam. 8.25"  
 N. Coord. 13667132.78' E. Coord. 2186615.40' Surface Elevation 528.31' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 40.00' Sump Length 0'  
 Top of Casing Elevation 531.46' Stickup 3.15'  
 Depth to Water: 1. Ft. btoc 47.19 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

**SKETCH MAP**

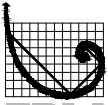


**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
528.31	0			0		0-5	NO RECOVERY: Previously excavated by hydrovac truck.
525	5			100		5-7	SILTY CLAY: Brown; dry to damp; medium stiff; medium plasticity; some white calcareous concretions present. At 5.5' bgs: Slight orange mottling. At 6' bgs: White silt lens.
520	10			50		7-10	CLAY: Grey; dry to damp; stiff; medium to high plasticity; minor silt content at depth; white calcareous concretions throughout. At 7.5' bgs: Orange mottling. At 9' bgs: Yellowish orange silt lens.
515	15			75		10-12.5	SILT: Alternating light grey and yellowish brown, stratified with orange, yellow, and red; damp; loose; non-plastic.
						12.5-15	NO RECOVERY.
510	20					15-22	SILT: Brownish light grey; damp; loose to medium dense; non-plastic; some yellow stringers. At 16' bgs: Alternating pinkish brown stratifications (2" thick). At 16.5' bgs: Orange band (2" thick). At 17.5' bgs: Orange band (1" thick).  At 19' bgs: Light grey and pinkish brown laminations; minor clay content; occasional orange silt stringers.





**ERM** Environmental Resources Management

**JKS-45  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-45 Date Drilled 2016-04-04  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 62.00' Boring Diam. 8.25"  
 N. Coord. 13667132.78' E. Coord. 2186615.40' Surface Elevation 528.31' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 40.00' Sump Length 0'  
 Top of Casing Elevation 531.46' Stickup 3.15'  
 Depth to Water: 1. Ft. btoc 47.19 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

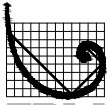
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
505	20	[Hatched pattern]	[Solid black]	75		22-25	CLAYEY SILT: Pinkish brown laminated with light grey; dry to damp; medium dense to dense; slight plasticity; trace yellow and orange silt stringers.
500	25	[Hatched pattern]	[Solid black]	100	JKS-45_28-30 USCS: Fat Clay (CH) AL: 61 / 22 / 39 -200 Sieve: 91.6	25-34.5	SILTY CLAY: Dark reddish brown; dry to damp; medium stiff; low plasticity; fractures along planar surfaces.  At 25.5' bgs: Light grey silt lens (2" thick).  At 28' bgs: Light grey silt stringers; yellow silt stringers and minor gypsum crystals from 28' to 30' bgs. Non-cohesive grab sample collected from 28'-30' bgs.
495	30	[Hatched pattern]	[Solid black]	100			At 31.5' bgs: Dry; yellow silt stringers; abundant yellowish orange silt stringers to 32' bgs.  At 33.5' bgs: Trace gypsum crystals.
490	35	[Hatched pattern]	[Solid black]	100	JKS-45_36-38 USCS: Fat Clay (CH) AL: 67 / 24 / 43 -200 Sieve: 90.5	34.5-35 35-36	SILT: Dark pinkish brown laminated with greyish brown; dry; dense; non-plastic; some clay content.
						36-38	SILTY CLAY: Very dark reddish brown; damp to moist; medium stiff; low plasticity; trace yellow silt; minor gypsum crystals; brownish black band (2" thick) at 35' bgs.
						38-43	CLAY: Pinkish grey; dry; very stiff to hard; very high plasticity (fat). Non-cohesive grab sample collected from 36'-38' bgs. At 36.5' bgs: Yellow and orange silt stringers to 37.5' bgs. SILT: Orangish brown; dry to damp; medium dense to dense; slight plasticity; slight clay content.
40	40	[Dotted pattern]	[Dotted pattern]				



**ERM Environmental Resources Management**

**JKS-45  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-45 Date Drilled 2016-04-04  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 62.00' Boring Diam. 8.25"  
 N. Coord. 13667132.78' E. Coord. 2186615.40' Surface Elevation 528.31' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 40.00' Sump Length 0'  
 Top of Casing Elevation 531.46' Stickup 3.15'  
 Depth to Water: 1. Ft. btoc 47.19 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

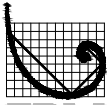
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
485	40	[Hatched pattern]	[Dotted pattern]	80		43-45	At 38.75' bgs: Brownish black band (1.5" thick). At 39.25' bgs: Yellow silt stringers. At 39.5' bgs: Color change to brownish grey; very dense; increased clay content. At 40' bgs: Yellow and orange silt stringers to 43' bgs; some compacted silt pieces to 43' bgs. CLAYEY SILT: Dark reddish brown; damp; medium dense; slight plasticity; orange silt stringers throughout.
480	45	[Dotted pattern]	[Dotted pattern]	50	JKS-45_50-52 USCS: Silty Sand (SM) AL: Non-plastic -200 Sieve: 12.6	45-55	At 44.5' bgs: Trace fine-grained sand content. SAND: Light grey to grey stratified with yellow, orange and red; wet to saturated; fine-grained to medium grained with depth; sub-rounded; well sorted; loose; non-plastic; minor clay lenses (1/16" to 1/8" thick).
475	50	[Dotted pattern]	[Dotted pattern]	50			At 48' bgs: Color change to orangish brown with orange laminations; no clay content. At 49.5' bgs: Intermixed red color to 50' bgs. At 50' bgs: Color change to pinkish brown. Non-cohesive grab sample collected from 50'-52' bgs.
470	55	[Hatched pattern]	[Dotted pattern]	100	JKS-45_55-57 USCS: Fat Clay (CH) AL: 75 / 28 / 47 -200 Sieve: 97	55-62	At 54.5' bgs: Brownish orange band (2" thick). CLAY: Dark grey; damp; stiff to very stiff; very high plasticity (fat); occasional light grey silt stringers; fractures along silt stringers. Non-cohesive sample collected from 55'-57' bgs.
60		[Hatched pattern]	[Dotted pattern]				



**ERM** Environmental Resources Management

**JKS-45  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-45 Date Drilled 2016-04-04  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 62.00' Boring Diam. 8.25"  
 N. Coord. 13667132.78' E. Coord. 2186615.40' Surface Elevation 528.31' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 40.00' Sump Length 0'  
 Top of Casing Elevation 531.46' Stickup 3.15'  
 Depth to Water: 1. Ft. btoc 47.19 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

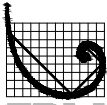
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
60				100	JKS-45_60-62 USCS: Fat Clay (CH) AL: 75 / 26 / 49 -200 Sieve: 86.4 k: 1.82x10 <sup>-8</sup>		Cohesive sample (Shelby tube) collected from 60'-62' bgs.  Boring terminated at 62' bgs.
465							
65							
460							
70							
455							
75							
450							
80							



**ERM Environmental Resources Management**

**JKS-46  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-46 Date Drilled 2016-04-05  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 30.00' Boring Diam. 8.25"  
 N. Coord. 13667810.11' E. Coord. 2187972.31' Surface Elevation 495.75' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 499.08' Stickup 3.33'  
 Depth to Water: 1. Ft. btoc 19.38 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

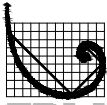
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
495.75	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			100		5-8	CLAYEY SAND: Reddish orange; damp to moist; fine-grained; sub-round; well-sorted; medium dense; slight to low plasticity; some silt content.
						8-10	At 7.5' bgs: Dense grey clay lenses (1/2" thick). SANDY CLAY: Reddish orange; medium stiff; slight to low plasticity; minor silt content; dense grey clay lenses (1/2" thick); yellow and yellowish orange silt stringers.
485	10			75		10-11	At 9.5' bgs: Increased silt content. CLAY: Grey; dry; stiff; medium plasticity; minor silt content; fractures along tan silt to fine-grained sand stringers.
						11-15	SAND: Tan; damp; fine-grained; sub-round, well sorted; loose; non-plastic.
							At 13' bgs: Striated with pink and orange.
480	15			85		15-19.5	At 14' bgs: Color change to reddish orange; some silt content; occasional clay lenses. At 14.75' bgs: Orange silt lens. SILT: Red with orange; damp to dry; loose; slight plasticity. At 15.5' bgs: Color change to grey. At 15.75' bgs: Color change to red.
							At 16' bgs: Color change to tan with yellow; fractures along planar surfaces. At 17' bgs: Moist.
						19.5-25	At 18.75' bgs: Color change to red and orange. SAND: Tan; moist; fine-grained, coarsens with depth; sub-round; well sorted; loose; non-plastic; minor silt and trace clay; orange and yellow silt stringers.



**ERM Environmental Resources Management**

**JKS-46  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-46 Date Drilled 2016-04-05  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 30.00' Boring Diam. 8.25"  
 N. Coord. 13667810.11' E. Coord. 2187972.31' Surface Elevation 495.75' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 499.08' Stickup 3.33'  
 Depth to Water: 1. Ft. btoc 19.38 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

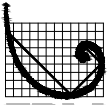
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
475	20	[Dotted pattern]	[Well casing]	75	No Samples Collected	25-30	At 20' bgs: Color change to brownish tan with orange band (2" thick) at 20.25' bgs. At 21.5' bgs: Color change to tannish grey with yellowish orange band (2" thick). At 22.5' bgs: Color change to tan stratified with pinkish orange and orange.  CLAY: Dark greyish brown; damp to dry; very stiff; high to very high plasticity (fat); fractures along planar surfaces; Light grey and yellowish orange silt lenses throughout.
470	25	[Diagonal lines]	[Well casing]	100			At 29.75' bgs: Dark grey silt lenses; some very small gypsum crystals. Boring terminated at 30' bgs.
465	30						
460	35						
40	40						



JKS-47  
DRILLING LOG

Proj. No. 0337367 Boring/Well ID JKS-47 Date Drilled 2016-04-05  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 48.00' Boring Diam. 8.25"  
 N. Coord. 13665709.79' E. Coord. 2186503.87' Surface Elevation 510.28' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 25.00' Sump Length 0'  
 Top of Casing Elevation 513.63' Stickup 3.35'  
 Depth to Water: 1. Ft. btoc 31.37 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
510.28 510	0				No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
505	5			0		5-9.5	CLAYEY SILT: Pinkish brown with grey; damp to moist; loose; slight to low plasticity; occasional yellow and orange silt lenses. At 5.5' bgs: Clay lens (2" thick).
500	10			90		9.5-20	At 9.25' bgs: Clay lens (2" thick). SILT: Light grey; damp; medium dense; slight plasticity; minor clay content, decreases with depth; abundant yellow and orange silt stringers; fractures along planar surfaces. At 10' bgs: Striated with pinkish brown to 12' bgs.
495	15			50			At 12.5' bgs: No clay content. At 13' bgs: Color change to tan; dry; yellow and orange silt stringers.
	20						



**ERM Environmental Resources Management**

**JKS-47  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-47 Date Drilled 2016-04-05  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 48.00' Boring Diam. 8.25"  
 N. Coord. 13665709.79' E. Coord. 2186503.87' Surface Elevation 510.28' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 25.00' Sump Length 0'  
 Top of Casing Elevation 513.63' Stickup 3.35'  
 Depth to Water: 1. Ft. btoc 31.37 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

**SKETCH MAP**

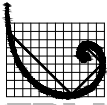


**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
490	20	[Graphic Log]	[Well Construction]	75	No Samples Collected	20-23	At 20' bgs: Whitish tan striated with yellow; minor fine-grained sand content. SANDY SILT: Whitish tan; dry; loose; non-plastic; occasional yellow and orange silt stringers, occurrence increases with depth.
485	25	[Graphic Log]	[Well Construction]	50		23-48	SAND: Whitish tan; dry to moist with depth; fine-grained; sub-round; well sorted; minor yellow and orange silt stringers; thin clay pinkish brown to brown clay laminations to 23.25' bgs. At 25' bgs: Color change to tannish brown; very moist.
480	30	[Graphic Log]	[Well Construction]	100			At 30' bgs: Saturated; Orange band (1" thick) at 30.25' bgs.
475	35	[Graphic Log]	[Well Construction]	50			At 34' bgs: Orange striations to 35' bgs. At 35' bgs: Trace orange silt stringers.
470	40	[Graphic Log]	[Well Construction]				





**ERM Environmental Resources Management**

**JKS-47  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-47 Date Drilled 2016-04-05  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 48.00' Boring Diam. 8.25"  
 N. Coord. 13665709.79' E. Coord. 2186503.87' Surface Elevation 510.28' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 25.00' Sump Length 0'  
 Top of Casing Elevation 513.63' Stickup 3.35'  
 Depth to Water: 1. Ft. btoc 31.37 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

**SKETCH MAP**

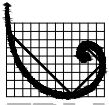


**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	40	[Dotted pattern]	[Hatched pattern]	75	No Samples Collected		At 40' bgs: Clayey sand lens (2" thick). At 40.5' bgs: Occasional pinkish brown silt stringers to 41' bgs. At 41.5' bgs: Abundant yellowish orange silt stringers to 42.5' bgs.
465	45	[Dotted pattern]	[Hatched pattern]	100			At 41.5' bgs: Orange and brown laminated silt stringers to 43' bgs.  At 44' bgs: Medium-grained; no silt content.  At 46' bgs: Orangish brown silt layer (1/2" thick). At 46.5' bgs: Color change to greyish tan; fine to medium-grained with decreasing grain size with depth.
460	50						Boring terminated at 48' bgs.
455	55						
60							





**ERM Environmental Resources Management**

**JKS-48  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-48 Date Drilled 2016-04-06  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 30.00' Boring Diam. 8.25"  
 N. Coord. 13659658.78' E. Coord. 2186490.78' Surface Elevation 493.71' Ft MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 18.50' Sump Length 0'  
 Top of Casing Elevation 497.19' Stickup 3.48'  
 Depth to Water: 1. Ft. btoc 11.28 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

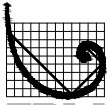
**SKETCH MAP**



**NOTES**

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
493.71	0			0		0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			100		5-6	CLAYEY SILT: Orangish brown; damp; medium dense to dense; slight to low plasticity. At 5.5' bgs: Brown band (2" thick). At 5.75' bgs: Color change to brown; damp to dry; minor clay content; fractures along planar surfaces.
485	10			75	JKS-48_10-12.5 USCS: Clayey Sand (SC) AL: 35 / 16 / 19 -200 Sieve: 44.6	6-6.5 6.5-7 7-7.5	SILTY CLAY: Orangish brown heavily mottled with grey and orange; damp; stiff; medium plasticity; occasional grey and orange silt stringers. SILT: Brownish tan with grey and orange; damp; medium dense; slight plasticity; trace clay. SILTY CLAY: Orangish brown heavily mottled with grey and orange; damp; stiff; medium plasticity; occasional grey and orange silt stringers.
480	15			80	JKS-48_15-16.5 USCS: Sandy Lean Clay (CL) AL: 48 / 19 / 29 -200 Sieve: 58.9	7.5-12.5	CLAYEY SILT: Brown; damp to moist; medium dense; low plasticity; light grey and orange silt stringers. At 9' bgs: Dense silty clay layer (2" thick). At 9.25' bgs: Dense silty clay layer (2" thick). Non-cohesive grab sample collected from 10'-12.5' bgs. At 10.5' bgs: Dense silty clay layer (2" thick).
475	20				JKS-48_19-20 USCS: Clayey Sand (SC) AL: 26 / 16 / 10 -200 Sieve: 48.7	12.5-15	SAND: Brownish grey; damp to moist; fine-grained; sub-angular; moderately sorted; loose; non-plastic; minor silt content. At 13.5' bgs: Dense clay lens (1" thick). At 14.5' bgs: Color change to dark brown.
						15-16.5	CLAY: Brownish orange heavily mottled with dark brown, orange, and orangish red; moist; stiff; high plasticity; trace silt content, increases with depth; orange silt stringers. Non-cohesive grab sample collected from 15'-16.5' bgs.
						16.5-19	CLAYEY SILTY SAND: Brownish tan; very moist; loose to medium dense; slight plasticity; decreasing clay content with depth; occasional orange silt stringers. At 16.5' bgs: Wet.
						19-20	SAND: Orangish brown; very moist to wet; fine-grained; sub-angular; moderately sorted; loose; non-plastic; minor silt content, decreases with depth; laminated with light grey clay to 19.25' bgs. Non-cohesive grab sample collected from 19'-20' bgs.



**ERM Environmental Resources Management**

**JKS-48  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-48 Date Drilled 2016-04-06  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 30.00' Boring Diam. 8.25"  
 N. Coord. 13659658.78' E. Coord. 2186490.78' Surface Elevation 493.71' Ft MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 18.50' Sump Length 0'  
 Top of Casing Elevation 497.19' Stickup 3.48'  
 Depth to Water: 1. Ft. btoc 11.28 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

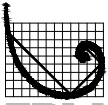
SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20	[Graphic Log showing soil layers with various patterns: stippled, horizontal lines, vertical lines, and solid black]	[Well Construction diagram showing casing and screen]	50		20-22.5	SILTY SAND: Orangish brown; saturated; fine to very-fine grained; sub-angular, poorly sorted; loose; non-plastic; minor clay content. At 20.25' bgs: Thin grey clay laminations.
	22.5-25					SAND: Tannish brown with grey; saturated; fine-grained; sub-angular; moderately sorted; loose; non-plastic; some silt content; orange silt stringers. At 24.5' bgs: Orange silt lens to 24.75' bgs.	
	25-27.5					INTERBEDDED SILTY SAND AND CLAY: Tannish grey; saturated; medium dense; laminated silty fine-grained sand with pinkish brown clay; clay laminations fracture along planar surfaces; yellow and orange silt stringers throughout.	
465	27.5-30					CLAYEY SILTY SAND: Tannish grey; saturated; loose; slight plasticity; orange 1/16" thick silt laminations throughout. At 29.5' bgs: Pinkish brown (1/16" thick) clay laminations to 30' bgs. Refusal (bedrock) encountered at 30' bgs.	
460	35						
455							
450							
445							
440							
435							
430							
425							
420							
415							
410							
405							
400							



JKS-49  
DRILLING LOG

Proj. No. 0337367 Boring/Well ID JKS-49 Date Drilled 2016-04-06  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 19.00' Boring Diam. 8.25"  
 N. Coord. 13660519.40' E. Coord. 2186229.15' Surface Elevation 495.17' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 7.00' Sump Length 0'  
 Top of Casing Elevation 498.63' Stickup 3.46'  
 Depth to Water: 1. Ft. btoc 9.32 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

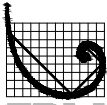
SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
495.17 495	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			50		5-6 6-10	SAND: Greyish tan; very moist; fine-grained; sub-angular; moderately sorted; loose; non-plastic; orange silt stringers. SILT: Greyish tan; very moist; loose; non-plastic; minor fine-grained sand; occasional yellow silt stringers.
485	10			100		10-15	At 9.5' bgs: Color change to light brown; wet; orange silt stringers. SAND: Light brown; wet; fine-grained; sub-angular; moderately sorted; loose to medium dense; non-plastic; minor silt content; abundant orange silt stringers. At 11.75' bgs: Orange silt lens (2" thick); trace silt stringers. At 12' bgs: Decreasing silt content.
480	15			100		15-16.5 16.5-19	At 14' bgs: Color change to greyish tan. SANDY SILT: Light brown; wet to saturated; loose; non-plastic; occasional orange silt stringers. At 17.5' bgs: Pinkish brown clay lens (3/16" thick). SILT: Brownish orange; wet to saturated; loose; non-plastic; minor fine-grained sand content. At 17.5' bgs: Color change to light brown. At 18.25' bgs: Color change to orange; pinkish brown clay lens (1/16" thick). At 18.5' bgs: Minor orange and red sandstone pieces, occurrence increases at depth. Refusal (bedrock) encountered at 19' bgs.
475	20						



**ERM Environmental Resources Management**

**JKS-50  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-50 Date Drilled 2016-04-06  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 14.00' Boring Diam. 8.25"  
 N. Coord. 13660122.87' E. Coord. 2186836.72' Surface Elevation 494.87' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 7.50' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 2.50' Sump Length 0'  
 Top of Casing Elevation 498.20' Stickup 3.33'  
 Depth to Water: 1. Ft. btoc 11.76 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

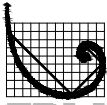
SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
494.87	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			80		5-7.75	SILTY CLAY: Orangish brown heavily mottled with light grey, brown, and tan; damp; stiff; medium to high plasticity; increasing silt content with depth; orange silt stringers. At 6' bgs: Tan silt lens (2" thick).
485	10			25		7.75-8.25	At 7.5' bgs: Color change to brownish orange; minor fine-grained sand content.
						8.25-9.25	SAND: Tan; damp; fine-grained, sub-angular; moderately sorted; dense; non-plastic; minor silt content; occasional orange silt stringers.
						9.25-10	SILTY CLAY: Orangish brown mottled with grey, brown, red and occasional yellow; damp; stiff; medium plasticity; orange silt stringers throughout.
						10-13	SILT: Tan; moist; loose; non-plastic; trace orange silt stringers. At 9.75' bgs: Soft clay lens (3/16" thick).
							NO RECOVERY.
						13-13.75	SILTY CLAY: Brown; saturated; loose; low plasticity; orange silt stringers; sandstone pieces (3/8" thick) near 13.75' bgs.
480	15					13.75-14	SANDSTONE: Brownish orange laminated with orange, tan, and dark brown.
475	20						Refusal (bedrock) encountered at 14' bgs.



**ERM Environmental Resources Management**

**JKS-51  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-51 Date Drilled 2016-04-07  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 29.50' Boring Diam. 8.25"  
 N. Coord. 13660243.53' E. Coord. 2185630.39' Surface Elevation 494.04' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 7.00' Sump Length 0'  
 Top of Casing Elevation 496.92' Stickup 2.88'  
 Depth to Water: 1. Ft. btoc 10.56 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

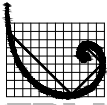
SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
494.04	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			60		5-6.5	SILTY CLAY: Light brown with occasional orange mottling; wet; soft; low plasticity; occasional gravel (1/16" thick).
485	10			100		6.5-10	SAND: Light brown; very moist; fine-grained; sub-angular; moderately sorted; medium dense; slight plasticity; minor silt and clay content. At 7.5' bgs: Clay lenses (up to 3/4" thick) to 8.5' bgs.  At 8.5' bgs: Occasional orange silt stringers to 9.5' bgs. At 9' bgs: Clay lamina (1/16" thick) to 10' bgs. At 9.5' bgs: Wet.
480	15			100		10-15	SILT: Light brown; wet; medium dense; low plasticity; laminated with grey clay (1/16" to 3/16" thick) throughout; minor fine-grained sand; orange silt stringers throughout.  At 12.5' bgs: Sand lens (2" thick).  At 13.5' bgs: Sand lens (2" thick); fractures in planar surfaces to 14.5' bgs. At 14' bgs: Occasional thin clay lamina to 15' bgs. At 14.5' bgs: Color change to light grey.
475	20					15-17.75	CLAY: Pinkish grey; moist; medium stiff; low to medium plasticity; laminated with orange and grey silt (up to 3/4" thick) throughout. CLAY: Grey; moist; medium stiff; low plasticity; trace silt content; abundant orange silt stringers.
						17.75-18.25	SILTY SAND: Light brown; wet to saturated; very fine to fine-grained; sub-angular; poorly sorted; loose; non-plastic.
						18.25-19.75	At 19.25' bgs: Pinkish grey clay lens (2" thick); thin red silt lens below clay; occasional orange silt stringers.
						19.75-26.5	SAND: Light grey; wet; fine-grained; sub-angular; moderately sorted; loose; non-plastic; occasional orange silt stringers.



**ERM Environmental Resources Management**

**JKS-51  
DRILLING LOG**

Proj. No. 0337367 Boring/Well ID JKS-51 Date Drilled 2016-04-07  
 Project Groundwater Investigation Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 29.50' Boring Diam. 8.25"  
 N. Coord. 13660243.53' E. Coord. 2185630.39' Surface Elevation 494.04' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 7.00' Sump Length 0'  
 Top of Casing Elevation 496.92' Stickup 2.88'  
 Depth to Water: 1. Ft. btoc 10.56 ( 2016-05-31 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Joseph Ray  
 Drilling Method Hollow-Stem Auger Log By Nick Houtchens

SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20	[Graphic Log]	[Well Construction]	100	No Samples Collected		At 21.25' bgs: Red silt lens (1/16" thick); abundant orange silt stringers.
470	25	[Graphic Log]	[Well Construction]	100		26.5-27.75	At 24' bgs: Minor silt and trace clay content. At 26.25' bgs: Reddish orange silt lens (1/16" thick). SANDY SILT: Tannish light grey; wet; loose; slight plasticity; occasional yellow and orange silt stringers.
465	30	[Graphic Log]	[Well Construction]			27.75-28 28-29.5	At 27.5' bgs: Trace clay content. CLAY: Dark brown mottled with tannish brown; moist; stiff; very high plasticity (fat); brown silt stringers throughout. SAND: Tannish light grey; wet; fine-grained; sub-angular; moderately sorted; loose; non-plastic; trace silt, occurrence decreases with depth; abundant orange silt stringers. At 29.25' bgs: Color change to light brown; occasional orange silt stringers. Refusal (bedrock) encountered at 29.5' bgs.
460	35	[Graphic Log]	[Well Construction]				
455	40	[Graphic Log]	[Well Construction]				



## STATE OF TEXAS WELL REPORT for Tracking #424209

Owner: <b>CPS Energy</b>	Owner Well #: <b>JKS-45</b>
Address: <b>PO Box 2906 San Antonio, TX 78299</b>	Grid #: <b>68-46-5</b>
Well Location: <b>Calaveras Power Station San Antonio, TX</b>	Latitude: <b>29° 19' 01" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 18' 08" W</b>
	Elevation: <b>528 ft. above sea level</b>
Type of Work: <b>New Well</b>	
	Proposed Use: <b>Monitor</b>

Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>62</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>38</b>	<b>56</b>	<b>Sand</b>	<b>20/40</b>

Annular Seal Data: **No Data**

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>52</b>	<b>62</b>





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**IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

**Texas Department of Licensing and Regulation  
P.O. Box 12157  
Austin, TX 78711  
(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #424210

Owner: <b>CPS ENERGY</b>	Owner Well #: <b>JKS-46</b>
Address: <b>PO BOX 2906 SAN ANTONIO, TX 78299</b>	Grid #: <b>68-46-5</b>
Well Location: <b>Calaveras Power Station SAN ANTONIO, TX</b>	Latitude: <b>29° 19' 01" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 18' 08" W</b>
	Elevation: <b>496 ft. above sea level</b>

Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>
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Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>30</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>13</b>	<b>25</b>	<b>Sand</b>	<b>20/40</b>

Annular Seal Data: **No Data**

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: <b>Surface Slab Installed</b>	<b>Surface Completion by Driller</b>
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Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>26</b>	<b>30</b>

Water Quality: Strata Depth (ft.) No Data Water Type No Data  
Chemical Analysis Made: No  
Did the driller knowingly penetrate any strata which contained injurious constituents?: No

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Strata Core Services, LLC**  
**112 S. Norwood Drive**  
**Hurst, TX 76053**

Driller Name: **Joseph Ray** License Number: **58794**

Comments: **No Data**

Lithology:			Casing:						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)	
0	5	ASH							
5	8	LT BRN SANDY CLAY	2	Riser	New Plastic (PVC)	40	0	15	
8	14	LT GRY CLAY	2	Screen	New Plastic (PVC)	40 10	15	25	
14	28	LT GRY SAND							
28	30	BRN CLAY							

**IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

**Texas Department of Licensing and Regulation**  
**P.O. Box 12157**  
**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #424211

Owner:	CPS ENERGY	Owner Well #:	JKS-47
Address:	PO BOX 2906 SAN ANTONIO, TX 78299	Grid #:	68-46-5
Well Location:	Calaveras Power Station SAN ANTONIO, TX	Latitude:	29° 18' 01" N
Well County:	Bexar	Longitude:	098° 18' 08" W
		Elevation:	510 ft. above sea level
Type of Work: <b>New Well</b>		Proposed Use: <b>Monitor</b>	

Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>48</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>23</b>	<b>41</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>2</b>	<b>23</b>	<b>Bentonite 15 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>41</b>	<b>48</b>



Water Quality:                      *Strata Depth (ft.)*                      *Water Type*  
    **No Data**    **No Data**

Chemical Analysis Made:    **No**

Did the driller knowingly penetrate any strata which  
 contained injurious constituents?:    **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data:    The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:    **Strata Core Services, LLC**  
    **112 S. Norwood Drive**  
    **Hurst, TX 76053**

Driller Name:                      **Joseph Ray**    License Number:    **58794**

Comments:                      **No Data**

Lithology:			Casing:						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	
0	5	ASH							
5	8	LT BRN SANDY CLAY	2	Riser	New Plastic (PVC)	40	0	25	
8	14	LT GRAY SANDY CLAY	2	Screen	New Plastic (PVC)	40 10	25	40	
14	20	LT GRAY SAND							
20	40	BRN SILTY CLAY							
40	48	LT GRAY SAND							

**IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

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**Texas Department of Licensing and Regulation**  
**P.O. Box 12157**  
**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #424212

Owner:	CPS ENERGY	Owner Well #:	JKS-48
Address:	PO BOX 2906 SAN ANTONIO, TX 78299	Grid #:	68-46-5
Well Location:	Calaveras Power Station SAN ANTONIO, TX	Latitude:	29° 19' 01" N
Well County:	Bexar	Longitude:	098° 18' 08" W
		Elevation:	494 ft. above sea level
Type of Work: <b>New Well</b>		Proposed Use: <b>Monitor</b>	

Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>30</b>
Drilling Method:	<b>Hollow Stem Auger</b>		
Borehole Completion:	<b>Filter Packed</b>		
	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>
Filter Pack Intervals:	<b>16.5</b>	<b>20.5</b>	<b>Sand</b>
	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>2</b>	<b>16.5</b>	<b>Bentonite 15 Bags/Sacks</b>
Seal Method:	<b>Hand Mixed</b>		
Sealed By:	<b>Driller</b>		
			Distance to Property Line (ft.): <b>No Data</b>
			Distance to Septic Field or other concentrated contamination (ft.): <b>No Data</b>
			Distance to Septic Tank (ft.): <b>No Data</b>
			Method of Verification: <b>No Data</b>
Surface Completion:	<b>Surface Slab Installed</b>		<b>Surface Completion by Driller</b>

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>29.5</b>	<b>30</b>

Water Quality:                      *Strata Depth (ft.)*                      *Water Type*  
    **No Data**     **No Data**

Chemical Analysis Made:    **No**

Did the driller knowingly penetrate any strata which  
 contained injurious constituents?:    **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data:    The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:    **Strata Core Services, LLC**  
    **112 S. Norwood Drive**  
    **Hurst, TX 76053**

Driller Name:                      **Joseph Ray**     License Number:    **58794**

Comments:                      **No Data**

**Lithology:**  
**DESCRIPTION & COLOR OF FORMATION MATERIAL**

**Casing:**  
**BLANK PIPE & WELL SCREEN DATA**

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>
0	5	ASH						
5	8	LT BRN CLAY	2	Riser	New Plastic (PVC)	40	0	18.5
8	14	LT GRAY CLAY	2	Screen	New Plastic (PVC)	40 10	18.5	28.5
14	20	LT GRAY SAND						
20	30	BRN SILTY CLAY						

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**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #424213

Owner:	CPS ENERGY	Owner Well #:	JKS-49
Address:	PO BOX 2906 SAN ANTONIO, TX 78299	Grid #:	68-46-5
Well Location:	Calaveras Power Station SAN ANTONIO, TX	Latitude:	29° 19' 01" N
Well County:	Bexar	Longitude:	098° 18' 08" W
		Elevation:	495 ft. above sea level

Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>
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Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>19</b>
Drilling Method:	<b>Hollow Stem Auger</b>		
Borehole Completion:	<b>Filter Packed</b>		

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>7</b>	<b>17</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>2</b>	<b>7</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion:	<b>Surface Slab Installed</b>	<b>Surface Completion by Driller</b>
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Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>18</b>	<b>19</b>



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Water Quality:                 *Strata Depth (ft.)*                                 *Water Type*  
  **No Data**   **No Data**

Chemical Analysis Made:     **No**

Did the driller knowingly penetrate any strata which  
  contained injurious constituents?:     **No**

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**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

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Certification Data:         The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:     **Strata Core Services, LLC**  
  **112 S. Norwood Drive**  
  **Hurst, TX 76053**

Driller Name:                **Joseph Ray**   License Number:     **58794**

Comments:                  **No Data**

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Lithology:			Casing:						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	
0	5	ASH							
5	8	LT BRN CLAY	2	Riser	New Plastic (PVC)	40	0	7	
8	14	LT GRAY CLAY	2	Screen	New Plastic (PVC)	40 10	7	17	
14	19	LT GRAY SAND							

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**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #424216

Owner:	CPS ENERGY	Owner Well #:	JKS-50
Address:	PO BOX 2906 SAN ANTONIO, TX 78299	Grid #:	68-46-5
Well Location:	Calaveras Power Station SAN ANTONIO, TX	Latitude:	29° 19' 01" N
Well County:	Bexar	Longitude:	098° 18' 08" W
		Elevation:	489 ft. above sea level

Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>
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Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>14</b>
Drilling Method:	<b>Hollow Stem Auger</b>		
Borehole Completion:	<b>Filter Packed</b>		
	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>
Filter Pack Intervals:	<b>1.5</b>	<b>10</b>	<b>Sand</b>
			<b>20/40</b>
	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0.5</b>	<b>1.5</b>	<b>Bentonite 1 Bags/Sacks</b>
Seal Method:	<b>Hand Mixed</b>		
Sealed By:	<b>Driller</b>		
			Distance to Property Line (ft.): <b>No Data</b>
			Distance to Septic Field or other concentrated contamination (ft.): <b>No Data</b>
			Distance to Septic Tank (ft.): <b>No Data</b>
			Method of Verification: <b>No Data</b>
Surface Completion:	<b>Surface Slab Installed</b>		<b>Surface Completion by Driller</b>

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>10</b>	<b>14</b>

Water Quality:                      *Strata Depth (ft.)*                      *Water Type*  
    **No Data**                      **No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data:                      The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:                      **Strata Core Services, LLC**  
    **112 S. Norwood Drive**  
    **Hurst, TX 76053**

Driller Name:                      **Joseph Ray**                      License Number:                      **58794**

Comments:                      **No Data**

Lithology:			Casing:						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	
0	5	ASH	2	Riser	New Plastic (PVC)	40	0	2.5	
5	8	LT BRN CLAY	2	Screen	New Plastic (PVC)	40 10	2.5	10	
8	14	LT GRAY CLAY							
14	15	LT GRAY SAND							

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## STATE OF TEXAS WELL REPORT for Tracking #424218

Owner:	CPS ENERGY	Owner Well #:	JKS-51
Address:	PO BOX 2906 SAN ANTONIO, TX 78299	Grid #:	68-46-5
Well Location:	Calaveras Power Station SAN ANTONIO, TX	Latitude:	29° 19' 01" N
Well County:	Bexar	Longitude:	098° 18' 08" W
		Elevation:	491 ft. above sea level

Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>
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Drilling Start Date: **4/4/2016**      Drilling End Date: **4/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>29.5</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>5</b>	<b>23</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>2</b>	<b>5</b>	<b>Bentonite 3 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion:	<b>Surface Slab Installed</b>	<b>Surface Completion by Driller</b>
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Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	<i>Description (number of sacks &amp; material)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Plug Information:	<b>Bentonite</b>	<b>23</b>	<b>29.5</b>



Water Quality: **Strata Depth (ft.)** **No Data** **Water Type** **No Data**  
 Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Strata Core Services, LLC**  
**112 S. Norwood Drive**  
**Hurst, TX 76053**

Driller Name: **Joseph Ray** License Number: **58794**

Comments: **No Data**

**Lithology:**  
**DESCRIPTION & COLOR OF FORMATION MATERIAL**

**Casing:**  
**BLANK PIPE & WELL SCREEN DATA**

Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	ASH						
5	8	LT BRN CLAY	2	Riser	New Plastic (PVC)	40	0	7
8	14	LT GRAY CLAY	2	Screen	New Plastic (PVC)	40 10	7	22
14	20	LT GRAY SAND						
20	24	BRN SITY CLAY						

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**Austin, TX 78711**  
**(512) 463-7880**



Environmental Resources Management

JKS-50R  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-50R Date Drilled 2016-10-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 22.50' Boring Diam. 8.25"  
 N. Coord. 13660149.90' E. Coord. 186841.92' Surface Elevation 494.96' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 9.50' Sump Length 0'  
 Top of Casing Elevation 498.48' Stickup 3.52'  
 Depth to Water: 1. Ft. btoc 12.67 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
494.96	0				No Samples Collected	0-15	See boring log JKS-50 from 4/6/16.
490	5			0			
485	10			0			
480	15			50		15-17.5	CLAYEY SAND: Light brown; wet; loose; trace dark gray sandy clay content; very coarse gravel (2" diam.) present.
475	20					17.5-22.5	CLAYEY SILTY SAND: Light brown; saturated; loose; light gray pieces of clay; few large (2" diam.) very coarse (2" diam.) angular rocks present.



JKS-50R  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-50R Date Drilled 2016-10-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 22.50' Boring Diam. 8.25"  
 N. Coord. 13660149.90' E. Coord. 186841.92' Surface Elevation 494.96' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 9.50' Sump Length 0'  
 Top of Casing Elevation 498.48' Stickup 3.52'  
 Depth to Water: 1. Ft. btoc 12.67 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

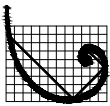
SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20			50		22-22.5	CLAYEY SAND: Brownish gray; dry to damp; loose. Boring terminated at 22.5' bgs.
465	25						
460	30						
455	35						
450	40						





JKS-52  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-52 Date Drilled 2016-09-01  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 32.50' Boring Diam. 8.25"  
 N. Coord. 13659683.26' E. Coord. 2186139.05' Surface Elevation 493.56' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 19.00' Sump Length 0'  
 Top of Casing Elevation 493.15' Stickup -0.41'  
 Depth to Water: 1. Ft. btoc 7.30 (2016-05-21) 2. Ft. \_\_\_\_\_ (\_\_\_\_\_)  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP



NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
493.56	0				No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			0		5-7	CLAYEY SILT: Orangish brown with red and light gray; damp; loose; slight plasticity; red nodules throughout. no odor. At 5' bgs: Red clay lense (1" thick). At 5.8' bgs: Light gray clay lense.
				100		7-8	SILTY CLAY: Tan; damp.
485						8-10	CLAYEY SILT: Gray with light gray and tan streaks; damp.
	10					10-12	CLAY: Dark gray to brownish gray, mottled with light gray and bluish gray; damp; medium dense; slight plasticity.
				100		12-12.5	SILTY CLAY: Dark gray.
480						12.5-13.5	SAND: Tan with light brownish gray; damp; loose; layered with iron-oxide staining, (1/4" thick).
	15					13.5-15	CLAYEY SILT: Tan with light brownish gray; damp; medium dense; non-plastic.
				100		15-19	SAND: Tan with gray clay stringers; damp; loose.
475						19-20	SAND: Light tan; saturated; loose.
	20						



ERM Environmental Resources Management

JKS-52  
DRILLING LOG

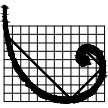
Proj. No. 0366643 Boring/Well ID JKS-52 Date Drilled 2016-09-01  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 32.50' Boring Diam. 8.25"  
 N. Coord. 13659683.26' E. Coord. 2186139.05' Surface Elevation 493.56' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 19.00' Sump Length 0'  
 Top of Casing Elevation 493.15' Stickup -0.41'  
 Depth to Water: 1. Ft. btoc 7.30 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20	[Graphic Log Pattern]	[Well Construction Pattern]	100		20-24	SAND: Light orange and tan; damp; medium dense; no odor. At 21' bgs: Color change to tan with gray striations. At 22' bgs: Color change to tan; damp; and loose; At 22.5' bgs: Two gray striations layered within iron-oxide staining.
465	25	[Graphic Log Pattern]	[Well Construction Pattern]	100		24-25 25-30	CLAYEY SAND: Tan; saturated; medium dense. INTERBEDDED CLAY AND SAND: Gray and tan; damp; loose. At 27.5' bgs: Intermittent pinkish gray coloration of clay content to 30' bgs.
460	30	[Graphic Log Pattern]	[Well Construction Pattern]	100		30-31 31-32.5	SAND: Gray; damp; loose. INTERBEDDED CLAY AND SAND: Orange with pinkish gray; damp; loose; medium plasticity.
455	35	[Graphic Log Pattern]	[Well Construction Pattern]				Boring terminated at 32.5' bgs.
450							
445							
440							
435							
430							
425							
420							
415							
410							
405							
400							



JKS-53  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-53 Date Drilled 2016-09-02  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.00' Boring Diam. 8.25"  
 N. Coord. 13659757.34' E. Coord. 2185892.80' Surface Elevation 491.33' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 494.74' Stickup 3.41'  
 Depth to Water: 1. Ft. btoc 8.50 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

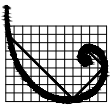
SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
491.33	0					0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490				0			
	5					5-7.5	SANDY SILTY CLAY: Tan to reddish gray; wet; low plasticity; no odor. At 6' bgs: Pockets of orange colored sand.
485				100			
	10				JKS-53_10-12.5 USCS: Clayey Sand (SC) AL: 30 / 14 / 16 - #200: 35.9 k: 5.34x10 <sup>-6</sup>	10-15	NO RECOVERY Cohesive sample (Shelby tube) collected from 10'-12' bgs.
480				0	JKS-53_12.5-15 USCS: Clayey Sand (SC) AL: 29 / 15 / 14 - #200: 48.8 k: 4.13x10 <sup>-8</sup>		Cohesive sample (Shelby tube) collected from 12.5'-15' bgs.
	15					15-16	CLAYEY SAND: Tan; wet; loose; non-plastic; no odor.
475				100		16-17.5	INTERBEDDED CLAY AND SAND: Orangish light brown sand interbedded with pinkish gray clay. At 16.5 - 17' bgs: Tan sand; damp.
						17.5-19.5	CLAYEY SAND: Light brown and tannish gray; saturated; loose; slight plasticity. At 18.5-19' bgs: Tan sand.
	20					19.5-20	INTERBEDDED CLAY AND SAND: Tan sand interbedded with pinkish gray clay; layered with iron-oxide staining; damp; loose.





JKS-53  
DRILLING LOG

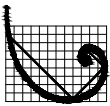
Proj. No. 0366643 Boring/Well ID JKS-53 Date Drilled 2016-09-02  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.00' Boring Diam. 8.25"  
 N. Coord. 13659757.34' E. Coord. 2185892.80' Surface Elevation 491.33' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 494.74' Stickup 3.41'  
 Depth to Water: 1. Ft. btoc 8.50 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20			100	JKS-53_20-21 USCS: Clayey Sand (SC) AL: 27 / 14 / 13 - #200: 37.6	20-25	CLAYEY SAND: Gray with tannish orange staining; saturated; loose; non-plastic. Non-cohesive grab sample collected from 20'-21' bgs. At 22-22.5' bgs: Color change to orangish light brown; moist. At 22.5-25' bgs: Saturated.
465	25			100		25-27	SAND: Reddish brown mixed with light gray; damp; medium dense; non-plastic; dry and crumbly with depth.  Boring terminated at 27' bgs.
460	30						
455	35						
450	40						



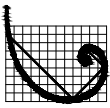
JKS-54  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-54 Date Drilled 2016-09-02  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.50' Boring Diam. 8.25"  
 N. Coord. 13659753.34' E. Coord. 2185641.96' Surface Elevation 492.69' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 496.40' Stickup 3.71'  
 Depth to Water: 1. Ft. btoc 10.79 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
492.69	0					0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490				0			
	5					5-5.8	CLAYEY SILT: Orangish brown with red; damp; loose; non-plastic; no odor.
						5.8-7.2	At 5.8' bgs: White chalky material.
						7.2-8	CLAYEY SAND: Light brown to tan; damp.
485				100		8-11.5	INTERBEDDED CLAY AND SAND: Gray clay laminations (1" thick).
	10						CLAYEY SAND: Orangish brown; medium dense; non-plastic.
							At 10.8' bgs: Tan; saturated; and loose.
480				100	JKS-54_13-14 USCS: Silty Clayey Sand (SC-SM) AL: 22 / 15 / 7 - #200: 33.5	11.5-12.5	INTERBEDDED CLAY AND SAND: Tan sand interbedded with light pinkish gray clay; damp; clay laminations are 1/4"-1/2" thick.
						12.5-15	CLAYEY SAND: Tan; wet to saturated; loose; non-plastic. Non-cohesive grab sample collected from 13'-14' bgs. At 13.2-14.2' bgs: Saturated.
	15					15-27.5	At 14.9' bgs: Single thin (1" thick) clay layer. INTERBEDDED CLAY AND SAND: Tan fine grained sand and light pinkish gray clay; damp.
475				100			
	20						



JKS-54  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-54 Date Drilled 2016-09-02  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.50' Boring Diam. 8.25"  
 N. Coord. 13659753.34' E. Coord. 2185641.96' Surface Elevation 492.69' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 496.40' Stickup 3.71'  
 Depth to Water: 1. Ft. btoc 10.79 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

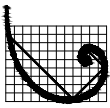
SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20	[Graphic Log]	[Well Construction]	100			
465	25	[Graphic Log]	[Well Construction]	100			At 25-28' bgs: Iron-oxide stained layers between sand and clay; clay content has slight to low plasticity; clay layers are 1/2" thick.
460	30	[Graphic Log]	[Well Construction]				Refusal encountered at 28' bgs.
455	35	[Graphic Log]	[Well Construction]				
450	40	[Graphic Log]	[Well Construction]				





JKS-55  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-55 Date Drilled 2016-09-06  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 25.00' Boring Diam. 8.25"  
 N. Coord. 13659749.76' E. Coord. 2186840.46' Surface Elevation 490.13' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 493.81' Stickup 3.68'  
 Depth to Water: 1. Ft. btoc 8.36 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
490.13	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
485	5			0		5-11.5	NO RECOVERY: Moderately to highly cemented sand.
480	10			0		11.5-12.5	NO RECOVERY: Cuttings are saturated; clayey silt material.
				0		12.5-13.5	SANDY CLAY: Dark olive gray; damp; soft; non-plastic.
475	15			100		13.5-18.5	CLAYEY SAND: Tannish gray with trace iron-oxide staining; damp; loose; non-plastic. At 15' bgs: White chalky material (1" thick); wet. At 15.5-17.5' bgs: Clayey sand mixed with some gravel. At 16.5' bgs: White chalky layer (1/2" thick). At 17.5' bgs: White chalky layer (1/2" thick). At 17.5-18.5' bgs: Saturated; tan clayey sand with trace gravel.
						18.5-19.8	SAND: Gray; wet; fine grained.
	20					19.8-20	SAND: Gray; very dense; moderately to highly cemented.



ERM Environmental Resources Management

JKS-55  
DRILLING LOG

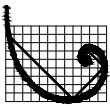
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 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 25.00' Boring Diam. 8.25"  
 N. Coord. 13659749.76' E. Coord. 2186840.46' Surface Elevation 490.13' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 493.81' Stickup 3.68'  
 Depth to Water: 1. Ft. btoc 8.36 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20			100		20-21	SANDY CLAY: Gray; damp; soft; slight plasticity.
					21-22.5	INTERBEDDED CLAY AND SAND: Fine grained tan sand interbedded with pinkish gray clay; damp.	
					22.5-23.5	CLAYEY SAND: Tan; trace gravel; one large piece of sandstone (>1" thick).	
					23.5-25	SAND: Pinkish gray; fine grained; damp; very thin layers of iron-oxide staining.	
465	25					Boring terminated at 25' bgs.	
460	30						
455	35						
40							



JKS-56  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-56 Date Drilled 2016-09-06  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 25.00' Boring Diam. 8.25"  
 N. Coord. 13660382.47' E. Coord. 2186847.61' Surface Elevation 493.07' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Sump Length 0'  
 Top of Casing Elevation 496.66' Stickup 3.59'  
 Depth to Water: 1. Ft. btoc 11.20 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
493.07	0				No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5			0		5-5.5 5.5-7	SANDY CLAY: Reddish gray; damp; stiff; non-plastic. At 5.5' bgs: Gray sandstone piece (>1" thick). SAND: Light orangish brown; fine grained; damp; loose.
485	7.5			100	0	7-7.5 7.5-9.5	At 6.25' bgs: Color changes to tannish gray with some orangish brown. SANDY CLAY: Orange; damp; stiff to very stiff; non-plastic. CLAYEY SILT: Orangish tan; saturated; loose; non-plastic; mixed with some gravel and trace pockets of gray, fine grained sand.
480	10			15		9.5-10 10-13	CLAYEY SILTY SAND: Orangish tan; saturated; loose; non-plastic. NO RECOVERY
475	15			50		13-22.5	CLAYEY SAND: Tan; fine grained; saturated; loose; non-plastic.  At 15' bgs: Small pocket of gray, fine grained, loose sand (1" thick). At 16' bgs: Coarse, angular gravel layer (~1-2" thick)
	20						



JKS-56  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-56 Date Drilled 2016-09-06  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 25.00' Boring Diam. 8.25"  
 N. Coord. 13660382.47' E. Coord. 2186847.61' Surface Elevation 493.07' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Sump Length 0'  
 Top of Casing Elevation 496.66' Stickup 3.59'  
 Depth to Water: 1. Ft. btoc 11.20 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

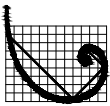
SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20			50		22.5-24.9	SAND: Brownish gray; fine grained; saturated; trace clay content.
465	25					24.9-25	SANDY CLAY: Reddish brown; saturated; very soft. Boring terminated at 25' bgs.





JKS-57  
DRILLING LOG

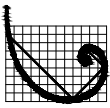
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 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.50' Boring Diam. 0.00"  
 N. Coord. 13668235.72' E. Coord. 2187486.38' Surface Elevation 503.83' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 506.91' Stickup 3.08'  
 Depth to Water: 1. Ft. btoc 20.07 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
503.83	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
500	5			100		5-8	CLAYEY SILT: Dark brown; damp; loose to medium dense; very slight plasticity; rootlets present.
495	10			100		8-12.2	CLAYEY SAND: Orangish brown with trace gray and iron-oxide staining; damp; loose to medium dense; slight plasticity; rootlets present.  At 10' bgs: Color becomes grayish tan mottled with yellow iron-oxide staining.
490	15			100		12.2-14	SANDSTONE: Magenta red with orangish yellow and gray; damp; several pieces of reddish brown nodules (>1" thick) surrounded by yellow sandy clay.
485	20			100		14-15	SANDY CLAY: Orangish yellow and gray; damp; slight plasticity; gray and orangish yellow striations of sandy clay; white crystalline structures with medium grained sand throughout.
						15-25	INTERBEDDED CLAY AND SAND: Gray with yellow and iron-oxide staining; dry; soft; medium plasticity. At 15-16' bgs: Mostly sand and iron-oxide staining. At 16-17.5' bgs: Mostly gray clay. At 17.5-18.5' bgs: Mostly sand with some yellow and trace iron-oxide staining. At 18.5-20' bgs: Mostly sand with some iron-oxide staining.



JKS-57  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-57 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.50' Boring Diam. 0.00"  
 N. Coord. 13668235.72' E. Coord. 2187486.38' Surface Elevation 503.83' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 506.91' Stickup 3.08'  
 Depth to Water: 1. Ft. btoc 20.07 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204.  
 Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
480	20	[Graphic Log]	[Well Construction]	100			At 20-21' bgs: Mostly sand with yellow and trace iron-oxide staining. At 21-21.5' bgs: 2" thick layer of reddish brown, hard-packed sand; 4" thick layer of tan, very fine grained, loose sand. At 21.5-25' bgs: Mostly dark gray clay; At 22.5' bgs: Reddish brown coloration;
475	25	[Graphic Log]	[Well Construction]	100		25-25.5 25.5-27	At 24-25' bgs: Color is brownish gray with redox stippling. SAND: Gray; fine grained; dry; medium dense; low plasticity. At 25.5' bgs: Very thin (1/8" thick) brownish red coloration. INTERBEDDED CLAY AND SAND: Brownish gray clay interbedded with fine grained sand; dense; hard-packed.
470	30	[Graphic Log]	[Well Construction]			27-27.5	At 26.6' bgs: Thin, tan, dry, very fine grained, sand. SAND: Highly cemented; reddish brown nodules present. Refusal encountered at 27.5' bgs.
465	35	[Graphic Log]	[Well Construction]				
460	40	[Graphic Log]	[Well Construction]				



ERM Environmental Resources Management

JKS-58  
DRILLING LOG

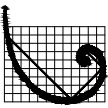
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 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 32.00' Boring Diam. 8.25"  
 N. Coord. 13667994.99' E. Coord. 2187797.39' Surface Elevation 500.94' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Sump Length 0'  
 Top of Casing Elevation 504.45' Stickup 3.51'  
 Depth to Water: 1. Ft. btoc 21.09 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

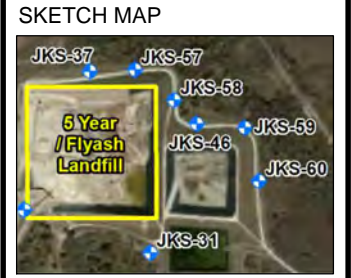
Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
500.94	0			0		0-5	NO RECOVERY: Previously excavated by hydrovac truck.
495	5			100		5-6	SAND: Brown; fine grained; moist; very loose.
490	10			100		6-7	CLAYEY SAND: Grayish brown with red; fine grained; damp; loose; non-plastic.
485	15			100		7-10	SAND: Red, orange, and gray; damp medium grained; very loose to medium dense; slight gray, soft to medium dense, sandy clay; (clay content increases with depth).
						10-17	At 9.8' bgs: Color change to dark gray. At 10' bgs: Hard, sandstone, iron ore piece (>1" thick). SILTY CLAY: Gray with alternating yellow and orange layers; dry; dense; slight plasticity.
							At 12.2' bgs: Brown sand seam (3" thick).
						17-17.5	At 16-16.5' bgs: Brownish tan sandy clay.
						17.5-19.5	At 16.5-17' bgs: Gray clay has fractured texture. CLAY: Gray; damp; mixed with coarse grained sand. SAND: Tan; moist to wet. At 18-19.5' bgs: Color change to gray with black staining; no odor; white, crystalline, coarse grained structures present.
	20					19.5-20	CLAYEY SILTY SAND: Orangish brown; dry; gravel and some small sandstone pieces present.



JKS-58  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-58 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 32.00' Boring Diam. 8.25"  
 N. Coord. 13667994.99' E. Coord. 2187797.39' Surface Elevation 500.94' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Sump Length 0'  
 Top of Casing Elevation 504.45' Stickup 3.51'  
 Depth to Water: 1. Ft. btoc 21.09 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204.  
 Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
480	20			100		20-21	CLAY: Gray; dry; stiff; small, tan sandy clay pockets present.
						21-22.5	INTERBEDDED CLAY AND SAND: Gray and orangish tan; damp; clay is pinkish gray interbedded with thin orange sand layers.
						22.5-25.5	CLAY: Dark pinkish gray; dry; stiff; several very thin, light gray, silty sand layers.  At 24.5-24.7' bgs: Tan, dry, silty clay.
475	25			100	JKS-58_26-27 USCS: Sandy Lean Clay (CL) AL: 38 / 18 / 20 - #200: 50.9	25.5-30	CLAYEY SAND: Tan; moist to saturated. At 25.5-27.5' bgs: No distinct layers. Non-cohesive grab sample collected from 26'-27' bgs.  At 27.5' bgs: Thin saturated seam. At 27.5-30' bgs: Yellow and orange layering.
470	30				JKS-58_30-32.5 USCS: Fat Clay (CH) AL: 57 / 20 / 37 - #200: 89.1 k: 1.53x10 <sup>-7</sup>	30-32.5	NO RECOVERY: Cohesive sample (Shelby tune) collected from 30'-32' bgs.  Boring terminated at 32.5' bgs.
465	35						
40							





**ERM** Environmental Resources Management

**JKS-59  
DRILLING LOG**

Proj. No. 0366643 Boring/Well ID JKS-59 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.00' Boring Diam. 8.25"  
 N. Coord. 13667779.88' E. Coord. 2188352.07' Surface Elevation 493.53' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 496.45' Stickup 2.92'  
 Depth to Water: 1. Ft. btoc 15.49 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

**SKETCH MAP**

**NOTES**

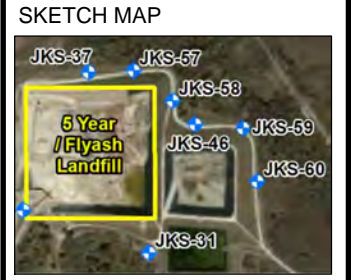
Coordinates in Texas South Central State Plane 4204.  
Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
493.53	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
490	5					5-6.5	SILTY SAND: Brown; damp; loose.
						6.5-7	SAND: Tan; damp; loose.
				100		7-10	SILTY CLAY: Dark brown; damp; soft; slight plasticity.
485	10					10-11	At 9-10' bgs: Decreasing silt content; increasing stiffness; some iron-oxide stained nodules observed. CLAY: Dark brown; damp; medium stiff; low to medium plasticity.
				100		11-15	SILTY CLAY: Dark orangish brown to orangish brown; damp; soft; increasing silt content with depth; increasing gray streaks/fissures with depth.
480	15					15-15.5	CLAY: Dark brown to brown; damp; medium stiff to stiff; low plasticity.
				100		15.5-18	SILTY SAND: Tan; saturated; loose. At 16' bgs: Wet; crumbly; trace clay content.
475	20					18-20	At 17.5' bgs: Saturated. SANDY CLAY: Light bluish gray mottled with orange iron-oxide and black staining; moist; medium stiff; slight plasticity.



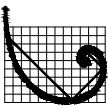
JKS-59  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-59 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 27.00' Boring Diam. 8.25"  
 N. Coord. 13667779.88' E. Coord. 2188352.07' Surface Elevation 493.53' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 12.00' Sump Length 0'  
 Top of Casing Elevation 496.45' Stickup 2.92'  
 Depth to Water: 1. Ft. btoc 15.49 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



NOTES  
 Coordinates in Texas South Central State Plane 4204.  
 Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)				
470	20			100		20-20.5	CLAY: Brown to light brown; damp; medium stiff to stiff; low plasticity. SANDY CLAY: Light gray mottled with orangish iron-oxide staining; moist; medium stiff; slight plasticity. CLAY: Dark pinkish gray; moist; soft; layered with very thin orange/iron-oxide stained silty sand. SILT: Tan; saturated; very loose. CLAY: Dark pinkish gray; soft; layered with very thin orange/iron-oxide stained silty sand. SAND: Gray with orange staining; fine grained; saturated; loose. CLAY: Gray; saturated; very soft; high plasticity. Boring terminated at 27' bgs.				
						20.5-21					
						21-22.5					
						22.5-22.8					
						22.8-25					
	25										
						25-26					
						26-27					
465	30										
460	35										
455											
40											



**ERM** Environmental Resources Management

**JKS-60  
DRILLING LOG**

Proj. No. 0366643 Boring/Well ID JKS-60 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 26.00' Boring Diam. 8.25"  
 N. Coord. 13667357.02 E. Coord. 2188465.44 Surface Elevation 492.68' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Sump Length 0'  
 Top of Casing Elevation 495.70' Stickup 3.02'  
 Depth to Water: 1. Ft. btoc 17.40 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

**SKETCH MAP**

**NOTES**

Coordinates in Texas South Central State Plane 4204.  
 Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
492.68	0				No Samples Collected	0-5	NO RECOVERY: Previously excavated with hydrovac truck.
490	5			0		5-10	SAND: Grayish tan with orange and yellow; very fine grained; damp; loose; no odor. At 6' bgs: Color change to light pinkish orange.  At 7.5' bgs: Color change to light gray with trace orange and yellow.
485	10			100		10-10.8	CLAY: Dark gray; moist; soft; slight plasticity.
480	10.8-16			100		10.8-16	SAND: White with yellow; very fine grained; damp; loose.  At 11.6-13' bgs: Color change to pale yellow.  At 13-16' bgs: Color change to light orangish yellow.
475	15			0		16-23.5	At 15' bgs: Thin reddish orange stringer. At 15-16' bgs: Moist. SAND: Light orange; very fine grained; damp; very dense; unable to collect soil core, soil descriptions based on observation of auger cuttings.  At 18-23.5' bgs: Color change to pale yellow.
20	20						



ERM Environmental Resources Management

JKS-60  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-60 Date Drilled 2016-09-07  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 26.00' Boring Diam. 8.25"  
 N. Coord. 13667357.02 E. Coord. 2188465.44 Surface Elevation 492.68' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Sump Length 0'  
 Top of Casing Elevation 495.70' Stickup 3.02'  
 Depth to Water: 1. Ft. btoc 17.40 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
470	20	[Graphic Log]	[Well Construction]	0			At 22' bgs: Moisture content increases to wet.
	25	[Graphic Log]	[Well Construction]	100		23.5-25.7	SAND: Tan; fine grained; saturated; loose.
465	30	[Graphic Log]	[Well Construction]			25.7-25.9	At 25.5' bgs: Color change to white with brown; medium grained.
460	35	[Graphic Log]	[Well Construction]			25.9-26	SILTY SAND: Dark reddish staining; saturated. CLAY-SHALE: Shaley clay; tan; wet; dense; non-plastic. Boring terminated at 26' bgs.
455	40	[Graphic Log]	[Well Construction]				





JKS-61  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-61 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 35.00' Boring Diam. 8.25"  
 N. Coord. 13665721.04' E. Coord. 2187196.65' Surface Elevation 502.52' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 18.00' Sump Length 0'  
 Top of Casing Elevation 505.51' Stickup 2.99'  
 Depth to Water: 1. Ft. btoc 24.46 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
502.52	0				No Samples Collected	0-5	NO RECOVERY: Previously excavated with hydrovac truck.
500	5			0		5-5.2 5.2-10.5	SANDY SILT: Dark brown; damp; loose; contains rootlets. SAND: Light tannish orange; damp; fine grained; loose.
495	10			100		10.5-12.5	INTERBEDDED CLAY AND SAND: Light gray to white; very fine grained; very hard packed; very thin (1/10") pinkish gray clay stringers throughout.
490	15			100		12.5-20	At 10.5' bgs: Pinkish gray clay layer (1" thick). SAND: Light gray to white with trace yellow and orange colorations; dry; very fine grained; very hard packed. At 12.5-15' bgs: Sand is cemented.
485	20			100			At 16.5-19' bgs: Three clay stringers (1/4" thick).



ERM Environmental Resources Management

JKS-61  
DRILLING LOG

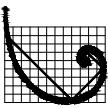
Proj. No. 0366643 Boring/Well ID JKS-61 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 35.00' Boring Diam. 8.25"  
 N. Coord. 13665721.04' E. Coord. 2187196.65' Surface Elevation 502.52' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 18.00' Sump Length 0'  
 Top of Casing Elevation 505.51' Stickup 2.99'  
 Depth to Water: 1. Ft. btoc 24.46 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204.  
Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
480	20	[Hatched pattern]	[Dotted pattern]	100		20-22.5	CLAYEY SAND: Gray with trace orange; damp; fine grained; loose; trace clay content present. At 21' bgs: Color change to tan with orange and gray; moisture content becomes wet. At 21.8' bgs: Thin pinkish gray clay seam (1/4" thick).
		[Dotted pattern]	[Dotted pattern]			22.5-25	SAND: Gray with orange, tan, and yellow; fine grained; wet; loose.
475	25	[Hatched pattern]	[Dotted pattern]	100		25-31.5	CLAYEY SAND: Gray; fine grained; wet to saturated; loose. At 25-25.8' bgs: Saturated.  At 27.5-28.5' bgs: Saturated.  At 30-31' bgs: Saturated.  At 31-32.5' bgs: Wet.
470	30	[Hatched pattern]	[Dotted pattern]	100		31.5-32.5	SANDY CLAY: Pinkish gray; damp; medium dense; non-plastic to plastic; very thin sand stringers throughout (1/10" thick).
		[Hatched pattern]	[Dotted pattern]			32.5-33	CLAYEY SILTY SAND: Gray; saturated; loose.
		[Hatched pattern]	[Dotted pattern]			33-35	SANDY CLAY: Pinkish gray; damp; medium dense; slightly plastic; very thin sand stringers throughout (1/10" thick).
	35	[Hatched pattern]	[Dotted pattern]				Boring terminated at 35' bgs.
465							
40							



**ERM** Environmental Resources Management

**JKS-62  
DRILLING LOG**

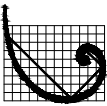
Proj. No. 0366643 Boring/Well ID JKS-62 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 37.00' Boring Diam. 8.25"  
 N. Coord. 13666020.13' E. Coord. 2187153.88' Surface Elevation 506.71' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Sump Length 0'  
 Top of Casing Elevation 509.84' Stickup 3.13'  
 Depth to Water: 1. Ft. btoc 28.90 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
506.71	0					0-5	NO RECOVERY: Previously excavated with hydrovac truck.
505				0		5-6	SANDY SILT: Dark brown; damp; very loose; slight to low plasticity; trace rootlets.
	5					6-9	INTERBEDDED CLAY AND SAND: Light gray; dry; sand content fine grained, loose; clay content is pinkish gray with slight to low plasticity.
500				100			
	10					9-15	CLAYEY SAND: Light gray with yellowish orange and pale yellow; very fine grained; dry; trace clay content. At 10' bgs: Color change to light pinkish brown and yellowish orange; moisture content increases to damp; sand is loose; clay is soft and non-plastic. At 11' bgs: Color change to white/light gray and tan, clay is darker gray; moisture content decreases to dry; very dense; crumbles easily.
495				100			
	15					15-20	SAND: White; dry; dense but crumbles easily.
490				50			
	20						



JKS-62  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-62 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 37.00' Boring Diam. 8.25"  
 N. Coord. 13666020.13' E. Coord. 2187153.88' Surface Elevation 506.71' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 10.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Sump Length 0'  
 Top of Casing Elevation 509.84' Stickup 3.13'  
 Depth to Water: 1. Ft. btoc 28.90 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
485	20	[Dotted pattern]	[Dotted pattern]	50		20-25	SAND: Light gray to tannish gray; fine grained; dry to damp; loose.  At 21.2' bgs: Moisture content increases to damp. At 21.4' bgs: Yellow and iron-oxide staining.
480	25	[Horizontal lines]	[Horizontal lines]	100		25-27.5	INTERBEDDED CLAY AND SAND: Gray; fine grained; wet; loose. At 25.5' bgs: Iron-oxide staining and thin (1/4" thick) pinkish gray clay layer.  At 27.5' bgs: Iron-oxide staining and thin (1/4" thick) pinkish gray clay layer.
475	30	[Diagonal lines]	[Diagonal lines]	0		27.5-29.5	CLAYEY SAND: Gray with iron-oxide staining; saturated; loose; trace clay content. At 29' bgs: Increased iron-oxide staining with clay layers.
470	35	[Cross-hatch]	[Cross-hatch]	0	JKS-62_35-37 USCS: Clayey Sand (SC) AL: 38 / 17 / 21 - #200: 32.3 k: 6.63x10 <sup>-7</sup>	29.5-30 30-30.5 30.5-31 31-31.5 31.5-35	INTERBEDDED CLAY AND SAND: Pinkish gray; damp; medium dense; slight plasticity. SAND: Gray; fine grained; damp. INTERBEDDED CLAY AND SAND: Orange, fine grained, moist sand; gray, low plasticity clay; loose to medium dense. CLAY: Brown; moist; loose to medium dense; non plastic. At 31.5 bgs: Thin reddish brown nodule layer (1/4" thick). CLAY: Brown; damp; soft; high plasticity; unable to collect soil core; descriptions based on observation of auger cuttings.
470	35	[Cross-hatch]	[Cross-hatch]	0		35-37	NO RECOVERY: Cohesive sample (Shelby tube) collected from 35'-37' bgs.  Boring terminated at 35' bgs.





JKS-63  
DRILLING LOG

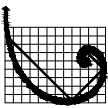
Proj. No. 0366643 Boring/Well ID JKS-63 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 50.00' Boring Diam. 8.25"  
 N. Coord. 13666230.86' E. Coord. 2186553.38' Surface Elevation 523.55' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 30.00' Sump Length 0'  
 Top of Casing Elevation 526.86' Stickup 3.31'  
 Depth to Water: 1. Ft. btoc 44.70 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
523.55	0			0	No Samples Collected	0-5	NO RECOVERY: Previously excavated by hydrovac truck.
520	5			100		5-5.5 5.5-6 6-7.8	SAND: Brown; fine-grained; moist; loose. CLAYEY SAND: Tan; moist; single piece of gray, non-plastic clay. SILTY SAND: Brown lense; fine grained; moist; loose; trace rootlets.
515	10			100		7.8-10.2	SANDY CLAY: Reddish brown to dark gray with red; dry to damp; very stiff; hard-packed; non-plastic.
510	15			100		10.2-12.2	CLAYEY SAND: Orange to pinkish orange; dry to damp; very dense; non-plastic.
505	20			75		12.2-18	INTERBEDDED CLAY AND SAND: Tan; very fine-grained; very dense/hard-packed; layered with thin gray sandy clay seams.  At 15' bgs: Sand color changes to very light gray to white; pinkish gray sandy clay seams throughout; layered with pale yellow colorations.
						18-20	SAND: Gray to brownish orange; dry; very fine-grained; medium dense; crumbles easily.



JKS-63  
DRILLING LOG

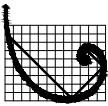
Proj. No. 0366643 Boring/Well ID JKS-63 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 50.00' Boring Diam. 8.25"  
 N. Coord. 13666230.86' E. Coord. 2186553.38' Surface Elevation 523.55' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 30.00' Sump Length 0'  
 Top of Casing Elevation 526.86' Stickup 3.31'  
 Depth to Water: 1. Ft. btoc 44.70 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
20						20-30	INTERBEDDED CLAY AND SAND: Light gray; very fine-grained; dry to damp; dense/hard-packed; layered with thin pinkish gray clay seams and iron-oxide staining.
500				80			
25							
495				80			
30						30-39	SAND: Gray; dry to saturated; fine-grained; very hard packed; crumbles easily.  At 32.5' bgs: Medium-grained.
490				80			
35							
485				80			At 38-39' bgs: Saturated.
40						39-39.5 39.5-50	CLAYEY SAND: Dark reddish brown; wet; loose. SAND: Gray; wet; fine-grained; loose.



**ERM** Environmental Resources Management

**JKS-63  
DRILLING LOG**

Proj. No. 0366643 Boring/Well ID JKS-63 Date Drilled 2016-09-08  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras Power Station - San Antonio Boring T.D. 50.00' Boring Diam. 8.25"  
 N. Coord. 13666230.86' E. Coord. 2186553.38' Surface Elevation 523.55' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 20.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 30.00' Sump Length 0'  
 Top of Casing Elevation 526.86' Stickup 3.31'  
 Depth to Water: 1. Ft. btoc 44.70 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

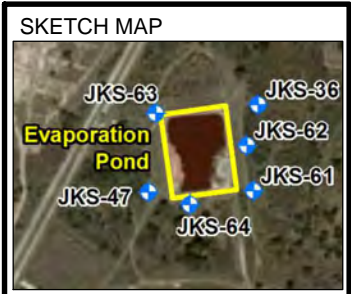
Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
40							
480				80			
45							At 45' bgs: Moisture content increases to saturated; trace iron-oxide staining.
475				80			
50							Boring terminated at 50' bgs.
470							
55							
465							
60							



# Environmental Resources Management

## JKS-64 DRILLING LOG

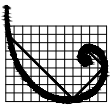
Proj. No. 0366643 Boring/Well ID JKS-64 Date Drilled 2016-09-09  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras power Station - San Antonio Boring T.D. 32.00' Boring Diam. 8.25"  
 N. Coord. 13665627.14' E. Coord. 2186778.76' Surface Elevation 504.38' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 507.84' Stickup 3.46'  
 Depth to Water: 1. Ft. btoc 25.06 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry



**NOTES**  
 Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
504.38	0			0		0-5	NO RECOVERY: Previously excavated with hydrovac truck.
500	5					5-6.5	SILTY SAND: Brown; moist; loose.
				100		6.5-8	INTERBEDDED CLAY AND SAND: Pinkish gray and orange; fine grained, orange sand; pinkish gray clay layered with iron-oxide staining; damp; non-plastic.
495	10					8-13	SAND: Light gray and pale yellow; dry; very fine-grained; dense; very hard-packed; trace clay content; layered appearance.
490	15			100		13-22.5	INTERBEDDED CLAY AND SAND: Light gray and pale yellow, fine-grained sand; dark gray, slightly plastic, medium stiff clay.
485	20						At 17' bgs: Thickness of clay layers increases (1-2" thick); low plasticity.





JKS-64  
DRILLING LOG

Proj. No. 0366643 Boring/Well ID JKS-64 Date Drilled 2016-09-09  
 Project Ground Water Investigation - Phase II Owner CPS Energy  
 Location Calaveras power Station - San Antonio Boring T.D. 32.00' Boring Diam. 8.25"  
 N. Coord. 13665627.14' E. Coord. 2186778.76' Surface Elevation 504.38' Ft. MSL Datum  
 Screen: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Slot Size 0.01"  
 Casing: Type Sch. 40 PVC Diam. 2.00" Length 15.00' Sump Length 0'  
 Top of Casing Elevation 507.84' Stickup 3.46'  
 Depth to Water: 1. Ft. btoc 25.06 ( 2016-05-21 ) 2. Ft. \_\_\_\_\_ ( \_\_\_\_\_ )  
 Drilling Company Strata Core Services, LLC Driller Ryan Spaust  
 Drilling Method Hollow-Stem Auger Log By Andrew Henry

SKETCH MAP

NOTES

Coordinates in Texas South Central State Plane 4204. Elevations in NAVD88 computed using Geoid03.

Elevation (Ft MSL)	Depth (Feet)	Graphic Log	Well Construction	Recovery (%)	Lab Sample Data	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
480	20	[Graphic Log]	[Well Construction]	100	JKS-64_20-30 USCS: Clayey Sand (SC) AL: 29 / 14 / 15 - #200: 30.1	20-22.5	At 20' bgs: Saturated; clay color changes to pinkish gray. Non-cohesive grab sample collected from 20'-30' bgs.
480	22.5	[Graphic Log]	[Well Construction]	100		22.5-25	SAND: Gray with bluish gray and orange; fine-grained; loose.
480	25	[Graphic Log]	[Well Construction]	100		25-30	At 23.8' bgs: Bluish gray, low plasticity clay (1/2" thick); sand color changes to greenish blue. INTERBEDDED CLAY AND SAND: Tannish gray; wet to saturated; fine-grained; wet to saturated; loose; clay layers are pinkish gray with iron-oxide staining.
475	26.8	[Graphic Log]	[Well Construction]	100		26.8-27.5	At 26.8' bgs: Wet.
475	27.5	[Graphic Log]	[Well Construction]	100		27.5-28.3	At 27.5' bgs: Saturated.
475	28.3	[Graphic Log]	[Well Construction]	100		28.3-30	At 28.3' bgs: Wet.
475	30	[Graphic Log]	[Well Construction]	100		30-32	At 30' bgs: Gray clay; dense/stiff; low plasticity; 1" thick. NO RECOVERY: Geotechnical sample collected, but not analyzed.
470	32	[Graphic Log]	[Well Construction]	100			Boring terminated at 32' bgs.
465	35	[Graphic Log]	[Well Construction]	100			
465	40	[Graphic Log]	[Well Construction]	100			

## STATE OF TEXAS WELL REPORT for Tracking #443567

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-50R</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
<hr/>	
Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>

Drilling Start Date: **10/7/2016**      Drilling End Date: **10/7/2016**

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	<b>8.25</b>	<b>0</b>	<b>19.5</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	Bottom Depth (ft.)	Filter Material	Size
Filter Pack Intervals:	<b>7.5</b>	<b>19.5</b>	<b>Sand</b>	<b>20/40</b>

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>7.5</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality: Strata Depth (ft.) **No Data** Water Type **No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Strata Core Services, LLC**  
**112 S. Norwood Drive**  
**Hurst, TX 76053**

Driller Name: **William Fields** License Number: **56033**

Apprentice Name: **Ryan Spaust**

Comments: **No Data**

Lithology:			Casing:					
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA					
Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	17.5	Clayey sand -light brown	2	Riser	New Plastic (PVC)	40	0	9.5
17.5	19.5	Clayey silty sand - light brown	2	Screen	New Plastic (PVC)	40 10	9.5	19.5

**IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

**Texas Department of Licensing and Regulation**  
**P.O. Box 12157**  
**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #443571

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-52</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/1/2016**                      Drilling End Date: **9/1/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>29</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>7.5</b>	<b>19.5</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>17</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**





## STATE OF TEXAS WELL REPORT for Tracking #443589

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-53</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/2/2016**                      Drilling End Date: **9/2/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>25</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>17</b>	<b>25</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>17</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



## STATE OF TEXAS WELL REPORT for Tracking #443590

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-54</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
<hr/>	
Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>

Drilling Start Date: **9/2/2016**      Drilling End Date: **9/2/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>22</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>10</b>	<b>22</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>10</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**

**Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**





## STATE OF TEXAS WELL REPORT for Tracking #443591

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-55</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
<hr/>	
Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>

Drilling Start Date: **9/6/2016**      Drilling End Date: **9/6/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>25</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>12</b>	<b>25</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>12</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**





## STATE OF TEXAS WELL REPORT for Tracking #443592

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-56</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/6/2016**                      Drilling End Date: **9/6/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>25</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>8</b>	<b>25</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>8</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



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Water Quality:                      *Strata Depth (ft.)*                      *Water Type*  
**No Data**                                      **No Data**  
Chemical Analysis Made:    **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?:    **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

---

Certification Data:    The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:    **Strata Core Services, LLC**  
                                  **112 S. Norwood Drive**  
                                  **Hurst, TX 76053**

Driller Name:                      **William Fields**                                      License Number:    **56033**

Apprentice Name:                **Ryan Spaust**

Comments:                         **No Data**

---

<i>Lithology:</i>			<i>Casing:</i>						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	
0	7	Clayey silt - orangish brown	2	Riser	New Plastic (PVC)	40	0	10	
7	15	Clayey silty - gray to brown							
15	19	Sand - tan with gray	2	Screen	New Plastic (PVC)	40 10	10	25	
19	23	Sand - light orange and tan							
23	25	Sand - reddish brown							

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Please include the report's Tracking Number on your written request.

**Texas Department of Licensing and Regulation**  
**P.O. Box 12157**  
**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #443593

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-57</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/7/2016**                      Drilling End Date: **9/7/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>27</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>10</b>	<b>27</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>10</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality: **No Data** **No Data**

Strata Depth (ft.) **No Data** Water Type **No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Strata Core Services, LLC**  
**112 S. Norwood Drive**  
**Hurst, TX 76053**

Driller Name: **William Fields** License Number: **56033**

Apprentice Name: **Ryan Spaust**

Comments: **No Data**

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL			Casing: BLANK PIPE & WELL SCREEN DATA						
Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)	
0	7	Clayey silt - orangish brown	2	Riser	New Plastic (PVC)	40	0	12	
7	15	Clayey silty - gray to brown							
15	19	Sand - tan with gray	2	Screen	New Plastic (PVC)	40 10	12	27	
19	23	Sand - light orange and tan							
23	27	Sand - reddish brown							

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**Texas Department of Licensing and Regulation**  
**P.O. Box 12157**  
**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #443594

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-58</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/7/2016**                      Drilling End Date: **9/7/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>30</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>18</b>	<b>30</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>18</b>	<b>Bentonite 4 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**





## STATE OF TEXAS WELL REPORT for Tracking #443595

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-59</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/7/2016**                      Drilling End Date: **9/7/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>27</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>10</b>	<b>27</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>10</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



## STATE OF TEXAS WELL REPORT for Tracking #443596

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-60</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/7/2016**                      Drilling End Date: **9/7/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>25</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>8</b>	<b>25</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>8</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



Water Quality:                      *Strata Depth (ft.)*                      *Water Type*  
    **No Data**     **No Data**

Chemical Analysis Made:    **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?:    **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

Certification Data:    The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:    **Strata Core Services, LLC**  
    **112 S. Norwood Drive**  
    **Hurst, TX 76053**

Driller Name:                      **William Fields**     License Number:    **56033**

Apprentice Name:                      **Ryan Spaust**

Comments:                              **No Data**

**Lithology:**  
**DESCRIPTION & COLOR OF FORMATION MATERIAL**

**Casing:**  
**BLANK PIPE & WELL SCREEN DATA**

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>	<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>
<b>0</b>	<b>7</b>	<b>Clayey silt - orangish brown</b>	<b>2</b>	<b>Riser</b>	<b>New Plastic (PVC)</b>	<b>40</b>	<b>0</b>	<b>10</b>
<b>7</b>	<b>15</b>	<b>Clayey silty - gray to brown</b>	<b>2</b>	<b>Screen</b>	<b>New Plastic (PVC)</b>	<b>40 10</b>	<b>10</b>	<b>25</b>
<b>15</b>	<b>19</b>	<b>Sand - tan with gray</b>						
<b>19</b>	<b>23</b>	<b>Sand - light orange and tan</b>						
<b>23</b>	<b>25</b>	<b>Sand - reddish brown</b>						

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**Austin, TX 78711**  
**(512) 463-7880**

## STATE OF TEXAS WELL REPORT for Tracking #443597

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-61</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/8/2016**                      Drilling End Date: **9/8/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>33</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>15</b>	<b>33</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>15</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

---

Strata Depth (ft.)                                  Water Type  
Water Quality:                                  **No Data**                                  **No Data**

Chemical Analysis Made:    **No**

Did the driller knowingly penetrate any strata which  
contained injurious constituents?:    **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

---

Certification Data:    The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information:    **Strata Core Services, LLC**  
                                 **112 S. Norwood Drive**  
                                 **Hurst, TX 76053**

Driller Name:            **William Fields**                                  License Number:    **56033**

Apprentice Name:      **Ryan Spaust**

Comments:                **No Data**

---

Lithology:			Casing:						
DESCRIPTION & COLOR OF FORMATION MATERIAL			BLANK PIPE & WELL SCREEN DATA						
Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)	
0	7	Clayey silt - orangish brown	2	Riser	New Plastic (PVC)	40	0	18	
7	15	Clayey silty - gray to brown	2	Screen	New Plastic (PVC)	40 10	18	33	
15	19	Sand - tan with gray							
19	23	Sand - light orange and tan							
23	33	Sand - reddish brown							

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## STATE OF TEXAS WELL REPORT for Tracking #443598

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-62</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/8/2016**                      Drilling End Date: **9/8/2016**

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	<b>8.25</b>	<b>0</b>	<b>30</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	Bottom Depth (ft.)	Filter Material	Size
Filter Pack Intervals:	<b>18</b>	<b>30</b>	<b>Sand</b>	<b>20/40</b>

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>18</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**





## STATE OF TEXAS WELL REPORT for Tracking #443599

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-63</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
Type of Work: <b>New Well</b> Proposed Use: <b>Monitor</b>	

Drilling Start Date: **9/8/2016**                      Drilling End Date: **9/8/2016**

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	<b>8.25</b>	<b>0</b>	<b>50</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	Bottom Depth (ft.)	Filter Material	Size
Filter Pack Intervals:	<b>28</b>	<b>50</b>	<b>Sand</b>	<b>20/40</b>

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>28</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**                      **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



## STATE OF TEXAS WELL REPORT for Tracking #443600

Owner: <b>Calaveras Power Station</b>	Owner Well #: <b>JKS-64</b>
Address: <b>12940 US 181 San Antonio, TX 78223</b>	Grid #: <b>68-46-5</b>
Well Location: <b>12940 US 181 San Antonio, TX 78223</b>	Latitude: <b>29° 18' 28.4" N</b>
Well County: <b>Bexar</b>	Longitude: <b>098° 19' 01.91" W</b>
	Elevation: <b>No Data</b>
<hr/>	
Type of Work: <b>New Well</b>	Proposed Use: <b>Monitor</b>

Drilling Start Date: **9/9/2016**      Drilling End Date: **9/9/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>8.25</b>	<b>0</b>	<b>30</b>

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Filter Material</i>	<i>Size</i>
Filter Pack Intervals:	<b>12</b>	<b>30</b>	<b>Sand</b>	<b>20/40</b>

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>2</b>	<b>Cement 1 Bags/Sacks</b>
	<b>2</b>	<b>12</b>	<b>Bentonite 2 Bags/Sacks</b>

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**

**Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**



Water Quality: **Strata Depth (ft.)** **No Data** **Water Type** **No Data**  
**Chemical Analysis Made:** **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

**The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.**

**Certification Data:** The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

**Company Information:** **Strata Core Services, LLC**  
**112 S. Norwood Drive**  
**Hurst, TX 76053**

**Driller Name:** **William Fields** **License Number:** **56033**

**Apprentice Name:** **Ryan Spaust**

**Comments:** **No Data**

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL			Casing: BLANK PIPE & WELL SCREEN DATA						
Top (ft.)	Bottom (ft.)	Description	Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)	
0	7	Clayey silt - orangish brown	2	Riser	New Plastic (PVC)	40	0	15	
7	15	Clayey silty - gray to brown	2	Screen	New Plastic (PVC)	40 10	15	30	
15	19	Sand - tan with gray							
19	23	Sand - light orange and tan							
23	30	Sand - reddish brown							

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**Austin, TX 78711**  
**(512) 463-7880**

**Laboratory Results**  
*Appendix B*

**Environmental Resources Management**  
206 East 9<sup>th</sup> Street, Suite 1700  
Austin, Texas 78701  
(512) 459-4700



## TABLE 1 LABORATORY TEST SUMMARY

PROJECT: GW Investigation / CPS Calaveras Station

HTS PROJECT NO.: 16-S-217

LOCATION: San Antonio, Texas

CLIENT: ERM

ERM PROJECT #: 0337367

Sample ID	Sample Depth (feet)	Type of Material	Moisture Content (%)	Bulk Density (pcf)	Atterberg Limits (%)			-200 Sieve (%)	Coefficient of Permeability, k (cm/sec)	Solids Specific Gravity	Remarks
					LL	PL	PI				
JKS-45	28-30	Fat Clay (CH)	24.3	120.9	61	22	39	91.6*	1.82 <sup>-08</sup>	2.696	28'-30': Particle Size Analysis (ASTM D422)
	36-38	Fat Clay (CH)	19.0		67	24	43	90.5*			36'-38': Particle Size Analysis (ASTM D422)
	50-52	Silty Sand (SM)	18.0		Non Plastic			12.6*			50'-52': Particle Size Analysis (ASTM D422)
	55-57	Fat Clay (CH)	27.9		75	28	47	97.0*			55'-57': Particle Size Analysis (ASTM D422)
	60-62	Fat Clay (CH)	22.6		75	26	49	86.4*			60'-62': Particle Size Analysis (ASTM D421) (no hydrometer)
JKS-48	10-12.5	Clayey Sand (SC)	20.5	35	16	19	44.6*			10'-12.5': Particle Size Analysis (ASTM D422)	
	15-16.5	Sandy Lean Clay (CL)	19.1	48	19	29	58.9*			15'-16.5': Particle Size Analysis (ASTM D422)	
	19-20	Clayey Sand (SC)	25.2	26	16	10	48.7*			19'-20': Particle Size Analysis (ASTM D422)	
* From Particle Size Analysis testing											



## HTS, Inc. Consultants

9416 Pickering Street  
Houston, Texas 77091  
Tel: (713) 692-8373 Fax: (713) 692-8501

### SPECIFIC GRAVITY OF SOIL SOLIDS

( ASTM D-854 )

Project No:	16-S-217	Sample Identification:	Samples transported to HTS Laboratory on 04/12/2016
Technician:	M. Coronado	Sample Description:	Fat Clay (CH)

Project : Laboratory Testing - GW Investigation / CPS Calaveras Station (ERM Project #: 0337367)

### LABORATORY TEST DATA / RESULTS

	Sample:	JKS-45, 60'-62'	
	Flask No.	F-1	
	Flask Weight (gms)	171.83	
	Weight of Dry Soil (gms)	50.02	
	Wt. Flask and Water (gms)	669.90	
	Wt. Flask+Water+Soil (gms)	701.37	
	Volume of Flask at 20° (ml)	500.0	
	Container No.	51	
	Wt. of Container (gms)	30.49	
	Wt. of Container + Soil (gms)	80.51	
	Temperature ( ° C )	20.9	
	Specific Gravity:	<b>2.696</b>	

Performed By: MC Date: 5/9/2016

Checked By: BFM Date: 05/13/16





# HTS, Inc. Consultants

9416 Pickering Street  
Houston, Texas 77091

Tel: (713) 692-8373 Fax: (713) 692-8501

## FALLING HEAD / RISING TAIL HYDRAULIC CONDUCTIVITY TEST ( ASTM D-5084-03 )

Project No:	16-S-217	Sample Identification:	JKS-45, Depth = 60'-62'
Technician:	M. Coronado	Sample Description:	Fat Clay (CH)

Project : Laboratory Testing - GW Investigation / CPS Calaveras Station (ERM #: 0337367)

INITIAL CONDITIONS				FINAL CONDITIONS			
WATER CONTENT		SPECIMEN DATA		WATER CONTENT		SPECIMEN DATA	
Tare No.:	50	Length, in:	2.065	Tare No.:	46	Length, in:	2.048
Wet+Tare, gms:	153.61	Diameter, in:	2.763	Wet+Tare, gms:	154.96	Diameter, in:	2.815
Dry+Tare, gms:	130.96	Wet mass, gms:	402.31	Dry+Tare, gms:	128.83	Wet mass, gms:	413.68
Tare Weight, gms:	30.50	Area, cm <sup>2</sup> :	38.68	Tare Weight, gms:	30.50	Area, cm <sup>2</sup> :	40.15
Moisture, %	22.5	Volume, cc:	202.9	Moisture, %	26.6	Volume, cc:	208.9
		Unit wet wt, pcf:	123.7			Unit wet wt, pcf:	123.6
Specific Gravity:	2.696	Unit dry wt, pcf:	101.0	Specific Gravity:	2.696	Unit dry wt, pcf:	97.6
Saturation, %:	91.2	Void Ratio:	0.666	Saturation, %:	99.1	Void Ratio:	0.723
Perm. Cell No.:	3	Burret diam, cm:	1.123	Burret area, cm <sup>2</sup> .	0.991	Burret factor, cm/cc:	1.009
Cell Pressure, psi:	10.0	Head Pressure, psi:	7.0	Tail Pressure, psi:	5.0	Hydraulic Gradient:	30.3

### PERMEABILITY MEASUREMENTS

Date	Time	Elapsed Time (sec)	Temp (C)	Pressure Diff. (psi)	Head Rdg (cc)	Tail Rdg (cc)	Head Change (cm)	Tail Change (cm)	Total Head (cm)	Permeability Kt (cm/sec)	Permeability K <sub>20</sub> (cm/sec)
5/2/2016	9:15a	0	21.9	2.0	2.00	20.00	0.000	0.000	158.76	0.00E+00	0.00E+00
5/2/2016	12:15p	10800	21.9	2.0	2.20	19.70	0.202	0.303	158.26	1.89E-08	1.81E-08
5/2/2016	3:20p	11100	22.0	2.0	2.50	19.40	0.303	0.303	157.65	2.22E-08	2.12E-08
5/3/2016	9:15a	64500	21.9	2.0	4.00	17.90	1.514	1.514	154.63	1.93E-08	1.85E-08
5/3/2016	12:20p	11100	21.9	2.0	4.50	17.40	0.505	0.505	153.62	3.79E-08	3.63E-08
5/4/2016	9:25a	75900	21.9	2.0	6.00	16.00	1.514	1.413	150.69	1.63E-08	1.56E-08
5/4/2016	12:55p	12600	22.0	2.0	6.30	15.70	0.303	0.303	150.08	2.05E-08	1.96E-08
5/4/2016	4:35p	13200	22.0	2.0	6.60	15.40	0.303	0.303	149.48	1.97E-08	1.88E-08
5/5/2016	9:10a	59700	21.9	2.0	8.00	14.10	1.413	1.312	146.75	1.98E-08	1.89E-08

Coefficient of Permeability, k = **1.82E-08** cm/sec

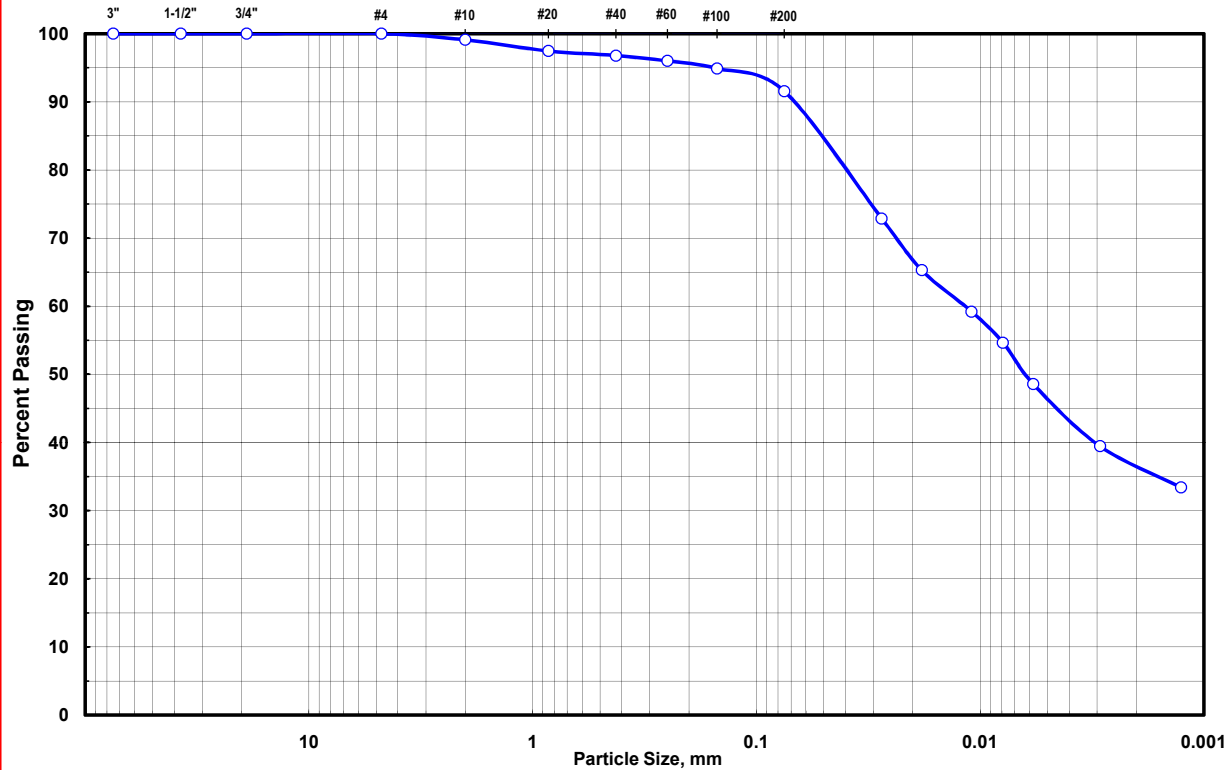
Performed By: MC Date: 4/26/2016 Checked By: BFM Date: 05/13/16



# HTS, Inc. Consultants

416 Pickering Street  
 Houston, Texas 77091  
 Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	61	% Pass No. 200:	91.6
Client:	ERM	Plastic Limit:	22	% Moisture:	24.3
Project No.:	16-S-217	Plasticity Index:	39	Test Method:	ASTM D-422
Sample ID:	JKS-45, 28'-30'	Tested By:	MC	Date Tested:	4/25/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Fat Clay (CH)	Date Checked:	5/12/2016		

# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 4/25/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JKS-45, 28'-30' SAMPLE DESCRIPTION: Fat Clay (CH)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.70 (estimated) DRY WEIGHT OF SOIL: 65.02

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 0.99

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
9:57 AM	0							
9:59 AM	2	20.9	51.0	48.0	8.40	0.01344	0.0275	73.5
10:02 AM	5	20.9	46.0	43.0	9.20	0.01344	0.0182	65.9
10:12 AM	15	20.9	42.0	39.0	9.90	0.01344	0.0109	59.7
10:27 AM	30	20.9	39.0	36.0	10.40	0.01344	0.0079	55.1
10:57 AM	60	20.9	35.0	32.0	11.10	0.01344	0.0058	49.0
2:07 PM	250	21.0	29.0	26.0	12.00	0.01328	0.0029	39.8
9:57 AM	1440	20.9	25.0	22.0	12.70	0.01344	0.0013	33.7

## SIEVE ANALYSIS

STARTING WEIGHT: **65.02** gms. Container ID: **F** STARTING DRY WEIGHT: **64.63** gms.

Container + Soil: **29.35** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.26** gms.

Wt. of Container: **14.33** gms.

Hygroscopic Moisture: **0.60** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	0.57	0.9	99.1
#20	0.8500	1.08	1.7	97.5
#40	0.4250	1.53	2.3	96.8
#60	0.2500	2.04	3.1	96.0
#100	0.1500	2.76	4.3	94.9
#200	0.0750	4.97	7.6	91.6
	0.0275			72.9
	0.0182			65.3
	0.0109			59.2
	0.0079			54.7
	0.0058			48.6
	0.0029			39.5
	0.0013			33.4

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**

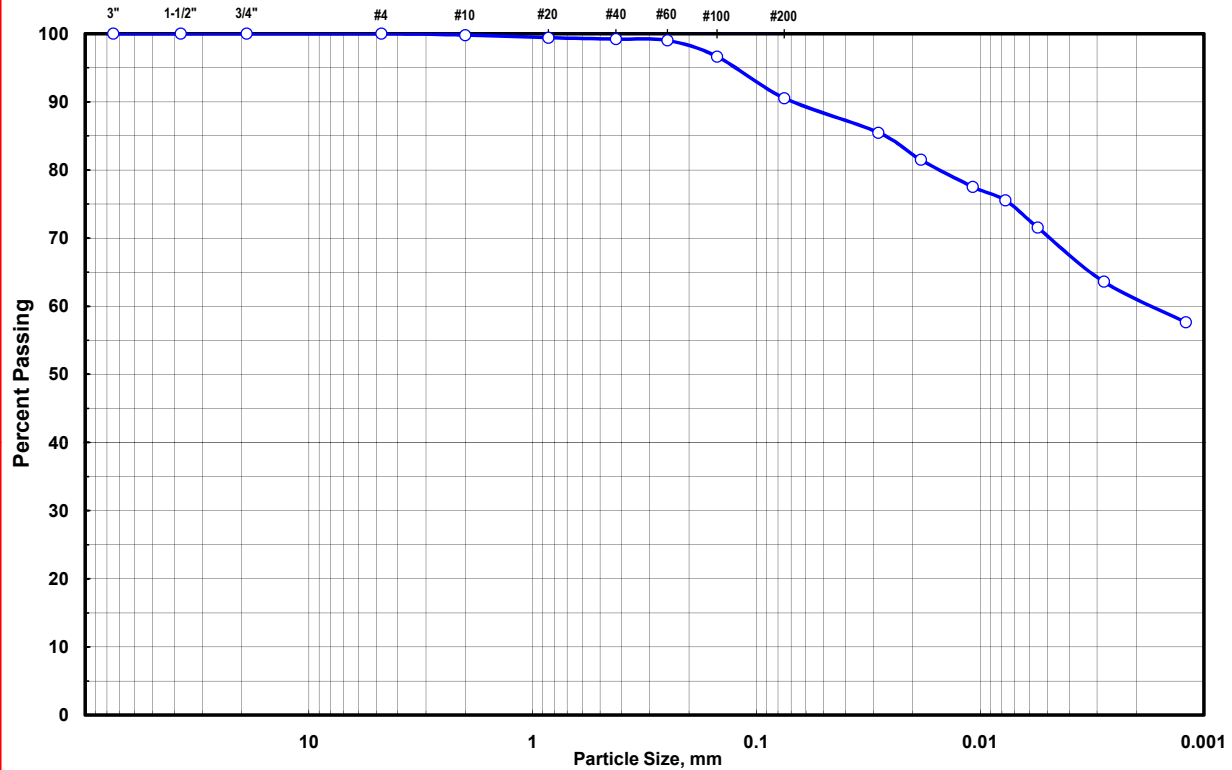




# HTS, Inc. Consultants

416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	67	% Pass No. 200:	90.5
Client:	ERM	Plastic Limit:	24	% Moisture:	19.0
Project No.:	16-S-217	Plasticity Index:	43	Test Method:	ASTM D-422
Sample ID:	JKS-45, 36'-38'	Tested By:	MC	Date Tested:	4/25/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Fat Clay (CH)	Date Checked:	5/12/2016		



# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 4/25/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JKS-45, 36'-38' SAMPLE DESCRIPTION: Fat Clay (CH)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.70 (estimated) DRY WEIGHT OF SOIL: 50.04

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 0.99

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
10:07 AM	0							
10:09 AM	2	21.0	46.0	43.0	9.20	0.01328	0.0285	85.6
10:12 AM	5	21.0	44.0	41.0	9.60	0.01328	0.0184	81.7
10:22 AM	15	21.0	42.0	39.0	9.90	0.01328	0.0108	77.7
10:37 AM	30	21.0	41.0	38.0	10.10	0.01328	0.0077	75.7
11:07 AM	60	21.0	39.0	36.0	10.40	0.01328	0.0055	71.7
2:17 PM	250	21.0	35.0	32.0	11.10	0.01328	0.0028	63.7
10:07 AM	1440	20.9	32.0	29.0	11.50	0.01344	0.0012	57.8

## SIEVE ANALYSIS

STARTING WEIGHT: **50.04** gms. Container ID: **B** STARTING DRY WEIGHT: **49.71** gms.

Container + Soil: **29.35** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.25** gms.

Wt. of Container: **14.32** gms.

Hygroscopic Moisture: **0.67** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	0.10	0.2	99.8
#20	0.8500	0.20	0.4	99.4
#40	0.4250	0.29	0.6	99.2
#60	0.2500	0.40	0.8	99.0
#100	0.1500	1.58	3.2	96.6
#200	0.0750	4.65	9.3	90.5
	0.0285			85.5
	0.0184			81.5
	0.0108			77.5
	0.0077			75.5
	0.0055			71.6
	0.0028			63.6
	0.0012			57.6

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**

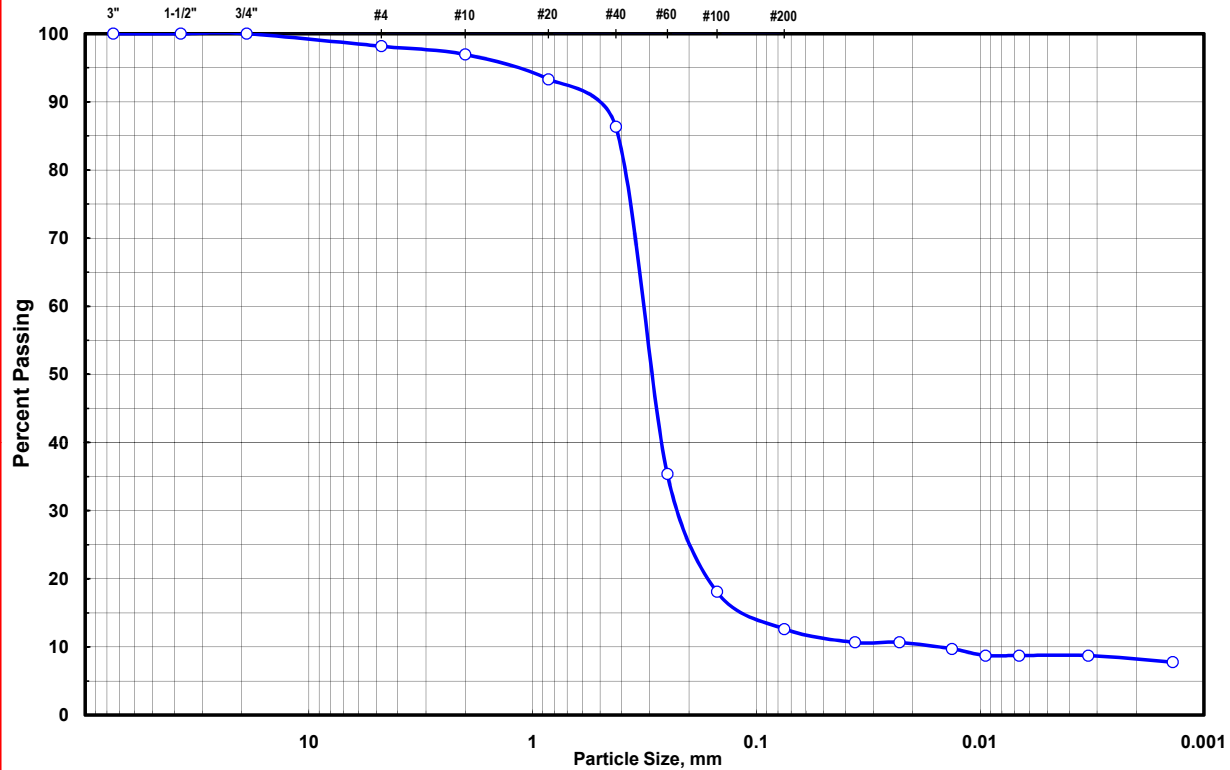




## HTS, Inc. Consultants

416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

### PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	<b>Non-Plastic</b>	% Pass No. 200:	<b>12.6</b>
Client:	ERM	Plastic Limit:	<b>Non-Plastic</b>	% Moisture:	<b>18.0</b>
Project No.:	16-S-217	Plasticity Index:	<b>Non-Plastic</b>	Test Method:	<b>ASTM D-422</b>
Sample ID:	JKS-45, 50'-52'	Tested By:	<b>MC</b>	Date Tested:	<b>3/29/2016</b>
Remarks:	ERM Project #: 0337367	Checked By:	<b>BFM</b>		
Description:	<b>Silty Sand (SM)</b>	Date Checked:	<b>5/12/2016</b>		

# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 5/2/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JKS-45, 50'-52' SAMPLE DESCRIPTION: Silty Sand (SM)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.65 (estimated) DRY WEIGHT OF SOIL: 100.02

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 1.00

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
10:22 AM	0							
10:24 AM	2	21.2	14.0	11.0	14.50	0.01348	0.0363	11.0
10:27 AM	5	21.2	14.0	11.0	14.50	0.01348	0.0230	11.0
10:37 AM	15	21.2	13.0	10.0	14.70	0.01348	0.0133	10.0
10:52 AM	30	21.2	12.0	9.0	14.80	0.01348	0.0095	9.0
11:22 AM	60	21.3	12.0	9.0	14.80	0.01348	0.0067	9.0
2:32 PM	250	21.3	12.0	9.0	14.80	0.01348	0.0033	9.0
10:22 AM	1440	21.0	11.0	8.0	15.00	0.01348	0.0014	8.0

## SIEVE ANALYSIS

STARTING WEIGHT: **100.02** gms. Container ID: **A** STARTING DRY WEIGHT: **99.89** gms.

Container + Soil: **29.49** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.47** gms.

Wt. of Container: **14.42** gms.

Hygroscopic Moisture: **0.13** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	1.83	1.8	98.2
#10	2.0000	3.04	3.0	97.0
#20	0.8500	3.76	3.8	93.3
#40	0.4250	10.95	11.0	86.3
#60	0.2500	63.50	63.5	35.4
#100	0.1500	81.36	81.3	18.1
#200	0.0750	87.00	87.0	12.6
	0.0363			10.7
	0.0230			10.7
	0.0133			9.7
	0.0095			8.7
	0.0067			8.7
	0.0033			8.7
	0.0014			7.8

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**

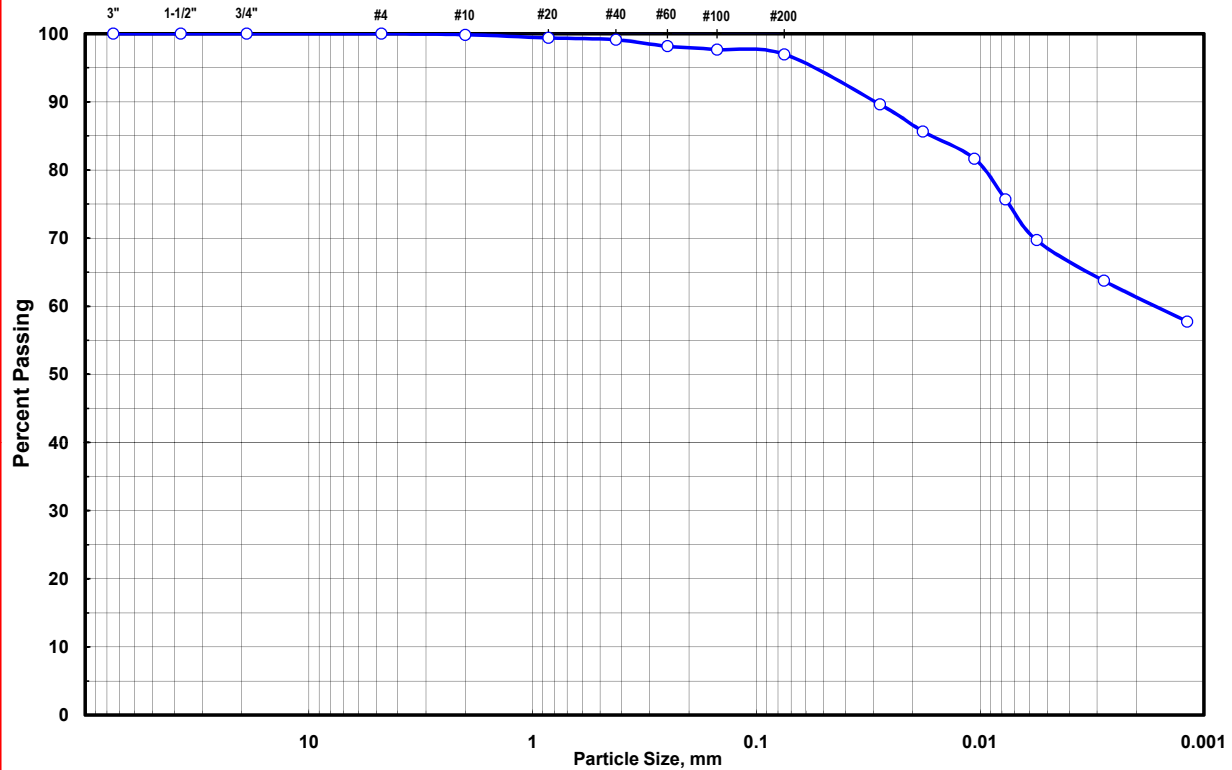




# HTS, Inc. Consultants

416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	75	% Pass No. 200:	97.0
Client:	ERM	Plastic Limit:	28	% Moisture:	27.9
Project No.:	16-S-217	Plasticity Index:	47	Test Method:	ASTM D-422
Sample ID:	JKS-45, 55'-57'	Tested By:	MC	Date Tested:	5/2/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Fat Clay (CH)	Date Checked:	5/13/2016		



# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 5/2/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JKS-45, 55'-57' SAMPLE DESCRIPTION: Fat Clay (CH)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.70 (estimated) DRY WEIGHT OF SOIL: 50.02

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 0.99

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
10:32 AM	0							
10:34 AM	2	21.4	48.0	45.0	8.90	0.01328	0.0280	89.8
10:37 AM	5	21.4	46.0	43.0	9.20	0.01328	0.0180	85.8
10:47 AM	15	21.4	44.0	41.0	9.60	0.01328	0.0106	81.8
11:02 AM	30	21.4	41.0	38.0	10.10	0.01328	0.0077	75.8
11:32 AM	60	21.4	38.0	35.0	10.60	0.01328	0.0056	69.8
2:42 PM	250	21.4	35.0	32.0	11.10	0.01328	0.0028	63.8
10:32 AM	1440	21.0	32.0	29.0	11.50	0.01328	0.0012	57.9

## SIEVE ANALYSIS

STARTING WEIGHT: **50.02** gms. Container ID: **D** STARTING DRY WEIGHT: **49.62** gms.

Container + Soil: **29.20** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.08** gms.

Wt. of Container: **14.19** gms.

Hygroscopic Moisture: **0.81** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	0.08	0.2	99.8
#20	0.8500	0.23	0.5	99.4
#40	0.4250	0.36	0.7	99.1
#60	0.2500	0.84	1.7	98.2
#100	0.1500	1.08	2.2	97.7
#200	0.0750	1.44	2.9	97.0
	0.0280			89.6
	0.0180			85.7
	0.0106			81.7
	0.0077			75.7
	0.0056			69.7
	0.0028			63.7
	0.0012			57.8

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**



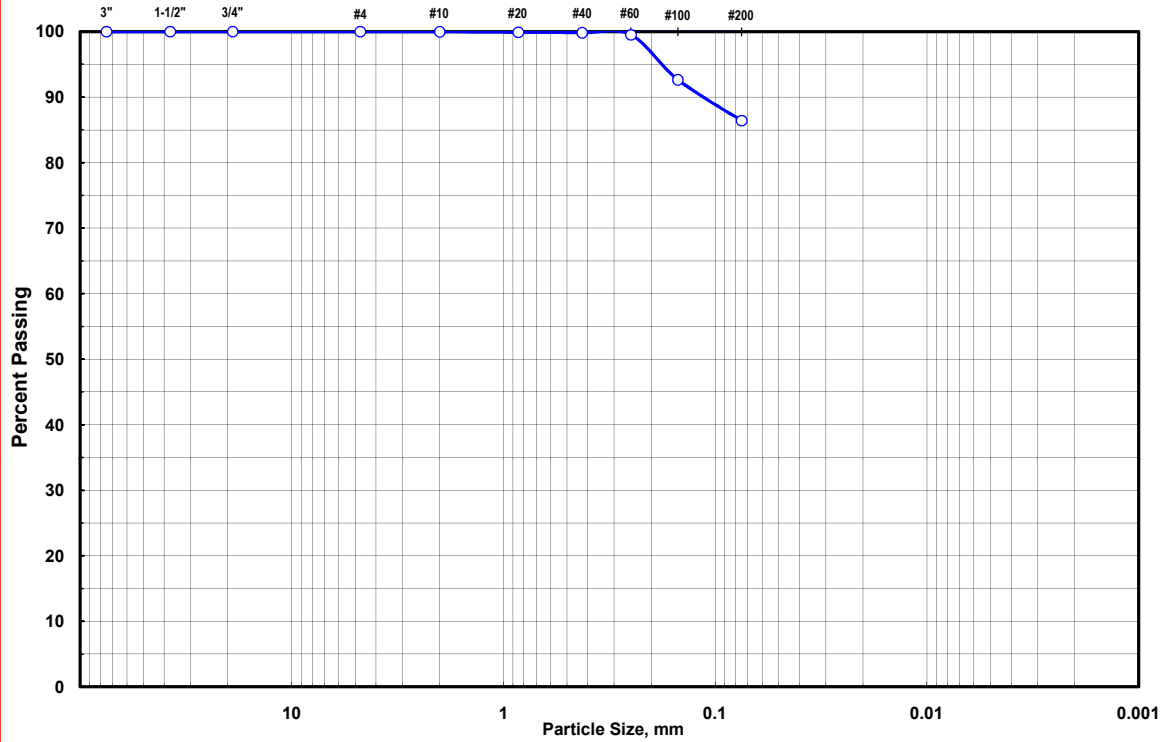


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Houston, Texas 77091

Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	75	% Pass No. 200:	86.4
Client:	ERM	Plastic Limit:	26	% Moisture:	22.6
Project No.:	16-S-217	Plasticity Index:	49	Test Method:	ASTM D-421
Sample ID:	JKS-45, 60'-62'	Tested By:	MC	Date Tested:	5/2/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Fat Clay (CH)	Date Checked:	5/13/2016		

# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 4/28/2016  
 DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_  
 SAMPLE LOCATION: JK-45, 60'-62' SAMPLE DESCRIPTION: Fat Clay (CH)  
 DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3  
 SPECIFIC GRAVITY OF SOIL: 2.70 (estimated) DRY WEIGHT OF SOIL: 220.50  
 GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 0.99

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER

## SIEVE ANALYSIS

STARTING WEIGHT: **220.50** gms. Container ID: **E** STARTING DRY WEIGHT: **220.50** gms.  
 Container + Soil: **527.07** gms. (corrected for hygroscopic moisture)  
 Container + Dry Soil: **527.07** gms.  
 Wt. of Container: **365.51** gms.  
 Hygroscopic Moisture: **0.00** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	0.02	0.0	100.0
#20	0.8500	0.20	0.1	99.9
#40	0.4250	0.37	0.2	99.8
#60	0.2500	1.08	0.5	99.5
#100	0.1500	16.21	7.4	92.6
#200	0.0750	29.92	13.6	86.4

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-421)**







# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 4/28/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JK-48, 10'-12.5' SAMPLE DESCRIPTION: Clayey Sand (SC)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.65 (estimated) DRY WEIGHT OF SOIL: 70.03

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 1.00

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
10:52 AM	0							
10:54 AM	2	21.3	31.0	28.0	11.70	0.01348	0.0326	40.2
10:57 AM	5	21.3	30.0	27.0	12.00	0.01348	0.0209	38.8
11:07 AM	15	21.3	29.0	26.0	12.00	0.01348	0.0121	37.3
11:22 AM	30	21.3	28.0	25.0	12.20	0.01348	0.0086	35.9
11:52 AM	60	21.3	27.5	24.5	12.40	0.01348	0.0061	35.2
3:02 PM	250	21.5	27.0	24.0	12.40	0.01348	0.0030	34.5
10:52 AM	1440	21.3	25.0	22.0	12.70	0.01348	0.0013	31.6

## SIEVE ANALYSIS

STARTING WEIGHT: **70.03** gms. Container ID: **G** STARTING DRY WEIGHT: **69.66** gms.

Container + Soil: **29.37** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.29** gms.

Wt. of Container: **14.32** gms.

Hygroscopic Moisture: **0.53** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.15	0.2	99.8
#10	2.0000	0.48	0.7	99.3
#20	0.8500	0.92	1.3	98.0
#40	0.4250	1.17	1.7	97.7
#60	0.2500	2.18	3.1	96.2
#100	0.1500	18.46	26.4	73.1
#200	0.0750	38.58	55.1	44.6
	0.0326			39.9
	0.0209			38.5
	0.0121			37.1
	0.0086			35.6
	0.0061			34.9
	0.0030			34.2
	0.0013			31.4

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**

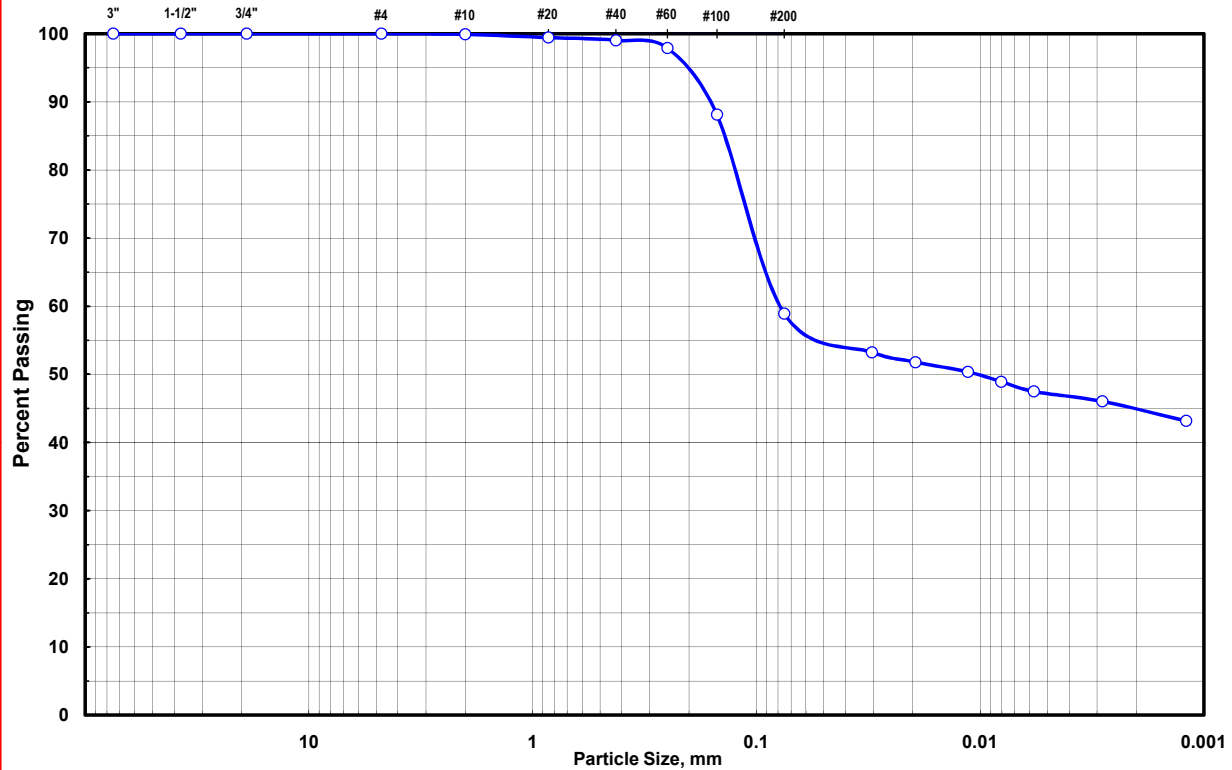




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Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	48	% Pass No. 200:	58.9
Client:	ERM	Plastic Limit:	19	% Moisture:	19.1
Project No.:	16-S-217	Plasticity Index:	29	Test Method:	ASTM D-422
Sample ID:	JKS-48, 15'-16.5'	Tested By:	MC	Date Tested:	4/29/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Sandy Lean Clay (CL)	Date Checked:	5/13/2016		

# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 4/29/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JK-48, 15'-16.5' SAMPLE DESCRIPTION: Sandy Lean Clay (CL)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.65 (estimated) DRY WEIGHT OF SOIL: 70.03

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 1.00

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
11:02 AM	0							
11:04 AM	2	21.2	40.0	37.0	10.20	0.01348	0.0304	53.3
11:07 AM	5	21.2	39.0	36.0	10.40	0.01348	0.0194	51.9
11:17 AM	15	21.2	38.0	35.0	10.60	0.01348	0.0113	50.4
11:32 AM	30	21.2	37.0	34.0	10.70	0.01348	0.0081	49.0
12:02 PM	60	21.2	36.0	33.0	10.90	0.01348	0.0057	47.5
3:12 PM	250	21.4	35.0	32.0	11.10	0.01348	0.0028	46.1
11:02 AM	1440	21.2	33.0	30.0	11.40	0.01348	0.0012	43.2

## SIEVE ANALYSIS

STARTING WEIGHT: **70.03** gms. Container ID: **H** STARTING DRY WEIGHT: **69.43** gms.

Container + Soil: **29.39** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.26** gms.

Wt. of Container: **14.34** gms.

Hygroscopic Moisture: **0.87** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	0.06	0.1	99.9
#20	0.8500	0.33	0.5	99.4
#40	0.4250	0.61	0.9	99.0
#60	0.2500	1.41	2.0	97.9
#100	0.1500	8.26	11.8	88.1
#200	0.0750	28.74	41.0	58.9
	0.0304			53.2
	0.0194			51.8
	0.0113			50.4
	0.0081			48.9
	0.0057			47.5
	0.0028			46.1
	0.0012			43.2

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**

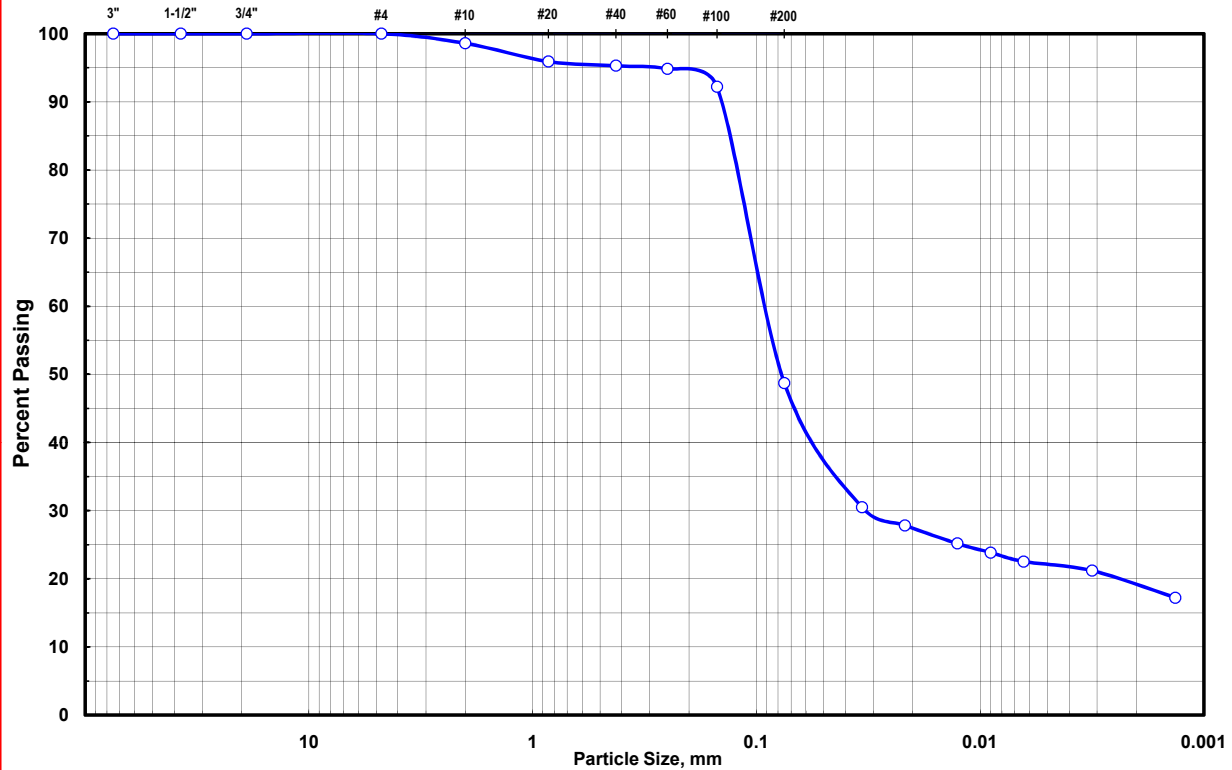




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416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Laboratory Testing - GW Investigation / CPS Calaveras Station	Liquid Limit:	26	% Pass No. 200:	48.7
Client:	ERM	Plastic Limit:	16	% Moisture:	25.2
Project No.:	16-S-217	Plasticity Index:	10	Test Method:	ASTM D-422
Sample ID:	JKS-48, 19'-20'	Tested By:	MC	Date Tested:	5/2/2016
Remarks:	ERM Project #: 0337367	Checked By:	BFM		
Description:	Clayey Sand (SC)	Date Checked:	5/13/2016		

# HYDROMETER ANALYSIS

CLIENT: ERM PROJECT: CPS Calaveras Station DATE: 5/2/2016

DATE SAMPLED: 04/12/16 LABORATORY I.D. NO: \_\_\_\_\_

SAMPLE LOCATION: JK-48, 19'-20' SAMPLE DESCRIPTION: Sandy Lean Clay (CL)

DISPERSING AGENT: Sodium Hexametaphosphate COMPOSITE CORRECTION: 3

SPECIFIC GRAVITY OF SOIL: 2.65 (estimated) DRY WEIGHT OF SOIL: 75.02

GRADUATE: 1000 ML HYDROMETER: 152H a VALUE: 1.00

TIME OF READING	ELAPSED TIME (min)	TEMP READING (C)	ACTUAL HYDROMETER READING	CORRECTED HYDROMETER READING (Composite Reading)	EFFECTIVE DEPTH L, cm	VALUE OF K	DIAMETER OF PARTICLE SIZE, mm	PERCENT FINER
10:42 AM	0							
10:44 AM	2	21.2	26.0	23.0	12.50	0.01348	0.0337	30.9
10:47 AM	5	21.2	24.0	21.0	12.90	0.01348	0.0217	28.2
10:57 AM	15	21.2	22.0	19.0	13.20	0.01348	0.0126	25.5
11:12 AM	30	21.2	21.0	18.0	13.30	0.01348	0.0090	24.2
11:42 AM	60	21.2	20.0	17.0	13.50	0.01348	0.0064	22.9
2:52 PM	250	21.4	19.0	16.0	13.70	0.01348	0.0032	21.5
10:42 AM	1440	21.2	16.0	13.0	14.20	0.01348	0.0013	17.5

## SIEVE ANALYSIS

STARTING WEIGHT: **75.02** gms. Container ID: **F** STARTING DRY WEIGHT: **74.37** gms.

Container + Soil: **29.36** gms. (corrected for hygroscopic moisture)

Container + Dry Soil: **29.23** gms.

Wt. of Container: **14.32** gms.

Hygroscopic Moisture: **0.87** %

SIEVE SIZE	PARTICLE SIZE, mm	CUMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
3"	75.0000	0.00	0.0	100.0
1-1/2"	37.5000	0.00	0.0	100.0
3/4"	19.0000	0.00	0.0	100.0
#4	4.7500	0.00	0.0	100.0
#10	2.0000	1.06	1.4	98.6
#20	0.8500	2.04	2.7	95.9
#40	0.4250	2.50	3.3	95.3
#60	0.2500	2.85	3.8	94.8
#100	0.1500	4.83	6.4	92.2
#200	0.0750	37.93	50.6	48.7
	0.0337			30.5
	0.0217			27.8
	0.0126			25.2
	0.0090			23.9
	0.0064			22.5
	0.0032			21.2
	0.0013			17.2

HYDROMETER ANALYSIS CALCULATION.XLS

**Particle Size Analysis of Soils (ASTM D-422)**





## TABLE 1 LABORATORY TEST SUMMARY

PAGE 1 OF 1

**PROJECT:** Phase II - CCR Well Network Installation  
**LOCATION:** CPS Calaveras Power Station  
 San Antonio, Texas  
**CLIENT:** Environmental Resources Management

**HTS PROJECT NO.:** 16-S-370

**ERM PROJECT #:** 0366643

Sample ID	Sample Depth (feet)	Type of Material	Moisture Content (%)	Bulk Density (pcf)	Atterberg Limits (%)			-200 Sieve* (%)	Coefficient of Permeability, k (cm/sec)	Solids Specific Gravity	Remarks
					LL	PL	PI				
JKS-53	10-12.5	Clayey Sand (SC)	24.2	101.8	30	14	16	35.9	5.34E-06	2.68	10'-12.5': Particle Size Analysis (ASTM D421)
	12.5-15	Clayey Sand (SC)	23.6	97.1	29	15	14	48.8	4.13E-08	2.68	12.5'-15': Particle Size Analysis (ASTM D421)
	20-21	Clayey Sand (SC)	29.5		27	14	13	37.6			20'-21': Particle Size Analysis (ASTM D422)
JKS-54	13-14	Silty Clayey Sand (SC-SM)	25.5		22	15	7	33.5			13'-14': Particle Size Analysis (ASTM D422)
JKS-58	26-27	Sandy Lean Clay (CL)	22.7		38	18	20	50.9			26'-27': Particle Size Analysis (ASTM D422)
	30-32.5	Fat Clay (CH)	20.3	100.0	57	20	37	89.1	1.53E-07	2.72	30'- 32.5': Particle Size Analysis (ASTM D421)
JKS-62	35-37	Clayey Sand (SC)	18.4	93.8	38	17	21	32.3	6.63E-07	2.68	35'-37': Particle Size Analysis (ASTM D421)
JKS-64	20-30	Clayey Sand (SC)	28.6		29	14	15	30.1			20'-30': Particle Size Analysis (ASTM D422)
<i>ASTM D 421: Particle Size Analysis without Hydrometer</i> <i>ASTM D 422: Particle Size Analysis With Hydrometer</i>  * From Particle Size Analysis testing											





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 Tel: (713) 692-8373 Fax: (713) 692-8501

**SPECIFIC GRAVITY OF SOIL SOLIDS**

(ASTM D-854)

Project No:	16-S-370	Project Name:	Laboratory Testing, CCR Well Network/CPS Calaveras Station, ERM Project No. 0366643
Technician:	M. Coronado	Testing Date:	10/05/2016 and 10/06/2016

**LABORATORY TEST DATA/ RESULTS**

Sample ID: JKS-53, 10'-12.5'		Sample: JKS-53, 12.5'-15'		Sample: JKS-58, 30'-32.5'		Sample: JKS-62, 35'-37'	
Flask No.	A-1	Flask No.	B-1	Flask No.	C-1	Flask No.	D-1
Flask Weight (gms)	169.35	Flask Weight (gms)	169.41	Flask Weight (gms)	174.29	Flask Weight (gms)	171.31
Weight of Dry Soil (gms)	75.18	Weight of Dry Soil (gms)	75.05	Weight of Dry Soil (gms)	50.10	Weight of Dry Soil (gms)	75.08
Wt. Flask and Water (gms)	667.02	Wt. Flask and Water (gms)	667.28	Wt. Flask and Water (gms)	672.37	Wt. Flask and Water (gms)	669.05
Wt. Flask+Water+Soil (gms)	714.16	Wt. Flask+Water+Soil (gms)	714.36	Wt. Flask+Water+Soil (gms)	704.03	Wt. Flask+Water+Soil (gms)	716.07
Volume of Flask at 20° (ml)	500.0	Volume of Flask at 20° (ml)	500.0	Volume of Flask at 20° (ml)	500.0	Volume of Flask at 20° (ml)	500.0
Container No.	40	Container No.	41	Container No.	42	Container No.	43
Wt. of Container (gms)	30.43	Wt. of Container (gms)	30.53	Wt. of Container (gms)	30.55	Wt. of Container (gms)	30.40
Wt. of Container + Soil (gms)	105.61	Wt. of Container + Soil (gms)	105.58	Wt. of Container + Soil (gms)	80.65	Wt. of Container + Soil (gms)	105.48
Temperature ( °C )	22.8	Temperature ( °C )	22.7	Temperature ( °C )	22.5	Temperature ( °C )	22.4
Specific Gravity:	<b>2.681</b>	Specific Gravity:	<b>2.683</b>	Specific Gravity:	<b>2.717</b>	Specific Gravity:	<b>2.676</b>

Checked By: BFM      Date: 10/12/16





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**FALLING HEAD / RISING TAIL HYDRAULIC CONDUCTIVITY TEST**  
 ( ASTM D-5084-03 )

Project No:	16-S-370	Sample Identification:	JKS-53, Depth = 10'-12.5'
Technician:	M. Coronado	Sample Description:	Tan and brown CLAYEY SAND (SC)

**Project: Laboratory Testing, CCR Well Network/CPS Calaveras Station (ERM Project No. 0366643)**

INITIAL CONDITIONS				FINAL CONDITIONS			
WATER CONTENT		SPECIMEN DATA		WATER CONTENT		SPECIMEN DATA	
Tare No.:	54	Length, in:	2.062	Tare No.:	40	Length, in:	2.030
Wet+Tare, gms:	131.44	Diameter, in:	2.725	Wet+Tare, gms:	131.44	Diameter, in:	2.738
Dry+Tare, gms:	111.76	Wet mass, gms:	397.05	Dry+Tare, gms:	111.66	Wet mass, gms:	394.94
Tare Weight, gms:	30.56	Area, cm <sup>2</sup> :	37.63	Tare Weight, gms:	30.42	Area, cm <sup>2</sup> :	37.99
Moisture, %	24.2	Volume, cc:	197.1	Moisture, %	24.3	Volume, cc:	195.9
		Unit wet wt, pcf:	125.7			Unit wet wt, pcf:	125.8
Specific Gravity:	2.681	Unit dry wt, pcf:	101.2	Specific Gravity:	2.681	Unit dry wt, pcf:	101.2
Saturation, %:	99.5	Void Ratio:	0.653	Saturation, %:	99.8	Void Ratio:	0.653
Perm. Cell No.:	5	Burret diam, cm:	1.06	Burret area, cm <sup>2</sup> :	1.06	Burret factor, cm/cc:	1.009
Cell Pressure, psi:	5.0	Head Pressure, psi:	2.0	Tail Pressure, psi:	1.0	Hydraulic Gradient:	16.9

**PERMEABILITY MEASUREMENTS**

Date	Time	Elapsed Time (sec)	Temp (C)	Pressure Diff. (psi)	Head Rdg (cc)	Tail Rdg (cc)	Head Change (cm)	Tail Change (cm)	Total Head (cm)	Permeability Kt (cm/sec)	Permeability K <sub>20</sub> (cm/sec)
10/6/2016	9:30a	0	23.6	1.0	2.00	20.00	0.000	0.000	88.46	0.00E+00	0.00E+00
10/6/2016	9:35a	300	23.6	1.0	3.00	19.00	1.009	1.009	86.44	5.53E-06	5.07E-06
10/6/2016	9:40a	300	23.6	1.0	4.20	17.60	1.211	1.413	83.82	7.39E-06	6.77E-06
10/6/2016	9:45a	300	23.6	1.0	5.10	16.50	0.908	1.110	81.80	5.84E-06	5.36E-06
10/6/2016	9:50a	300	23.6	1.0	6.00	15.80	0.908	0.706	80.19	4.78E-06	4.38E-06
10/6/2016	9:55a	300	23.6	1.0	7.00	14.80	1.009	1.009	78.17	6.11E-06	5.60E-06
10/6/2016	10:00a	300	23.6	1.0	8.00	13.70	1.009	1.110	76.05	6.59E-06	6.04E-06

Coefficient of Permeability, k = **5.34E-06** cm/sec

Performed By: MC Date: 10/3/2016 Checked By: BFM Date: 10/12/16



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## FALLING HEAD / RISING TAIL HYDRAULIC CONDUCTIVITY TEST ( ASTM D-5084-03 )

Project No:	16-S-370	Sample Identification:	JKS-53, Depth = 12.5'-15'
Technician:	M. Coronado	Sample Description:	Light brown and brown CLAYEY SAND (SC)

### Project: Laboratory Testing, CCR Well Network/CPS Calaveras Station (ERM Project No. 0366643)

INITIAL CONDITIONS				FINAL CONDITIONS			
WATER CONTENT		SPECIMEN DATA		WATER CONTENT		SPECIMEN DATA	
Tare No.:	53	Length, in:	2.095	Tare No.:	43	Length, in:	2.095
Wet+Tare, gms:	136.44	Diameter, in:	2.705	Wet+Tare, gms:	132.79	Diameter, in:	2.703
Dry+Tare, gms:	116.19	Wet mass, gms:	393.77	Dry+Tare, gms:	112.35	Wet mass, gms:	393.23
Tare Weight, gms:	30.54	Area, cm <sup>2</sup> :	37.08	Tare Weight, gms:	30.41	Area, cm <sup>2</sup> :	37.02
Moisture, %	23.6	Volume, cc:	197.3	Moisture, %	24.9	Volume, cc:	197.0
		Unit wet wt, pcf:	124.5			Unit wet wt, pcf:	124.6
Specific Gravity:	2.683	Unit dry wt, pcf:	100.7	Specific Gravity:	2.683	Unit dry wt, pcf:	99.7
Saturation, %:	95.8	Void Ratio:	0.662	Saturation, %:	98.5	Void Ratio:	0.679
Perm. Cell No.:	1	Burret diam, cm:	1.06	Burret area, cm <sup>2</sup> :	0.991	Burret factor, cm/cc:	1.009
Cell Pressure, psi:	5.0	Head Pressure, psi:	2.0	Tail Pressure, psi:	1.0	Hydraulic Gradient:	16.6

## PERMEABILITY MEASUREMENTS

Date	Time	Elapsed Time (sec)	Temp (C)	Pressure Diff. (psi)	Head Rdg (cc)	Tail Rdg (cc)	Head Change (cm)	Tail Change (cm)	Total Head (cm)	Permeability Kt (cm/sec)	Permeability K <sub>20</sub> (cm/sec)
10/6/2016	10:10a	0	23.9	1.0	2.00	20.00	0.000	0.000	88.46	0.00E+00	0.00E+00
10/6/2016	11:15a	3900	23.9	1.0	2.10	19.90	0.101	0.101	88.26	4.17E-08	3.79E-08
10/6/2016	12:15p	3600	23.9	1.0	2.20	19.80	0.101	0.101	88.06	4.53E-08	4.12E-08
10/6/2016	1:15p	3600	23.9	1.0	2.30	19.70	0.101	0.101	87.86	4.54E-08	4.13E-08
10/6/2016	2:15p	3600	23.9	1.0	2.40	19.60	0.101	0.101	87.65	4.55E-08	4.14E-08
10/6/2016	3:15p	3600	23.9	1.0	2.50	19.50	0.101	0.101	87.45	4.56E-08	4.14E-08

Coefficient of Permeability, k = **4.13E-08** cm/sec

Performed By: MC Date: 10/3/2016

Checked By: BFM Date: 10/12/16





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Houston, Texas 77091  
Tel: (713) 692-8373 Fax: (713) 692-8501

## FALLING HEAD / RISING TAIL HYDRAULIC CONDUCTIVITY TEST ( ASTM D-5084-03 )

Project No:	16-S-370	Sample Identification:	JKS-58, Depth = 30'-32.5'
Technician:	M. Coronado	Sample Description:	Dark gray FAT CLAY (CH)

**Project: Laboratory Testing, CCR Well Network/CPS Calaveras Station (ERM Project No. 0366643)**

INITIAL CONDITIONS				FINAL CONDITIONS			
WATER CONTENT		SPECIMEN DATA		WATER CONTENT		SPECIMEN DATA	
Tare No.:	51	Length, in:	1.932	Tare No.:	42	Length, in:	1.930
Wet+Tare, gms:	133.56	Diameter, in:	2.700	Wet+Tare, gms:	131.43	Diameter, in:	2.710
Dry+Tare, gms:	116.21	Wet mass, gms:	360.36	Dry+Tare, gms:	110.27	Wet mass, gms:	365.13
Tare Weight, gms:	30.56	Area, cm <sup>2</sup> :	36.94	Tare Weight, gms:	30.55	Area, cm <sup>2</sup> :	37.21
Moisture, %	20.3	Volume, cc:	181.3	Moisture, %	26.5	Volume, cc:	182.4
		Unit wet wt, pcf:	124.0			Unit wet wt, pcf:	124.9
Specific Gravity:	2.717	Unit dry wt, pcf:	103.2	Specific Gravity:	2.717	Unit dry wt, pcf:	98.7
Saturation, %:	85.5	Void Ratio:	0.644	Saturation, %:	100.4	Void Ratio:	0.717
Perm. Cell No.:	2	Burret diam, cm:	1.06	Burret area, cm <sup>2</sup> :	0.991	Burret factor, cm/cc:	1.009
Cell Pressure, psi:	7.0	Head Pressure, psi:	3.0	Tail Pressure, psi:	2.0	Hydraulic Gradient:	18.0

## PERMEABILITY MEASUREMENTS

Date	Time	Elapsed Time (sec)	Temp (C)	Pressure Diff. (psi)	Head Rdg (cc)	Tail Rdg (cc)	Head Change (cm)	Tail Change (cm)	Total Head (cm)	Permeability Kt (cm/sec)	Permeability K <sub>20</sub> (cm/sec)
10/6/2016	10:45a	0	23.7	1.0	2.00	20.00	0.000	0.000	88.46	0.00E+00	0.00E+00
10/6/2016	11:15a	1800	23.7	1.0	2.20	19.80	0.202	0.202	88.06	1.66E-07	1.52E-07
10/6/2016	11:30a	900	23.7	1.0	2.30	19.70	0.101	0.101	87.86	1.66E-07	1.52E-07
10/6/2016	11:45a	900	23.7	1.0	2.50	19.50	0.202	0.202	87.45	3.34E-07	3.05E-07
10/6/2016	12:45a	3600	23.7	1.0	2.80	19.30	0.303	0.202	86.95	1.05E-07	9.59E-08
10/6/2016	1:45p	3600	23.7	1.0	3.00	19.00	0.202	0.303	86.44	1.06E-07	9.64E-08
10/6/2016	2:45p	3600	23.7	1.0	3.30	18.70	0.303	0.303	85.84	1.27E-07	1.16E-07

Coefficient of Permeability, k = **1.53E-07** cm/sec

Performed By: MC Date: 10/3/2016 Checked By: BFM Date: 10/12/16





# HTS, Inc. Consultants

9416 Pickering Street  
Houston, Texas 77091  
Tel: (713) 692-8373 Fax: (713) 692-8501

## FALLING HEAD / RISING TAIL HYDRAULIC CONDUCTIVITY TEST ( ASTM D-5084-03 )

Project No:	16-S-370	Sample Identification:	JKS-62, Depth = 35'-37'
Technician:	M. Coronado	Sample Description:	Light brown and brown CLAYEY SAND (SC)

**Project: Laboratory Testing, CCR Well Network/CPS Calaveras Station (ERM Project No. 0366643)**

INITIAL CONDITIONS				FINAL CONDITIONS			
WATER CONTENT		SPECIMEN DATA		WATER CONTENT		SPECIMEN DATA	
Tare No.:	52	Length, in:	2.040	Tare No.:	41	Length, in:	2.033
Wet+Tare, gms:	133.74	Diameter, in:	2.695	Wet+Tare, gms:	135.61	Diameter, in:	2.700
Dry+Tare, gms:	117.68	Wet mass, gms:	347.14	Dry+Tare, gms:	114.90	Wet mass, gms:	357.91
Tare Weight, gms:	30.54	Area, cm <sup>2</sup> :	36.80	Tare Weight, gms:	30.53	Area, cm <sup>2</sup> :	36.94
Moisture, %	18.4	Volume, cc:	190.7	Moisture, %	24.5	Volume, cc:	190.7
		Unit wet wt, pcf:	113.6			Unit wet wt, pcf:	117.1
Specific Gravity:	2.676	Unit dry wt, pcf:	95.9	Specific Gravity:	2.676	Unit dry wt, pcf:	94.0
Saturation, %:	66.6	Void Ratio:	0.741	Saturation, %:	84.5	Void Ratio:	0.776
Perm. Cell No.:	3	Burret diam, cm:	1.06	Burret area, cm <sup>2</sup> :	0.991	Burret factor, cm/cc:	1.009
Cell Pressure, psi:	5.0	Head Pressure, psi:	2.0	Tail Pressure, psi:	1.0	Hydraulic Gradient:	17.1

## PERMEABILITY MEASUREMENTS

Date	Time	Elapsed Time (sec)	Temp (C)	Pressure Diff. (psi)	Head Rdg (cc)	Tail Rdg (cc)	Head Change (cm)	Tail Change (cm)	Total Head (cm)	Permeability Kt (cm/sec)	Permeability K <sub>20</sub> (cm/sec)
10/6/2016	10:30a	0	24.6	1.0	2.00	20.00	0.000	0.000	88.46	0.00E+00	0.00E+00
10/6/2016	10:40a	600	24.6	1.0	2.50	19.70	0.505	0.303	87.65	1.06E-06	9.44E-07
10/6/2016	10:50a	600	24.6	1.0	2.70	19.50	0.202	0.202	87.25	5.33E-07	4.75E-07
10/6/2016	11:00a	600	24.6	1.0	2.90	19.00	0.202	0.505	86.54	9.38E-07	8.37E-07
10/6/2016	11:10a	600	24.6	1.0	3.20	18.70	0.303	0.303	85.94	8.10E-07	7.23E-07
10/6/2016	11:20a	600	24.6	1.0	3.40	18.40	0.202	0.303	85.44	6.80E-07	6.06E-07
10/6/2016	11:30a	600	24.6	1.0	3.60	18.20	0.202	0.202	85.03	5.47E-07	4.88E-07

Coefficient of Permeability, k = **6.63E-07** cm/sec

Performed By: MC Date: 10/6/2016

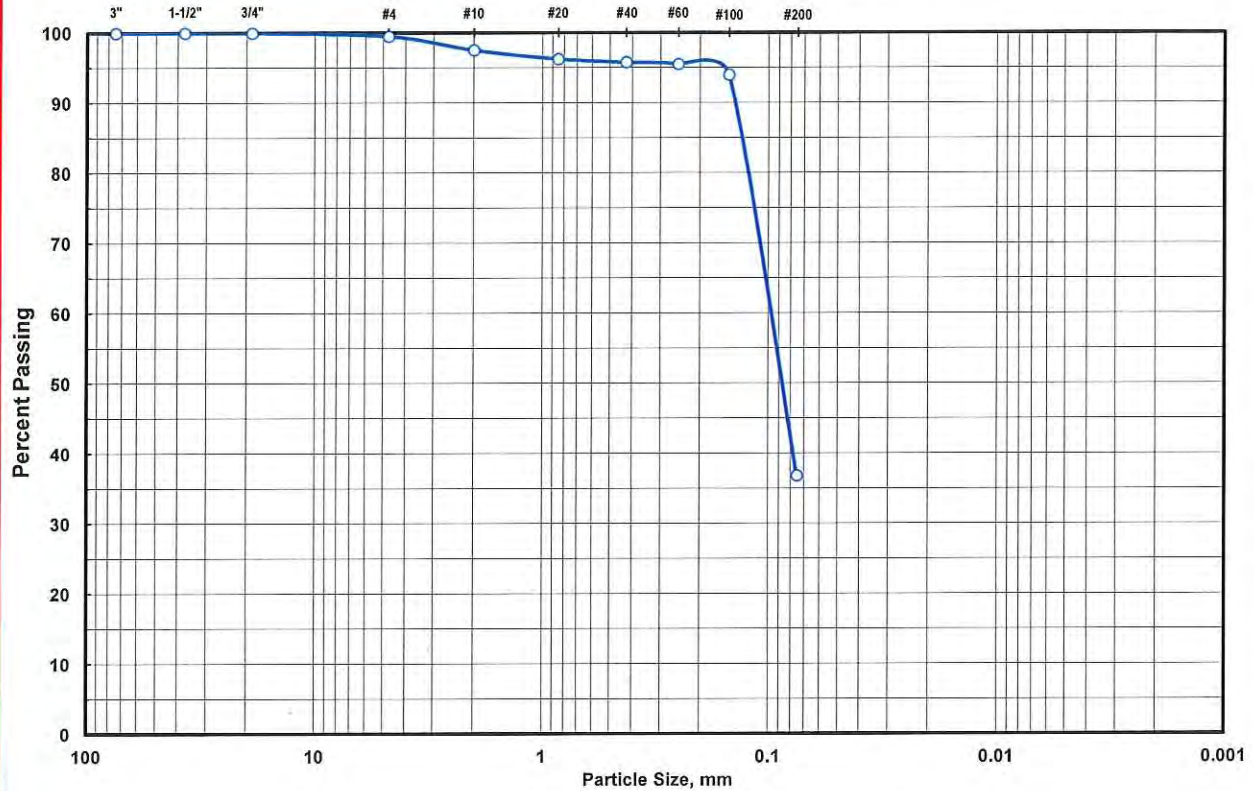
Checked By: BFM Date: 10/12/16



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416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE (ASTM D-421)



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	30	% Pass No. 200:	36.8
Client:	Environmental Resources Management	Plastic Limit:	14	% Moisture:	24.2
Project No.:	16-S-370	Plasticity Index:	16	Test Method:	ASTM D-421
Sample ID:	JKS- 53 , Depth = 10' - 12.5'	Tested By:	MC	Date Tested:	10/5/2016
Remarks:		Checked By:	BHA		
Description:	Tan and brown CLAYEY SAND (SC)	Date Checked:	10/12/2016		

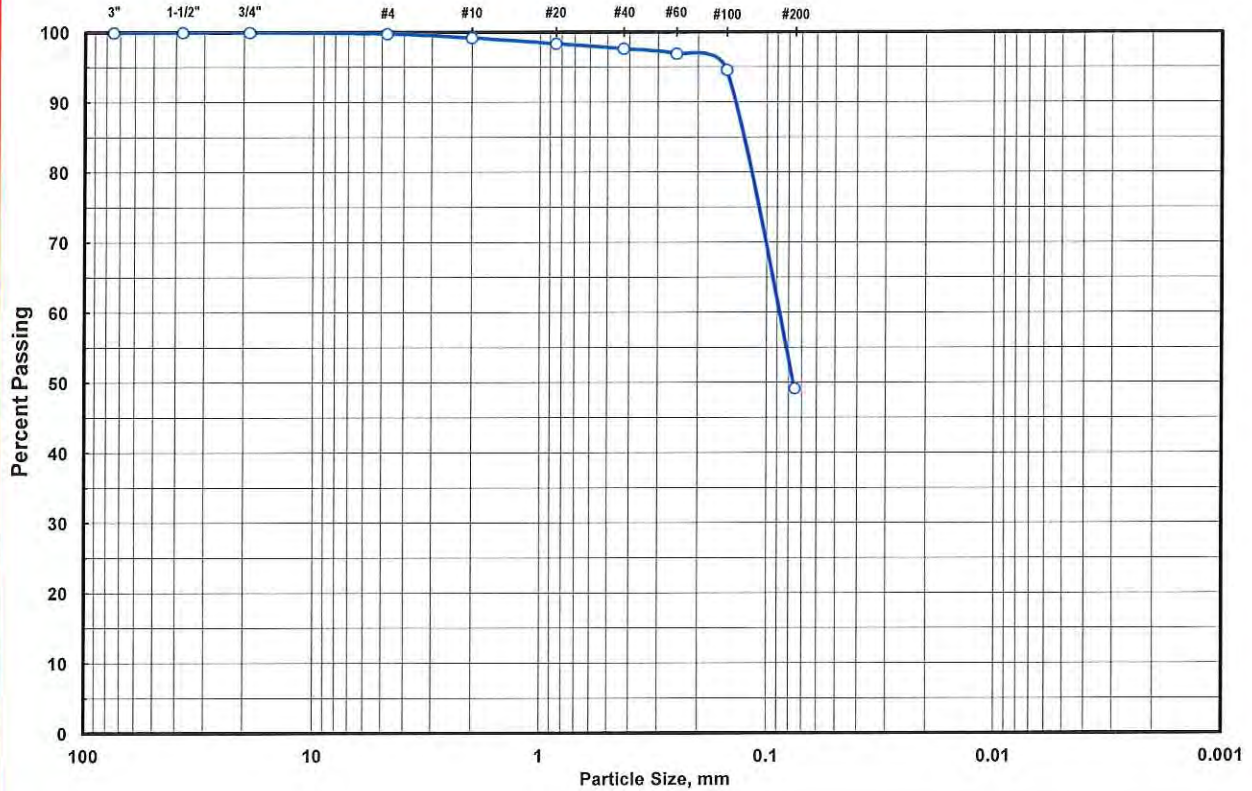




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Houston, Texas 77091  
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## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-421 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

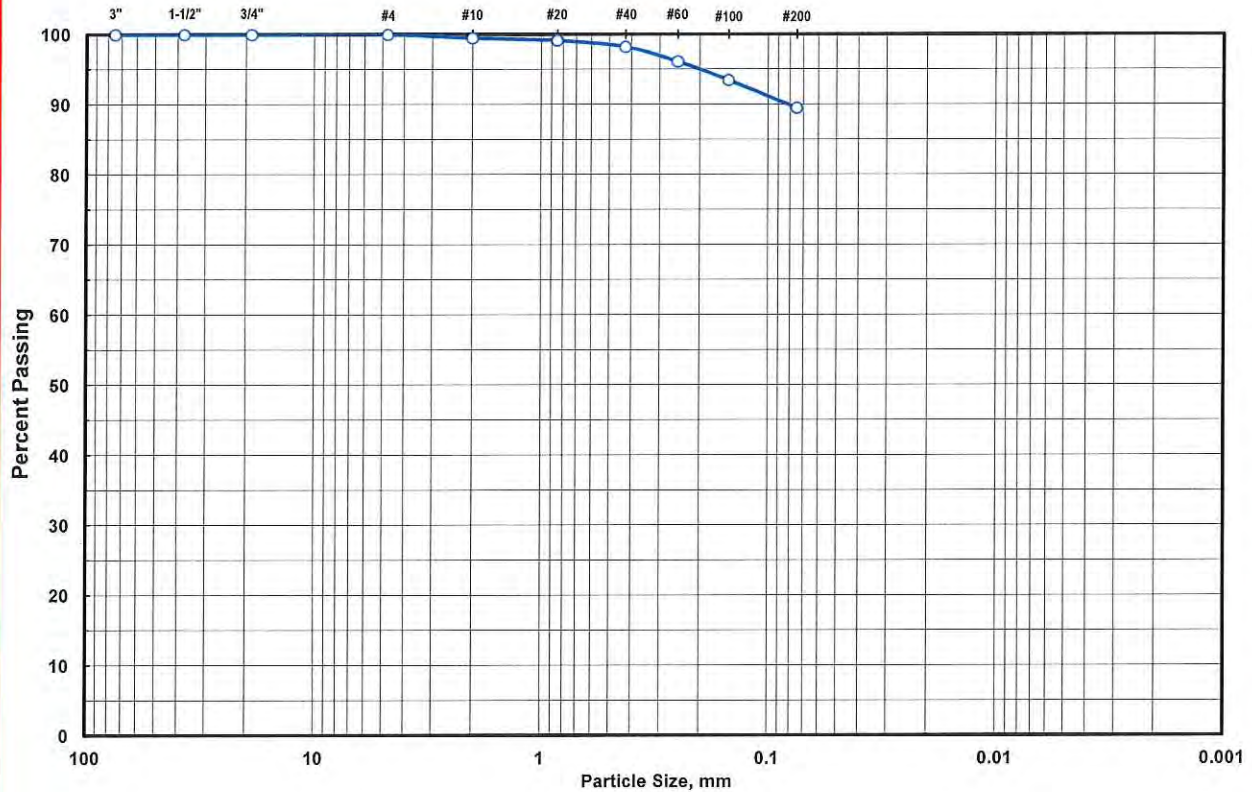
Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	29	% Pass No. 200:	49.2
Client:	Environmental Resources Management	Plastic Limit:	15	% Moisture:	23.6
Project No.:	16-S-370	Plasticity Index:	14	Test Method:	ASTM D-421
Sample ID:	JKS- 53 , Depth = 12.5' - 15'	Tested By:	MC	Date Tested:	10/5/2016
Remarks:		Checked By:	BHA		
Description:	Tan and brown CLAYEY SAND (SC)	Date Checked:	10/12/2016		



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## PARTICLE SIZE DISTRIBUTION CURVE (ASTM D-421)



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	57	% Pass No. 200:	89.5
Client:	Environmental Resources Management	Plastic Limit:	20	% Moisture:	20.3
Project No.:	16-S-370	Plasticity Index:	37	Test Method:	ASTM D-421
Sample ID:	JKS- 58 , Depth = 30' - 32.5'	Tested By:	MC	Date Tested:	10/5/2016
Remarks:		Checked By:	BHA		
Description:	Dark gray FAT CLAY (CH)	Date Checked:	10/12/2016		

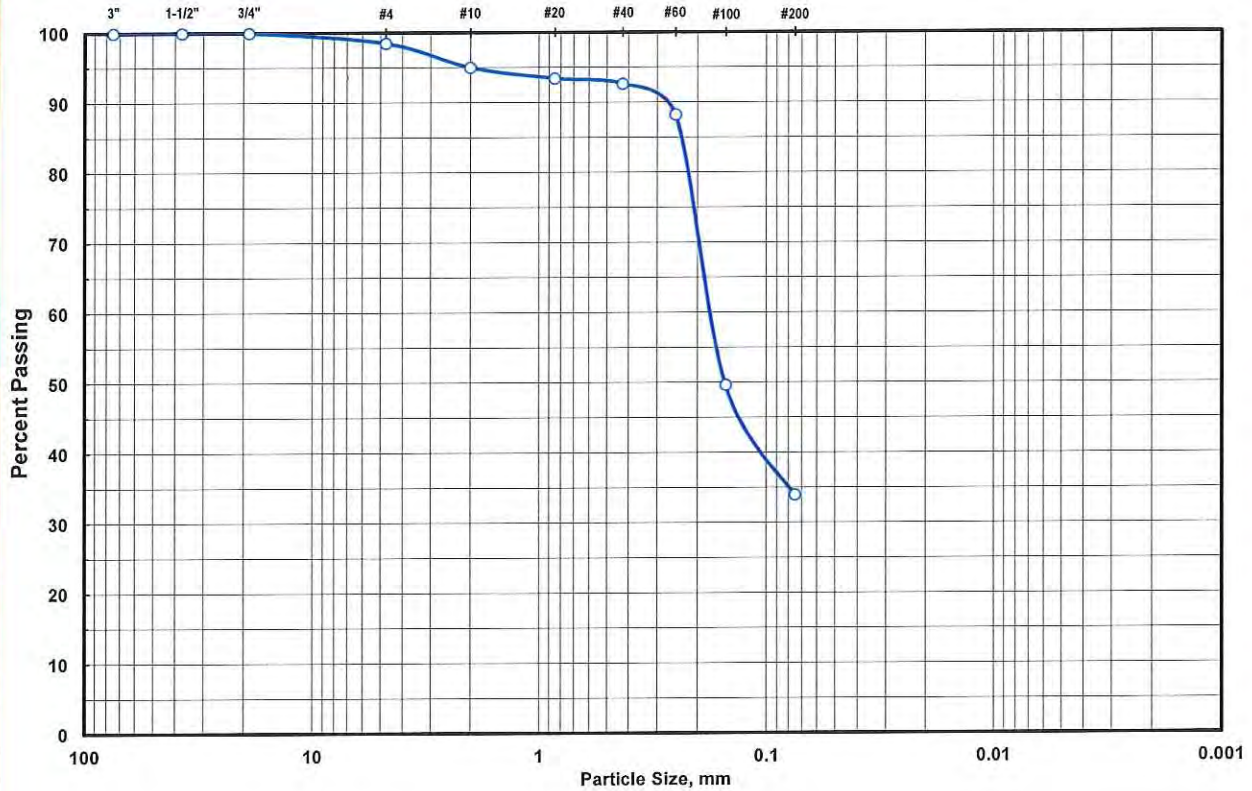




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Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE (ASTM D-421)



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

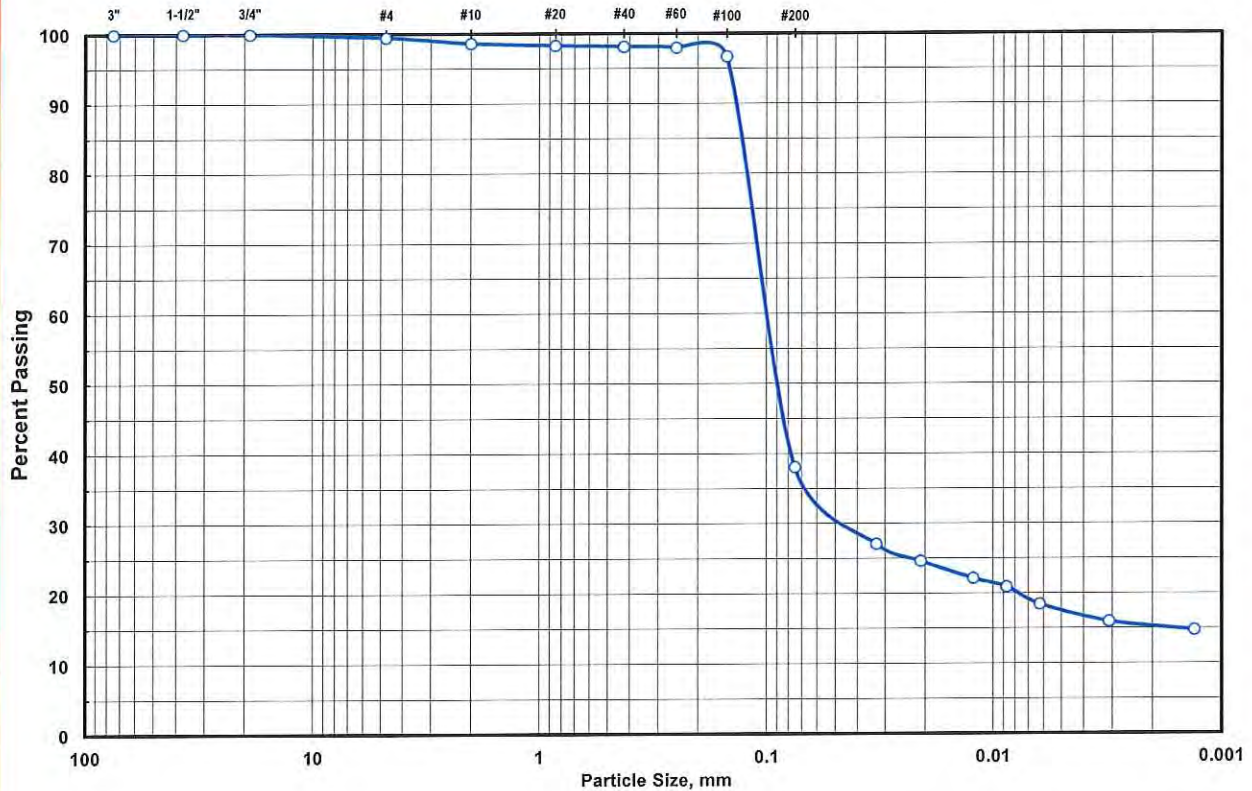
Project:	<b>Phase II - CCR Well Network Installation, CPS Calaveras Power Station</b>	Liquid Limit:	<b>38</b>	% Pass No. 200:	<b>34.0</b>
Client:	<b>Environmental Resources Management</b>	Plastic Limit:	<b>17</b>	% Moisture:	<b>18.4</b>
Project No.:	<b>16-S-370</b>	Plasticity Index:	<b>21</b>	Test Method:	<b>ASTM D-421</b>
Sample ID:	<b>JKS- 62 , Depth = 35' - 37'</b>	Tested By:	<b>MC</b>	Date Tested:	<b>10/5/2016</b>
Remarks:		Checked By:	<b>BHA</b>		
Description:	<b>Light brown and brown CLAYEY SAND (SC)</b>	Date Checked:	<b>10/12/2016</b>		



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Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE (ASTM D-422)



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	27	% Pass No. 200:	38.1
Client:	Environmental Resources Management	Plastic Limit:	14	% Moisture:	29.5
Project No.:	16-S-370	Plasticity Index:	13	Test Method:	ASTM D-422
Sample ID:	JKS- 53 , Depth = 20' - 21'	Tested By:	MC	Date Tested:	10/4/2016
Remarks:		Checked By:	BHA		
Description:	Tan and light brown CLAYEY SAND (SC)	Date Checked:	10/12/2016		

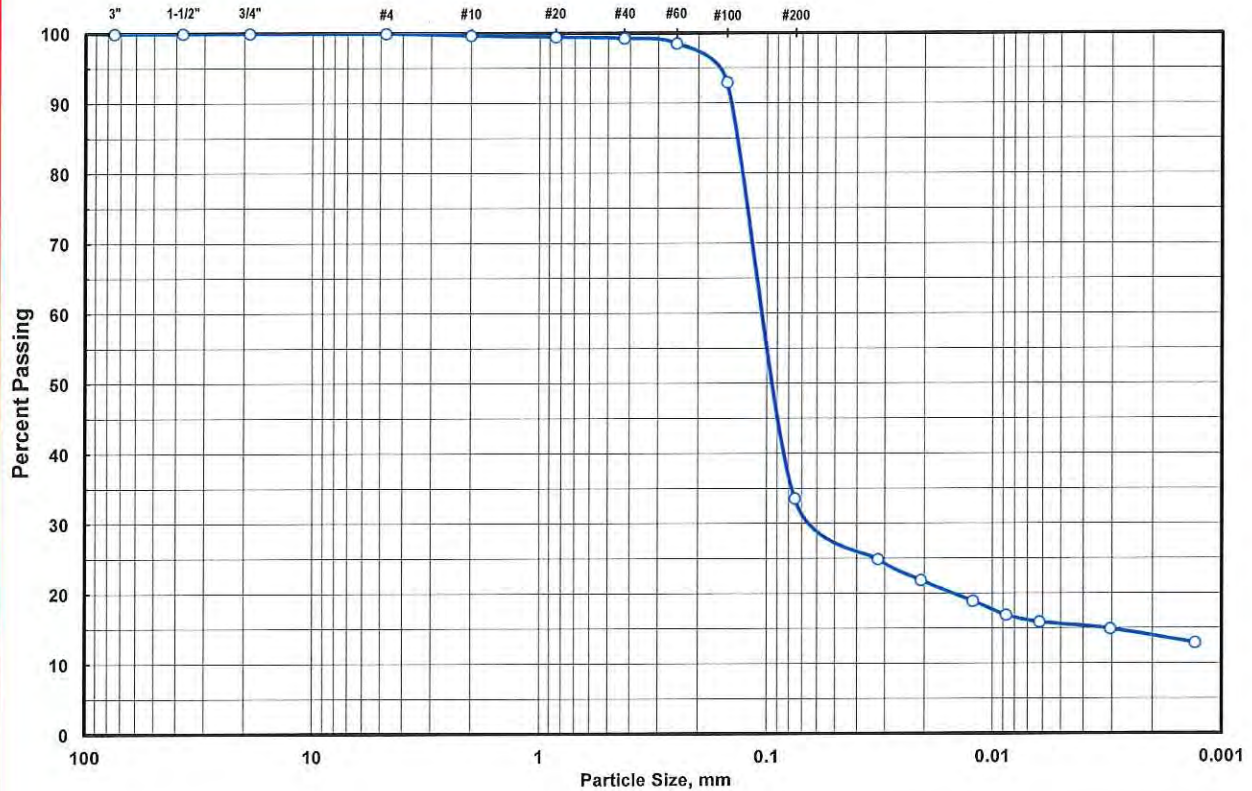




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416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

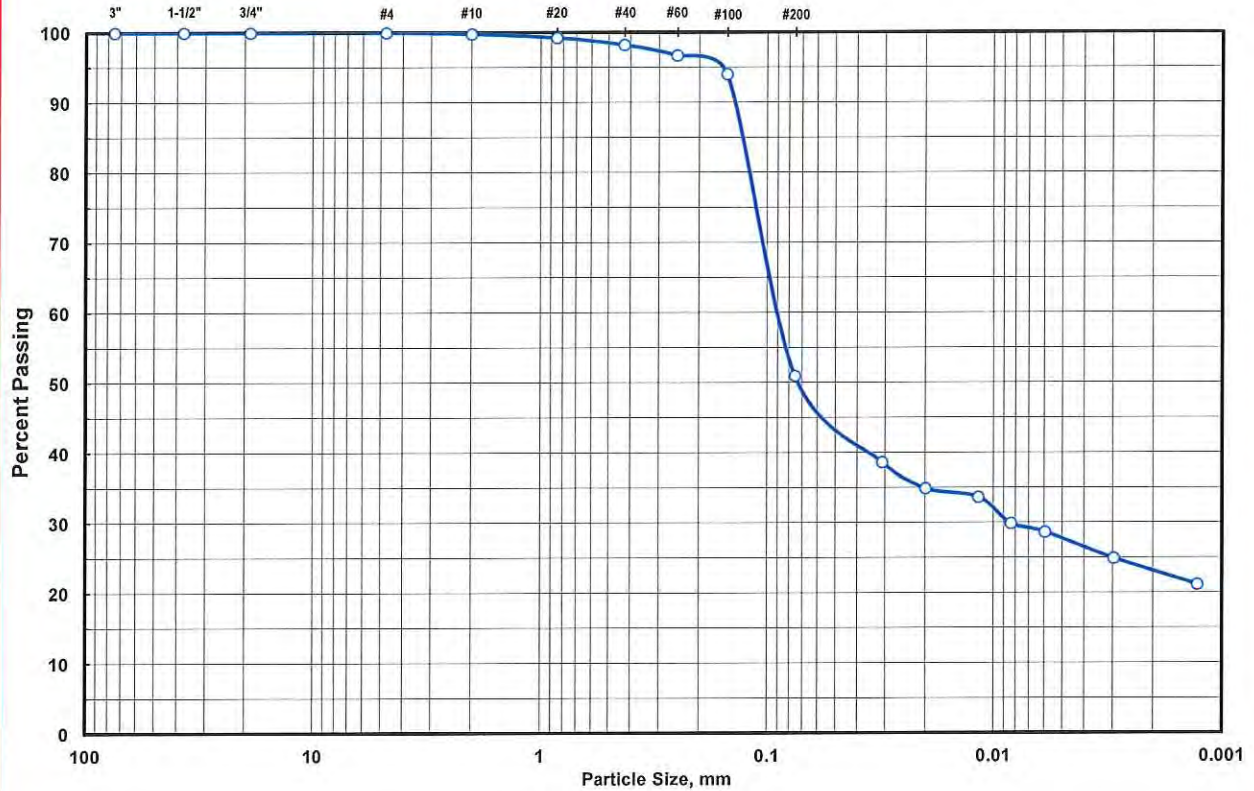
Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	22	% Pass No. 200:	33.6
Client:	Environmental Resources Management	Plastic Limit:	15	% Moisture:	25.5
Project No.:	16-S-370	Plasticity Index:	7	Test Method:	ASTM D-422
Sample ID:	JKS- 54 , Depth = 13' - 14'	Tested By:	MC	Date Tested:	10/4/2016
Remarks:		Checked By:	BHA		
Description:	Light brown and tan SILTY CLAYEY SAND (SC-SM)	Date Checked:	10/12/2016		



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416 Pickering Street  
Houston, Texas 77091  
Ph: 713-692-8373 Fax: 713-692-8502

## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	<b>Phase II - CCR Well Network Installation, CPS Calaveras Power Station</b>	Liquid Limit:	<b>38</b>	% Pass No. 200:	<b>51.0</b>
Client:	<b>Environmental Resources Management</b>	Plastic Limit:	<b>18</b>	% Moisture:	<b>22.7</b>
Project No.:	<b>16-S-370</b>	Plasticity Index:	<b>20</b>	Test Method:	<b>ASTM D-422</b>
Sample ID:	<b>JKS- 58 , Depth = 26' - 27'</b>	Tested By:	<b>MC</b>	Date Tested:	<b>10/4/2016</b>
Remarks:		Checked By:	<b>BHA</b>		
Description:	<b>Tan and brown SANDY LEAN CLAY (CL)</b>	Date Checked:	<b>10/12/2016</b>		



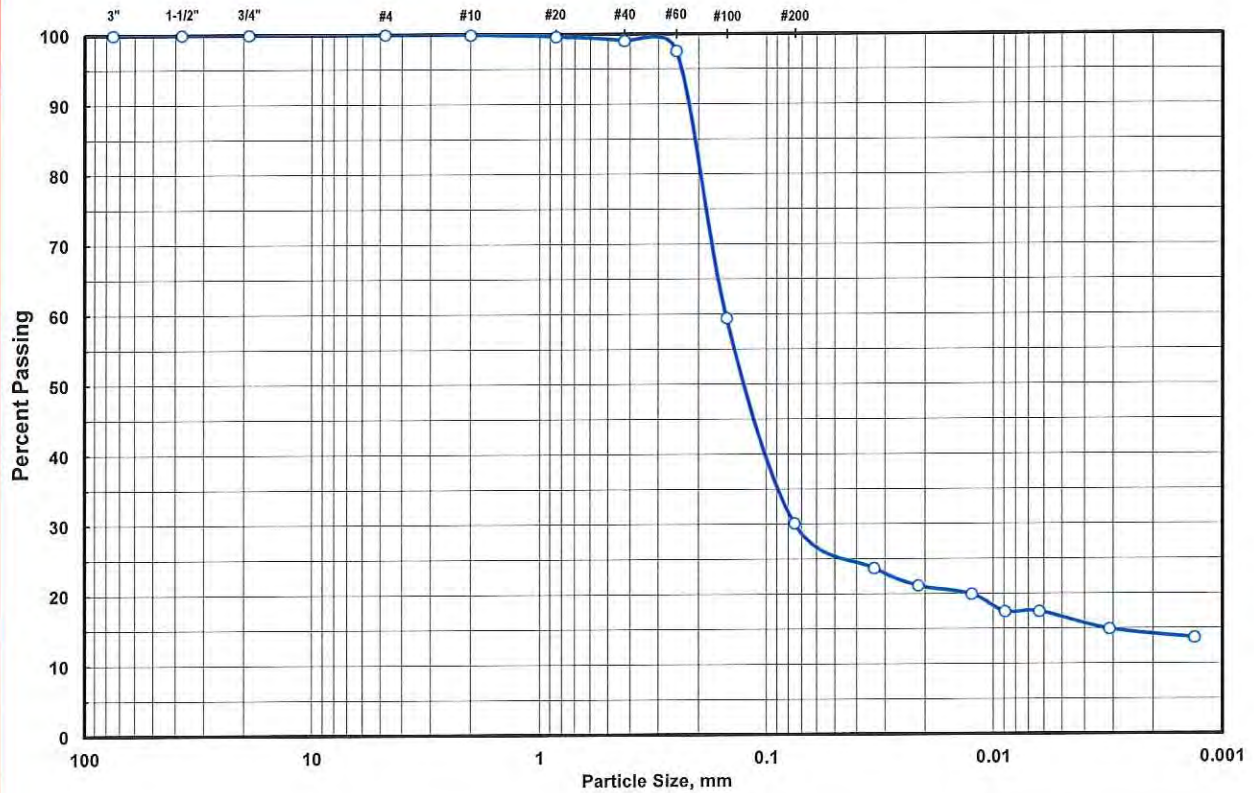


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## PARTICLE SIZE DISTRIBUTION CURVE ( ASTM D-422 )



GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		

### ASTM D-2487 SOIL CLASSIFICATION

Project:	Phase II - CCR Well Network Installation, CPS Calaveras Power Station	Liquid Limit:	29	% Pass No. 200:	30.2
Client:	Environmental Resources Management	Plastic Limit:	14	% Moisture:	28.6
Project No.:	16-S-370	Plasticity Index:	15	Test Method:	ASTM D-422
Sample ID:	JKS- 64 , Depth = 20' - 30'	Tested By:	MC	Date Tested:	10/4/2016
Remarks:		Checked By:	BHA		
Description:	Dark brown CLAYEY SAND (SC)	Date Checked:	10/12/2016		

**Groundwater Monitoring System Certification**  
*Appendix C*

**Environmental Resources Management**  
206 East 9<sup>th</sup> Street, Suite 1700  
Austin, Texas 78701  
(512) 459-4700

**GROUNDWATER MONITORING SYSTEM CERTIFICATION**

**40 CFR §257.91(f)**

**Calaveras Power Station**

**San Antonio, Texas**

**CPS Energy**

The owner or operator must obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of 40 CFR §257.91.

According to 40 CFR §257.91(a), the groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that:

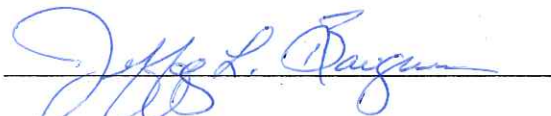
1. Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit; and
2. Accurately represent the quality of groundwater passing the waste boundary of the CCR unit.

40 CFR §257.91(b) states that the number, spacing, and depths of groundwater monitoring system must be determined based upon site-specific technical information that must include a characterization of:

- (1) Aquifer thickness, groundwater flow rate, groundwater flow direction; and
- (2) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer.

*CERTIFICATION*

I hereby certify that the groundwater monitoring systems for the CCR units located at the Calaveras Power Station have been designed and constructed to meet the requirements of 40 CFR §257.91.



Jeffery L. Bauguss, P.E.

Texas Licensed Professional Engineer No. 86195



10/16/19